MAHARASHTRA ACADEMY OF NAVAL EDUCATION & TRAINING (MANET), PUNE – 412 201

Qualifying Entrance Test for

B. Tech Marine Engineering & B. Sc. Nautical Science

Date : 27/05/2018   **Time – 2 Hrs.**   **Total Marks – 150**

User ID : _ _ _ _ _ _ _ _ _   **Application Form Number :** 201 _ _ _ _ _ _

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SECTION-I (ENGLISH)

Q1. to Q30. Choose the correct alternative out of four options.

Q1. Rahul and Ramesh have _____ to the Market.
a) go   b) going   c) gone   d) will go

Q2. Merchant Navy _____ bring about positive changes in the economy.
a) had   b) is   c) will   d) shall

Q3. The idiom, Hold your horses means_____
a) wait   b) control anger   c) Go on a vacation   d) go

Q4. The figure of speech,' Jack of all trades master of none' means --------------
a) be best in all   b) do a lot of things but be best in none
c) do nothing   d) excel

Q5. She _____ to study English.
a) wants   b) want   c) wanting   d) had wanting

Q6. The word that means, ' argue over trivial things,' is_____
a) banter   b) beaker   c) bicker   d) gather.

Q7. Let's meet _____ the station.
a) on   b) in   c) at   d) from

Q8. Where there is a will _____
a) there is a path   b) there is a way
c) there is a niche   d) there is motivation.

Q9. Recognize this tense, 'Sun rises in the East.'
a) present continuous tense   b) present perfect tense
c) present perfect continuous tense d) simple present tense.

Q10. The active voice of ' the mouse was eaten by the cat' is _____
a) cat ate the mouse   b) the mouse was being eaten by the cat.
c) cat eats the mouse   d) mouse is eating the cat.

Q11. Add the correct question tag, ' I am tired _____
a) isn't I?   b) weren't I?   c) aren't I?   d) amn' t I?

Q12. This Shop is working _____ 1987
a) since   b) for   c) with   d) from.

Q13. The use of the word, 'peoples' is correct.
a) False   b) True   c) Maybe   d) Only in certain situation.

Q14. Faculty is a type of _____
a) gender noun   b) collective noun   c) adjective   d) adverb.

Q15. Choose the correct sentence:
a) Childrens are happy   b) Children are happys
c) Childs is happy   d) The children are happy

Q16. A formal letter typically ends with
a) Yours faithfully   b) yours faithfully
c) your's faithfully   d) Your's faithfully.

Q17. He is _____ honest man.
a) a   b) the   c) an   d) of

Q18. He jumped _____ the table.
a) of   b) through   c) under   d) off

Q19. The sentence structure of an active voice sentence for simple present tense is _____
a) S+ V + O   b) O + V + S   c) V+ S + O   d) O+ S + V

Q20. The use of the term, ' Cousin Brother' is _____
a) right   b) wrong   c) not required   d) needed.

Q21. This is the _____ day of my life.
a) bad   b) badder   c) baddest   d) worst.

Q22. The meaning of the old English word, thou', today means _____
a) your   b) he   c) you   d) she

Q23. When referring to God, we must use the pronoun _____
  a) He   b) She   c) it   d) They

Q24. I have _____ my breakfast.
  a) eat   b) eating   c) had   d) make.

Q25. The word, 'Guru' is included in the English dictionary.
  a) True   b) False   c) Maybe
  d) Not possible as it is not an English word.

Q26. Select the correct form of introduction.
  a) Myself Amit kumar.   b) I was Amit Kumar
  c) I am fine. My name is Amit Kumar.   d) I am Amit Kumar.

Q27. The Snake _____ on the ground.
  a) crawls   b) shivers   c) slithers   d) walks.

Q28. You have to work _____ the ship.
  a) in   b) on   c) with   d) off

Q29. My _____ sister irritates me a lot.
  a) smaller   b) younger   c) tiny   d) sibling

Q30. They have _____ over their resignation.
  a) hand   b) handed   c) handing   d) will be handling.

