Application No.

INFORMATION BULLETIN
AND
APPLICATION FORM

JOINT CSIR – UGC TEST FOR
JUNIOR RESEARCH FELLOWSHIP
AND
ELIGIBILITY FOR LECTURESHIP

NATIONAL ELIGIBILITY TEST (NET),
DECEMBER, 2012

EXAMINATION UNIT
HUMAN RESOURCE DEVELOPMENT GROUP
COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH
CSIR COMPLEX, LIBRARY AVENUE, PUSA
NEW DELHI-110012

Price : Rs. 400 for General Category.
Rs. 200 for OBC Category.
Rs. 100 for SC/ST/PH/VH Category.

HOW TO OBTAIN THE APPLICATION FORM AND EXAMINATION FEE PAYABLE

BY HAND:

Candidates applying for the Test may obtain the Information Bulletin and Application forms (inclusive of fee payable) through the notified branches of the Bank (App V) from Tuesday, 21st August, 2012 upto Tuesday the 18th September, 2012 by paying the following fee in cash:

	CATEGORY	***FEES***
1.	General (GEN)	- Rs. 400/-
2.	Other Backward Classes (OBC) (Non Creamy Layer)	- Rs. 200/-
3.	Scheduled Caste (SC) /Scheduled Tribe (ST)/ Physically handicapped (PH) or visually handicapped (VH)	- Rs. 100/-

BY POST:

The information Bulletin and Application Form may also be obtained through post from the **Indian Bank, 3/1, West Patel Nagar, New Delhi-110 008** (Ph. No. 011-25888257) by sending a crossed Demand draft for Rs. 400/-, Rs. 200/- or Rs.100/- (as the case may be) drawn in favour of **"Indian Bank, West Patel Nagar, New Delhi."** For this purpose, the candidate should send a request to the Bank with TWO address slips clearly mentioning the address at which he/she desires the Information Bulletin and Application Form **to be sent by Value Payable Post (V.P.P.)** The above mentioned Bank will entertain the request for forms through post between Tuesday the 21st August, 2012 and the Monday, the 10th September, 2012.

The candidate should write his/her name, Date of Birth, address, Date of Examination (23.12.2012) and subject code on the back of the Demand Draft so that it can be located easily, if it gets detached accidentally from the letter of request for supply of Information Bulletin. However, before attaching the draft with letter of request, the candidates should check that it bears the code number of the issuing bank and drawee bank and also amount and signatures of issuing authority.

Examination fee paid for this examination will neither be adjusted for any subsequent examination nor refunded under any circumstances.

ENCLOSURES REQUIRED WITH THE APPLICATION FORM

1. One passport size recent (not later than 6 months) black and white photograph (pasted on the application form and signed across by the candidate).
2. Wherever applicable, an attested copy of PHYSICALLY or VISUALLY HANDICAP or SC/ST/OBC certificate in the prescribed form (App II or III as the case may be).

TO AVOID DISLOCATION, PLACE THE APPLICATION FORM AND THE ABOVE ENCLOSURE(S) IF ANY, SAFELY IN THE ENVELOPE PROVIDED WITH THE BULLETIN. USE PAPER CLIPS ONLY. ***PLEASE DO NOT USE STAPLER PINS OR THREAD STRING TO TIE THE DOCUMENTS WITH THE APPLICATION FORM.***

Candidate should detach the form of 'Postal Certificate' from the back-cover page of bulletin and keep it secured with them after getting it signed and stamped from the Post Office from where the Application was dispatched.

WHERE TO SEND THE COMPLETED APPLICATION FORM

The application form, duly completed with requisite enclosures & fixing requisite postage stamp on the mailing envelope should be sent to the **Sr. Controller of Examination, Examination Unit, Human Resource Development Group, CSIR Complex, (Opposite Institute of Hotel Management), Library Avenue, Pusa, New Delhi 110012** ***only Under Certificate of Posting (U.P.C.) / ordinary post so as to reach this Unit on or before Monday, The 24.09.2012 (Monday the 01.10.2012 for remote areas given in Para 7 of this bulletin).***

WHEN TO EXPECT THE ADMISSION CERTIFICATE

Admission Certificates for the Test indicating the time schedule and also the venue of Test will be issued to all the candidates about 3 weeks before the date of Test. In order to ensure prompt delivery of Admission Cards the candidates should give their complete and correct Postal address (in block letters) in space provided in the application form. **Alphabetic list of the candidates registered for December, 2012 (NET) will be displayed on our website : http://www.csirhrdg.res.in tentatively on 23rd November, 2012.**

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APPENDICES

SAMPLE ENCLOSURES

OTHER IMPORTANT ENCLOSURES

i) Application Form for the Joint CSIR-UGC NET Test December, 2012

ii) Certificate of Posting (to be detached if applicable from the back cover page)

iii) Envelope with CSIR address (for submission of duly filled in application form)

PLEASE NOTE

1. **Mode of dispatch of duly filled in Application Form : - *'Under Certificate of Posting' (U.P.C.) / ordinary post*.**

2. Alphabetic list of the candidates registered for December, 2012 NET will be displayed on our website **http://www.csirhrdg.res.in** tentatively on 23rd November, 2012. Candidates may check their registration with the above list, within the notified period, failing which, shall be the responsibility of the candidate.

3. Admission Certificate to all the registered candidates indicating schedule & venue of the test will be issued about three weeks before the test. ***However, if any registered candidate does not receive the same latest by 17th December, 2012, the candidate must download the duplicate Admission Certificate from above said CSIR, HRDG website immediately***. CSIR will not be responsible for any delay/non-receipt of Admission Certificate by the candidate.

4. The Coordinators addresses for December, 2012 NET will be available on our website around first week of December, 2012.

5. **In case, application for December, 2012 NET is reported 'Not received by the Examination Unit' (as per Para 7.1) the candidate may apply to Examination Unit at the address as given in page No.7 of Information Bulletin, alongwith following document for obtaining a valid Admission Certificate (Subject to fulfilling eligibility criteria) between 23rd November 2012 to 29th November, 2012:-**

   (i) Photocopy of both side of completed application form

   (ii) Certificate of Posting

   Candidates must write his/her Contact No./Fax No./e-mail/Correspondence Address clearly for prompt action while applying for the above purpose.

   Please note that no request in this regard will be entertained without the above two documents after 29th November, 2012.

6. The Question Booklet for this test will be printed in Hindi & English Version except in Engineering Sciences, where the Question Booklet will be printed in English Version only. The candidate opting for Hindi medium in Columns **No. 5** of Application Form, will be supplied Question Booklet printed in Bilingual and candidates opting for English medium, will be supplied Question Booklet printed in English Version only. The candidate will be required to answer as per option exercised in Column **No. 5** of Application Form.

7. Candidates are not allowed to carry the Question Booklet & Answer sheet (OMR Sheet) after the Exam.

8. Candidates enrolled for M.Sc. or having completed 10+2+3 years of the required qualifying examination (Pl. refer coloum No. 3.2) may apply under result awaited "RA" category & submit attestation format given on the reverse of the application form.

9. More than one application form from a candidate opting different subject(s) will not be accepted in any case.

10. Candidate should exercise due care in filling up the application form. No change in the entries made in the original application form will be allowed under any circumstances at later stage.

11. No relevant column of the application form should be left blank. Incomplete or defective applications shall be summarily rejected.

12. Candidate should check that the Serial number printed on the Information Bulletin, Application form, Certificate of Posting card and the envelope are the same.

INTRODUCTION

ABOUT THE CSIR/UGC FELLOWSHIPS

The CSIR and UGC provide CSIR/UGC Research Fellowship to bright young men and women for training in methods of research under expert guidance of faculty members/scientists working in University Departments/ National Laboratories and Institutions in various fields of Science & Technology.

The CSIR/UGC fellowships are tenable in Universities/IITs/Post Graduate Colleges/Govt. Research Establishments including those of the CSIR, Academy of Scientific & Innovative Research (AcSIR), Research & Development establishments of recognized public or private sector industrial firms and other recognized institutions. However, CSIR reserves right to determine the place best suited to provide necessary facilities in the area of science and technology in which the awardees are to specialize.

The CSIR/UGC Fellowship is tenable in India. Only bonafide Indian citizen residing in India are eligible for the award of Junior Research fellowships. The program is aimed at National Science & Technology Human Resource Development.

A certain number of JRFs are awarded each year by CSIR/UGC to those holding the required degree, with a minimum 55% marks (50% for SC/ST candidates and PH/VH candidates [Para 3.2]), who qualify the Joint CSIR-UGC Test for Junior Research Fellowship and Eligibility for Lectureship- National Eligibility Test (NET) conducted by CSIR twice in a year.

This Test also determines the eligibility of candidates (i.e. it is eligibility criteria only) for Lectureship positions in Indian Universities/Colleges. Those who qualify for JRF are eligible for Lectureship also, subject to fulfilling the eligibility criteria laid down by UGC. Some aspirants besides JRF are declared eligible for Lectureship (NET) category only, based on their performance in the test.

The award of CSIR/UGC Fellowship is for fixed tenure and does not imply any assurance or guarantee for subsequent employment by CSIR/UGC to the beneficiary.

VALUE OF JUNIOR RESEARCH FELLOWSHIP (NET)

Candidates qualifying for the award of JRF (NET) will receive fellowship either from CSIR or UGC as per their assignment or from the Schemes with which they may find association. A list showing various CSIR Laboratories/ Institutes with their area of specialization is given on page 2-3.

(I) The value of the JRF (NET) fellowship, at present, is Rs. 16,000/- (Rupees Sixteen thousand only) per month. The fellowship will be governed by terms and conditions of CSIR, UGC or Research Scheme, as applicable.

(ii) The number of fellowships for each subject is limited. SC/ST applicants will be given such special considerations as may be decided by the Co-ordination Committee as per policy guidelines.

(iii) The duration of fellowship will be initially for 2 (two) years carrying a monthly stipend of *Rs. 16,000/-*. On completion of two years as JRF (NET), the stipend of a fellow may be increased to *Rs. 18,000/-* p.m. for the 3rd year on the basis of assessment of candidate's research progress/ achievements through interview by the prescribed Expert Committee and Ph.D registration. Upon such a recommendation, the fellow will be called SRF (NET). *The total tenure as JRF (NET) plus SRF (NET) shall not exceed 5 (five) years.*

However, candidates may go through the terms and conditions for CSIR Research Fellowship posted on our website *http://www.csirhrdg.res.in* for better awareness.

For further details about the CSIR and UGC schemes for grant of fellowships etc., you may contact the following: (Candidates are advised to contact the UGC only, for any clarification regarding eligibility for Lectureship):

(a) Fellowships under CSIR Scheme:

DEPUTY SECRETARY/UNDER SECRETARY (EMR), HRD GROUP, CSIR, CSIR COMPLEX, OPPOSITE INSTITUTE OF HOTEL MANAGEMENT, LIBRARY AVENUE, PUSA, NEW DELHI-110 012. (011-25842058, Fax 011-25860595)

(b) Fellowships under UGC Schemes:

UNDER SECRETARY, SELECTION & AWARD BUREAU, UNIVERSITY GRANT COMMISSION, SOUTH CAMPUS, UNIVERSITY OF DELHI, BENITO JUAREZ MARG, DHAULA KUAN, NEW DELHI-110021. (011-24117095)

(c) For Eligibility for Lectureship:

EDUCATION OFFICER, UNIVERSITY GRANTS COMMISSION, SOUTH CAMPUS, UNIVERSITY OF DELHI, BENITO JUAREZ MARG, DHAULA KUAN, NEW DELHI - 110021. (011-24117095)

LIST OF CSIR LABORATORIES / INSTITUTES

Council of Scientific and Industrial Research (CSIR) is one of the largest research and development (R&D) organization in the world devoted to Scientific and Technical Manpower Development in India. It has a network of 37 laboratories and 80 field stations spread all over India. These are engaged in cutting edge research activities covering a wide range of scientific disciplines.

1. **CSIR-Advanced Materials and Processes Research Institute (AMPRI), Bhopal - 462 026**
   Development of low-cost/alternative building materials; natural resources database management and modelling studies on groundwater resources; Wasteland development using coal ash; Medicinal plants; Composite materials.

2. **CSIR-Central Building Research Institute(CBRI), Roorkee - 247 667**
   Providing S & T back up to the problems of buildings & construction industries in the areas of housing; building materials; geotechnical & structural engineering.

3. **CSIR-Centre for Cellular and Molecular Biology (CCMB), Hyderabad - 500 007**
   Biophysics & Biochemistry; Molecular Biology; genetics and evolution; biomedicines & biotechnology.

4. **CSIR-Central Drug Research Institute (CDRI), Lucknow - 226 001**
   Development of contraceptives; new drugs for tropical diseases (malaria, filariasis, leishmaniasis); cardio-vascular and central nervous system disorders.

5. **CSIR-Central Electrochemical Research Institute (CECRI), Karaikudi - 623 006**
   Batteries and power sources, electrochemical materials science, electrohydromettalurgy, electrochemical instrumentation.

6. **CSIR-Central Electronics Engineering Research Institute(CEERI), Pilani - 333 031.**
   Microelectronics-LSI\VLSI circuits; Strategic electronics (Semiconductor Devices); Industrial electronics-Microprocessor and PC based control systems for sugar, tea, leather, dairy, pulp, paper, and textile industry; colour graphics and digital mapping systems; Museum Electronics-Audio-Visual systems and speech engineering.

7. **CSIR-Central Food Technological Research Institute (CFTRI), Mysore - 570 013.**
   Development of food products and processes for optimal utilization of country's agricultural produce; upgrading traditional food technology and development of appropriate technologies for reducing/eliminating post-harvest losses of perishables and durables; bioactive substances and food packaging.

8. **CSIR-Central Glass and Ceramic Research Institute (CGCRI), Kolkata - 700 032.**
   Development of different varieties of optical glasses; electronic materials; low-cost building materials and bio-ceramics.

9. **CSIR-Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow 226 016.**
   Development of agrotechnologies for economically important medicinal and aromatic plants. Basic research in the area of phytochemistry; pathology; genetics, entomology and pharmacognosy.

10. **CSIR-Central Institute of Mining & Fuel Research (CIMFR), Dhanbad-826001 (Jharkand).**
    To provide R&D inputs for entire coal-energy chain from mining to consumption.
    It's R&D thrust area include:
    Mines safety; technology upgradation; environmental issues; alternative energy sources; perfecting ground control technology for tunneling & underground and caveras; optimising slope stability in open cost mines.

11. **CSIR-Central Leather Research Institute (CLRI), Chennai - 600 020.**
    Modernisation of tanneries; development of environment friendly chemicals and technologies including enzymatic options, tannery and slaughter house by-products; waste water management; region-specific appropriate technologies.

12. **CSIR-Central Mechanical Engineering Research Institute (CMERI), Durgapur-715 209.**
    Design and development of mobile manipulators; robotics; deep-seabed mining systems; and reliability analysis of systems in atomic power plants.

13. **CSIR-Central Road Research Institute (CRRI), New Delhi 110 020.**
    Pavement design and performance; road condition monitoring; maintenance planning and management; landslide management and hazard mitigation; deterioration and rehabilitation of bridges; transportation planning; traffic engineering road safety and environmental problems.

14. **CSIR-Central Salt and Marine Chemical Research Institute (CSMCRI), Bhavnagar– 364 002.**
    Salt engineering; marine chemicals; desalination of brackish/saline water; marine algae; photo-inorganic chemistry and phytosalinity.

15. **CSIR-Central Scientific Instruments Organisation (CSIO), Chandigarh -160 020.**
    Development of instruments for microelectronics; special defence needs; Development of analytical instrumentation.

16. **CSIR-Indian Institute of Chemical Biology (IICB), Kolkata - 700 032.**
    Natural products of medicinal, biological and industrial value; development of innovative immunoassay techniques; development of tissue-targeted drug-delivery system.

17. **CSIR-Indian Institute of Chemical Technology(IICT), Hyderabad 500 007.**
    Development of technologies for pesticides, drugs, organic intermediates and fine chemicals.

18. **CSIR-Indian Institute of Petroleum(IIP), Dehradun 248 005.**

    Petroleum refining technology; Separation Processes ; Catalytic reforming; Petroleum Products Applications; alternative fuels.

19. **CSIR-Indian Institute of Integrative Medicine (IIIM), Jammu - 180 001**
Natural products and organic chemistry; introduction, improvement and cultivation of medicinal and aromatic plants; post harvest technology and applied microbiology and mutation genetics.

20. **CSIR-Indian Institute of Toxicology Research (IITR), Lucknow - 226 001.**
Neurotoxicology; environmental health; immunotoxicology and environmental biotechnology.

21. **CSIR-Institute of Genomics and Integrative Biology (IGIB), Delhi - 110 007.**
Allergy and Immunology; diagnostics; genetic engineering; bio-organics and high tech reagents.

22. **CSIR-Institute of Himalayan Bioresource Technology (IHBT), Palampur – 176 061.**
Floriculture; tea sciences; biotechnology and natural plant products.

23. **CSIR-Institute of Minerals and Materials Technology (IMMT), Bhubaneswar - 751 013**
Mineral processing; extractive metallurgy; survey and cultivation of aromatic, medicinal and other economic plants.

24. **CSIR-Institute of Microbial Technology(IMT), Chandigarh 160 031**
Molecular biology and microbial genetics; animal cell/tissue culture and protein engineering.

25. **CSIR-National Aerospace Laboratories (NAL), Bangalore -560 017**
Aerospace electronics; High density acoustics; modelling of fluid flows; aircraft and missile aerodynamics.

26. **CSIR-National Botanical Research Institute (NBRI), Lucknow - 226 001**
Plant biotechnology; environmental sciences ; taxonomy and ethnobotany; plant molecular biology.

27. **CSIR-National Chemical Laboratory (NCL), Pune - 411 008**
Catalysis, biotechnology ; organic chemical technology. Basic research in chemistry and biochemistry.

28. **CSIR-National Environmental Engineering Research Institute (NEERI), Nagpur- 440 020**
National / societal missions on drinking water; environmental biotechnology; hazardous waste management; modelling and optimization.

29. **CSIR-National Geophysical Research Institute (NGRI), Hyderabad - 500 007**
Seismology; geophysical exploration and geophysical instrumentation.

30. **CSIR-National Institute of Oceanography (NIO), Goa - 403 004**
International Geosphere-Bio-sphere programme; oceanographic studies of the Antarctic waters; marine biotechnology and technologies for rural development.

31. **CSIR-National Institute of Science Technology and Development Studies (NISTADS), New Delhi-110 012**
Mathematical modelling for S&T studies; information systems and S&T archival resources.

32. **CSIR-National Institute of Science Communication and Information Resources (NISCAIR), New Delhi-110 012**
Information services : Medicinal & Aromatic Plants Information Service (MAPIS); and Industrial Information Service: Science Popularization. Design and development of S&T database; network-based online services; R&D in information science and technology.

33. **CSIR-National Institute for Interdisciplinary Science & Technology, (NIIST), Thiruvananthapuram - 695 019**
Ceramics, Alloy and Composites, polymers; Clays/Beach sand Minerals; Modelling & Simulations of Material Science; Inorganic/ Analytical / Organic Chemistry

34. **CSIR-National Metallurgical Laboratory (NML), Jamshedpur-831 007**
Mineral benefaction; development ; processing and evaluation of alloys.

35. **CSIR-National Physical Laboratory (NPL), New Delhi - 110 012**
Measurements, standards and calibration; cryogenics and superconductivity; applied projects like thin films; underwater acoustic devices and nonconventional energy devices; Radio & Atmospheric Sciences.

36. **CSIR-North-East Institute of Science & Technology, (NEIST), Jorhat - 785 006**
Development of oil field chemicals; agrochemicals; drugs and drug intermediates; organic chemistry; bio-chemistry and geoscience.

37. **CSIR-Structural Engineering Research Centre (SERC), Chennai - 600 113**
Structural dynamics; experimental mechanics; structural concretes and concrete composites.

THE JOINT CSIR-UGC TEST FOR JUNIOR RESEARCH FELLOWSHIP AND ELIGIBILITY FOR LECTURESHIP, NATIONAL ELIGIBILITY TEST (NET), December , 2012.

1. CSIR will hold the above national level test on ***23rd December, 2012*** for determining the eligibility of the ***Indian national candidates*** for the award of Junior Research Fellowships (JRF)-NET and for determining eligibility for appointment of Lecturers-(NET) in certain subject areas falling under the faculty of Science. The award of Junior Research Fellowship-(NET) to the successful eligible candidates will depend on their finding admission/placement in a university/ national laboratory/ institution of higher learning and research, as applicable.

1.1 *A candidate may apply either for 'JRF' OR for 'Lectureship (LS) only'. He/she may indicate his/her preference in Col. 3 of the application, as the case may be. CSIR may consider candidates applying for 'JRF' or 'Lectureship only' depending on his/her performance in the test and number of fellowships available*

1.2 Two separate merit lists, one comprising the candidates qualifying for the award of Junior Research Fellowship (JRF -

NET) and the second, of those candidates qualifying the Eligibility Test for Lectureship (LS-NET), will be made on the basis of their performance in the above Test. **Candidates qualifying for JRF (NET), will also be eligible for Lectureship-(NET), subject to fulfilling the eligibility criteria laid down by UGC.The candidates qualifying for Lectureship-(NET) will be eligible only for recruitment as Lecturers, as well as for JRF-ship in a Scheme/Project, if otherwise suitable.** However they will not be eligible for Regular JRF-NET Fellowship. If a candidate is found to be overage for JRF-(NET), he/she will automatically be considered for Lectureship-(NET) only.

The candidates, who will qualify in the Test for eligibility for 'Lectureship-(NET) only', will be governed by the rules and regulations for recruitment of Lecturers as framed by the respective Universities/Colleges, subject to NET eligiblity criteria & verification of required certificates/documents by the UGC.

1.3 The result of the single MCQ examination to be held on 23.12.2012 may be declared sometime in March, 2013 and will be posted on our website: http://www.csirhrdg.res.in.

2. AWARD OF FELLOWSHIP

Candidates qualifying for the award of JRF-(NET) will receive fellowship either from CSIR or UGC as per their assignment or from the Schemes with which they may find association, subject to fullfilling of JRF (NET) eligibility criteria & verification of required certificates/documents by the CSIR/UGC respectively.