ROUGH WORK

SECTION-II (PHYSICS)

Q31. to Q60. Choose the correct alternative out of four options.

Q31. What is the unit of force?

a) Meter   b) Seconds   c) Newton   d) Watt

Q32. Power at output of series LCR circuit at resonance is?

a) maximum   b) minimum   c) can't say   d) zero

Q33. The frequency for which a $5\mu f$ capacitor has a reactance of 1000Ω is given by:

a) $\frac{1000}{\pi}\frac{cycle}{sec}$ b) $\frac{100}{\pi}\frac{cycle}{sec}$ c) $\frac{200}{\pi}\frac{cycle}{sec}$ d) $\frac{5000}{\pi}\frac{cycle}{sec}$

Q34. By increasing the temperature the resistance of semiconductor?

a) Increases   b) decreases   c) remains constant   d) be Zero

Q35. Average value of Voltage over a time period of T is?

a) 2π b) 4π c) 0   d) $2\pi i$

Q36. Total earth magnetic field is given by?

a) $B = \sqrt{B_v^2 + B_H^2}$ b) $B = B_H \sin\theta$

c) $B = B_V \cos\theta$ d) $B = 0$

Q37. Average power dissipation in a pure inductive AC circuit is?

a) $\frac{Li^2}{2}$ b) $2Li^2$ c) $\frac{Li^2}{4}$ d) Zero

Q38. What will be the energy stored in inductor?

a) $\frac{Li^2}{2}$ b) $2Li^2$ c) $\frac{Li^2}{4}$ d) Zero

Q39. The frequency of a $10\mu H$ inductor having conductance of 10^{-3} mho is?

a) 15.915 MHz   b) 100 MHz   c) 20.245 MHz   d) 63.63 MHz

Q40. What is the height of geosynchronous orbit above the earth surface?

a) 36000 km   b) 22236 mi   c) 2236 mi   d) 20000km

Q41. What is the angle between magnetic meridian and geographical meridian?

a) 11.5^0 b) 10^0 c) 11.5 rad   d) 5^0

Q42. Whose susceptibility is temperature independent?

a) ferromagnetic materials   b) ferrimagnetic materials

c) diamagnetic materials   d) anti ferromagnetic material

Q43. When a particle revolve with uniform speed on a circular path:

a) No force act on it   b) No acceleration acts on it

c) No work is done by it   d) Its velocity is constant

Q44. Maximum safe speed does not depends on:

a) Mass of vehicle   b)Radius of curvature

c) Angle of inclination(Banking)   d)Acceleration due to gravity

Q45. A rectifier converts

a) A.C. into D.C   b) A.C. into pulsating D.C.

c) D.C. into A.C.   d) D.C. into pulsating D.C

Q46. When a sound wave get reflected from denser medium phase changes by:

a) 2π b) $\frac{\pi}{2}$ c) π d) No phase change

Q47. The process of adding impurities to the pure semiconductor is called?

a) Drouping   b) Drooping   c) Doping   d) None of these

Q48. Moment of inertia depends on:

a) Distribution of particles   b) Mass

c) Position of axis of rotation   d) All of the above

Q49. Which of the following is not a E.M. wave:

a) Radio Waves   b) Sound Wave   c) X-Rays   d) Light Wave

Q50. Longitudinal wave cannot travel through:

a) Vacuum   b) Solids   c) Liquids   d) Gases

Q51. Through fluids, which of the following types of wave cannot be propagated:

a) Longitudinal   b) Transverse   c) Progressive   d) Stationary

Q52. Which of the following is used to express intensity of magnetic field in vacuum?

a) Gauss   b) oersted   c) Weber   d) tesla

Q53. In nuclear reaction there is conservation of:

    a) Mass only   b) Energy only

    c) Momentum only   d) Mass, Energy and Momentum

Q54. What is phase difference between Sine and Cos wave?

    a) 90^0 b) 180^0 c) 0^0 d) 45^0

Q55. A bat flies at a steady speed of 4 ms^{-1} emitting a sound of f = 90×10^3 Hz. It is flying horizontally towards a vertical wall. The frequency of the reflected sound as detected by the bat will be _____.
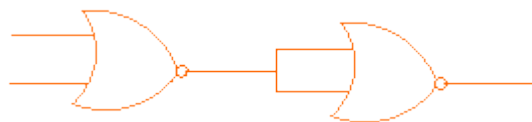
    (Take velocity of sound in air as 330 ms^{-1}).

    a) 92.1×10^3 Hz   b) 89.1×10^3 Hz

    c) 88.1×10^3 Hz   d) 87.1×10^3 Hz

Q56. Heat energy received by the earth from the sun is due to

    a) Convection   b) Radiation

    c) Reflection of light   d) Transmission of light

Q57. A body at high temperature T^{0}K radiates heat at rate proportional to

    a) T^4 b) T^{-4} c) T d) T^2

Q58. When a black body is heated, it emits heat radiations of

    a) Infrared wavelengths   b) Ultraviolet wavelengths

    c) All wavelengths   d) A particular wavelengths

Q59. Identify the logic operation performed by the circuit given here.

    a) NOT   b) NAND   c) OR   d) NOR

Q60. Dimensions of energy are?

    a) $[M^1 L^2 T^{-2}]$ b) $[M^1 L^{-2} T^{-2}]$ c) $[M^{-1} L^{-2} T^{-2}]$ d) $[M^1 L^2 T^2]$

ROUGH WORK

SECTION-III (CHEMISTRY)

Q61. to Q90. Choose the correct alternative out of four options.

Q61. The father of modern chemistry is?

    a) Priestley   b) Lavoisier   c) Dalton   d) Mendeleeff

Q62. Which one is not metal

    a) Sulpher   b) Sugar   c) Nitrogen   d) All

Q63. Which one is the pure element

    a) Glass   b) Cement   c) Sodium   d) None of these

Q64. An element X forms an oxide XO_3 What is the valency of X?

    a) 1   b) 2   c) 3   d) 6

Q65. Which of the following has highest frequency?

    a) Cosmic rays   b) X-rays   c) Radio waves   d) Micro waves

Q66. In isotopes the number of neutrons are

    a) Same   b) Different   c) Both   d) None

Q67. Which one of the following is not radioactive?

    a) Astanine   b) Francium   c) Tritium   d) Zirconium

Q68. The heaviest naturally occurring elements is

    a) Thorium   b) Uranium   c) Mercury   d) Polonium

Q69. The maximum number of hydrogen bonds in H_2O molecule is

    a) 1   b) 2   c) 3   d) 4

Q70. pH value of acidic solution is

    a) <7   b) >7   c) 7   d) None

Q71. Red litmus paper is changed into blue in solution of

    a) Base   b) Acid   c) Salt   d) None

Q72. Which of the following gases will have the highest rate of diffusion

    a) O_2 b) CO_2 c) NH_3 d) N_2

Q73. The density of the gas is equal to

a) np   b) MP/RT   c) P/RT   d) M/V

Q74. Which of the following among alkali metals is most reactive?

a) Na   b) K   c) Rb   d) Cs

Q75. The law of relative lowering of vapour pressure was given by

a) Vant Hoff   b) Ostwald   c) Lewis   d) Raoult

Q76. Out of the following which one is an example of emulsion?

a) Soap solution   b) Milk   c) Blood   d) Air

Q77. Air is

a) Compound   b) Element   c) Mixture   d) Solution

Q78. The atoms of the elements having same mass number but different atomic number are called

a) Isotopes   b) Isobars   c) Isotones   d) Isomers

Q79. Which one of the following element is essential for construction is nuclear reactors?

a) Cobalt   b) Nickel   c) Zirconium   d) Tungsten

Q80. The structure of ethylene is

a) Linear   b) Tetrahedral   c) Octahedral   d) Triangular

Q81. Which one has hydrogen bonding?