3. SUBJECTS OF TEST AND CONDITIONS OF ELIGIBILITY

3.1 SUBJECTS OF THE TEST

The Test will be held in the subjects as under ***(please refer "List of Codes" at Appendix IV):***

1. **Chemical Sciences**
2. **Earth, Atmospheric, Ocean and Planetary Sciences**
3. **Life Sciences**
4. **Mathematical Sciences**
5. **Physical Sciences**
6. **Engineering Sciences**

3.2 EDUCATIONAL QUALIFICATION UNDER THE SUBJECTS MENTIONED IN PARA 3.1 ABOVE:–

BS-4 years program/BE/B. Tech/B. Pharma/MBBS/Integrated BS-MS/M.Sc. or Equivalent degree with at least 55% marks for General & OBC (50% for SC/ST candidates, Physically and Visually handicapped candidates)

Candidate enrolled for M.Sc. or having completed 10+2+3 years of the above qualifying examination are also eligible to apply in the above subject under the Result Awaited (RA) category on the condition that they complete the qualifying degree with requisite percentage of marks within the validity period of two years to avail the fellowship from the effective date of award.

Such candidatges will have to submit the attestation format (Given at the reverse of the appliaiton form) duly certified by the Head of the Department/Institute from where the candidate is appearing or has appeared.

B.Sc. (Hons) or equivalent degree holders or students enrolled in integrated MS-Ph.D program with at least 55% marks for General & OBC candidates; 50% for SC/ST candidates, Physically and Visually handicapped candidates are also eligible to apply.

Candidates with bachelor's degree, whether Science, engineering or any other discipline, will be eligible for fellowship only after getting registered/enrolled for Ph.D/integrated Ph.D. programm within the validity period of two years.

The eligible for lectureship of NET qualified candidates will be subject to fulfilling the criteria laid down by UGC. Ph.D. degree holders who have passed Master's degree prior to 19th September, 1991 with at least 50% marks are eligible to apply for Lectureship only.

The candidates with the above qualification are advised to fill up their degree with percentage of marks in column No. 20 & 21, as applicable (if they are applying through informatin Bulletin) or column No. 18 to 21, as applicable (for Online applicaitons).

3.3 AGE LIMIT & RELAXATION

The age limit for admission to the Test is as under:

For JRF (NET): Maximum 28 years as on 01-07-2012 (upper age limit may be relaxed up to 5 years in case of candidates belonging to SC/ST/OBC (As per GOI central list), Physically handicapped/Visually handicapped and female applicants).

For Lectureship (NET): ***No upper age limit.***

4. DATE AND SCHEME OF THE TEST

4.1 DATE OF TEST

The test in the subject of (I) Life Sciences (II) Mathematical Sciences & (III) Physical sciences will be held in the Morning Session (Time: 9.00 AM to 12.00 noon) and the test in the subject of (I) Chemical Sciences, (II) Earth, Atmospheric, Ocean and Planetary Sciences & (III) Engineering Sciences will be held in the Afternoon Session (Time:2.00PM to 5.00 PM).

The single paper MCQ based test will be held on Sunday, the 23rd December, 2012 as under:

Morning Session

Subject	Marks	Timings	Duration
(I) Life Sciences (II) Mathematical Sciences (III) Physical Sciences	200	9.00 AM to 12.00 Noon	3 hours

Afternoon Session

Subject	Marks	Timings	Duration
(I) Chemical Sciences (II) Earth, Atmospheric, Ocean and Planetary Sciences (III) Engineering Sciences	200	2.00 PM to 5.00 PM	3 hours

4.2 SCHEME OF TEST : Please refer Appendix-I for syllabus and scheme of the test.

4.2.1 **The Question Booklet for this test will be printed in Hindi & English Version except in Engineering Sciences, where the Question Booklet will be printed in English Version only. The candidate opting for Hindi medium in Column No. 5 of Application Form, will be supplied Question Booklet printed in bilingual and candidates opting for English Medium, will be supplied Question Booklet printed in English Version only. The candidate will be required to answer as per option exercised in Column No. 5 of Application Form.**

4.2.2 **Candidate are not allowed to carry Question Booklet & Answer Sheet (OMR Sheet) after the examination.**

4.3. SYLLABUS OF THE TEST

Detailed Syllabus of single MCQ Paper (Section A, B & C), subject-wise syllabus of single Paper is given in this Bulletin at Appendix-I.

5. EXAMINATION CENTRES

The test will be held at 26 Centres spread all over India, specified (with codes) in Appendix IV.
If sufficient number of candidates do not opt for any of the above Centres, that particular Centre may stand deleted from the above list OR otherwise also, the concerned candidates may be allotted another Centre nearest to their place of residence, at the discretion of CSIR. No TA/DA will be admissible to any candidate for attending the test, in any circumstances.

5.1 REQUEST FOR CHANGE OF CENTRE

No request for change of centre would ordinarily be granted. However, a request for change of Centre may be entertained on merits, if received in this unit latest by 15-10-2012.

6. CANDIDATE SEEKING FEE CONCESSION

An ***SC/ST/OBC*** candidate should submit a copy of the caste certificate which falls under Central Government list about being SC/ST/OBC (attested by a Gazetted Officer) issued by the ***prescribed authority of Govt. of India;*** **in English or Hindi and in form given in the Bulletin at Appendix-II (for SC/ST candidates) or in Appendix III (for OBC candidates).** ***In case the Caste/Category certificate is in regional language, the candidate should enclose an English/Hindi translation of the same duly notarized by a notary.*** For allowing concessions in this regard, **CSIR follows only the Central Govt. lists and not state Govt. list.** The SC/ST/OBC candidates should ensure from the competent authority issuing the caste/class certificate ***that their communities are enlisted in the common central list of the Government of India, otherwise they shall not be eligible for any fee/age concession***

6.1 ***Physically Handicapped (PH) or VISUALLY HANDICAPPED (VH)*** person suffering from impaired eye-sight which cannot be corrected with eye glasses, seeking to apply for this examination under PH/VH category, should submit an attested copy of certificates about being ***handicapped, from a Government Hospital/ Medical Board*** (duly attested by a Gazetted Officer), along with his/her application form and **bring attested copy of the same at the time of the test also.**

An application form, claiming fee concession but without an attested copy of a valid SC/ST/OBC/PHYSICAL OR VISUAL HANDICAP (PH/VH) certificate, will be summarily rejected.

7. HOW TO APPLY AND THE LAST DATE OF SUBMISSION OF APPLICATION FORM

Candidates seeking admission to the Test must apply in the prescribed application form provided along with this Information Bulletin. Please handle this form carefully while filling up and should send **only 'Under Certificate of Posting' (U.P.C.)/ ordinary post (as applicable)** in the prescribed envelope, duly stamped by the candidates, supplied with Information Bulletin.

Candidate should fill-in the application form legibly and carefully, in his/her own handwriting with Black INK pen only.

Candidate should super-scribe the APPLICATION FORM NUMBER, CENTRE CODE, SUBJECT CODE and MEDIUM OF EXAMINATION EITHER HINDI OR ENGLISH in the boxes provided on the envelope and also in the application form (with enclosure as per page(i)).

Candidates should send the duly completed application form with requisite enclosure(s) (only in the prescribed envelope supplied with the Bulletin) to the **Sr. Controller of Examination, Examination Unit, Human Resource Development Group, CSIR Complex, Opposite Institute of Hotel Management, Library Avenue, Pusa, New Delhi 110012** ***Under Certificate of Posting (U.P.C.)/ordinary post so as to reach this Unit on or before 24.09.2012.***

For candidates applying from Assam, Arunachal Pradesh, Meghalaya, Mizoram, Manipur, Nagaland, Tripura, Sikkim, Ladakh Division of J&K State, Lahaul and Spiti district of Himachal Pradesh, Andaman and Nicobar Islands and Lakshdweep, ***the application form must reach to the Sr. Controller of Examination CSIR on or before 01.10.2012.***

The candidates are advised in their own interest to apply early enough to ensure timely receipt of their applications by the Examination Unit on or before the closing date.

7.1 The eligible candidates, in their own interest, are advised **to keep a photocopy of both sides of completed application form, Certificate of Posting** and three identical copies of the **recent passport size photographs** which has been affixed

on the application form, before submitting the same to the Examination Unit, CSIR.

(Alphabetic list of the candidates registered for December 2012 NET will be displayed on our website http://www.csirhrdg.res.in tentatively on 23rd November, 2012. Candidates may check their registration with the above list. In case, application for December, 2012 NET is reported 'Not Received by the Examination Unit' the candidate may approach the Examination Unit at the address as given in page **No. 6** of Information Bulletin, **alongwith photocopy of both sides of completed application form and Certificate of Posting** for **obtaining a valid Admission Certificate** (Subject to fulfilling eligibility criteria). **Request in this regard will NOT be entertained after 29th November, 2012).**

APPLICATION FORM RECEIVED AFTER CLOSING DATE WILL NOT BE ENTERTAINED.

8. OTHER GENERAL INFORMATION

(I) The Centres and date of the Test are liable to be changed at the discretion of CSIR. No TA will be paid to the candidates by the CSIR.

(ii) Candidates should note that their candidature is provisional. No candidate will be admitted to the Test unless he/she holds the admission Certificate to the Test. The mere fact that an Acknowledgement Card/Admission Certificate has been issued to a candidate will not imply that the Council has finally accepted his/her candidature. **Candidates may note that the verification of essential eligibility conditions of a candidate with reference to the documents as may be called for, will be taken up only by the Lecturer appointing/JRF awarding authorities after the candidate has qualified in the Test. Accordingly, till then your candidature will remain provisional.**

(iii) A candidate must ensure that communications sent to him/her at the address stated in his/her application form are redirected, if necessary. Any change in address of correspondence should be promptly brought to the notice of this Unit within the prescribed period, i.e., by **15.10.2012.**

(iv) Candidates may please note that all communications to CSIR should invariably contain the following particulars, failing which no response is possible:
(a) Application form No.
(b) Name of the candidate (in full and in BLOCK LETTERS)
(c) Date of Birth
(d) Father's Name
(e) Subject
(f) Centre for Examination
(g) Medium of Examination (Hindi/English)

(v) In all matters the decision of the CSIR as to the eligibility or otherwise of a candidate for admission to the Test or his/her subsequent qualifying in the Test shall be final.

(vi) Any attempt on the part of a candidate to obtain support for his/her candidature by any means may disqualify him/her for admission to the examination.

(vii) A candidate who is found guilty of impersonation or of submitting fabricated documents or documents which have been tampered with or of making statements which are incorrect or false or of suppressing material information or otherwise resorting to any other irregular or improper means for obtaining admission to the examination, or of using or attempting to use unfair means or of misbehavior in the examination hall, may be liable to criminal prosecution:
(a) Be debarred by the CSIR from this test and future tests also.
(b) Will be liable to disciplinary action under the appropriate rules, if he/she is already in service under Government/ Autonomous Bodies/UGC/CSIR.

(viii) All disputes pertaining to the NET Examination shall fall within the jurisdiction of Delhi only.

(ix) Candidates must write the papers in their own hand. ***Only visually handicapped candidates suffering from impaired eye-sight which cannot be corrected with eye glasses, will be provided the help of a SCRIBE (a graduate level person in Science other than his/her subject to write the answers for them), If they request for the same in their application form*** (under VH category, column 7 and 8 of application form). They will also be given **30 minutes extra for single MCQ Paper.**

(x) CSIR will not be responsible for any printing error in this booklet.

ALL CORRESPONDENCE REGARDING THIS EXAMINATION SHOULD BE ADDRESSED TO

The Sr. Controller of Examinations, Examination Unit
Human Resource Development Group,
Council of Scientific and Industrial Research,
CSIR Complex,
(Opposite Institute of Hotel Management)
Library Avenue, Pusa, New Delhi - 110 012

EPBAX No.: 011-25841582, 25842493, 25842704, 25842729, 25841492 (Ext. 132,452,413,451)
Fax: 011-25843305, 25840887
E-mail: examunit@csirhrdg.res.in
Website : http://www.csirhrdg.res.in

APPENDIX - I

CSIR-UGC National Eligibility Test (NET) for Junior Research Fellowship and Lecturer-ship
SYLLABUS AND EXAMINATION SCHEME FOR SINGLE MCQ PAPER

1. CHEMICAL SCIENCES

EXAM SCHEME

TIME: 3 HOURS **MAXIMUM MARKS: 200**

Single Paper Test having Multiple Choice Questions (MCQs) is divided in three parts.

Part 'A'

This part shall carry 20 questions pertaining to General aptitude with emphasis on logical reasoning graphical analysis, analytical and numerical ability, quantitative comparisons, series formation, puzzles etc. The candidates shall be required to answer any 15 questions. Each question shall be of two marks. The total marks allocated to this section shall be 30 out of 200.

Part 'B'

This part shall contain 50 Multiple Choice Questions(MCQs) generally covering the topics given in the syllabus. A candidate shall be required to answer any 35 questions. Each question shall be of two marks. The total marks allocated to this section shall be 70 out of 200.

Part 'C'

This part shall contain 75 questions that are designed to test a candidate's knowledge of scientific concepts and/or application of the scientific concepts. The questions shall be of analytical nature where a candidate is expected to apply the scientific knowledge to arrive at the solution to the given scientific problem. A candidate shall be required to answer any 25 questions. Each question shall be of four marks. The total marks allocated to this section shall be 100 out of 200.

There will be negative marking @25% for each wrong answer. To enable the candidates to go through the questions, the question paper booklet shall be distributed 15 minutes before the scheduled time of the exam. The answer sheet (OMR sheet) shall be distributed at the scheduled time of the exam.

SYLLABUS

Part 'A'

This part shall carry 20 questions pertaining to General aptitude with emphasis on logical reasoning graphical analysis, analytical and numerical ability, quantitative comparisons, series formation, puzzles etc. The candidates shall be required to answer any 15 questions. Each question shall be of two marks. The total marks allocated to this section shall be 30 out of 200.

(Common Syllabus for Part B & C)

Inorganic Chemistry

1. Chemical periodicity
2. Structure and bonding in homo- and heteronuclear molecules, including shapes of molecules (VSEPR Theory).
3. Concepts of acids and bases, Hard-Soft acid base concept, Non-aqueous solvents.
4. Main group elements and their compounds: Allotropy, synthesis, structure and bonding, industrial importance of the compounds.
5. Transition elements and coordination compounds: structure, bonding theories, spectral and magnetic properties, reaction mechanisms.
6. Inner transition elements: spectral and magnetic properties, redox chemistry, analytical applications.
7. Organometallic compounds: synthesis, bonding and structure, and reactivity. Organometallics in homogeneous catalysis.
8. Cages and metal clusters.
9. Analytical chemistry- separation, spectroscopic, electro- and thermoanalytical methods.
10. Bioinorganic chemistry: photosystems, porphyrins, metalloenzymes, oxygen transport, electron- transfer reactions; nitrogen fixation, metal complexes in medicine.
11. Characterisation of inorganic compounds by IR, Raman, NMR, EPR, Mössbauer, UV-vis, NQR, MS, electron spectroscopy and microscopic techniques.
12. Nuclear chemistry: nuclear reactions, fission and fusion, radio-analytical techniques and activation analysis.

Physical Chemistry:

1. Basic principles of quantum mechanics: Postulates; operator algebra; exactly- solvable systems: particle-in-a-box, harmonic oscillator and the hydrogen atom, including shapes of atomic orbitals; orbital and spin angular momenta; tunneling.

2. Approximate methods of quantum mechanics: Variational principle; perturbation theory up to second order in energy; applications.
3. Atomic structure and spectroscopy; term symbols; many-electron systems and antisymmetry principle.
4. Chemical bonding in diatomics; elementary concepts of MO and VB theories; Huckel theory for conjugated π- electron systems.
5. Chemical applications of group theory; symmetry elements; point groups; character tables; selection rules.
6. Molecular spectroscopy: Rotational and vibrational spectra of diatomic molecules; electronic spectra; IR and Raman activities – selection rules; basic principles of magnetic resonance.
7. Chemical thermodynamics: Laws, state and path functions and their applications; thermodynamic description of various types of processes; Maxwell's relations; spontaneity and equilibria; temperature and pressure dependence of thermodynamic quantities; Le Chatelier principle; elementary description of phase transitions; phase equilibria and phase rule; thermodynamics of ideal and non-ideal gases, and solutions.
8. Statistical thermodynamics: Boltzmann distribution; kinetic theory of gases; partition functions and their relation to thermodynamic quantities – calculations for model systems.
9. Electrochemistry: Nernst equation, redox systems, electrochemical cells; Debye-Huckel theory; electrolytic conductance – Kohlrausch's law and its applications; ionic equilibria; conductometric and potentiometric titrations.
10. Chemical kinetics: Empirical rate laws and temperature dependence; complex reactions; steady state approximation; determination of reaction mechanisms; collision and transition state theories of rate constants; unimolecular reactions; enzyme kinetics; salt effects; homogeneous catalysis; photochemical reactions.
11. Colloids and surfaces: Stability and properties of colloids; isotherms and surface area; heterogeneous catalysis.
12. Solid state: Crystal structures; Bragg's law and applications; band structure of solids.
13. Polymer chemistry: Molar masses; kinetics of polymerization.
14. Data analysis: Mean and standard deviation; absolute and relative errors; linear regression; covariance and correlation coefficient.

Organic Chemistry

1. IUPAC nomenclature of organic molecules including regio- and stereoisomers.
2. Principles of stereochemistry: Configurational and conformational isomerism in acyclic and cyclic compounds; stereogenicity, stereoselectivity, enantioselectivity, diastereoselectivity and asymmetric induction.
3. Aromaticity: Benzenoid and non-benzenoid compounds – generation and reactions.
4. Organic reactive intermediates: Generation, stability and reactivity of carbocations, carbanions, free radicals, carbenes, benzynes and nitrenes.
5. Organic reaction mechanisms involving addition, elimination and substitution reactions with electrophilic, nucleophilic or radical species. Determination of reaction pathways.
6. Common named reactions and rearrangements – applications in organic synthesis.
7. Organic transformations and reagents: Functional group interconversion including oxidations and reductions; common catalysts and reagents (organic, inorganic, organometallic and enzymatic). Chemo, regio and stereoselective transformations.
8. Concepts in organic synthesis: Retrosynthesis, disconnection, synthons, linear and convergent synthesis, umpolung of reactivity and protecting groups.
9. Asymmetric synthesis: Chiral auxiliaries, methods of asymmetric induction – substrate, reagent and catalyst controlled reactions; determination of enantiomeric and diastereomeric excess; enantio-discrimination. Resolution– optical and kinetic.
10. Pericyclic reactions – electrocyclisation, cycloaddition, sigmatropic rearrangements and other related concerted reactions. Principles and applications of photochemical reactions in organic chemistry.
11. Synthesis and reactivity of common heterocyclic compounds containing one or two heteroatoms (O, N, S).
12. Chemistry of natural products: Carbohydrates, proteins and peptides, fatty acids, nucleic acids, terpenes, steroids and alkaloids. Biogenesis of terpenoids and alkaloids.
13. Structure determination of organic compounds by IR, UV-Vis, 1H & 13C NMR and Mass spectroscopic techniques.

Interdisciplinary topics

1. Chemistry in nanoscience and technology.
2. Catalysis and green chemistry.
3. Medicinal chemistry.
4. Supramolecular chemistry.
5. Environmental chemistry.

2. EARTH, ATMOSPHERIC, OCEAN AND PLANETARY SCIENCES

EXAM SCHEME

TIME: 3 HOURS **MAXIMUM MARKS: 200**

Single Paper Test having Multiple Choice Questions (MCQs) is divided in three parts.

Part 'A'

This part shall carry 20 questions pertaining to General aptitude with emphasis on logical reasoning graphical analysis, analytical and numerical ability, quantitative comparisons, series formation, puzzles etc. The candidates shall be required to answer any 15 questions. Each question shall be of two marks. The total marks allocated to this section shall be 30 out of 200.

Part 'B'

This part shall contain 50 Multiple Choice Questions(MCQs) generally covering the topics given in the syllabus. A candidate shall be required to answer any 35 questions. Each question shall be of two marks. The total marks allocated to this section shall be 70 out of 200.

Part 'C'

This part shall contain 40 questions that are designed to test a candidate's knowledge of scientific concepts and/or application of the scientific concepts. The questions shall be of analytical nature where a candidate is expected to apply the scientific knowledge to arrive at the solution to the given scientific problem. A candidate shall be required to answer any 10 complete questions, including sub-parts. Each questions shall be of 10 marks. The total marks allocated to this section shall be 100 out of 200.

For Part 'A' and 'B' there will be negative marking @25% for each wrong answer. No negative marking for Part 'C'. To enable the candidates to go through the questions, the question paper booklet shall be distributed 15 minutes before the scheduled time of the exam. The answer sheet (OMR sheet) shall be distributed at the scheduled time of the exam.

SYLLABUS

Part 'A'

This part shall carry 20 questions pertaining to General aptitude with emphasis on logical reasoning graphical analysis, analytical and numerical ability, quantitative comparisons, series formation, puzzles etc. The candidates shall be required to answer any 15 questions. Each question shall be of two marks. The total marks allocated to this section shall be 30 out of 200.

Part 'B'

1. The Earth and the Solar System:

Milky Way and the solar system. Modern theories on the origin of the Earth and other planetary bodies. Earth's orbital parameters, Kepler's laws of planetary motion, Geological Time Scale; Space and time scales of processes in the solid Earth, atmosphere and oceans. Age of the Earth. Radioactive isotopes and their applications in earth sciences. Basic principles of stratigraphy. Theories about the origin of life and the nature of fossil record. Earth's gravity and magnetic fields and its thermal structure: Concept of Geoid and, spheroid; Isostasy.

2A. Earth Materials, surface features and Processes: Gross composition and physical properties of important minerals and rocks; properties and processes responsible for mineral concentrations; nature and distribution of rocks and minerals in different units of the earth and different parts of India.

2B. Surface features and Processes

Physiography of the Earth; weathering, erosion, transportation and deposition of Earth's material; formation of soil, sediments and sedimentary rocks; energy balance of the Earth's surface processes; physiographic features and river basins in India.

3. Interior of the Earth, Deformation and Tectonics

Basic concepts of seismology and internal structure of the Earth. Physico-chemical and seismic properties of Earth's interior. Concepts of stress and strain. Behaviour of rocks under stress; Folds, joints and faults. Earthquakes – their causes and measurement. Interplate and intraplate seismicity. Paleomagnetism, sea floor spreading and plate tectonics.

4. Oceans and Atmosphere

Hypsography of the continents and ocean floor –continental shelf, slope, rise and abyssal plains. Physical and chemical properties of sea water and their spatial variations. Residence times of elements in sea water. Ocean currents, waves and tides, important current systems, thermohaline circulation and the oceanic conveyor belt. Major water masses of the world's oceans. Biological productivity in the oceans.

Motion of fluids, waves in atmospheric and oceanic systems. Atmospheric turbulence and boundary layer. Structure and chemical composition of the atmosphere, lapse rate and stability, scale height, geopotential, greenhouse gases and global warming. Cloud formation and precipitation processes, air- sea interactions on different space and time scales. Insolation and heat budget, radiation balance, general circulation of the atmosphere and ocean. Climatic and sea level changes on different time scales. Coupled ocean-atmosphere system, El Nino Southern Oscillation (ENSO). General weather systems of India, - Monsoon system, cyclone and jet stream, Western disturbances and severe local convective systems, distribution of precipitation over India.

Marine and atmospheric pollution, ozone depletion.

5. Environmental Earth Sciences

Properties of water; hydrological cycle; water resources and management. Energy resources, uses, degradation, alternatives and management; Ecology and biodiversity. Impact of use of energy and land on the environment. Exploitation and conservation of mineral and other natural resources. Natural hazards. Elements of Remote Sensing.

Part 'C'

I. GEOLOGY

1) MINERALOGY AND PETROLOGY:

Concept of point group, space group, reciprocal lattice, diffraction and imaging. Concepts of crystal field theory and mineralogical spectroscopy. TEM and SEM applications. Lattice defects (point, line and planar). Electrical, magnetic and optical properties of minerals. Bonding and crystal structures of common oxides, sulphides, and silicates. Transformation of minerals – polymorphism, polytypism, and polysomatism. Solid solution and exsolution.

Steady-state geotherms. Genesis, properties, emplacement and crystallization of magmas. Phase equilibrium studies of simple systems, effect of volatiles on melt equilibria. Magma-mixing, -mingling and -immiscibility.

Metamorphic structures and textures; isograds and facies. Mineral reactions with condensed phases, solid solutions, mixed volatile equilibria and thermobarometry. Metamorphism of pelites, mafic-ultra mafic rocks and siliceous dolomites. Material transport during metamorphism. P-T-t path in regional metamorphic terrains, plate tectonics and metamorphism.

Petrogenetic aspects of important rock suites of India, such as the Deccan Traps, layered intrusive complexes, anorthosites, carbonatites, charnockites, khondalites gondites and granitoids.

2) STRUCTURAL GEOLOGY AND GEOTECTONICS:

Theory of stress and strain. Behaviour of rocks under stress. Mohr circle. Various states of stress and their representation by Mohr circles. Different types of failure and sliding criteria. Geometry and mechanics of fracturing and conditions for reactivation of pre-existing discontinuities. Common types of finite strain ellipsoids. L-, L-S-, and S-tectonic fabrics. Techniques of strain analysis. Particle paths and flow patterns. Progressive strain history. Introduction to deformation mechanisms. Role of fluids in deformation processes. Geometry and analyses of brittle-ductile and ductile shear zones. Sheath folds. Geometry and mechanics of development of folds, boudins, foliations and lineations. Interference patterns of superposed fold. Fault-related folding. Gravity induced structures. Tectonic features of extensional-, compressional-, and strike-slip-terranes. and relevance to plate boundaries.

3) PALEONTOLOGY AND ITS APPLICATIONS:

Theories on origin of life. Organic evolution – Punctuated Equilibrium and Phyletic Gradualism models. Mass extinctions and their causes. Application of fossils in age determination and correlation. Paleoecology, Life habitats and various ecosystems, Paleobiogeography. Modes of preservation of fossils and taphonomic considerations. Types of microfossils. Environmental significance of fossils and trace fossils. Use of microfossils in interpretation of sea floor tectonism. Application of micropaleontology in hydrocarbon exploration. Oxygen and Carbon isotope studies of microfossils and their use in paleoceanographic and paleoclimatic interpretation. Important invertebrate fossils, vertebrate fossils, plant fossils and microfossils in Indian stratigraphy.

4) SEDIMENTOLOGY AND STRATIGRAPHY:

Clastic sediments- gravel, sand and mud; biogenic, chemical and volcanogenic sediments. Classification of conglomerates, sandstones and mudstones, and carbonate rocks. Flow regimes and processes of sediment transport. Sedimentary textures and structures. Sedimentary facies and environments, reconstruction of paleoenvironments. Formation and evolution of sedimentary basins. Diagenesis of siliciclastic and carbonate rocks.

Recent developments in stratigraphic classification. Code of stratigraphic nomenclature – Stratotypes, Global Boundary Stratotype Sections and Points (GSSP). Lithostratigraphic, chronostratigraphic and biostratigraphic subdivisions. Methods of startigraphic correlation including Shaw's Graphic correlation. Concept of sequence stratigraphy. Rates of sediment accumulation, unconformities. Facies concept in Stratigraphy – Walther's law. Methods for paleogeographic reconstruction. Earth's Climatic History. Phanerozoic stratigraphy of India with reference to the type areas– their correlation with equivalent formations in other regions. Boundary problems in Indian Phanerozoic stratigraphy.

5) MARINE GEOLOGY AND PALEOCEANOGRAPHY:

Morphologic and tectonic domains of the ocean floor. Structure, composition and mechanism of the formation of oceanic crust. hydrothermal vents-. Ocean margins and their significance. Ocean Circulation, Coriolis effect and Ekman spiral, convergence, divergence and upwelling, El Nino. Indian Ocean Dipole Thermohaline circulation and oceanic conveyor belt. Formation of Bottom waters; major water masses of the world's oceans. Oceanic sediments: Factors controlling the deposition and distribution of oceanic sediments; geochronology of oceanic sediments, diagenetic changes in oxic and anoxic environments. Tectonic evolution of the ocean basins. Mineral resources. Paleoceanography – Approaches to paleoceanographic reconstructions; various proxy indicators for paleoceanographic interpretation. Reconstruction of monsoon variability by using marine proxy records Opening and closing of ocean gateways and their effect on circulation and climate during the Cenozoic. Sea level processes and Sea level changes.

Methods of paleo Sea Surface temperature. Quantifications.

6) GEOCHEMISTRY:

Structure and atomic properties of elements, the Periodic Table; ionic substitution in minerals; Phase rule and its applications in petrology, thermodynamics of reactions involving pure phases, ideal and non-ideal solutions, and fluids; equilibrium and distribution coefficients. Nucleation and diffusion processes in igneous, metamorphic and sedimentary environments, redox reactions and Eh-pH diagrams and their applications. Mineral/mineral assemblages as 'sensors' of ambient environments. Geochemical studies of aerosols, surface-, marine-, and ground waters. Radioactive decay schemes and their application to geochronology and petrogenesis. Stable isotopes and their application to earth system processes; geochemical cylcles.

7) ECONOMIC GEOLOGY:

Magmatic, hydrothermal and surface processes of ore formation. Metallogeny and its relation to crustal evolution; Active ore-forming systems, methods of mineral deposit studies including ore microscopy, fluid inclusions and isotopic systematics; ores and metamorphism- cause and effect relationships. Geological setting, characteristics, and genesis of ferrous, base and noble metals. Origin, migration and entrapment of petroleum; properties of source and reservoir rocks; structural, stratigraphic and combination traps. Methods of petroleum exploration. Petroliferous basins of India. Origin of peat, lignite, bitumen and anthracite. Classification, rank and grading of coal; coal petrography, coal resources of India. Gas hydrates and coal bed methane. Nuclear and non-conventional energy resources.

8) PRECAMBRIAN GEOLOGY AND CRUSTAL EVOLUTION:

Evolution of lithosphere, hydrosphere, atmosphere, biosphere, and cryosphere;, lithological, geochemical and stratigraphic characteristics of granite – greenstone and granulite belts. Stratigraphy and geochronology of the cratonic nuclei, mobile belts and Proterozoic sedimentary basins of India. Life in Precambrian. Precambrian – Cambrian boundary with special reference to India.

9) QUATERNARY GEOLOGY:

Definition of Quaternary. Quaternary Stratigraphy – Oxygen Isotope stratigraphy, biostratigraphy and magnetostratigraphy. Quaternary climates – glacial-interglacial cycles, eustatic changes, proxy indicators of paleoenvironmental/ paleoclimatic changes, - land, ocean and cryosphere (ice core studies). Responses of geomorphic systems to climate, sea level and tectonics on variable time scales in the Quaternary,. Quaternary dating methods, –radiocarbon, Uranium series, Luminescence, Amino-acid, relative dating methods. Quaternary stratigraphy of India– continental records (fluvial, glacial, aeolian, palaeosols and duricrust); marine records; continental-marine correlation of Quaternary record.

Evolution of man and Stone Age cultures. Plant and animal life in relation to glacial and interglacial cycles during Quaternary.

Tectonic geomorphology, neotectonics, active tectonics and their applications to natural hazard assessment.

10) (I) APPLIED GEOLOGY:

(i) Remote Sensing and GIS: Elements of photogrammetry, elements of photo-interpretation, electromagnetic spectrum, emission range, film and imagery, sensors, geological interpretations of air photos and imageries. Global positioning systems. GIS- data structure, attribute data, thematic layers and query analysis.

(ii) Engineering Geology: Engineering properties of rocks and physical characteristics of building stones, concretes and other aggregates. Geological investigations for construction of dams, bridges, highways and tunnels. Remedial measures. Mass movements with special emphasis on landslides and causes of hillslope instability. Seismic design of buildings.

(iii) Mineral Exploration: Geological, geophysical, geochemical and geobotanical methods of surface and sub-surface exploration on different scales. Sampling, assaying and evaluation of mineral deposits.

(iv) Hydrogeology: Groundwater, Darcy's law, hydrological characteristics of aquifers, hydrological cycle. Precipitation, evapotranspiration and infiltration processes. Hydrological classification of water-bearing formations. Fresh and salt-water relationships in coastal and inland areas. Groundwater exploration and water pollution. Groundwater regimes in India.

(II) PHYSICAL GEOGRAPHY

1) Geomorphology: Development in geomorphology. Historical and process Geomorphology. Landforms in relation to climate, rock type, structure and tectonics. Processes – weathering, pedogenesis, mass movement, erosion, transportation and deposition. Geomorphic processes and landforms – fluvial, glacial, eolian, coastal and karst. River forms and processes – stream flow, stage-discharge relationship; hydrographs and flood frequency analysis. Submarine relief. Geomorphology and topographic analysis including DEM, Environmental change– causes, effects on processes and landforms. Extra-terrestrial geomorphology.

2) Climatology: Fundamental principles of climatology. Earth's radiation balance; latitudinal and seasonal variation of insolation, temperature, pressure, wind belts, humidity, cloud formation and precipitation, water balance. Air masses, monsoon, Jet streams, tropical cyclones, and ENSO. Classification of climates – Koppen's and Thornthwaite's scheme of classification. Climate change.

3) Bio-geography: Elements of biogeography with special reference to India; environment, habitat, plant-animal association; zoo-geography of India; Biomes, elements of plant geography, distribution of forests and major plant communities. Distribution of major animal communities. Conservation of forests. Wildlife sanctuaries and parks.

4) Environmental Geography: Man-land relationship. Resources – renewable and non-renewable. Natural and man-made hazards – droughts, floods, cyclones, earthquakes, landslides, tsunamis. Ecological balance, environmental pollution and deterioration.

5) Geography of India: Physiography, drainage, climate, soils and natural resources – the Himalaya, Ganga-Brahmaputra

Plains, and peninsular India Precambrian shield, the Gondwana rift basins, Deccan Plateau. Indian climatology with special reference to seasonal distribution and variation of temperature, humidity, wind and precipitation; Climate zones of India. Agricultural geography of India. Population – its distribution and characteristics. Urbanization and migration. Environmental problems and issues.

(III) GEOPHYSICS

1) **Signal Processing:** Continuous and discrete signals; Fourier series; linear time invariant systems with deterministic and random inputs; band limited signal and sampling theorem; discrete and Fast Fourier transform; Z-transform; convolution; Filters: discrete and continuous, recursive, non-recursive, optimal and inverse filters; deconvolution.
2) **Field theory:** Newtonian potential; Laplace and Poisson's equations; Green's Theorem; Gauss' law; Continuation integral; equivalent stratum; Maxwell's equations and electromagnetic theory; Displacement potential, Helmhotz's theorem and seismic wave propagation.
3) **Numerical analysis and inversion:** Numerical differentiation and integration, finite element, and finite difference techniques; Simpson's rules; Gauss' quadrature formula; initial value problems; pattern recognition in Geophysics. Well posed and ill-posed problems; method of least squares; direct search and gradient methods; generalized inversion techniques; singular value decomposition; global optimization.
4) **Gravity and Magnetic fields of the earth:** Normal gravity field; Clairaut's theorem; Shape of the earth; deflection of the vertical, geoid, free-air, Bouguer and isostatic anomalies, isostatic models for local and regional compensation. Geomagnetic field, secular and transient variations and their theories; palaeomagnetism, construction of polar wandering curves.
5) **Plate Tectonics and Geodynamics:** Vine-Mathews hypothesis, marine magnetic anomalies, sea floor spreading; mid-oceanic ridges and geodynamics; plate tectonics hypothesis; plate boundaries and seismicity. Heat flow mechanisms, core-mantle convection and mantle plumes.
6) **Seismology & Tomography:** Seismometry: short period, long period, broad band and strong motion; elements of earthquake seismology; seismic sources: faulting source, double couple hypothesis, elastodynamics, Haskell's function, seismic moment tensor, focal mechanism and fault plane solutions; seismic gaps; seismotectonics and structure of the earth; Himalayan and stable continental region earthquakes, reservoir induced seismicity; seismic hazards; earthquake prediction.
7) **Gravity and Magnetic Methods:** Gravimeters and magnetometers; data acquisition from land, air and ship; corrections and reduction of anomalies; ambiguity; regional and residual separation; continuation and derivative calculations; interpretation of anomalies of simple geometric bodies, single pole, sphere, horizontal cylinder, sheet, dyke and fault. Forward modelling and inversion of arbitrary shaped bodies and 2-D, 3-D interfaces. Interpretations in frequency domain.
8) **Electrical and Electromagnetic Methods:** Electrical profiling and sounding, typical sounding curves, pseudo-sections; resistivity transform and direct interpretation; induced polarization methods. Electromagnetic field techniques; elliptic polarization, in-phase and out of phase components, horizontal and vertical loop methods; interpretation; VLF (very low frequency); AFMAG (Audio frequency magnetic) methods; and central frequency sounding; transient electromagnetic methods; magneto-telluric method; geomagnetic depth sounding.
9) **Seismic Methods: Generalized Snell's Law;** Ray theory; reflection, refraction, diffraction; Zoeppritz's equation; seismic energy sources; detectors; seismic noises and noise profile analysis; seismic data recording and telemetry devices; reduction to a datum and weathering corrections; Interpretation of a refraction seismic data by graphical and analytical techniques; CDP/CMP; seismic reflection data processing, velocity analysis, F-K filtering, stacking, deconvolution, migration before and after stack; bright spot analysis; wavelet processing; attenuation studies, shear waves, AVO; VSP; introduction to 3D seismics; seismic stratigraphy.
10) **Well logging and other methods:** Open hole, cased hole and production logging; Electrical logs; lateral, latero, induction, S.P; porosity logs; sonic, density, neutron; natural gamma; determination of formation factor, porosity, permeability, density, water saturation, lithology; logging while drilling. Radioactive and geothermal methods.

(IV) METEOROLOGY

1) **Climatology:** Same as under Geography
2) **Physical Meteorology:** Thermal structure of the atmosphere and its composition. Radiation: basic Laws - Rayleigh and Mie scattering, multiple scattering, radiation from the sun, solar constant, effect of clouds, surface and planetary albedo. Emission and absorption of terrestrial radiation, radiation windows, radiative transfer, Greenhouse effect, net radiation budget; Thermodynamics of dry and moist air: specific gas constant, Adiabatic and isoentropic processes, entropy and enthalpy, Moisture variables, virtual temperature; Clausius – Clapeyron equation, adiabatic process of moist air; thermodynamic diagrams: Hydrostatic equilibrium: Hydrostatic equation, variation of pressure with height, geopotential, standard atmosphere, altimetry. Vertical stability of the atmosphere: Dry and moist air parcel and slice methods. Tropical convection.
3) **Atmospheric Electricity:** Fair weather electric field in the atmosphere and potential gradients, ionization in the atmosphere. Electrical fields in thunderstorms, theories of thunderstorm electrification.
4) **Cloud Physics:** Cloud classification, condensation nuclei, growth of cloud drops and ice-crystals, precipitation mechanisms: Bergeron, Findeisen process, coalescence process – Precipitation of warm and mixed clouds, artificial precipitation, hail suppression, fog and cloud – dissipation, radar observation of clouds and precipitation, radar equation, rain drop spectra, radar echoes of hail storm and tornadoes, radar observation of hurricanes, measurements of rainfall by radar.
5) **Dynamic Meteorology:** Basic equations and fundamental forces: Pressure, gravity, centripetal and Corolis forces, continuity equation in Cartesian and isobaric coordinates. Momentum equation Cartesian and spherical coordinates; scale analysis, inertial flow, geostrophic and gradient winds, thermal wind. Divergence and vertical motion Rossby,

Richardson, Reynolds and Froude numbers. Circulation, vorticity and divergence; Bjerknese circulation theorem and applications, vorticity and divergence equations, scale analysis, potential vorticity, stream function and velocity potential. Atmospheric turbulence: Mixing length theory, planetary boundary layer equations, surface layer, Ekman layer, eddy transport of heat, moisture and momentum, Richardson criterion; Linear Perturbation Theory: Internal and external gravity waves, inertia waves, gravity waves, Rossby waves, wave motion in the tropics, barotropic and baroclinic instabilities. Atmospheric Energetics: Kinetic, potential and internal energies – conversion of potential and internal energies into kinetic energy, available potential energy.

6) **Numerical Weather Prediction:** Computational instability, filtering of sound and gravity waves, filtered forecast equations, barotropic and equivalent barotropic models, two parameter baroclinic model, relaxation method. Multi-layer primitive equation models. Short, medium and long range weather prediction. Objective analysis; Initialization of the data for use in weather prediction models; data assimilation techniques, application of satellite in NWP (Numerical Weather Prediction) and remotely sensed data.

7) **General Circulation and Climate Modelling:** Observed zonally symmetric circulations, meridional circulation models, mean meridional and eddy transport of momentum and energy, angular momentum and energy budgets; zonally asymmetric features of general circulation; standing eddies; east-west circulations in tropics: climate variability and forcings; feedback processes, low frequency variability, MJO Madden-Julian oscillation), ENSO, QBO (quasi-biennial oscillation) and sunspot cycles. Basic principles of general circulation modelling; grid-point and spectral GCMs; role of the ocean in climate modelling; interannual variability of ocean fields (SST, winds, circulation, etc.) and its relationship with monsoon, concepts of ocean – atmosphere coupled models.

8) **Synoptic Meteorology:** Weather observations and transmission, synoptic charts, analysis of surface, upper air another derivative chart, stream-lines, isotachs and contour analysis; tilt and slope of pressure/weather systems with height. Synoptic weather forecasting, prediction of weather elements such as rain, maximum and minimum temperature and fog; hazardous weather elements like thunderstorms, duststorms, tornadoes. Tropical meteorology: Trade wind inversion, ITCZ; monsoon trough tropical cyclones, their structure and development theory; monsoon depressions; tropical easterly jet stream; low level jets, Somali jet, waves in easterlies; western disturbances; SW and NE monsoons; synoptic features associated with onset, withdrawal, break active and weak monsoons and their prediction. Air masses and fronts: sources, origin and classification of air masses; and fronts, frontogenesis and frontolysis; structure of cold and warm fronts; weather systems associated with fronts. Extra-tropical synoptic scale features: jet streams, extratropical cyclones and anticyclones.

9) **Aviation Meteorology:** Role of meteorology in aviation, weather hazards associated with take off cruising and landing, inflight – icing, turbulence, visibility, fog, clouds, rain, gusts, wind shear and thunderstorms, nowcasting and very short range forecasting.

10) **Satellite Meteorology:** Meteorological satellites – Polar orbiting and geostationary satellites, visible and infrared radiometers, multiscanner radiometers; identification of synoptic systems, fog and sandstorms, detection of cyclones, estimation of SST, cloud top temperatures, winds and rainfall: temperature and humidity soundings.

(V) OCEAN SCIENCES

1) **Physical Oceanography:** T-S diagrams; mixing processes in the oceans; characteristics of important water masses.

Wind generated waves in the oceans; their characteristics; shallow and deep water waves. Propagation, refraction, and reflection of waves. Wave spectrum, principles of wave forecasting.

Tide-producing forces and their magnitudes; prediction of tides by the harmonic method; tides and tidal currents in shallow seas, estuaries and rivers. Factors influencing coastal processes; transformation of waves in shallow water; effects of stratification; effect of bottom friction, phenomena of wave reflection, refraction and diffraction; breakers and surf; littoral currents; wave action on sediments – movement to beach material; rip currents; beach stability, ocean beach nourishment; harbour resonance; seiches; tsunami; interaction of waves and structure.

Estuaries: classification and nomenclature; tides in estuaries; estuarine circulation and mixing; depth – averaged and breadth – averaged models; sedimentation in estuaries; salinity intrusion in estuaries; effect of stratification; coastal pollution; mixing and dispersal of pollutants in estuaries and near-shore areas; coastal zone management.

The global wind system; action of wind on ocean surface; Ekman's theory; Sverdrup, Stommel and Munk's theories; upwelling and sinking with special reference to the Indian ocean. Inertial currents; divergences and convergences; geostrophic motion; barotropic and baroclinic conditions; oceanic eddies, relationship between density, pressure and dynamic topography; relative and slope currents. Wind driven coastal currents; typical scales of motion in the ocean.

Characteristics of the global conveyor belt circulation and its causes.

Formation of subtropical gyres; western boundary currents; equatorial current systems; El Nino; monsoonal winds and currents over the North Indian Ocean; Somali current; southern ocean. Upwelling process in the Arabian Sea.