a) HCl   b) HBr   c) HF   d) HL

Q82. Which of the following is a halogen?

a) Astatine   b) Ruthenium   c) Radon   d) Cesium

Q83. The most malleable metal is

a) Platinum   b) Silver   c) Gold   d) Iron

Q84. What nucleus of atom contains?

a) Protons   b) Electrons

c) Electrons and protons   d) protons and neutrons

Q85. The number of protons and neutrons in the nucleus of tritium are

a) 2 and 2   b) 2 and 1   c) 1 and 2   d) 1 and 1

Q86. Acidity increases in the order

a) $ClCH_2.COOH < Cl_2CH.COOH < Cl_3C.COOH$

b) $Cl_2CH.COOH < Cl_3C.COOH < ClCH_2.COOH$

c) $Cl_3C.COOH < ClCH_2.COOH < Cl_2CH.COOH$

d) $Cl_3C.COOH < Cl_2CH.COOH < ClCH_2.COOH$

Q87. Among the following grouping, which represents the collection of isoelectronic species?

a) NO^+, C_{22}^-, O_2^-, CO

b) CO, NO, N_2, C_{22}

c) CO, NO^+, CN^-, C_{22}^-

d) NO, N_2, O_2^-, CN^-

Q88. When a lead battery is discharge

a) SO_2 is evolved

b) Lead sulphate is consumed

c) Lead of formed

d) Sulphuric acid is consumed

Q89. Which one is meta boric acid

a) HBO_2 b) $H_2B_4O_7$ c) H_3BO_3 d) $B(OH)_3$

Q90. $K_2[HgI_4]$ detects the ion / group

a) NH_2 b) NO   c) NH_4^+ d) $AlCl_3$

ROUGH WORK

SECTION-IV (MATHEMATICS)

Choose the correct alternative out of four options.

Q91. $\int \left(x^2 + \frac{2}{x^3} - 7\right) dx = ?$

    a) $\frac{x^3}{3} + \frac{2}{x^2} - 7$ b) $\frac{x^3}{3} - \frac{2}{x^2} - 7$

    c) $\frac{x^3}{3} - \frac{1}{x^2} - 7x$ d) $\frac{x^3}{3} - \frac{1}{x^2} - 7x + c$

Q92. $\begin{vmatrix} 1 & 3 & 4 \\ 2 & -1 & 3 \\ 2 & 1 & 2 \end{vmatrix} = \ldots\ldots$

    a) 17   b) 18   c) 20   d) -21

Q93. Find x if $\begin{vmatrix} 5 & -3 & 7 \\ 2 & 1 & 2 \\ 9 & -1 & x \end{vmatrix} = 0$

    a) 14   b) 11   c) 6   d) 25

Q94. $\int \cos \sqrt{x}\, dx = ?$

    a) $\sqrt{x} \sin \sqrt{x}$ b) $2\sqrt{x} \sin \sqrt{x}$

    c) $\frac{1}{\sqrt{x}} \sin \sqrt{x}$ d) $\frac{1}{2\sqrt{x}} \sin \sqrt{x}$

Q95. A feasible solution which optimizes the objective function is called
.... Solution.

    a) Linear   b) Optimal   c) Quadratic   d) Regular

Q96. $\log_3 3 = \cdots$

    a) 0   b) 1   c) 2   d) 3

Q97. $\frac{d}{dx} e^{2x} = \cdots$

    a) $2e^{2x}$ b) $e^{2x}/2$ c) e^{2x} d) 0

Q98. $\int_0^{\frac{\pi}{2}} cosx \, dx = \cdots$

a) 0   b) -1   c) 3   d) 2

Q99. $\lim_{x \to 0} sinx = \cdots$

a) -1   b) 0   c) 2   d) 1

Q100. $\begin{vmatrix} 2 & 3 \\ -1 & 4 \end{vmatrix} =$

a) 10   b) 11   c) 12   d) 13

Q101. The logarithm of unity is.....