2) **Chemical Oceanography:** Composition of seawater – Classification of elements based on their distribution; major and minor constituents; behavior of elements; chemical exchanges across interfaces and residence times in seawater.

Chemical and biological interactions – Ionic interactions; cycling and air-sea exchange of important biogenic dissolved gases; carbon dioxide-carbonate system; alkalinity and control of pH; abiotic and biotic controls of trace elements in the ocean; biological pump and controls on atmospheric composition.

3) **Geological Oceanography:** Same topics as under subhead “Marine Geology & paleo-oceanography.

4) **Biological Oceanography:** Classification of the marine environment and marine organisms. Physio-chemical factors affecting marine life – light, temperature, salinity, pressure, nutrients, dissolved gases; adaptation and biological processes.

Primary and secondary production; factors controlling phytoplankton and zooplankton abundance and diversity; nekton and fisheries oceanography; benthic organisms; coastal marine communities and community ecology – estuaries, coral reefs and mangrove communities, deep-sea ecology including hydrothermal vent communities.

Energy flow and mineral cycling – energy transfer and transfer efficiencies through different trophic levels; food webs including the microbial loop.

Human impacts on marine communities; impacts of climate change on marine biodiversity.

Impact of pollution on marine environments including fisheries.

3. LIFE SCIENCES

EXAM SCHEME

TIME: 3 HOURS **MAXIMUM MARKS: 200**

Single Paper Test having Multiple Choice Questions (MCQs) is divided in three parts.

Part 'A'
This part shall carry 20 questions pertaining to General aptitude with emphasis on logical reasoning graphical analysis, analytical and numerical ability, quantitative comparisons, series formation, puzzles etc. The candidates shall be required to answer any 15 questions. Each question shall be of two marks. The total marks allocated to this section shall be 30 out of 200.

Part 'B'
This part shall contain 50 Multiple Choice Questions(MCQs) generally covering the topics given in the syllabus. A candidate shall be required to answer any 35 questions. Each question shall be of two marks. The total marks allocated to this section shall be 70 out of 200.

Part 'C'
This part shall contain 75 questions that are designed to test a candidate's knowledge of scientific concepts and/or application of the scientific concepts. The questions shall be of analytical nature where a candidate is expected to apply the scientific knowledge to arrive at the solution to the given scientific problem. A candidate shall be required to answer any 25 questions. Each question shall be of four marks. The total marks allocated to this section shall be 100 out of 200.

There will be negative marking @25% for each wrong answer. To enable the candidates to go through the questions, the question paper booklet shall be distributed 15 minutes before the scheduled time of the exam. The answer sheet (OMR sheet) shall be distributed at the scheduled time of the exam.

SYLLABUS

Part 'A'

This part shall carry 20 questions pertaining to General aptitude with emphasis on logical reasoning graphical analysis, analytical and numerical ability, quantitative comparisons, series formation, puzzles etc. The candidates shall be required to answer any 15 questions. Each question shall be of two marks. The total marks allocated to this section shall be 30 out of 200.

(Common Syllabus for Part B & C)

1. Molecules and their Interaction Relevant to Biology
2. Cellular Organization
3. Fundamental Processes
4. Cell Communication and Cell Signaling
5. Developmental Biology
6. System Physiology – Plant
7. System Physiology – Animal
8. Inheritance Biology
9. Diversity of Life Forms
10. Ecological Principles
11. Evolution and Behavior
12. Applied Biology
13. Methods in Biology

1. MOLECULES AND THEIR INTERACTION RELAVENT TO BIOLOGY

A) Structure of atoms, molecules and chemical bonds.

B) Composition, structure and function of biomolecules (carbohydrates, lipids, proteins, nucleic acids and vitamins).

C) Stablizing interactions (Van der Waals, electrostatic, hydrogen bonding, hydrophobic interaction, etc.).
D) Principles of biophysical chemistry (pH, buffer, reaction kinetics, thermodynamics, colligative properties).
E) Bioenergetics, glycolysis, oxidative phosphorylation, coupled reaction, group transfer, biological energy transducers.
F) Principles of catalysis, enzymes and enzyme kinetics, enzyme regulation, mechanism of enzyme catalysis, isozymes
G) Conformation of proteins (Ramachandran plot, secondary structure, domains, motif and folds).
H) Conformation of nucleic acids (helix (A, B, Z), t-RNA, micro-RNA).
I) Stability of proteins and nucleic acids.
J) Metabolism of carbohydrates, lipids, amino acids nucleotides and vitamins.

2. CELLULAR ORGANIZATION

A) **Membrane structure and function** (Structure of model membrane, lipid bilayer and membrane protein diffusion, osmosis, ion channels, active transport, membrane pumps, mechanism of sorting and regulation of intracellular transport,electrical properties of membranes).

B) **Structural organization and function of intracellular organelles** (Cell wall, nucleus, mitochondria, Golgi bodies, lysosomes, endoplasmic reticulum, peroxisomes, plastids, vacuoles, chloroplast, structure &function of cytoskeleton and its role in motility).

C) **Organization of genes and chromosomes** (Operon, unique and repetitive DNA, interrupted genes, gene families, structure of chromatin and chromosomes, heterochromatin, euchromatin, transposons).

D) **Cell division and cell cycle** (Mitosis and meiosis, their regulation, steps in cell cycle, regulation and control of cell cycle).

E) **Microbial Physiology** (Growth yield and characteristics, strategies of cell division, stress response)

3. FUNDAMENTAL PROCESSES

A) **DNA replication, repair and recombination** (Unit of replication, enzymes involved, replication origin and replication fork, fidelity of replication, extrachromosomal replicons, DNA damage and repair mechanisms, homologous and site-specific recombination).

B) **RNA synthesis and processing** (transcription factors and machinery, formation of initiation complex, transcription activator and repressor, RNA polymerases, capping, elongation, and termination, RNA processing, RNA editing, splicing, and polyadenylation, structure and function of different types of RNA, RNA transport).

C) **Protein synthesis and processing** (Ribosome, formation of initiation complex, initiation factors and their regulation, elongation and elongation factors, termination, genetic code, aminoacylation of tRNA, tRNA-identity, aminoacyl tRNA synthetase, and translational proof-reading, translational inhibitors, Post- translational modification of proteins).

D) **Control of gene expression at transcription and translation level** (regulating the expression of phages, viruses, prokaryotic and eukaryotic genes, role of chromatin in gene expression and gene silencing).

4. Cell communication and cell signaling

A) **Host parasite interaction** Recognition and entry processes of different pathogens like bacteria, viruses into animal and plant host cells, alteration of host cell behavior by pathogens, virus-induced cell transformation, pathogen-induced diseases in animals and plants, cell-cell fusion in both normal and abnormal cells.

B) **Cell signaling** Hormones and their receptors, cell surface receptor, signaling through G-protein coupled receptors, signal transduction pathways, second messengers, regulation of signaling pathways, bacterial and plant two-component systems, light signaling in plants, bacterial chemotaxis and quorum sensing.

C) **Cellular communication** Regulation of hematopoiesis, general principles of cell communication, cell adhesion and roles of different adhesion molecules, gap junctions, extracellular matrix, integrins. neurotransmission and its regulation.

D) **Cancer** Genetic rearrangements in progenitor cells, oncogenes, tumor suppressor genes, cancer and the cell cycle, virus-induced cancer, metastasis, interaction of cancer cells with normal cells, apoptosis, therapeutic interventions of uncontrolled cell growth.

E) **Innate and adaptive immune system** Cells and molecules involved in innate and adaptive immunity, antigens, antigenicity and immunogenicity. B and T cell epitopes, structure and function of antibody molecules. generation of antibody diversity, monoclonal antibodies, antibody engineering, antigen-antibody interactions, MHC molecules, antigen processing and presentation, activation and differentiation of B and T cells, B and T cell receptors, humoral and cell-mediated immune responses, primary and secondary immune modulation, the complement system, Toll-like receptors, cell-mediated effector functions, inflammation, hypersensitivity and autoimmunity, immune response during bacterial (tuberculosis), parasitic (malaria) and viral (HIV) infections, congenital and acquired immunodeficiencies, vaccines.

5. DEVELOPMENTAL BIOLOGY

A) **Basic concepts of development :** Potency, commitment, specification, induction, competence, determination and differentiation; morphogenetic gradients; cell fate and cell lineages; stem cells; genomic equivalence and the cytoplasmic determinants; imprinting; mutants and transgenics in analysis of development

B) **Gametogenesis, fertilization and early development:** Production of gametes, cell surface molecules in sperm-egg recognition in animals; embryo sac development and double fertilization in plants; zygote formation, cleavage, blastula formation, embryonic fields, gastrulation and formation of germ layers in animals; embryogenesis, establishment of symmetry in plants; seed formation and germination.

C) **Morphogenesis and organogenesis in animals :** Cell aggregation and differentiation in *Dictyostelium;* axes and pattern formation in *Drosophila,* amphibia and chick; organogenesis – vulva formation in *Caenorhabditis elegans,* eye lens induction, limb development and regeneration in vertebrates; differentiation of neurons, post embryonic

development- larval formation, metamorphosis; environmental regulation of normal development; sex determination.

D) **Morphogenesis and organogenesis in plants:** Organization of shoot and root apical meristem; shoot and root development; leaf development and phyllotaxy; transition to flowering, floral meristems and floral development in *Arabidopsis* and *Antirrhinum*

E) **Programmed cell death, aging and senescence**

6. SYSTEM PHYSIOLOGY - PLANT

A) **Photosynthesis -** Light harvesting complexes; mechanisms of electron transport; photoprotective mechanisms; CO_2 fixation-C_3, C_4 and CAM pathways.

B) **Respiration and photorespiration –** Citric acid cycle; plant mitochondrial electron transport and ATP synthesis; alternate oxidase; photorespiratory pathway.

C) **Nitrogen metabolism -** Nitrate and ammonium assimilation; amino acid biosynthesis.

D) **Plant hormones –** Biosynthesis, storage, breakdown and transport; physiological effects and mechanisms of action.

E) **Sensory photobiology** – Structure, function and mechanisms of action of phytochromes, cryptochromes and phototropins; stomatal movement; photoperiodism and biological clocks.

F) **Solute transport and photoassimilate translocation –** uptake, transport and translocation of water, ions, solutes and macromolecules from soil, through cells, across membranes, through xylem and phloem; transpiration; mechanisms of loading and unloading of photoassimilates.

G) **Secondary metabolites** – Biosynthesis of terpenes, phenols and nitrogenous compounds and their roles.

H) **Stress physiology** – Responses of plants to biotic (pathogen and insects) and abiotic (water, temperature and salt) stresses.

7. SYSTEM PHYSIOLOGY - ANIMAL

A) **Blood and circulation** – Blood corpuscles, haemopoiesis and formed elements, plasma function, blood volume, blood volume regulation, blood groups, haemoglobin, immunity, haemostasis.

B) **Cardiovascular System:** Comparative anatomy of heart structure, myogenic heart, specialized tissue, ECG – its principle and significance, cardiac cycle, heart as a pump, blood pressure, neural and chemical regulation of all above.

C) **Respiratory system** – Comparison of respiration in different species, anatomical considerations, transport of gases, exchange of gases, waste elimination, neural and chemical regulation of respiration.

D) **Nervous system** – Neurons, action potential, gross neuroanatomy of the brain and spinal cord, central and peripheral nervous system, neural control of muscle tone and posture.

E) **Sense organs** – Vision, hearing and tactile response.

F) **Excretory system** – Comparative physiology of excretion, kidney, urine formation, urine concentration, waste elimination, micturition, regulation of water balance, blood volume, blood pressure, electrolyte balance, acid-base balance.

G) **Thermoregulation** – Comfort zone, body temperature – physical, chemical, neural regulation, acclimatization.

H) **Stress and adaptation**

I) **Digestive system** – Digestion, absorption, energy balance, BMR.

J) **Endocrinology and reproduction** – Endocrine glands, basic mechanism of hormone action, hormones and diseases; reproductive processes, gametogenesis, ovulation, neuroendocrine regulation

8. INHERITANCE BIOLOGY

A) **Mendelian principles :** Dominance, segregation, independent assortment.

B) **Concept of gene :** Allele, multiple alleles, pseudoallele, complementation tests

C) **Extensions of Mendelian principles:** Codominance, incomplete dominance, gene interactions, pleiotropy, genomic imprinting, penetrance and expressivity, phenocopy, linkage and crossing over, sex linkage, sex limited and sex influenced characters.

D) **Gene mapping methods :** Linkage maps, tetrad analysis, mapping with molecular markers, mapping by using somatic cell hybrids, development of mapping population in plants.

E) **Extra chromosomal inheritance:** Inheritance of Mitochondrial and chloroplast genes, maternal inheritance.

F) **Microbial genetics:** Methods of genetic transfers–transformation,conjugation, transduction and sex-duction, mapping genes by interrupted mating, fine structure analysis of genes.

G) **Human genetics :** Pedigree analysis, lod score for linkage testing, karyotypes, genetic disorders.

H) **Quantitative genetics :** Polygenic inheritance, heritability and its measurements, QTL mapping.

I) **Mutation :** Types, causes and detection, mutant types – lethal, conditional, biochemica loss of function, gain of function, germinal verses somatic mutants, insertional mutagenesis.

J) **Structural and numerical alterations of chromosomes :** Deletion, duplication, inversion, translocation, ploidy and their genetic implications.

K) **Recombination :** Homologous and non-homologous recombination including transposition.

9. DIVERSITY OF LIFE FORMS:

A) **Principles & methods of taxonomy:** Concepts of species and hierarchical taxa, biological nomenclature, classical & quantititative methods of taxonomy of plants, animals and microorganisms.

B) **Levels of structural organization:** Unicellular, colonial and multicellular forms. Levels of organization of tissues, organs & systems. Comparative anatomy, adaptive radiation, adaptive modifications.

C) **Outline classification of plants, animals & microorganisms:** Important criteria used for classification in each taxon. Classification of plants, animals and microorganisms. Evolutionary relationships among taxa.

D) **Natural history of Indian subcontinent:** Major habitat types of the subcontinent, geographic origins and migrations of species. Comman Indian mammals, birds. Seasonality and phenology of the subcontinent.

E) **Organisms of health & agricultural importance:** Common parasites and pathogens of humans, domestic animals and crops.

F) **Organisms of conservation concern:** Rare, endangered species. Conservation strategies.

10. ECOLOGICAL PRINCIPLES

The Environment: Physical environment; biotic environment; biotic and abiotic interactions.

Habitat and Niche: Concept of habitat and niche; niche width and overlap; fundamental and realized niche; resource partitioning; character displacement.

Population Ecology: Characteristics of a population; population growth curves; population regulation; life history strategies (r and K selection); concept of metapopulation – demes and dispersal, interdemic extinctions, age structured populations.

Species Interactions: Types of interactions, interspecific competition, herbivory, carnivory, pollination, symbiosis.

Community Ecology: Nature of communities; community structure and attributes; levels of species diversity and its measurement; edges and ecotones.

Ecological Succession: Types; mechanisms; changes involved in succession; concept of climax.

Ecosystem Ecology: Ecosystem structure; ecosystem function; energy flow and mineral cycling (C,N,P); primary production and decomposition; structure and function of some Indian ecosystems: terrestrial (forest, grassland) and aquatic (fresh water, marine, eustarine).

Biogeography: Major terrestrial biomes; theory of island biogeography; biogeographical zones of India.

Applied Ecology: Environmental pollution; global environmental change; biodiversity: status, monitoring and documentation; major drivers of biodiversity change; biodiversity management approaches.

Conservation Biology: Principles of conservation, major approaches to management, Indian

case studies on conservation/management strategy (Project Tiger, Biosphere reserves).

11. EVOLUTION AND BEHAVIOUR

A) **Emergence of evolutionary thoughts:** Lamarck Darwin–concepts of variation, adaptation, struggle, fitness and natural selection; Mendelism; Spontaneity of mutations; The evolutionary synthesis.

B) **Origin of cells and unicellular evolution:** Origin of basic biological molecules; Abiotic synthesis of organic monomers and polymers; Concept of Oparin and Haldane; Experiement of Miller (1953); The first cell; Evolution of prokaryotes; Origin of eukaryotic cells; Evolution of unicellular eukaryotes; Anaerobic metabolism, photosynthesis and aerobic metabolism.

C) **Paleontology and Evolutionary History:** The evolutionary time scale; Eras, periods and epoch; Major events in the evolutionary time scale; Origins of unicellular and multi cellular organisms; Major groups of plants and animals; Stages in primate evolution including Homo.

D) **Molecular Evolution:** Concepts of neutral evolution, molecular divergence and molecular clocks; Molecular tools in phylogeny, classification and identification; Protein and nucleotide sequence analysis; origin of new genes and proteins; Gene duplication and divergence.

E) **The Mechanisms:** Population genetics – Populations, Gene pool, Gene frequency; Hardy-Weinberg Law; concepts and rate of change in gene frequency through natural selection, migration and random genetic drift; Adaptive radiation; Isolating mechanisms; Speciation; Allopatricity and Sympatricity; Convergent evolution; Sexual selection; Co- evolution.

F) **Brain, Behavior and Evolution:** Approaches and methods in study of behavior; Proximate and ultimate causation; Altruism and evolution-Group selection, Kin selection, Reciprocal altruism; Neural basis of learning, memory, cognition, sleep and arousal; Biological clocks; Development of behavior; Social communication; Social dominance; Use of space and territoriality; Mating systems, Parental investment and Reproductive success; Parental care; Aggressive behavior; Habitat selection and optimality in foraging; Migration, orientation and navigation; Domestication and behavioral changes.

12. APPLIED BIOLOGY:

A) Microbial fermentation and production of small and macro molecules.

B) Application of immunological principles, vaccines, diagnostics. Tissue and cell culture methods for plants and animals.

C) Transgenic animals and plants, molecular approaches to diagnosis and strain identification.

D) Genomics and its application to health and agriculture, including gene therapy.

E) Bioresource and uses of biodiversity.

F) Breeding in plants and animals, including marker – assisted selection

G) Bioremediation and phytoremediation

H) Biosensors

13. METHODS IN BIOLOGY

A) **Molecular Biology and Recombinant DNA methods:** Isolation and purification of RNA, DNA (genomic and plasmid) and proteins, different separation methods. Analysis of RNA, DNA and proteins by one and two dimensional gel electrophoresis, Isoelectric focusing gels. Molecular cloning of DNA or RNA fragments in bacterial and eukaryotic systems. Expression of recombinant proteins using bacterial, animal and plant vectors. Isolation of specific nucleic acid sequences Generation of genomic and cDNA libraries in plasmid, phage, cosmid, BAC and YAC vectors. In

vitro mutagenesis and deletion techniques, gene knock out in bacterial and eukaryotic organisms. Protein sequencing methods, detection of post translation modification of proteins. DNA sequencing methods, strategies for genome sequencing. Methods for analysis of gene expression at RNA and protein level, large scale expression, such as micro array based techniques Isolation, separation and analysis of carbohydrate and lipid molecules RFLP, RAPD and AFLP techniques.

B) **Histochemical and Immunotechniques:** Antibody generation, Detection of molecules using ELISA, RIA, western blot, immunoprecipitation, fluocytometry and immunofluorescence microscopy, detection of molecules in living cells, in situ localization by techniques such as FISH and GISH.

C) **Biophysical Method:** Molecular analysis using UV/visible, fluorescence, circular dichroism, NMR and ESR spectroscopy Molecular structure determination using X-ray diffraction and NMR, Molecular analysis using light scattering, different types of mass spectrometry and surface plasma resonance methods.

D) **Statisitcal Methods:** Measures of central tendency and dispersal; probability distributions (Binomial, Poisson and normal); Sampling distribution; Difference between parametric and non-parametric statistics; Confidence Interval; Errors; Levels of significance; Regression and Correlation; t-test; Analysis of variance; X2 test;; Basic introduction to Muetrovariate statistics, etc.

E) **Radiolabeling techniques:** Detection and measurement of different types of radioisotopes normally used in biology, incorporation of radioisotopes in biological tissues and cells, molecular imaging of radioactive material, safety guidelines.

F) **Microscopic techniques:** Visulization of cells and subcellular components by light microscopy, resolving powers of different microscopes, microscopy of living cells, scanning and transmission microscopes, different fixation and staining techniques for EM, freeze-etch and freeze- fracture methods for EM, image processing methods in microscopy.

G) **Electrophysiological methods:** Single neuron recording, patch-clamp recording, ECG, Brain activity recording, lesion and stimulation of brain, pharmacological testing, PET, MRI, fMRI, CAT.

H) **Methods in field biology:** Methods of estimating population density of animals and plants, ranging patterns through direct, indirect and remote observations, sampling methods in the study of behavior, habitat characterization: ground and remote sensing methods.

4. MATHEMATICAL SCIENCES

EXAM SCHEME

TIME: 3 HOURS **MAXIMUM MARKS: 200**

Single Paper Test having Multiple Choice Questions (MCQs) is divided in three parts.

Part 'A'

This part shall carry 20 questions pertaining to General aptitude with emphasis on logical reasoning graphical analysis, analytical and numerical ability, quantitative comparisons, series formation, puzzles etc. The candidates shall be required to answer any 15 questions. Each question shall be of two marks. The total marks allocated to this section shall be 30 out of 200.

Part 'B'

This part shall contain 40 Multiple Choice Questions (MCQs) generally covering the topics given in the syllabus. A candidate shall be required to answer any 25 questions. Each question shall be of three marks. The total marks allocated to this section shall be 75 out of 200.

Part 'C'

This part shall contain 60 questions that are designed to test a candidate's knowledge of scientific concepts and/or application of the scientific concepts. The questions shall be of analytical nature where a candidate is expected to apply the scientific knowledge to arrive at the solution to the given scientific problem. The questions in this part shall have multiple correct options. Credit in a question shall be given only on identification of ALL the correct options. No credit shall be allowed in a question if any incorrect option is marked as correct answer. No partial credit is allowed. A candidate shall be required to answer any 20 questions. Each question shall be of 4.75 marks. The total marks allocated to this section shall be 95 out of 200.

For Part 'A' and 'B' there will be Negative marking @25% for each wrong answer. No Negative marking for Part 'C'.To enable the candidates to go through the questions, the question paper booklet shall be distributed 15 minutes before the scheduled time of the exam. The answer sheet (OMR sheet) shall be distributed at the scheduled time of the exam.

SYLLABUS

Part 'A'

This part shall carry 20 questions pertaining to General aptitude with emphasis on logical reasoning graphical analysis, analytical and numerical ability, quantitative comparisons, series formation, puzzles etc. The candidates shall be required to answer any 15 questions. Each question shall be of two marks. The total marks allocated to this section shall be 30 out of 200.

(Common syllabus for Part 'B & C')

UNIT – 1

Analysis: Elementary set theory, finite, countable and uncountable sets, Real number system as a complete ordered field, Archimedean property, supremum, infimum.
Sequences and series, convergence, limsup, liminf.
Bolzano Weierstrass theorem, Heine Borel theorem.
Continuity, uniform continuity, differentiability, mean value theorem.
Sequences and series of functions, uniform convergence.
Riemann sums and Riemann integral, Improper Integrals.
Monotonic functions, types of discontinuity, functions of bounded variation, Lebesgue measure, Lebesgue integral.
Functions of several variables, directional derivative, partial derivative, derivative as a linear transformation, inverse and implicit function theorems.
Metric spaces, compactness, connectedness. Normed linear Spaces. Spaces of continuous functions as examples.
Linear Algebra: Vector spaces, subspaces, linear dependence, basis, dimension, algebra of linear transformations.
Algebra of matrices, rank and determinant of matrices, linear equations.
Eigenvalues and eigenvectors, Cayley-Hamilton theorem.
Matrix representation of linear transformations. Change of basis, canonical forms, diagonal forms, triangular forms, Jordan forms.
Inner product spaces, orthonormal basis.
Quadratic forms, reduction and classification of quadratic forms .

UNIT – 2

Complex Analysis: Algebra of complex numbers, the complex plane, polynomials, power series, transcendental functions such as exponential, trigonometric and hyperbolic functions.
Analytic functions, Cauchy-Riemann equations.
Contour integral, Cauchy's theorem, Cauchy's integral formula, Liouville's theorem, Maximum modulus principle, Schwarz lemma, Open mapping theorem.
Taylor series, Laurent series, calculus of residues.
Conformal mappings, Mobius transformations.
Algebra: Permutations, combinations, pigeon-hole principle, inclusion-exclusion principle, derangements.
Fundamental theorem of arithmetic, divisibility in Z, congruences, Chinese Remainder Theorem, Euler's Ø- function, primitive roots.
Groups, subgroups, normal subgroups, quotient groups, homomorphisms, cyclic groups, permutation groups, Cayley's theorem, class equations, Sylow theorems.
Rings, ideals, prime and maximal ideals, quotient rings, unique factorization domain, principal ideal domain, Euclidean domain.
Polynomial rings and irreducibility criteria.
Fields, finite fields, field extensions, Galois Theory.
Topology: basis, dense sets, subspace and product topology, separation axioms, connectedness and compactness.

UNIT – 3

Ordinary Differential Equations (ODEs): Existence and uniqueness of solutions of initial value problems for first order ordinary differential equations, singular solutions of first order ODEs, system of first order ODEs.
General theory of homogenous and non-homogeneous linear ODEs, variation of parameters, Sturm-Liouville boundary value problem, Green's function.
Partial Differential Equations (PDEs): Lagrange and Charpit methods for solving first order PDEs, Cauchy problem for first order PDEs.
Classification of second order PDEs, General solution of higher order PDEs with constant coefficients, Method of separation of variables for Laplace, Heat and Wave equations.
Numerical Analysis: Numerical solutions of algebraic equations, Method of iteration and Newton-Raphson method, Rate of convergence, Solution of systems of linear algebraic equations using Gauss elimination and Gauss-Seidel methods, Finite differences, Lagrange, Hermite and spline interpolation, Numerical differentiation and integration, Numerical solutions of ODEs using Picard, Euler, modified Euler and Runge-Kutta methods.
Calculus of Variations: Variation of a functional, Euler-Lagrange equation, Necessary and sufficient conditions for extrema. Variational methods for boundary value problems in ordinary and partial differential equations.
Linear Integral Equations: Linear integral equation of the first and second kind of Fredholm and Volterra type, Solutions with separable kernels. Characteristic numbers and eigenfunctions, resolvent kernel.
Classical Mechanics: Generalized coordinates, Lagrange's equations, Hamilton's canonical equations, Hamilton's principle and principle of least action, Two-dimensional motion of rigid bodies, Euler's dynamical equations for the motion of a rigid body about an axis, theory of small oscillations.

UNIT – 4

Descriptive statistics, exploratory data analysis
Sample space, discrete probability, independent events, Bayes theorem. Random variables and distribution functions (univariate and multivariate); expectation and moments. Independent random variables, marginal and conditional distributions. Characteristic

functions. Probability inequalities (Tchebyshef, Markov, Jensen). Modes of convergence, weak and strong laws of large numbers, Central Limit theorems (i.i.d. case).

Markov chains with finite and countable state space, classification of states, limiting behaviour of n-step transition probabilities, stationary distribution, Poisson and birth-and-death processes.

Standard discrete and continuous univariate distributions. sampling distributions, standard errors and asymptotic distributions, distribution of order statistics and range.

Methods of estimation, properties of estimators, confidence intervals. Tests of hypotheses: most powerful and uniformly most powerful tests, likelihood ratio tests. Analysis of discrete data and chi-square test of goodness of fit. Large sample tests.

Simple nonparametric tests for one and two sample problems, rank correlation and test for independence. Elementary Bayesian inference.

Gauss-Markov models, estimability of parameters, best linear unbiased estimators, confidence intervals, tests for linear hypotheses. Analysis of variance and covariance. Fixed, random and mixed effects models. Simple and multiple linear regression. Elementary regression diagnostics. Logistic regression.

Multivariate normal distribution, Wishart distribution and their properties. Distribution of quadratic forms. Inference for parameters, partial and multiple correlation coefficients and related tests. Data reduction techniques: Principle component analysis, Discriminant analysis, Cluster analysis, Canonical correlation.

Simple random sampling, stratified sampling and systematic sampling. Probability proportional to size sampling. Ratio and regression methods.

Completely randomized designs, randomized block designs and Latin-square designs. Connectedness and orthogonality of block designs, BIBD. 2K factorial experiments: confounding and construction.

Hazard function and failure rates, censoring and life testing, series and parallel systems.

Linear programming problem, simplex methods, duality. Elementary queuing and inventory models. Steady-state solutions of Markovian queuing models: M/M/1, M/M/1 with limited waiting space, M/M/C, M/M/C with limited waiting space, M/G/1.

All students are expected to answer questions from Unit-1. Mathematics students are expected to answer additional questions from Unit-II and III. Statistics students are expected to answer additional questions from Unit-IV.

5. PHYSICAL SCIENCES

EXAM SCHEME

TIME: 3 HOURS **MAXIMUM MARKS: 200**

Single Paper Test having Multiple Choice Questions (MCQs) is divided in three parts.

Part 'A'

This part shall carry 20 questions pertaining to General aptitude with emphasis on logical reasoning graphical analysis, analytical and numerical ability, quantitative comparisons, series formation, puzzles etc. The candidates shall be required to answer any 15 questions. Each question shall be of two marks. The total marks allocated to this section shall be 30 out of 200.

Part 'B'

This part shall contain 25 Multiple Choice Questions (MCQs) generally covering the topics given in the Part 'B' of syllabus. candidates are required to answer any 20 questions. Each question shall be of 3.5 Marks. The total marks allocated to this section shall be 70 out of 200.

Part 'C'

This part shall contain 30 questions from Part 'C' & 'B' of the syllabus that are designed to test a candidate's knowledge of scientific concepts and/or application of the scientific concepts. The questions shall be of analytical nature where a candidate is expected to apply the scientific knowledge to arrive at the solution to the given scientific problem. A candidate shall be required to answer any 20 questions. Each question shall be of 5 Marks. The total marks allocated to this section shall be 100 out of 200.

There will be negative marking @25% for each wrong answer. To enable the candidates to go through the questions, the question paper booklet shall be distributed 15 minutes before the scheduled time of the exam. The answer sheet (OMR sheet) shall be distributed at the scheduled time of the exam.

SYLLABUS

Part 'A'

This part shall carry 20 questions pertaining to General aptitude with emphasis on logical reasoning graphical analysis, analytical and numerical ability, quantitative comparisons, series formation, puzzles etc. The candidates shall be required to answer any 15 questions. Each question shall be of two marks. The total marks allocated to this section shall be 30 out of 200.

Part 'B'

I. Mathematical Methods of Physics

Dimensional analysis. Vector algebra and vector calculus. Linear algebra, matrices, Cayley-Hamilton Theorem. Eigenvalues and eigenvectors. Linear ordinary differential equations of first & second order, Special functions (Hermite, Bessel, Laguerre and Legendre functions). Fourier series, Fourier and Laplace transforms. Elements of complex analysis, analytic functions; Taylor &

Laurent series; poles, residues and evaluation of integrals. Elementary probability theory, random variables, binomial, Poisson and normal distributions. Central limit theorem.

II. Classical Mechanics

Newton's laws. Dynamical systems, Phase space dynamics, stability analysis. Central force motions. Two body Collisions - scattering in laboratory and Centre of mass frames. Rigid body dynamics- moment of inertia tensor. Non-inertial frames and pseudoforces. Variational principle. Generalized coordinates. Lagrangian and Hamiltonian formalism and equations of motion. Conservation laws and cyclic coordinates. Periodic motion: small oscillations, normal modes. Special theory of relativity- Lorentz transformations, relativistic kinematics and mass–energy equivalence.

III. Electromagnetic Theory

Electrostatics: Gauss's law and its applications, Laplace and Poisson equations, boundary value problems. Magnetostatics: Biot-Savart law, Ampere's theorem. Electromagnetic induction. Maxwell's equations in free space and linear isotropic media; boundary conditions on the fields at interfaces. Scalar and vector potentials, gauge invariance. Electromagnetic waves in free space. Dielectrics and conductors. Reflection and refraction, polarization, Fresnel's law, interference, coherence, and diffraction. Dynamics of charged particles in static and uniform electromagnetic fields.

IV. Quantum Mechanics

Wave-particle duality. Schrödinger equation (time-dependent and time-independent). Eigenvalue problems (particle in a box, harmonic oscillator, etc.). Tunneling through a barrier. Wave-function in coordinate and momentum representations. Commutators and Heisenberg uncertainty principle. Dirac notation for state vectors. Motion in a central potential: orbital angular momentum, angular momentum algebra, spin, addition of angular momenta; Hydrogen atom. Stern-Gerlach experiment. Time-independent perturbation theory and applications. Variational method. Time dependent perturbation theory and Fermi's golden rule, selection rules. Identical particles, Pauli exclusion principle, spin-statistics connection.

V. Thermodynamic and Statistical Physics

Laws of thermodynamics and their consequences. Thermodynamic potentials, Maxwell relations, chemical potential, phase equilibria. Phase space, micro- and macro-states. Micro-canonical, canonical and grand-canonical ensembles and partition functions. Free energy and its connection with thermodynamic quantities. Classical and quantum statistics. Ideal Bose and Fermi gases. Principle of detailed balance. Blackbody radiation and Planck's distribution law.

VI. Electronics and Experimental Methods

Semiconductor devices (diodes, junctions, transistors, field effect devices, homo- and hetero-junction devices), device structure, device characteristics, frequency dependence and applications. Opto-electronic devices (solar cells, photo-detectors, LEDs). Operational amplifiers and their applications. Digital techniques and applications (registers, counters, comparators and similar circuits). A/D and D/A converters. Microprocessor and microcontroller basics. Data interpretation and analysis. Precision and accuracy. Error analysis, propagation of errors. Least squares fitting,

Part 'C'

I. Mathematical Methods of Physics

Green's function. Partial differential equations (Laplace, wave and heat equations in two and three dimensions). Elements of computational techniques: root of functions, interpolation, extrapolation, integration by trapezoid and Simpson's rule, Solution of first order differential equation using Runge-Kutta method. Finite difference methods. Tensors. Introductory group theory: SU(2), O(3).

II. Classical Mechanics

Dynamical systems, Phase space dynamics, stability analysis. Poisson brackets and canonical transformations. Symmetry, invariance and Noether's theorem. Hamilton-Jacobi theory.

III. Electromagnetic Theory

Dispersion relations in plasma. Lorentz invariance of Maxwell's equation. Transmission lines and wave guides. Radiation- from moving charges and dipoles and retarded potentials.

IV. Quantum Mechanics

Spin-orbit coupling, fine structure. WKB approximation. Elementary theory of scattering: phase shifts, partial waves, Born approximation. Relativistic quantum mechanics: Klein-Gordon and Dirac equations. Semi-classical theory of radiation.

V. Thermodynamic and Statistical Physics

First- and second-order phase transitions. Diamagnetism, paramagnetism, and ferromagnetism. Ising model. Bose-Einstein condensation. Diffusion equation. Random walk and Brownian motion. Introduction to nonequilibrium processes.

VI. Electronics and Experimental Methods

Linear and nonlinear curve fitting, chi-square test. Transducers (temperature, pressure/vacuum, magnetic fields, vibration, optical, and particle detectors). Measurement and control. Signal conditioning and recovery. Impedance matching, amplification (Op-amp based, instrumentation amp, feedback), filtering and noise reduction, shielding and grounding. Fourier transforms, lock-in detector, box-car integrator, modulation techniques.

High frequency devices (including generators and detectors).

VII. Atomic & Molecular Physics

Quantum states of an electron in an atom. Electron spin. Spectrum of helium and alkali atom. Relativistic corrections for energy levels of hydrogen atom, hyperfine structure and isotopic shift, width of spectrum lines, LS & JJ couplings. Zeeman, Paschen-Bach & Stark effects. Electron spin resonance. Nuclear magnetic resonance, chemical shift. Frank-Condon principle. Born-Oppenheimer approximation. Electronic, rotational, vibrational and Raman spectra of diatomic molecules, selection rules. Lasers: spontaneous and stimulated emission, Einstein A & B coefficients. Optical pumping, population inversion, rate equation. Modes of resonators and coherence length.

VIII. Condensed Matter Physics

Bravais lattices. Reciprocal lattice. Diffraction and the structure factor. Bonding of solids. Elastic properties, phonons, lattice specific heat. Free electron theory and electronic specific heat. Response and relaxation phenomena. Drude model of electrical

and thermal conductivity. Hall effect and thermoelectric power. Electron motion in a periodic potential, band theory of solids: metals, insulators and semiconductors. Superconductivity: type-I and type-II superconductors. Josephson junctions. Superfluidity. Defects and dislocations. Ordered phases of matter: translational and orientational order, kinds of liquid crystalline order. Quasi crystals.

IX. Nuclear and Particle Physics

Basic nuclear properties: size, shape and charge distribution, spin and parity. Binding energy, semi-empirical mass formula, liquid drop model. Nature of the nuclear force, form of nucleon-nucleon potential, charge-independence and charge-symmetry of nuclear forces. Deuteron problem. Evidence of shell structure, single-particle shell model, its validity and limitations. Rotational spectra. Elementary ideas of alpha, beta and gamma decays and their selection rules. Fission and fusion. Nuclear reactions, reaction mechanism, compound nuclei and direct reactions.

Classification of fundamental forces. Elementary particles and their quantum numbers (charge, spin, parity, isospin, strangeness, etc.). Gellmann-Nishijima formula. Quark model, baryons and mesons. C, P, and T invariance. Application of symmetry arguments to particle reactions. Parity non-conservation in weak interaction. Relativistic kinematics.

6. ENGINEERING SCIENCES

EXAM SCHEME

TIME: 3 HOURS **MAXIMUM MARKS: 200**

Single Paper Test having Multiple Choice Questions (MCQs) is divided in three parts.

Part 'A'

This part shall carry 20 questions pertaining to General aptitude with emphasis on logical reasoning graphical analysis, analytical and numerical ability, quantitative comparisons, series formation, puzzles etc. The candidates shall be required to answer any 15 questions. Each question shall be of two marks. The total marks allocated to this section shall be 30 out of 200.

Part 'B' : This part shall contain 25 questions related to Mathematics and Engineering Aptitude. Candidates shall be required to answer any 20 questions. Each question shall be of 3.5 marks. Total marks allocated to this section shall be 70 out of 200.

Part 'C' : Shall contain subject related question of the following 7 subject areas :

1. Computer Science & Information Technology
2. Electrical Science
3. Electronics
4. Materials Science
5. Fluid Mechanics
6. Solid Mechanics
7. Thermodynamics

Each subject area will carry 10 questions. Candidates shall be required to answer any 20 questions out of a total of 70 questions. Each question shall be of 5 marks. The total marks allocated to this part shall be 100 out of 200.

There will be negative marking @25% for each wrong answer. To enable the candidates to go through the questions, the question paper booklet shall be distributed 15 minutes before the scheduled time of the exam. The answer sheet (OMR sheet) shall be distributed at the scheduled time of the exam.

SYLLABUS

Part 'A'

This part shall carry 20 questions pertaining to General aptitude with emphasis on logical reasoning graphical analysis, analytical and numerical ability, quantitative comparisons, series formation, puzzles etc. The candidates shall be required to answer any 15 questions. Each question shall be of two marks. The total marks allocated to this section shall be 30 out of 200.

Part 'B'

Mathematics And Engineering Aptitude

1. **Linear Algebra:** Algebra of matrices, inverse, rank, system of linear equations, symmetric, skew-symmetric and orthogonal matrices. Hermitian, skew-Hermitian and unitary matrices. eigenvalues and eigenvectors, diagonalisation of matrices.
2. **Calculus:** Functions of single variable, limit, continuity and differentiability, Mean value theorems, Indeterminate forms and L'Hospital rule, Maxima and minima, Taylor's series, Newton's method for finding roots of polynomials. Fundamental and mean value-theorems of integral calculus. Numerical integration by trapezoidal and Simpson's rule. Evaluation of definite and improper integrals, Beta and Gamma functions, Functions of two variables, limit, continuity, partial derivatives, Euler's theorem for homogeneous functions, total derivatives, maxima and minima, Lagrange method of multipliers, double integrals and their applications, sequence and series, tests for convergence, power series, Fourier Series, Half range sine and cosine series.
3. **Complex variables:** Analytic functions, Cauchy-Riemann equations, Line integral, Cauchy's integral theorem and integral formula Taylor's and Laurent' series, Residue theorem and its applications.

4. **Vector Calculus:** Gradient, divergence and curl, vector identities, directional derivatives, line, surface and volume integrals, Stokes, Gauss and Green's theorems and their applications.
5. **Ordinary Differential Equations:** First order equation (linear and nonlinear), Second order linear differential equations with variable coefficients, Variation of parameters method, higher order linear differential equations with constant coefficients, Cauchy-Euler's equations, power series solutions, Legendre polynomials and Bessel's functions of the first kind and their properties. Numerical solutions of first order ordinary differential equations by Euler's and Runge-Kutta methods.
6. **Probability:** Definitions of probability and simple theorems, conditional probability, Bayes Theorem.
7. **Solid Body Motion and Fluid Motion:** Particle dynamics; Projectiles; Rigid Body Dynamics; Lagrangian formulation; Eularian formulation; Bernoulli's Equation; Continuity equation; Surface tension; Viscosity; Brownian Motion.
8. **Energetics:** Laws of Thermodynamics; Concept of Free energy; Enthalpy, and Entropy; Equation of State; Thermodynamics relations.
9. **Electron Transport:** Structure of atoms, Concept of energy level, Bond Theory; Definition of conduction, Semiconductor and Insulators; Diode; Half wave & Full wave rectification; Amplifiers & Oscillators; Truth Table.
10. **Electromagnetics:** Theory of Electric and Magnetic potential & field; Biot & Savart's Law; Theory of Dipole; Theory of Oscillation of electron; Maxwell's equations; Transmission theory; Amplitude & Frequency Modulation.
11. **Materials:** Periodic table; Properties of elements; Reaction of materials; Metals and non-Metals (Inorganic materials), Elementary knowledge of monomeric and polymeric compounds; Organometallic compounds; Crystal structure and symmetry, Structure-property correlation-metals, ceramics, and polymers.

Part 'C'

1. COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

Basic Discrete Mathematics: Counting principles, linear recurrence, mathematical induction, equation sets, relations and function, predicate and propositional logic.

Digital Logic:

Logic functions, Minimization, Design and synthesis of combinational and sequential circuits; Number representation and computer arithmetic (fixed and floating point).

Computer Organization and Architecture:

Machine instructions and addressing modes, ALU and data-path, CPU control design, Memory interface, I/O interface (Interrupt and DMA mode), Instruction pipelining, Cache and main memory, Secondary storage.

Programming and Data Structures:

Programming in C; Functions, Recursion, Parameter passing, Scope, Binding; Abstract data types, Arrays, Stacks, Queues, Linked Lists, Trees, Binary search trees, Binary heaps.

Algorithms:

Analysis, Asymptotic notation, Notions of space and time complexity, Worst and average case analysis; Design: Greedy approach, Dynamic programming, Divide-andconquer; Tree and graph traversals, Connected components, Spanning trees, Shortest paths; Hashing, Sorting, Searching. Asymptotic analysis (best, worst, average cases) of time and space, upper and lower bounds, Basic concepts of complexity classes P, NP, NP-hard, NP-complete.

Operating System:

Processes, Threads, Inter-process communication, Concurrency, Synchronization, Deadlock, CPU scheduling, Memory management and virtual memory, File systems.

Databases:

ER-model, Relational model (relational algebra, tuple calculus), Database design (integrity constraints, normal forms), Query languages (SQL), File structures (sequential files, indexing, B and B+ trees), Transactions and concurrency control.

Information Systems and Software Engineering:

information gathering, requirement and feasibility analysis, data flow diagrams, process specifications, input/output design, process life cycle, planning and managing the project, design, coding, testing, implementation, maintenance.

2. ELECTRICAL SCIENCES

Electric Circuits and Fields:

Node and mesh analysis, transient response of dc and ac networks, sinusoidal steady-state analysis, resonance, basic filter concepts, ideal current and voltage sources, Thevenin's, Norton's and Superposition and Maximum Power Transfer theorems, two port networks, three phase circuits, measurement of power in three phase circuits, Gauss Theorem, electric field and potential due to point, line, plane and spherical charge distributions, Ampere's and Biot-Savart's laws, inductance, dielectrics, capacitance.