a) one   b) zero   c) infinity   d) negative

Q102. $\frac{d}{dx} a^x = \cdots$

a) a^x b) $2a^x$ c) $a^x \log a$ d) 0

Q103. 14. $\lim_{x \to 0} cosx = \cdots$

a) 0   b) 1   c) -1   d) 2

Q104. If two rows or columns of a determinant are identical, the value of determinant is ......

a) 0   b) 1   c) 2   d) -1

Q105. Find x if $\begin{vmatrix} x & 2 & 1 \\ 3 & 0 & 1 \\ 4 & -5 & 2 \end{vmatrix} = 0$

a) 19/5   b) 21   c) -21   d) -19/5

Q106. Evaluate $\begin{vmatrix} 3 & 10 & 1 \\ 3 & 0 & 1 \\ 5 & 3 & 2 \end{vmatrix}$

a) -10   b) -2   c) -4   d) 5

Q107. The value of $\log_4 64$ is ....

a) 2   b) 3   c) 4   d) 5

Q108. $\frac{d^2y}{dx^2} + \frac{dy}{dx} + 5 = 0$ has order .... And degree ....

a) 2,1   b) 1,1   c) 2,2   d) 1,2

Q109. The derivative of the constant function is equal to ....

a) 1   b) 0   c) 2   d) infinity

Q110. $\int e^x \, dx = \cdots$

a) e^x b) 0   c) logx   d) 1

Q111. Det(-2)=...

a) -2   b) 2   c) 0   d) 4

Q112. $\lim_{x \to 2} 2x = \cdots$

a) 4   b) 2   c) 0   d) -2

Q113. $log_a(m \times n) = \cdots$.

a) $log_a m \ X \ log_a n$ b) $log_a m + log_a n$

c) 0   d) 1

Q114. $\lim_{x \to 2} \frac{x^2 - 4}{x - 2} = \cdots$

a) 2   b) 4   c) 1   d) 2

Q115. Find x so that the distance between the points (x , 4) & (-5 , 3) is equal to 5.

a) -7 , -3   b) 7 , 3   c) 3 , -7   d) -3 , 7

Q116. Write the equation of the circle with center at (0,0) and a radius of 6.

a) x + 2y = 36   b) x² + y² = 36

c) 2x+ y² = 36   d) x² - y² = 36

Q117. Find the center and radius of the circle whose equation is given by:

(x - 2)² + (y + 5)² = 13

a) Center at (2 , 5) , radius = SQRT(13)

b) Center at (-2 , -5) , radius = SQRT(13)

c) Center at (2 , -5) , radius = SQRT(13)

d) Center at (-2 , 5) , radius = 13

Q118. Find the center and radius of the circle whose equation is given by:

$(5 - x)^2 + (y - 1)^2 = 4$

a) Center at (-5 , 1) , radius = -2

b) Center at (5 , -1) , radius = 2

c) Center at (-5 ,- 1) , radius =- 2

d) Center at (5 , 1) , radius = 2

Q119. Find the equation of a circle that has a diameter with end points

(-6 , 1) and (2 , -5).

a) $(x - 2)^2 + (y + 2)^2 = 25$

b) $(x + 2)^2 + (y - 2)^2 = 25$

c) $(x - 2)^2 + (y - 2)^2 = 25$

d) $(x + 2)^2 + (y + 2)^2 = 25$

Q120. For two events A and B of a sample space if P (A) = 0.8 P (B) = 0.6
$P (A \cap B) = 0.5$ then $P (A \cup B) = ?$

a) 0.7

b) 0.8

c) 0.9

d) 0.6

ROUGH WORK

SECTION-V (GENERAL AWARENESS)

Q121. to Q150. Choose the correct alternative out of four options.