Electrical Machines: Magnetic circuits

Magnetic circuits, Single phase transformer- equivalent circuit, phasor diagram, tests, regulation and efficiency, Three phase transformers- connections, parallel operation, auto-transformer; energy conversion principles, DC Machines- types , starting and speed control of dc motors, Three phase induction motors- principles, types, performance characteristics, starting and speed control, Single phase induction motors, synchronous machines performance, regulation and parallel operation of synchronous machine operating as generators, starting and speed control of synchronous motors and its applications, servo and stepper motors.

Power Systems:

Basic power generation concepts, transmission line models and performance, cable performance, insulation, corona and radio interference , Distribution systems, per-unit quantities, bus impedance and admittance matrices, load flow, voltage and frequency control, power factor correction; unbalanced analysis, symmetrical components, basic concepts of protection and stability; Introduction to HVDC systems.

Control Systems:

Principles of feedback control, transfer function, block diagrams, steady state errors, Routh and Nyquist techniques, Bode plots, Root loci, Lag , Lead and Lead-lag compensation; proportional, PI, PID controllers, state space model, state transition matrix, controllability and observability.

Power Electronics and Drives:

Semiconductor Power devices - power diodes, power transistors, thyristors, triacs, GTOs, MOSFETs, IGBTs – their characteristics and basic triggering circuits; diode rectifiers, thyristor based line commutated ac to dc converters, dc to dc converters – buck, boost, buck-boost, c'uk, flyback, forward, push-pull converters, single phase and three phase dc to ac inverters and related pulse width modulation techniques, stability of electric drives; speed control issues of dc motors, induction motors and synchronous motors.

3. ELECTRONICS

Analog Circuits and Systems:

Electronic devices: characteristics and small-signal equivalent circuits of diodes, BJTs and MOSFETs. Diode circuits: clipping, clamping and rectifier. Biasing and bias stability of BJT and FET amplifiers. Amplifiers: single-and multi-stage, differential and operational, feedback, and power. Frequency response of amplifiers. Op-amp circuits: voltage-to-current and current-to-voltage converters, active filters, sinusoidal oscillators, wave-shaping circuits, effect of practical parameters (input bias current, input offset voltage, open loop gain, input resistance, CMRR). Electronic measurements: voltage, current, impedance, time, phase, frequency measurements, oscilloscope.

Digital Circuits and Systems:

Boolean algebra and minimization of Boolean functions. Logic gates, TTL and CMOS IC families. Combinatorial circuits: arithmetic circuits, code converters, multiplexers and decoders. Sequential circuits: latches and flip-flops, counters and shift-registers. Sample-and-hold circuits, ADCs, DACs. Microprocessors and microcontrollers: number systems, 8085 and 8051 architecture, memory, I/O interfacing, Serial and parallel communication.

Signals and Systems:

Linear time invariant systems: impulse response, transfer function and frequency response of first- and second order systems, convolution. Random signals and noise: probability, random variables, probability density function, autocorrelation, power spectral density. Sampling theorem, Discrete-time systems: impulse and frequency response, IIR and FIR filters.

Communications:

Amplitude and angle modulation and demodulation, frequency and time division multiplexing. Pulse code modulation, amplitude shift keying, frequency shift keying and pulse shift keying for digital modulation. Bandwidth and SNR calculations. Information theory and channel capacity.

4. MATERIALS SCIENCE

Structure:

Atomic structure and bonding in materials. Crystal structure of materials, crystal systems, unit cells and space lattices, miller indices of planes and directions, packing geometry in metallic, ionic and covalent solids. Concept of amorphous, single and polycrystalline structures and their effect on properties of materials. Imperfections in crystalline solids and their role in influencing various properties.

Diffusion: Fick's laws and application of diffusion.

Metals and Alloys:

Solid solutions, solubility limit, phase rule, binary phase diagrams, intermediate phases, intermetallic compounds, iron-iron carbide phase diagram, heat treatment of steels, cold, hot working of metals, recovery, recrystallization and grain growth. Microstructure, properties and applications of ferrous and non-ferrous alloys.

Ceramics, Polymers, & Composites:

Structure, properties, processing and applications of ceramics. Classification, polymerization, structure and properties, processing and applications. Properties and applications of various composites.

Materials Characterization Tools:

X-ray diffraction, optical microscopy, scanning electron microscopy and transmission electron microscopy, differential thermal analysis, differential scanning calorimetry.

Materials Properties:

Stress-strain diagrams of metallic, ceramic and polymeric materials, modulus of elasticity, yield strength, tensile strength, toughness, elongation, plastic deformation, viscoelasticity, hardness, impact strength, creep, fatigue, ductile and brittle fracture.

Heat capacity, thermal conductivity, thermal expansion of materials. Concept of energy band diagram for materials - conductors, semiconductors and insulators, intrinsic and extrinsic semiconductors, dielectric properties. Origin of magnetism in metallic and ceramic materials, paramagnetism, diamagnetism, antiferro magnetism, ferromagnetism, ferrimagnetism, magnetic hysterisis.

Environmental Degradation:

Corrosion and oxidation of materials, prevention.

5. FLUID MECHANICS

Fluid Properties:

Relation between stress and strain rate for Newtonian fluids; Buoyancy, manometry, forces on submerged bodies.

Kinematics

Eulerian and Lagrangian description of fluid motion, strain rate and vorticity; concept of local and convective accelerations, steady and unsteady flows

Control Volume Based Analysis

Control volume analysis for mass, momentum and energy.

Differential equations of mass and momentum (Euler equation), Bernoulli's equation and its applications, Concept of fluid rotation.

Potential flow:

Vorticity, Stream function and Velocity potential function; Elementary flow fields and principles of superposition, potential flow past a circular cylinder.

Dimensional analysis:

Concept of geometric, kinematic and dynamic similarity, Non-dimensional numbers and their usage.

Viscous Flows

Navier-Stokes Equations; Exact Solutions; Couette Flow, Fully-developed pipe flow, Hydrodynamic lubrication, Basic ideas of Laminar and Turbulent flows, Prandtl-mixing length, Friction factor, Darcy-Weisbach relation, Simple pipe networks.

Boundary Layer

Qualitative ideas of boundary layer, Boundary Layer Equation; Separation, Streamlined and bluff bodies, drag and lift forces.

Measurements

Basic ideas of flow measurement using venturimeter, pitot-static tube and orifice plate.

6. SOLID MECHANICS

Equivalent force systems; free-body diagrams; equilibrium equations; analysis of determinate trusses and frames; friction; simple particle dynamics; plane kinematics and kinetics; work-energy and impulse-momentum principles;

Stresses and strains; principal stresses and strains; Mohr's circle; generalized Hooke's Law; thermal strain.

Axial, shear and bending moment diagrams; axial, shear and bending stresses; deflection of beams (symmetric bending); Torsion in circular shafts; thin walled pressure vessels. Energy methods (Catigliano's theorems) for analysis.

Combined axial, bending and torsional action; Theories of failure.

Buckling of columns.

Free vibration of single degree of freedom systems.

7. THERMODYNAMICS

Basic Concepts:

Continuum, macroscopic approach, thermodynamic system (closed and open or control volume); thermodynamic properties and equilibrium; state of a system, state diagram, path and process; different modes of work; Zeroth law of thermodynamics; concept of temperature; heat.

First Law of Thermodynamics:

Energy, enthalpy, specific heats, first law applied to closed systems and open systems (control volumes), steady and unsteady flow analysis.

Second Law of Thermodynamics:

Kelvin-Planck and Clausius statements, reversible and irreversible processes, Carnot theorems, thermodynamic temperature scale, Clausius inequality and concept of entropy, principle of increase of entropy, entropy balance for closed and open systems, exergy (availability) and irreversibility, non-flow and flow exergy.

Properties of Pure Substances:

Thermodynamic properties of pure substances in solid, liquid and vapor phases, P-V-T behaviour of simple compressible substances, phase rule, thermodynamic property tables and charts, ideal and real gases, equations of state, compressibility chart.

Thermodynamic Relations:

T-ds relations, Maxwell equations, Joule-Thomson coefficient, coefficient of volume expansion, adiabatic and isothermal compressibilities, Clapeyron equation.

Thermodynamic cycles:

Carnot vapour power cycle; simple Rankine cycle, reheat and regenerative Rankine cycle; Air standard cycles: Otto cycle, Diesel cycle, simple Brayton cycle, Brayton cycle with regeneration, reheat and intercooling; vapour-compression refrigeration cycle.

Ideal Gas Mixtures:

Dalton's and Amagat's laws, calculations of properties (internal energy, enthalpy, entropy), air-water vapour mixtures and simple thermodynamic processes involving them.

————X————

APPENDIX – II

FORM OF CERTIFICATE PRESCRIBED

Form of certificate as prescribed in M.H.A. O.M. No.42/21/49-N.G.S., dated 28.01.1952, as revised in Dept. Of Per. & A.R. LETTER No.36012/6/76-Est(S.C.T.), dated 29.10.1977, to be produced by a candidate belonging to a Scheduled Caste or Scheduled Tribe in support of his claim.

FORM OF CASTE CERTIFICATE

This is to certify that Shri/Shrimati*/Kumari*..... Son/daughter of Shri/Smt……..of village/ town*..... in District/Division*……..of the State/Union/Territory*.....belongs to the .....Caste/Tribe* which is recognised as a: Scheduled Caste/Scheduled Tribe under

The Constitution (Scheduled Castes) Order, 1950
*The Constitution (Scheduled Tribe) Order, 1950
*The Constitution (Scheduled Castes) (Union Territories) Orders, 1951
*The Constitution (Scheduled Tribes) (Union Territories) Orders, 1951
(As amended by the Scheduled Castes and Scheduled Tribes Lists (Modification Order) 1956, the Bombay Reorganisation Act, 1960, the Punjab Reorganisation Act 1966, the State of Himachal Pradesh Act, 1970, the north-eastern Areas (Reorgnisation) Act 1971 and the Scheduled Castes and
Scheduled tribes Orders (Amendment) Act 1976)
*The Constitution (Dadar & Nagar Haveli) Scheduled Castes Order, 1962,
*The Constitution (Dadar & Nagar Haveli) Scheduled Tribes Order, 1962,
*The Constitution (Pondicherry) Scheduled Castes Order, 1964,
*The Constitution (Nagaland)Scheduled Tribes Order, 1970,
*The Constitution (Sikkim) Scheduled Castes Order, 1978,
*The Constitution (Sikkim) Scheduled Tribes Order, 1978,
*The Constitution (Jammu & Kashmir) Scheduled Tribes Order, 1969,
*The Constitution (Scheduled Tribes) Order amendment Act 1991
*The Constitution (Scheduled Tribes) Order Second amendment Act 1991

2. This certificate is issued on the basis of the Scheduled Castes/Scheduled tribes Certificate issued to Shri/Shrimati Kumari*..... Father/mother* of Shrimati Kumari*.....in District Division.....of the State/Union territory*……..who belongs to the Caste/Tribe* which is recognised as a Scheduled Caste/ Scheduled Tribe* in the State/Union Territory*.....Issued by the……dated……

3. Shri/Shrimati/Kumari*.....and/or* his/her* family ordinarily reside(s) in village/town.....of.....District/Division* of the State/Union territory* of.....

Signature.....

Place_____ Designation.....

(With Seal of Office)

Date _____ State.....

Note: The term “Ordinarily resides” used here will have the same meaning as in Section 20 of the Representation of the Peoples Act, 1950.

Please delete the words, which are not applicable

AUTHORITIES EMPOWERED TO ISSUE CASTE CERTIFICATES

(Appendix 15 to Brochure on Reservation for SCs and STs in Service – 7th (Edition)
the under mentioned authorities have been empowered to issue Caste Certificates of verification

1. District magistrate/Additional District Magistrate/Collector/Deputy Commissioner/Additional Deputy Commissioner/ Deputy collector/1st Class Stipendiary Magistrate/Sub-Divisional Magistrate/Taluka Magistrate/Executive Magistrate/ Extra Assistant commissioner.
2. Chief Presidency Magistrate/Additional Chief Presidency Magistrate/Presidency Magistrate.
3. Revenue Officer not below the rank of Tehsildar.
4. Sub-Divisional Officer of the area where the candidate and/or his/her family normally resides.

   Note: Not below the rank of 1st Class Stipendiary Magistrate

APPENDIX – III

FORM OF CERTIFICATE TO BE PRODUCED BY OTHER BACKWARD CLASSES

This is to certify that Sh./Smt.Km……..son/daughter of Sh./Smt……..of village……..District/Division……..in the State……belongs to the……Community which is recognised as a backward class under:-

*(i) Government of India, Ministry of Welfare, Resolution No.12011/68/93-BCC(C) dated the 10th September, 1993, published in the Gazette of India, Extraordinary, Part – 1, Section 1, No.186 dated the 13th September, 1993.

*(ii) Government of India, Ministry of Welfare, Resolution No.12011/9/94 – BCC, dated the 19th October, 1994, published in the Gazette of India, Extraordinary, Part – 1, Section 1, No.163, dated the 20th October, 1994.

*(iii) Government of India, Ministry of Welfare, Resolution No.12011/7/95-BCC, dated the 24th May, 195, published in the Gazette of India, Extraordinary, Part – 1, Section 1, No.88, dated the 25th May, 1995.

*(iv) Government of India, Ministry of Welfare, Resolution No.12011/44/96-BCC, dated the 6th December,1996, published in the Gazette of India, Extraordinary, Part – 1, section 1, No.210 dated the 11th December, 1996

Shri……and/or his family ordinarily reside(s) in the……District/Division of the……State. This is also to certify that he/she does not belong to the persons/sections(Creamy Layer)mentioned in Column 3 of the Schedule to the government of India, Department of Personnel and Training OM NO.36012/22/93-Estt.9SCT), DATED 08.09.1993.

Signature……

Designation……
District magistrate, Deputy Commissioner, etc.
(With Seal of Office)

Place_____

Date _____

*Strike out which is not applicable

NB: (a) The term ordinarily used here will have the same meaning as in Section 20 of the Representation of the Peoples Act, 1950.

(b) Competent authorities to issue OBC certificates are as under:-

(i) District Magistrate/Additional District Magistrate/Collector/Deputy Commissioner/Additional Deputy Commissioner/Deputy Collector/1st Class Stipendiary Magistrate/Sub-Divisional Magistrate/Taluka Magistrate/Executive Magistrate/Extra Assistant Commissioner (not below, the rank of 1st Class Stipendiary Magistrate)

(ii) Chief Presidency Magistrate/Extra Assistant commissioner (not below the rank of 1st Class Stipendiary Magistrate)

(iii) Revenue Officer not below the rank of Tehsildar and Sub-Divisional Officer of the area where the candidate and /or his family resides.

APPENDIX - IV

LIST OF CODES

1. SUBJECT CODES (Col. 13 of Appl. Form)

Subject	*Code Name*	*Code No.*
CHEMICAL SCIENCES	CHE	1
EARTH SCIENCES	ERT	2
LIFE SCIENCES	LIF	3
MATHEMATICAL SCIENCES	MAT	4
PHYSICAL SCIENCES	PHY	5
ENGINEERING SCIENCES	ENG	6

2. MEDIUM OF EXAMINATION CODES (Col. 5 of Appl. Form)

Medium	*Code No.*
Hindi	1
English	2

3. CENTRE CODES (Col. 9 and 12 of Appl. Form)

Centre	*Code Name*	*Code No.*
BANGALORE	BAN	01
BHAVNAGAR	BHA	02
BHOPAL	BHO	03
BHUBNESHWAR	BHU	04
CHANDIGARH	CHA	05
CHENNAI	CHE	06
COCHIN	COC	07
DELHI	DEL	08
GUNTUR	GUN	09
GUWAHATI	GUW	10
HYDERABAD	HYD	11
IMPHAL	IMP	12
JAMMU	JMU	13
JAMSHEDPUR	JAM	14
KARAIKUDI	KAR	15
KOLKATA	KOL	16
LUCKNOW	LUC	17
NAGPUR	NAG	18
PILANI	PIL	19
PUNE	PUN	20
RAIPUR	RAI	21
ROORKEE	ROR	22
SRINAGAR	SRI	23
THIRUVANANTHPURAM	THI	24
UDAIPUR	UDA	25
VARANASI	VAR	26

4. STATE CODE Nos (Col. 29 of Appl. Form)

	Code No.
ANDAMAN & NICOBAR ISLANDS	01
ANDHRA PRADESH	02
ARUNACHAL PRADESH	03
ASSAM	04
BIHAR	05
CHANDIGARH	06
CHATTISGARH	07
DADRA & NAGAR HAVELI	08
DAMAN & DIU	09
DELHI	10
GOA	11
GUJARAT	12
HARYANA	13
HIMACHAL PRADESH	14
JAMMU & KASHMIR	15
JHARKHAND	16
KARNATAKA	17
KERALA	18
LAKSHADWEEP ISLANDS	19
MADHYA PRADESH	20
MAHARASHTRA	21
MANIPUR	22
MEGHALAYA	23
MIZORAM	24
NAGALAND	25
ORISSA	26
PONDICHERRY	27
PUNJAB	28
RAJASTHAN	29
SIKKIM	30
TAMIL NADU	31
TRIPURA	32
UTTARANCHAL	33
UTTAR PRADESH	34
WEST BENGAL	35
APO	36

5. SUBJECT SPECIALIZATION CODES (Col. 22 & 23 of Appl. Form)

CHEMICAL SCIENCES	
Analytical Chemistry	101
Inorganic Chemistry	102
Organic Chemistry	103
Physical Chemistry	104
Others	105
EARTH SCIENCES	
Geology	201
Geophysics	202
Meteorology	203
Oceanography	204
Physical Geography	205
Others	206
LIFE SCIENCES	
Biochemistry	301
Biodiversity and Taxonomy	302
Biotechnology	303
Botany	304
Genetics	305
Microbiology	306
Physiology	307
Zoology	308
Others	309
MATHEMATICAL SCIENCES	
Applied Mathematics	401
Pure Mathematics	402
Statistics	403
Others	404
PHYSICAL SCIENCES	
Atomic & Molecular Physics	501
Classical Dynamics	502
Condensed Matter Physics	503
Electromagnetics	504

Experimental Design	505	Chemical Engineering	603
Electronics	506	Computer Sc. and Information Technoloogy	604
Nuclear & Particle Physics	507	Electronics and Communication Engg.	605
Quantum Physics	508	Electrical Engineering	606
Thermodynamics	509	Instrumentation Engineering	607
Others	510	Mechanical Engineering	608
ENGINEERING SCIENCES		Mining Engineering	609
Aerospace Engineering	601	Metallurgical Engineering	610
Civil Engineering	602	Others	611

6. UNIVERSITY CODES (Col. 24 & 25 of the Appl. Form)

Name of University	Code
Acharya N.G.Ranga Agricultural University, Hyderabad	001
University of Agricultural Sciences, Bangalore	002
University of Agricultural Sciences, Dharward	003
Alagappa University, Karaikudi	004
Aligarh Muslim University, Aligarh	005
University of Allahabad, Allahabad	006
All Indian Institute of Medical Sciences, New Delhi	007
Amarvati University, Amaravati	008
Andhra University, Visakhapatnam	009
Anna University, Chennai	010
Annamalai University, Annamalainagar	011
Arunachal University ,Itanagar	012
Assam Agricultural University, Assam	013
Assam University, Silchar	014
Avinashilingam Inst. for Home Sc. & Higher Education for Women, Coimbatore	015
Awadhesh Pratap Singh University, Rewa	016
B.N.Mandal University, Madhepura	017
Babasaheb Bhimrao Ambedkar Bihar University, Muzaffarpur	018
Babasaheb Bhimrao Ambedkar University, Lucknow	019
Baba Farid University of Health Sciences, Faridcot	020
Banaras Hindu University, Varanasi	021
Banasthali Vidyapith, Banasthali	022
Bangalore University, Bangalore	023
Barkatullah Vishwavidyalaya, Bhopal	024
Bengal Engineering College, Howrah	025
Berhampur University, Berhampur	026
Bharathiar University, Coimbatore	027
Bharathidasan University, Tiruchirappalli	028
Bharati Vidyapeeth, Pune	029
Bhavnagar University, Bhavnagar	030
Bidhan Chandra Krishi Vishwavidyalaya, Nadia	031
Birla Institute of Technology,Ranchi	032
Birla Institute of Technology & Science, Pilani	033
Birsa Agricultural University, Ranchi	034
Bundelkhand University, Jhansi	035
University of Burdwan, Burdwan	036
University of Calcutta, Calcutta	037
University of Calicut, Kozhikode	038
Central Agricultural University, Imphal	039

Name of University	Code
Central Institute of English & Foreign Languages, Hyderabad	040
Central Inst. of Fisheries Education, Mumbai	041
Central Institute of Higher Tibetan Studies, Varanasi	042
Ch. Charan Singh University, Meerut	043
Ch. Charan Singh Haryana Agricultural University, Hisar	044
Chandra Shekhar Azad University of Agriculture & Technology, Kanpur	045
Chennai Medical College and Research Institute, Chennai	046
Chhatrapati Shahu Ji Maharaj Kanpur University, Kanpur	047
Cochin University of Science & Technology, Kochi	048
Dakshina Bharat Hindi Prachar Sabha, Chennai	049
Dayalbagh Educational Institute, Agra	050
Deccan College Post Graduate and Research Institute, Pune	051
Deendayal Upadhyaya Gorakhpur University, Gorekhpur	052
University of Delhi, Delhi	053
Devi Ahilya Vishwavidyalaya, Indore	054
Dibrugarh University, Dibrugarh	055
Dr. B.R.Ambedkar Open University, Hyderabad	056
Dr. Babasaheb Ambedkar Marathwada University, Aurangabad	057
Dr. Babasaheb Ambedkar Open University, Ahmedabad	058
Dr. Babasaheb Ambedkar Technological University, Raigad	059
Dr. Bhim Rao Ambedkar University, Agra	060
Dr. H.S. Gour Vishwavidyalaya, Sagar	061
Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola	062
Dr. Ram Manohar Lohia Avadh University, Faizabad	063
Dr. Y.S. Parmar University of Horticulture & Forestry, Solan	064
Dravidian University, Chitoor	065
Forest Research Institute, Dehradun	066
Gandhigram Rural Institute, Dindigul	067
Gauhati University, Guwahati	068
Goa University, Goa	069
Gokhale Inst. of Politics & Economics, Pune	070
Govind Ballabh Pant University of Agriculture & Technology, Pantnagar	071
Gujarat Agri. University, Banaskantha	072

National Dairy Research Institute, Karnal	163
National Institute of Mental Health & Neuro Sciences, Bangalore	164
National Institute of Technology	165
National Law School of India University, Bangalore	166
National Museum Institute of History of Art, Conservation and Museology, New Delhi	167
Netaji Subhash Open University, Calcutta	168
Nizam's Institute of Medical Sciences, Hyderabad	169
University of North Bengal, Darjeeling	170
North Eastern Hill Unversity, Shillong	171
North Gujarat University, Patan	172
North Maharashtra University, Jalgaon	173
NTR University of Health Sciences, Vijayawada	174
Orissa University of Agriculture and Technology, Bhubaneswar	175
Osmania University, Hyderabad	176
Pandit Ravishankar Shukla University, Raipur	177
Panjab University, Chandigarh	178
Patna University, Patna	179
Periyar University, Salem	180
Pondicherry University, Pondicherry	181
Postgraduate Institute of Medical Education and Research, Chandigarh	182
Potti Sreeramulu Telugu University, Hyderabad	183
University of Pune, Pune	184
Punjab Agricultural University, Ludhiana	185
Punjab Technical University, Jalandhar	186
Punjabi University, Patiala	187
Purvanchal University, Jaunpur	188
Rabindra Bharati University, Calcutta	189
Rajasthan Agricultural University, Bikaner	190
University of Rajasthan, Jaipur	191
Rajasthan Vidyapeeth, Udaipur	192
Rajendra Agricultural University, Samastipur	193
Rajiv Gandhi University of Health Sciences, Bangalore	194
Ranchi University, Ranchi	195
Rani Durgawati Vishwavidyalaya, Jabalpur	196
Rashtriya Sanskrit Vidyapeetha, Tirupati	197
University of Roorkee, Roorkee	198
Sambalpur University, Sambalpur	199
Sampurnanand Sanskrit Vishwavidyalaya, Varanasi	200
Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow	201
Sardar Patel University, Vallabh Vidyanagar	202
Saurashtra University, Rajkot	203
School of Planning and Architecture, New Delhi	204
Sher-e-Kashmir University of Agricultural Sciences & Technology, Srinagar	205
Shivaji University, Kohlapur	206
Siddhu Kanhu University, Dumka	207
Shri Jagannath Sanskrit Visvavidyalaya, Puri	208
Shri Lal Bahadur Shastri Rashtriya Sanskrit Vidyapeetha, New Delhi	209
Sikkim-Manipal University of Health, Medical & Technology Sciences, Gangtok	210
SNDT Women's University, Mumbai	211
South Gujarat University, Surat	212
Sree Chitra Tirunal Institute for Medical Sciences & Technology, Thiruvananthapuram	213
Sree Sankaracharya University of Sanskrit, Ernakulam	214
Sri Chandrasekharendra Saraswathi Viswa Mahavidyalaya, Kancheepuram	215
Sri Krishnadevaraya University, Anantapur	216
Sri Padmavati Mahila Visvavidyalayam, Tirupati	217
Sri Ramachandra Medical College and Research Institute, Chennai	218
Sri Sathya Sai Institute of Higher Learning, Anantapur	219
Sri Venkateswara Institute of Medical Sciences, Tirupati	220
Sri Venkateswara University, Tirupati	221
Swami Ramanand Teerth Marathwada University, Nanded	222
Tamil Nadu Agricultural University, Coimbatore	223
Tamil Nadu Dr. Ambedkar Law University, Chennai	224
Tamil Nadu Dr. M.G.R.Medical University, Chennai	225
Tamil Nadu Veterinary and Animal Sciences University, Chennai	226
Tamil University, Thanjavur	227
Tata Institute of Social Sciences, Mumbai	228
Tezpur University, Tezpur	229
Thapar Institute of Engineering & Technology, Patiala	230
Tilak Maharashtra Vidyapeeth, Pune	231
Tilka Manjhi Bhagalpur University, Bhagalpur	232
Tripura University, Agartala	233
Utkal University, Bhubaneswar	234
Veer Kunwar Singh University, Bihar	235
Vidyasagar University, Midnapore	236
Vikram University, Ujjain	237
Vinoba Bhave University, Hazaribag	238
Visva Bharati, Shantiniketan	239
Visveswaraiah Technological University, Belgaum	240
West Bengal University of Animal & Fishery Sciences, Calcutta	241
Yashwantrao Chavan Maharashtra Open University, Nashik	242
Guru Gobind Singh Indraprastha University, Delhi	243
Indian Institute of Information Technology, Allahabad	244
National Institute of Pharmaceutical Education and Research (NIPER), Mohali	245
Allahabad Agricultural Institute	246
Others	999

APPENDIX - V

LIST OF DESIGNATED BRANCHES OF BANKS SELLING APPLICATION FORM

(A) INDIAN BANK

ANDAMAN & NICOBAR ISLANDS: 1) 22, First floor Babu Lane, Aberdeen Bazaar, **Port Blair**

ANDHRA PRADESH: 1) 6-3-852, Red Cortege Ameerpet, Begumpet, **Hyderabad** 2) D.No. 26-2-36, Andhra Ratna Road, Gandhinagar, **Vijaywada** 3) Door No. 10-1, Ist Lane, Sambhashiva Pelnaaz Centre **Guntur** 4) 40-301, Bhagya Nagar Bellary Road, **Kurnool** 5) Sai Viswanatha Shopping Complex, 16/157 Trunk Road, **Nellore** 6) 5-2-994, Gr. Floor, S.L. Towers, Nizamshahi Road, GPO Abids, Osmangunj, **Hyderabad** 7) 201, Karan Centre Sarojini Devi Road, **Secunderabad** 8) 293, Gandhi Road, **Tirupathi** 9) Sivalayam Street, Imdadgarh Building, Krishna Distt, **Vijayawada** 10) 30-9-3, Sarda Street, Daba Gardens, **Visakhapatnam** 11) No. 14-2-153, J.P.N.Road, Mandi Bazar, **Warangal**.

ASSAM: 1) R N C Path, **Dibrugarh** 2) S S Road, Lakhtokia, **Guwahati** 3) Assam Trunk Road, Jorhat

BIHAR & JHARKHAND: 1) 4, Patal Babu Road, **Bhagalpur** 2) Golpathar Thakur Bari, **Gaya** 3) Main Road, Bistupur, Singhbhum Distt, **Jamshedpur** 4) West Gandhi Maidan, **Patna** 5) Sainik Bhavan Main Road, **Ranchi** 6) C/27, City Centre Sector IV, **Bokaro Steel City**

DELHI: 1) 309, Main Road, Chandni Chowk, **Delhi** 2) 13, Community Centre, Zamrudpur, Greater Kailash, **New Delhi.** 3) 106 & 107, Aurobindo Place, D D A Commercial Complex, Hauz Khas, **New Delhi** 4) C-26/27 Community Centre Janakpuri, **New Delhi** 5) 10174/1, Gurudwara Road, Near Bikanerwala, Naiwala, Karol Bagh, **New Delhi** 6) 1376, Lothian Road, Kashmere Gate, **Delhi** 7) 33, Pratap Nagar, Mayur Vihar, Phase-1, **Delhi** 8) Main G-41, Connaught Circus, **New Delhi** 9) 47-48, Pragati House, Nehru Place, **New Delhi** 10) D-1/1, Rana Pratap Bagh, **New Delhi** 11) A B 20, Safdarjung Development Enclave, **New Delhi** 12) A-7, NDSE Part-I Main Ring Road, South Extension, **New Delhi** 13) 3/1, West Patel Nagar, **New Delhi** 14) Aggarwal Tarun Plaza, DDA Shopping Centre, Tarun Enclave, Pitampura, **Delhi** 15) Aggarwal Mall, 1st Floor, Plot No. 3, Sector V, Ashirwad Chowk, Dwaraka, **New Delhi**

GOA: 1) Shop No. 14, 15, 16, Gurusai Plaza, Near Adharsa School, Isidora, Bapista Road, **Margao** 2) Hotel Bardez Building, Coscar Corner, **Mapusa** 3) Dr. Domingo Roque De-Souza Road, **Panaji**

GUJARAT: 1) 74, Swastik Society, Eternia Complex, OPT, C,G, Road, Navrang Pura, **Ahemdabad** 2) Prof. Manekrao Road Raopura, **Baroda** 3) Kantawala Dela Undivakhar, **Bhavnagar** 4) Kasi Vishwanath Road, **Jamnagar** 5) Shop No. 12-15, Reshamwala Market, Ring Road, **Surat** 6) Block 316, Sector 16, **Gandhi Nagar**

HARYANA: 1) A-3/3, Nehru Ground, **Faridabad** 2) Gurdwara Road, **Gurgaon** 3) SCF 20 Red Square Market, **Hissar** 4) 574/2, Civil Road, **Rohtak**

HIMACHAL PRADESH: 1) 17, The Mall **Shimla**

JAMMU: 1) 56 A/B, Gandhi Nagar, **Jammu** (J & K)

KARNATAKA: 1) 35, Lady Curzon Road, **Bangalore Cantonment** 2) 7, Gandhi Bazaar, Basavangudi, **Bangalore** 3) 37, Goldsmith Street Brucepet, **Bellary** 4) No 7 , 4th Main Road, Chamarajpet, **Bangalore** 5) Ist Floor, Mangala Shopping Complex Sangam Circle Line Bazaar Road, **Dharwar** 6) 57/4-9, R.S. Plaza, Ist floor, Vinoba Road, Gandhi Square, **Mysore** 7) 110, M G Road **Bangalore** 8) B H Road, **Shimoga**

KERALA: 1) 29/373 F Ground Floor, Ray Bhavan, NH 47 Byepass Thykoodam, Vyttila, **Kochi** 2) M C Road Baker Junction, **Kottayam** 3) LIC Building, S M Street, **Kozhikode** 4) Swaraj Round East, **Trissur** 5) Indian Bank Towers, M G Road **Thiruvananthapuram**

MADHYA PRADESH: 1) 83, M P Nagar, Zone II, **Bhopal** 2) 752 Iderganj Square Lashkar, **Gwalior** 3) G-1, Shree Vardhan Complex, 4, R N T Marg, **Indore** 4) 426, Marhataal, **Jabalpur**

CHATTISGARH: 1) Gurunanak Chowk, **Raipur** 2) 1st Floor, Taha Complex, Vyapar Vihar, **Bilaspur**

MAHARASHTRA: 1) "Parasmani" 228, Samarth Nagar, Aurangabad 2) 99, Polan Peth, First Floor, Dana Bazar, **Jalgaon** 3) United India Bldg. Sir PM Road, Fort, **Mumbai** 4) Gotmare Market, Laxmi Bhuwan Square, Dharampeth **Nagpur** 5) 480 Y, Swami R P Road, **Nasik** 6) 210, Mittal Towers B Wing, Nariman Point, **Mumbai** 7) 495, Mantri Heights Shaniwar Peth, **Pune City** 8) 35, Aurora Tower, East Wing-9, Moledina Road, Pune Contonment, **Pune** 9) Bakle Complex, 162/6, Railway Lines, **Sholapur**

MEGHALAYA: 1) G S Road, Rainbow Complex, Burra Bazar, Shillong East Khasi Hills, **Shillong**

ORISSA: 1) 32, Janpath Ashok Nagar Unit II, **Bhubaneswar** 2) Near Grand Bazar, Kutchery Road, Udit Nagar, Sundargarh Dist., **Rourkela** 3) Laxmi Talkies Road, **Sambalpur** 4) 566/1414, Padmalaya market Complex, Sahadev Khunta, **Balasore**

PONDICHERRY: 1) 288, M G Road, **Pondicherry**

PUNJAB: 1) 42, Chowk Farid Katra Sher Singh, **Amritsar** 2) 922, G T Road, **Jalandhar** 3) Lower Mal, Opposite Polo Ground, **Patiala**

CHANDIGARH: 1) SCO 38-39 Madhya Marg Sector 7 C, **Chandigarh**

RAJASTHAN: 1) Alakh Sagar KEM Road, **Bikaner** 2) "Dharma Heights" 10 Motilal Atal Road Opp. Ganpati Plaza, M.I. Road, **Jaipur** 3) 4th Chopasni Road, **Jodhpur** 4) MP A8 Mahavir Nagar II, **Kota** 5) 5, Abhay Niwas, Residency Road, **Udaipur**

SIKKIM: 1) Mahatma Gandhi Marg, New Market, **Gangtok**

TAMIL NADU: 1) Gee Gee Complex, First Floor 42, Anna Salai, **Chennai** 2) 31, Variety Hall Road, **Coimbatore Main** 3) 21, Koviloor Road, **Karaikudi** 4) 100 East Avani Moola St., **Madurai Main** 5) 128, Big Bazaar St., **Tiruchirapalli Main** 6) 5-J, Madurai Road, Tirunelveli **Junction**

UTTAR PRADESH: 1) E-11/8, Ist floor Prateek Centre, Sanjay Place, **Agra** 2) Marris Road, **Aligarh** 3) 249, Chak Zero Road, **Allahabad** 4) 152-E, Civil Lines Chowki Chauraha, **Bareilly** 5) 3, Navyug Market, Ghaziabad 6) Bank Road, **Gorakhpur** 7) 50/276 Halsi Road, **Kanpur** 8) 64, Cant. Board office **Kanpur Cantt.** 9) 1-2, Ashok Marg, **Lucknow** 10) B-1316, Sai Plaza B Block Crossing, Indira Nagar, **Lucknow** 11) 213, Begum Bridge Road, **Meerut** 12) C-7/34-B, Lahurabir, **Varanasi** 13) D-48/122, Missirpokhra, Godowlia, **Varanasi**

UTTRANCHAL: 1) 3 Astely Hall Rajpur Road, **Dehradun**

WEST BENGAL: 1) 150, B C Road, **Burdwan** 2) 3/1, R N Mukherjee Road, Shree Ram Chambers, **Kolkata Main** 3) Bajaj Bhawan Nachan Road Benachitty, **Durgapur** 4) Malancha Main Road Kharida Kharagpur Midnapore Dist. **Kharagpur** 5) Hilll Craft Road, siliguri, Darjeeling Dist., **Siliguri** 6) West Bengal University of Technology, BF-142, Salt Lake Sector-1, Salt Lake, **Kolkata** 7) Akash Ganga Commercial Complex, Ist floor, Block E, Basudebpur, Durga Chowk P.O., Khanjanchak, **Haldia** 8) 9/118, Rabindra Avenue, Khudiram Shaw Complex, 1st Floor, Opp. Zilla School, **Malda**

(B) ORIENTAL BANK OF COMMERCE

JAMMU & KASHMIR: 1) Poloview Residency Road, **Srinagar** (J&K)

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH
HRD GROUP, EXAMINATION UNIT

IMPORTANT : USE BLACK INK PEN ONLY TO FILL-UP THE FORM. BEFORE FILLING UP THE FORM, PLEASE READ INSTRUCTIONS AND SEE SAMPLE OF FILLED-IN APPLICATION FORM GIVEN IN THE INFORMATION BULLETIN.

1. ROLL NUMBER (To be filled by office only)

R

2. APPLICATION FORM NUMBER: **600001**

3. Applied For: JRF ○ LECTURESHIP ●

4. Subject: CHEM ○ EARTH ○ LIFE ○ MATHS ○ PHY ● ENGG ○

5. Medium of Exam: HINDI ● ENGLISH ○

6. Category: GEN ○ OBC ● SC ○ ST ○

7. Physically / Visually Handicapped (PH / VH): PH ○ VH ●

8. If VH, Do you Want Scribe's help **: YES ● NO ○

9. Exam Centre Code Number: 04

10. Date of Birth (DD/MM/YY): Date 16 / Month 10 / Year 85

11. Application Form Number as given in column 2 above: 600001

12. Exam Centre Code-Name (IN BLOCK LETTERS) *: BHU

13. Subject Code-Name (IN BLOCK LETTERS) *: MAT

14. Age as on 01-07-2012: Year 24 / Month 02 / Days 16

15. Male/Female: ● Ⓕ

16. Name of the candidate (IN BLOCK LETTERS): ARUN SHARMA

17. Father/Mother/Husband (F/M/H): ● Ⓜ Ⓗ

18. F/M/H Name. (Husband's Name is to be given in case of Married Women): RAJINDER SHARMA

19. Give details of qualified examination:
B.Sc. (Hons)/BS-4 years/BE/B.Tech/B. Pharma/MBBS/integrated BS-MS/M.Sc. or equivalent

(A) Degree: MSC

(B) Year of Passing: 2012

(C) % of marks obtained: .

(D) Division / Grade:

20. Candidates enrolled for M.Sc. or having completed 10+2+3 years of qualifying examination as given in column 19, may apply under Result Awaited (RA) category (Fill Attestation format given on the reverse of the application form)

(A) Degree | (B) Reslt Awaited Category (fill "RA" in the Box) | (C) Year of appearing in the final exam | (D) Attestation form submitted Yes ○ No ○

21. Give details of integrated MS-Ph.D. program, if enrolled:

(A) Year of Enrolment | (B) Year of passing Bachelors degree | (C) Division/Grade | (D) % of marks

22. Specialization Code*: 403

23. Specialization: STATISTICS

24. Univ./Institute Code*: 035

25. Name of the Univ./Institute awarding the degree: BUNDELKHAND UNIVERSITY, JHANSI

26. WRITE YOUR NAME AS WRITTEN IN COLUMN 16 ABOVE & COMPLETE MAILING ADDRESS IN BLOCK LETTERS ONLY.

NAME	ARUN SHARMA
ADDRESS	F-908, KIRTI NAGAR
	NEW DELHI
PIN CODE	110015

(DO NOT STAPLE)

PASTE A RECENT PASSPORT SIZE BLACK & WHITE PHOTOGRAPH

X

BEARING SIGNATURE OF CANDIDATE

27. Signature of Candidate

28. E-mail: arunkumar@yahoo.co.in

29. State Code*

* See List of codes at Appendix - IV of the Bulletin.
** See para 8 (viii) of the Bulletin Page 7

30. Complete Permanent Address (IN BLOCK LETTERS)

House No / Apartment / Street / Village

F 9 0 8

Town / Post Office

K I R T I N A G A R

City / District

N E W D E L H I

State

31. City D E L H I

Pin Code 1 1 0 0 1 5

DECLARATION

I, **.....,** hereby declare that all statements made in this application are true, complete and correct to the best of my knowledge and belief and in the event of any of the information being found false or incorrect or any ineligibility being detected before or after the test my candidature is liable to be cancelled and action initiated against me.

I have submitted only one application for this test.

I further declare that I fulfill all conditions of eligibility regarding Age limits, Educational qualifications etc. prescribed for the test.

I also declare that I have never been convicted by any court of law.

I declare that I have gone through the conditions attached to NET and shall abide by the same.

I have enclosed the attested copies of certificate of being SC/ST/OBC/PH/VH (Physically or Visually handicapped), (strike which is not applicable).

I understand that my application will be rejected summarily if found incomplete/ineligible, and no correspondence will be entertained by CSIR in this regard.

Date:

Place:

Signature of the Candidate.

ATTESTATION (FOR 'RA' CATEGORY ONLY)

I certify that the information given by the candidate Shri/Smt/Kum**.....**has been verified by me with reference to records.

Also, this is certified that the candidate is enrolled for M.Sc. or having completed 10+2+3 years of BS-4 year / BE / B. Tech/ B. Pharma/MBBS/Integrated BS-MS or equivalent degree & is eligible to apear under "RA" Category as laid down in the eligibility criteria of CSIR-UGC NET December 2012. (Strike which is not applicable)

Signature of the Head of Dept./Institute
Rubber stamp/seal

Name:

Designation:

NOTE : (Attestation should be signed by the Head of the Dept. or Institution where the candidate has appeared OR will be appearing in the above notified Qualification/Degree Examination as applicable.