Q121. Ozone Layer lies in:
a) Thermosphere   b) Stratosphere   c) Mesosphere   d) Ionosphere

Q122. On board ship which of the following machinery is generally used for steam generation?
a) Boiler   b) Generators   c) Compressor   d) None of them

Q123. Find the odd one out
a) LED Display   b) Printer   c) Mouse   d) Monitor

Q124. Celsius & Fahrenheit show the same temperature at:
a) 38   b) 40   c) 52   d) 68

Q125. Chetan Bhagat is the Indian author, columnist & speaker, which of the following novels is not written by him?
a) What young Indian wants   c) Revolution 2020
b) Five point someone   d) A Himalayan Love Story

Q126. Liquefied Petroleum gas (LPG) is mainly mixture of:
a) Propane & Butane   b) Methane & CO_2
c) Butane & CO   d) Propylene & Ethylene

Q127. Olympic games are organized after a gap of every –
a) Two year   b) Three year   c) Four year   d) Five year

Q128. How many languages are there in Indian currency?
a) 2   b) 6   c) 12   d) 17

Q129. India derives its name from
a) The River Indus   b) The Hindus   c) The Aryas   d) Lord Indra

Q130. The disease "bronchitis" is associated with:
a) Heart   b) Liver   c) Lungs   d) Intestine

Q131. A man said to a lady, "Your mother's husband's sister is my aunt." How is that lady related to that man?
a) Daughter   b) Sister   c) Grand-daughter   d) Mother

Q132. Which is the smallest country in the world?
a) San Mario   b) Monaco
c) Nauru   d) Vatican City

Q133. What is the name of India's first & fastest multi-pet flops super computer?
a) Avigyaan   b) Pratyush   c) Knowledge   d) None of them

Q134. Mountain Dew, a carbonated soft drink brand, is produced and owned by which company?
a) Coke   b) Parle   c) Duke   d) Pepsi

Q135. Which of the following is not a part of Volkswagen group?
a) Ducati   b) Bugatti   c) Jaguar   d) Lamborghini

Q136. The ratio of width of our National Flag to its length is–
a) 3 : 5   b) 2 : 3   c) 2 : 4   d) 3 : 4

Q137. Who is India's Ironman?
a) Pandit Jawaharlal Nehru   b) Mahatma Gandhi
c) Sardar Vallabhbhai Patel   d) Narendra Modi

Q138. Which colour indicates highest temperature?
a) Dull Red   b) Green   c) Orange   d) Black

Q139. What Country is often described as being shaped like a boot?
a) Italy   b) Japan   c) Ireland   d) Iran

Q140. ....is the bird which can fly backwards.
a) Cuckoo   b) Eagle   c) Humming bird   d) Wood pecker

Q141. Positive Electrons discovered by:
a) Anderson   b) Avogadro   c) Binet   d) Boyle

Q142. GDP is:
a) Gross Domestic Pension   b) Gross Domestic Product
c) Gross Domestic Price   d) None of above

Q143. Yogeshwar Dutt is related to which of the following sports?
a) Boxing   b) Wrestling   c) Cricket   d) Chess

Q144. Which of the following application is introduced by Govt. of India for easy online transaction?
a) Chillr   b) Paytm   c) BHIM   d) Payumoney

Q145. Which fruit has been declared as the official fruit of Kerala?
a) Banana   b) Jackfruit   c) Apple   d) Pineapple

Q146. India becomes world's _____ largest mobile phone producer.
a) Third   b) Fourth   c) First   d) Second

Q147. Who won Dadasaheb-Phalke Excellence Award in 2018 for best actor?

    a) Ranveer Singh   b) Salman khan

    c) Sahid kapoor   d) Ranbir Kapoor

Q148. World health Day is observed on:

    a) April 08   b) April 07   c) March 29   d) March 13

Q149. Capital of State Mizoram

    a) Imphal   b) Aizawl   c) Kohima   d) Agartala

Q150. Which IPL team has begun "Go Green" initiative?

    a) RR   b) RCB   c) MI   d) SRH

------ End ------

ROUGH WORK