FOR BANK USE ONLY

Received Rs. **.....** (Rupees**.....**)

by Cash/Demand Draft No. **.....** Dated**.....**

Signature & Seal of the issuing Bank

Date

MATHEMATICAL SCIENCES

mÙkj&i= 2012 (ii)
ANSWER SHEET 2012 (ii)

i"B & 1
SIDE - 1

ijh{kkFkh dk fooj.k @ PARTICULARS OF CANDIDATE

¼cM+s v{kjksa esa @ In Block Letters

¼dsoy cky lokbV iSu dk iz;ksx djsa @ Use Ball Point Pen Only

ijh{kkFkh dk uke Name of Candidate.	ARUN SHARMA
?kj dk irk tks vkosnu i= esa fn;k x;k gS Residence Address as given in Application form	F 908 KIRTI NAGAR
	NEW DELHI
'kgj / City	NEW DELHI — पिन/Pin 110015
रोल नंबर / Roll No.	505201 — प्रश्नपुस्तिका क्रमांक / Question Booklet No. 04023
दिनांक / Date (DD / MM / YYYY)	23 / 12 / 2012 — प्रश्नपुस्तिका कोड / Question Booklet Code C
केन्द्र का नाम / Centre Name	BHUBNESHWAR — हस्ताक्षर/Signature
विषय / Subject	MATHEMATICS

Boxes provided for Roll Number, Subject Code & Centre code on side-2 of Answer Sheet should be filled using the pattern given as: → 12345678

उत्तर–पत्र पृष्ठ –2 भरने के लिए अनुदेश

1. उत्तर–पत्रा को कम्प्यूटर द्वारा मूल्यांकन के लिए बनाया गया है। अतः आपके द्वारा नीचे दिए गए अनुदेशों का पालन न करने की स्थिति में इसका कम्प्यूटर द्वारा मूल्यांकन करना कठिन होगा। इसके फलस्वरूप होने वाली हानि परीक्षार्थी को ही भुगतनी होगी।
2. उत्तर मार्क करने के लिए केवल एच–बी पेन्सिल का प्रयोग करें।
3. अपना उत्तर उपयुक्त वृत्त में ही, जो उस प्रश्न की, जिसका आप उत्तर दे रहे हैं संख्या के अनुसार है, मार्क करें।
4. भाग 'ए' एवं 'बी' में प्रत्येक उत्तर के लिए केवल एक वृत्त को ही काला करें जैसा कि नीचे दर्शाया गया है।

गलत तरीका Wrong Method	गलत तरीका Wrong Method	गलत तरीका Wrong Method	गलत तरीका Wrong Method	गलत तरीका Wrong Method	lgh rjhdk Correct Method
○⊗○○	○⊘○○	○○○○	○◒○○	○●○●	○●○○

5. नीचे दर्शाए गये के अनुसार भाग 'सी' के प्रत्येक प्रश्न के उत्तर के लिए एक या एक से अधिक वृत्त को काला करें क्योंकि प्रत्येक प्रश्न के लिए एक या एक से अधिक सही विकल्प हो सकते हैं।

सही तरीका एक विकल्प के साथ Correct method with one right option	सही तरीका दो विकल्प के साथ Correct method with two right option	सही तरीका तीन विकल्प के साथ Correct method with three right option	सही तरीका चार विकल्प के साथ Correct method with four right option
○●○○	○●○●	○●●●	●●●●

6. केवल प्रदान की गई जगह पर ही मार्क लगाएं। कृपया उत्तर पत्र में किसी अन्य स्थान पर मार्क न लगाएं।
7. आपकी मार्किंग गहरी काली होनी चाहिए और उससे उत्तर–वृत्त भर जाना चाहिए।
8. यदि आप किसी उत्तर को बदलना चाहते हैं तो पहले अंकित किए हुए मार्क को पूरी तरह से मिटा दें और उसके बाद ही नया मार्क लगाएं।
9. उत्तर पत्रा पर रफ काम न करें। इसके लिए प्रश्न पुस्तिका के अंत में दिए रफ पन्नों का ही प्रयोग करें।

Instructions for Filling Side-2 of Answer Sheet

1. This answer sheet is designed for computer evaluation. Therefore, if you do not follow the instructions given below, it may make evaluation by the computer difficult. Any resultant loss to the candidate on above account, i.e. in not following the instructions completely, shall be of the candidate only.
2. For marking answer, use **HB** Pencil only.
3. Mark your answer only in the appropriate CIRCLE against the number corresponding to the question you are answering.
4. Darken only ONE ANSWER CIRCLE for each question in Part 'A' & 'B" as as shown below:
5. Darken one or more answer circle for each question in part 'C' as each question may have one or more correct options as shown below :
5. Make mark only in the space provided. Please do not make any stray mark(s) on the answer sheet.
6. Pencil marks should be dark enough and should fill the CIRCLE completely.
7. If you wish to change an answer, ERASE completely the already darkened CIRCLE with eraser and then make a fresh mark.
8. Rough work MUST NOT be done on the answer sheet. Use only sheet for rough work attached at the end of your booklet for this purpose.

MATHEMATICAL SCIENCES

उत्तर–पत्र / ANSWER SHEET

Serial No.

SIDE - 2

रोल नंबर Roll Number	प्रश्न पुस्तिका कोड Booklet Code	माध्यम Medium	विषय कोड Subject Code	केन्द्र कोड Centre Code
4052081	C	E	4	04

अन्वीक्षक के लिए निर्देश
INSTRUCTION FOR INVIGILATOR

कृपया हस्ताक्षर करने से पहले रोल नंबर, प्रश्न पुस्तिका कोड, केन्द्र कोड व परीक्षार्थी के हस्ताक्षर की जांच कर लें।

Check Roll Number, Booklet Code, Subject Code, Centre Code & Signature of Candidate before signing.

अन्वीक्षक केहस्ताक्षर / **Signature of Invigilator**

USE DARK HB PENCIL ONLY

Note: Roll Number, Subject Code & Centre Code should be filled in the boxes using the pattern given as:

ANSWER COLUMNS

PART 'A'

प्र.क्र. Q.No.	उत्तर / ANSWER 1	2	3	4
1	○	○	○	○
2	○	○	○	○
3	○	○	○	○
4	○	○	○	○
5	○	○	○	○
6	○	○	○	○
7	○	○	○	○
8	○	○	○	○
9	○	○	○	○
10	○	○	○	○
11	○	○	○	○
12	○	○	○	○
13	○	○	○	○
14	○	○	○	○
15	○	○	○	○
16	○	○	○	○
17	○	○	○	○
18	○	○	○	○
19	○	○	○	○
20	○	○	○	○

PART 'B'

प्र.क्र. Q.No.	उत्तर / ANSWER 1	2	3	4
21	○	○	○	○
22	○	○	○	○
23	○	○	○	○
24	○	○	○	○
25	○	○	○	○
26	○	○	○	○
27	○	○	○	○
28	○	○	○	○
29	○	○	○	○
30	○	○	○	○
31	○	○	○	○
32	○	○	○	○
33	○	○	○	○
34	○	○	○	○
35	○	○	○	○
36	○	○	○	○

प्र.क्र. Q.No.	उत्तर / ANSWER 1	2	3	4
37	○	○	○	○
38	○	○	○	○
39	○	○	○	○
40	○	○	○	○
41	○	○	○	○
42	○	○	○	○
43	○	○	○	○
44	○	○	○	○
45	○	○	○	○
46	○	○	○	○
47	○	○	○	○
48	○	○	○	○
49	○	○	○	○
50	○	○	○	○
51	○	○	○	○
52	○	○	○	○
53	○	○	○	○
54	○	○	○	○
55	○	○	○	○
56	○	○	○	○
57	○	○	○	○
58	○	○	○	○
59	○	○	○	○
60	○	○	○	○

PART 'C'

प्र.क्र. Q.No.	उत्तर / ANSWER 1	2	3	4
61	○	○	○	○
62	○	○	○	○
63	○	○	○	○
64	○	○	○	○
65	○	○	○	○
66	○	○	○	○
67	○	○	○	○
68	○	○	○	○
69	○	○	○	○
70	○	○	○	○
71	○	○	○	○
72	○	○	○	○

प्र.क्र. Q.No.	उत्तर / ANSWER 1	2	3	4
73	○	○	○	○
74	○	○	○	○
75	○	○	○	○
76	○	○	○	○
77	○	○	○	○
78	○	○	○	○
79	○	○	○	○
80	○	○	○	○
81	○	○	○	○
82	○	○	○	○
83	○	○	○	○
84	○	○	○	○
85	○	○	○	○
86	○	○	○	○
87	○	○	○	○
88	○	○	○	○
89	○	○	○	○
90	○	○	○	○
91	○	○	○	○
92	○	○	○	○
93	○	○	○	○
94	○	○	○	○
95	○	○	○	○
96	○	○	○	○
97	○	○	○	○
98	○	○	○	○
99	○	○	○	○
100	○	○	○	○
101	○	○	○	○
102	○	○	○	○
103	○	○	○	○
104	○	○	○	○
105	○	○	○	○
106	○	○	○	○
107	○	○	○	○
108	○	○	○	○
109	○	○	○	○

प्र.क्र. Q.No.	उत्तर / ANSWER 1	2	3	4
110	○	○	○	○
111	○	○	○	○
112	○	○	○	○
113	○	○	○	○
114	○	○	○	○
115	○	○	○	○
116	○	○	○	○
117	○	○	○	○
118	○	○	○	○
119	○	○	○	○
120	○	○	○	○

INSTRUCTIONS TO BE FOLLOWED BY THE CANDIDATE WHILE APPEARING IN THE TEST ON 23rd December, 2012.

GENERAL

1. Fill in your Roll No., Subject Code, Centre Code etc. by **BALL POINT** pen on the Side I of answer sheet/cover page of Question Booklet before writing on the answers.
2. On completion of the exam candidates are not allowed to carry the question paper and Answer sheet (OMR Sheet).
3. The Answer Sheets (OMR Sheet) of single MCQ Paper will be supplied separately with the Question Booklets. The Answer Sheet (OMR Sheet) together with Question Booklet of single MCQ Paper must be returned to the invigilator.
4. In single MCQ Paper, please read the instructions carefully on title page and attempt only the required number of questions. In case, the candidates attempt more than the required number of questions, only the first required number of questions will be evaluated.
5. The actual number of questions in each Part and Section to be asked and attempted may vary from exam to exam.
6. Cellular phones, calculators, digital diaries and any other electronic communication devices are not allowed in the Examination hall. No arrangement will be available for their safe keeping at the gate/centre.
7. Candidate found copying or resorting to any unfair means is liable to be disqualified from this and future examinations.
8. Candidate should not write anything anywhere except on answer sheets.

USE OF ANSWER SHEET (OMR SHEET) PROVIDED FOR SINGLE MCQ PAPER

1. Answer sheet will be provided separately with the test booklet Paper for marking correct responses. It is printed on both sides.

   The answer sheet has been devised to convert the answer given by the candidate directly into computer data. The candidate must follow the under mentioned instructions for filling up the answer sheet. Please check that the answer sheet is clearly printed and does not have smudge mark. Also, that it is not torn or mutilated.

   a) Side-I of the answer Sheet consist of space for filling up the particulars of the candidate, such as, name, address, signature and date, by the candidate carefully. He/she is also required to indicate the Serial number of the Test Booklet supplied to them along with the answer sheet. Candidate is advised to fill in side -I using BALL POINT pen only. It also contains the detailed instructions as to how the answers are to be marked on the side - II of the answer sheet.

   b) Side-II of Answer Sheet consists of two portions. In the top portion, the candidate is required to fill in their roll number; centre, subject and set code carefully. In the bottom portion, the questions progress from top to bottom. Candidate is advised to mark the correct response to the questions in the boxes containing answer number from 1-4 and provided alongside each question. Candidate is advised to fill in side -II using dark HB pencil only and attempt only the required number of questions.

2. Fill in each intended answer carefully and completely to cover the appropriate circle with a dark mark as shown in the sample illustration. Light or partial marks may not be read properly by the scoring machine. Do not make any rough calculation/scribbling on any side of the answer sheet. Completely erase any error or unintended marks. You may use blank page provided in the booklet itself for your rough work or calculations.
3. Mark one answer to each question only, i.e., no question should have more than one mark in its answer column, unless specified. If you put in more than one mark in any column, or having erroneously done so, have not completely erased the second mark, the computer will reject your answer to the question and no score will be awarded to it.
4. In order to avoid mistakes, which may make scoring by computer difficult, the candidate is advised to follow the instructions, which will be given on the Test Booklet, and also on the answer sheet. The candidate is advised to familiarize himself/herself with the sample answer sheet and the scheme of the examination as given in this Information Bulletin.
5. Do not fold, crease or mutilate the answer sheet in any manner whatsoever and also make sure that it does not have any smudge or other marks which may make evaluation by the computer difficult.
6. Negative marking as notified in the scheme of Exam will be done for incorrect answer in your answer sheet.
7. You have to return the answer sheet and the Test Booklet to the invigilator before leaving the Examination Hall.

IMPORTANT INSTRUCTIONS FOR FILLING UP THE APPLICATION FORM

1. USE ONLY ORIGINAL APPLICATION ATTACHED WITH THIS INFORMATION BULLETIN.
2. LEAVE A **BLANK SPACE** BETWEEN EACH WORD.
3. USE **BLACK INK PEN** ONLY.
4. PASTE A RECENT PASSPORT SIZE **'BLACK AND WHITE'** PHOTOGRAPH AT THE ASSIGNED PLACE AND **SIGN ACROSS** IT.
5. USE **CAPITAL LETTERS ONLY** TO FILL IN THE REQUIRED INFORMATION.
6. TO AVOID DISLOCATION, PLACE THE APPLICATION FORM AND ALL THE ENCLOSURES SAFELY IN THE ENVELOPE PROVIDED WITH THE BULLETIN, USE PAPER CLIPS ONLY. *PLEASE DO NOT USE STAPLER PINS OR THREAD STRING TO TIE THE DOCUMENTS WITH THE APPLICATION FORM.*
7. DO NOT WRITE ANY INFORMATION OUTSIDE THE GIVEN BOXES.
8. LEAVE THE BOX BLANK, IF NOT APPLICABLE.
9. PLEASE SEE THE "**LIST OF CODES**" (GIVEN AT APPENDIX IV) TO FILL IN THE REQUIRED CODES IN THE APPLICATION FORM.
10. DO NOT MAKE ANY CUTTING OR OVERWRITING. USE CORRECTING FLUID TO COVER THE MISTAKE AND RE-WRITE IN THE SAME BOX.
11. DARKEN THE APPROPRIATE CIRCLES COMPLETELY IN COL. 3 TO COL. 11, COL. 15, 17 & 20 (D) AS SHOWN BELOW:-

गलत तरीका Wrong Method	गलत तरीका Wrong Method	गलत तरीका Wrong Method	गलत तरीका Wrong Method	गलत तरीका Wrong Method	**सही तरीका** **Correct Method**
					

Please read the instructions in 'Information Bulletin' carefully and ensure before sending the filled in application form to the EXAMINATION UNIT, CSIR, that

(i) You fulfill all the eligibility conditions laid down for the admission to the test.

(ii) **Sr. No. 5; Option for Medium of Exam:** The Candidate opting for Hindi medium in Column No. 5 of Application Form, will be supplied Question Booklet/Test Booklet printed in bilingual and candidates opting for English medium, will be supplied Question Booklet / Test Booklet printed in English Version only.

(iii) You have got your application form attested from your Head of Department/ Institute in case you are a Result awaited candidate as per the eligibility criteria/attestation in application form.

(iv) You have clearly and legibly filled in all the columns of the application form and no relevant column has been left blank.

(v) You have pasted your recent (not more then six months old) passport size black and white photograph on the application form in space provided for the purpose and have signed across it.

(vi) You have enclosed requisite SC/ST/OBC/PH/VH certificates if you belong to any of these categories for fee concession. Fee concession shall be admissible if his/her caste falls under the central Govt. lists, otherwise he/she shall not be eligible for any fee concession & will have to pay fee at par with the general category candidates.

(vii) **If qualified B.Sc. (H) / B.S.-4 yrs / BE / B.Tech / B. Pharma / MBBS / Integrated BS-MS, M.Sc. or equivalent exam, you have filled up relevant degree etc. in col. 19 (A,B,C & D). If enrolled for M.Sc. or having completed 10+2+3 yrs of the above qualifying exam; you have filled up col. 20 (A,B,C,D) under result qualfied (RA) category.**

(viii) You have filled up the correct relevant Codes as per Lists of Codes after proper checking.

(ix) You have ensured that your application form is complete in all respect.

(x) You have signed the declaration in your application form and also in the box in col. 27.

(xi) You have filled your date of birth in col. 10 of the application and have also darkened the appropriate circles.

(xii) You have noted & followed the instructions as given at page i-iii.

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH
HRD GROUP, EXAMINATION UNIT

IMPORTANT : USE BLACK INK PEN ONLY TO FILL-UP THE FORM. BEFORE FILLING UP THE FORM, PLEASE READ INSTRUCTIONS AND SEE SAMPLE OF FILLED-IN APPLICATION FORM GIVEN IN THE INFORMATION BULLETIN.

1. ROLL NUMBER (To be filled by office only)

R

2. APPLICATION FORM NUMBER

3. Applied For: JRF ○ LECTURESHIP ○

4. Subject: CHEM ○ EARTH ○ LIFE ○ MATHS ○ PHY ○ ENGG ○

5. Medium of Exam: HINDI ○ ENGLISH ○

6. Category: GEN ○ OBC ○ SC ○ ST ○

7. Physically / Visually Handicapped (PH / VH): PH ○ VH ○

8. If VH, Do you Want Scribe's help ** : YES ○ NO ○

9. Exam Centre Code Number

10. Date of Birth (DD/MM/YY) — Date / Month / Year

11. Application Form Number as given in column 2 above

12. Exam Centre Code-Name (IN BLOCK LETTERS) *

13. Subject Code-Name (IN BLOCK LETTERS) *

14. Age as on 01-07-2012 — Year / Month / Days

15. Male/Female: Ⓜ Ⓕ

16. Name of the candidate (IN BLOCK LETTERS)

17. Father/Mother/Husband (F/M/H): Ⓕ Ⓜ Ⓗ

18. F/M/H Name. (Husband's Name is to be given in case of Married Women)

19. Give details of qualified examination:
B.Sc. (Hons)/BS-4 years/BE/B.Tech/B. Pharma/MBBS/integrated BS-MS/M.Sc. or equivalent

(A) Degree

(B) Year of Passing

(C) % of marks obtained .

(D) Division / Grade

20. Candidates enrolled for M.Sc. or having completed 10+2+3 years of qualifying examination as given in column 19, may apply under Result Awaited (RA) category (Fill Attestation format given on the reverse of the application form)

(A) Degree

(B) Reslt Awaited Category (fill "RA" in the Box)

(C) Year of appearing in the final exam

(D) Attestation form submitted Yes ○ No ○

21. Give details of integrated MS-Ph.D. program, if enrolled:

(A) Year of Enrolment

(B) Year of passing Bachelors degree

(C) Division/Grade

(D) % of marks .

22. Specialization Code*

23. Specialization

24. Univ./Institute Code*

25. Name of the Univ./Institute awarding the degree

26. WRITE YOUR NAME AS WRITTEN IN COLUMN 16 ABOVE & COMPLETE MAILING ADDRESS IN BLOCK LETTERS ONLY.

NAME	
ADDRESS	
PIN CODE	

(DO NOT STAPLE)

PASTE A RECENT PASSPORT SIZE BLACK & WHITE PHOTOGRAPH

X

BEARING SIGNATURE OF CANDIDATE

27. Signature of Candidate

28. E-mail

29. State Code*

* See List of codes at Appendix - IV of the Bulletin.

** See para 8 (viii) of the Bulletin page 7

30. Complete Permanent Address (IN BLOCK LETTERS)

House No / Apartment / Street / Village

Town / Post Office

City / District

State

31. City

Pin Code

DECLARATION

I, **.....,** hereby declare that all statements made in this application are true, complete and correct to the best of my knowledge and belief and in the event of any of the information being found false or incorrect or any ineligibility being detected before or after the test my candidature is liable to be cancelled and action initiated against me.

I have submitted only one application for this test.

I further declare that I fulfill all conditions of eligibility regarding Age limits, Educational qualifications etc. prescribed for the test.

I also declare that I have never been convicted by any court of law.

I declare that I have gone through the conditions attached to NET and shall abide by the same.

I have enclosed the attested copies of certificate of being SC/ST/OBC/PH/VH (Physically or Visually handicapped), (strike which is not applicable).

I understand that my application will be rejected summarily if found incomplete/ineligible, and no correspondence will be entertained by CSIR in this regard.

Date:

Place:

Signature of the Candidate.

ATTESTATION (FOR 'RA' CATEGORY ONLY)

I certify that the information given by the candidate Shri/Smt/Kum**.....**has been verified by me with reference to records.

Also, this is certified that the candidate is enrolled for M.Sc. or having completed 10+2+3 years of BS-4 year / BE / B. Tech/ B. Pharma/MBBS/Integrated BS-MS or equivalent degree & is eligible to apear under "RA" Category as laid down in the eligibility criteria of CSIR-UGC NET December 2012. (Strike which is not applicable)

Signature of the Head of Dept./Institute
Rubber stamp/seal

Name:

Designation:

NOTE : (Attestation should be signed by the Head of the Dept. or Institution where the candidate has appeared OR will be appearing in the above notified Qualification/Degree Examination as applicable.

FOR BANK USE ONLY

Received Rs. **.....** (Rupees**.....**)

by Cash/Demand Draft No. **.....** Dated**.....**

Signature & Seal of the issuing Bank

Date

FOR INFORMATION OF 'NET' ASPIRANTS.

SHYAMA PRASAD MUKHERJEE FELLOWSHIP

A special research fellowship, namely, "Dr. Shyama Prasad Mukherjee (SPM) Fellowship" has been constituted by the CSIR from the year 2001 to commemorate the birth centenary year (2000) of Dr. Shyama Prasad Mukherjee, who was the first Vice-President of the CSIR in the Independent India.

The objective of the Fellowship is to nurture budding scientific talent and to nourish the objective of pursuit of scientific research and pursuing Ph.D. programmes with a special fellowship in CSIR Laboratories or other specialized R & D Institutions/Universities.

The SPM Fellowship is initially conferred for a period of two years, which may be continued up to a maximum of five years, depending upon the progress of the fellow as assessed by the SPMF Committee. SPM Fellowship carries a stipend of Rupees 20,000 p.m. during first 2 years, which may be enhanced to Rupees 24,000 p.m. from 3rd year onwards with a contingency grant of Rupees 70,000 per annum. The fellowship may be withdrawn if the progress is not found up to the mark.

The SPM fellowship will be awarded directly to selective top CSIR-UGC NET awardees of each Exam. This details can be viewed at www.csirhrdg.res.in

Please detach the 'Certificate of Posting' card printed below. Clearly write your Name and Complete Mailing Address, affix requisite Postage stamp in assigned box and got it signed and stamped by the Post Office from where the Application was dispatched. **It may be preserved as acknowledgement.**

——————————————————— Cut here ———————————————————

UNDER CERTIFICATE OF POSTING (U.P.C.)

Received an envelop bearing form No. _____

Sender's Name & Complete Mailing Address:-

_____

_____

_____

_____Pin Code_____

Addressed to

SR. CONTROLLER OF EXAMINATIONS
EXAMINATION UNIT, HRD GROUP (CSIR)
CSIR COMPLEX, LIBRARY AVENUE
OPPOSITE INSTITUTE OF HOTEL MANAGEMENT
PUSA, NEW DELHI - 110 012

Please affix Postage Stamp of Rs. 3.00

STAMP & SIGNATURE
OF THE POSTAL AUTHORITY

IMPORTANT DATES AND INFORMATIONS

Date of the Examination	**Sunday, the 23rd December, 2012**
Date of start of sale of Information Bulletin	Tuesday, the 21st August, 2012
Date of close of sale of Information Bulletin by Post only	Monday, the 10th September, 2012
Date of close of sale of Information Bulletin by cash at all stations including Delhi	Tuesday, the 18th September, 2012
Last Date of receipt of completed application forms	Monday, the 24th September, 2012
Last Date of receipt of completed application forms (From Remote areas.)	Monday, the 1st October, 2012
Last date for receipt of requests for change of address/Centre on merits	Monday, the 15th October, 2012
Display of retistered candidates data on our website	Friday, the 23rd November, 2012

MODEL QUESTIONS FOR THIS TEST

Model questions for CSIR-UGC JRF/LS (NET) Examination will be available on our Website http://www.csirhrdg.res.in., before the closing date.

CSIR Examination Unit will not entertain any request for this purpose.

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