

Proctored Mock CAT- 3 2013

Section I: QA&DI

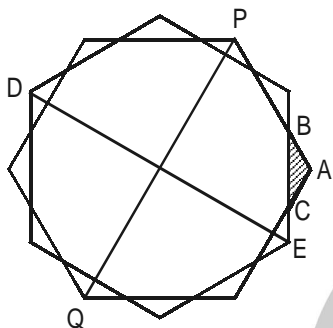
1. Let $P = \{n! + 1, n! + 2, \dots, n! + n\}$ such that 'n' is a natural number greater than 42. At the most, how many elements in set P can be prime numbers?
(a) 0 (b) 1 (c) 2 (d) More than 2
2. If $\log\left(x + \frac{16}{x}\right) > 1$, then what is the range of x?
(a) $2 < x < 8$ (b) $4 < x < 8$ (c) $x < 2$ or $x > 8$ (d) $0 < x < 2$ or $x > 8$
3. The vertices of a triangle ABC are (1, 2), (-3, 2) and (-3, -1). Find the coordinates of the incentre of the triangle.
(a) (-2, 1) (b) (-2, -1) (c) (2, -1) (d) None of these
4. Three runners – A, B and C – start from a point on a circular track simultaneously. A and B run in clockwise direction whereas C runs in anti-clockwise direction. When A and C meet for the first time, B is diametrically opposite to them. If A is the fastest among them, the ratio of the speeds of A, B and C can be
(a) 5 : 2 : 1 (b) 4 : 2 : 1 (c) 5 : 2 : 2 (d) 5 : 2 : 3
5. Three beakers – A, B and C – contain 100 ml of pure water, 100 ml of pure milk and 100 ml of pure alcohol respectively. To start with, 25 ml of the contents of beaker A is poured into beaker B. After mixing, 25 ml of the contents of beaker B is poured into beaker C, following which, 25 ml of the resultant mixture is poured into beaker A. What is the ratio of the final quantity of alcohol in beaker A to that of milk in beaker C?
(a) 3 : 2 (b) 2 : 3 (c) 5 : 4 (d) 4 : 5
6. A natural number 'N' can be represented as the sum of three natural numbers 'a', 'b' and 'c'; where 'a' is the cube root of one-third of 'N', 'b' is the square root of one-sixth of 'N' and 'c' is five-sixth of 'N'. If $N < 200$, what is the number of possible values of N?
(a) 0 (b) 1 (c) 2 (d) More than 2
7. Three natural numbers a, b and c are such that $a^2 + b^2 = c^2$. If $a = 20$, how many ordered pairs (b, c) are possible?
(a) 1 (b) 2 (c) 3 (d) 4

Directions for questions 8 to 10: Answer the questions on the basis of the information given below. Five friends – A, B, C, D and E – appeared in an exam. The examination paper consisted of 200 questions with 40 questions in each of the five sections – QA, VA, LR, RC and DI. For any of these 200 questions, a right answer fetches (+1) mark while a wrong answer fetches (–0.2) marks. Each of them attempted all the 200 questions. The table below shows the sum of the number of right answers given by each of the friends for five different combinations of two sections.

Persons → Sections ↓	A	B	C	D	E
QA and VA	14	34	30	42	34
LR and RC	32	23	35	44	32
DI and QA	23	25	31	18	52
VA and LR	29	28	36	47	31
RC and DI	30	12	28	43	37

8. How many questions were wrongly attempted by C in the exam?
 (a) 70 (b) 120
 (c) 130 (d) None of these
9. Who among the five friends had the highest score in the exam?
 (a) D (b) B
 (c) C (d) E
10. The total number of wrong answers given by these five friends altogether was same in which of the two sections?
 (a) VA and LR (b) QA and DI
 (c) RC and DI (d) RC and QA
11. When $a^3 + b^3 + c^3 + d^3 + e^3$ is divided by 7, the remainder is 'r'. If a, b, c, d and e are positive integers and none of them is divisible by 7, what is the sum of all the possible values of 'r'?
 (a) 15 (b) 10 (c) 5 (d) 21
12. If all the four-digit numbers that can be formed using the digits 1, 2, 3, 4, 5, 6, 7 and 8 without repetition are arranged in ascending order, what will be the rank of the number 5283?
 (a) 897th (b) 898th (c) 908th (d) None of these
13. If $[x]$ represents the greatest integer less than or equal to 'x' and $\left[\frac{x}{4}\right] = \left[\frac{x}{6}\right]$, how many non-negative integer values of 'x' are possible?
 (a) 3 (b) 4 (c) 5 (d) 6

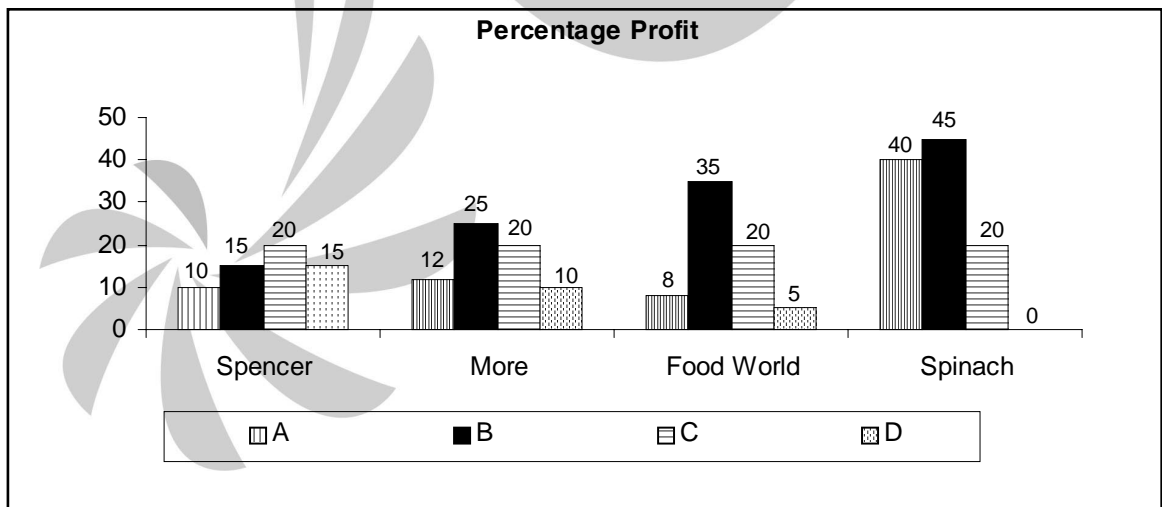
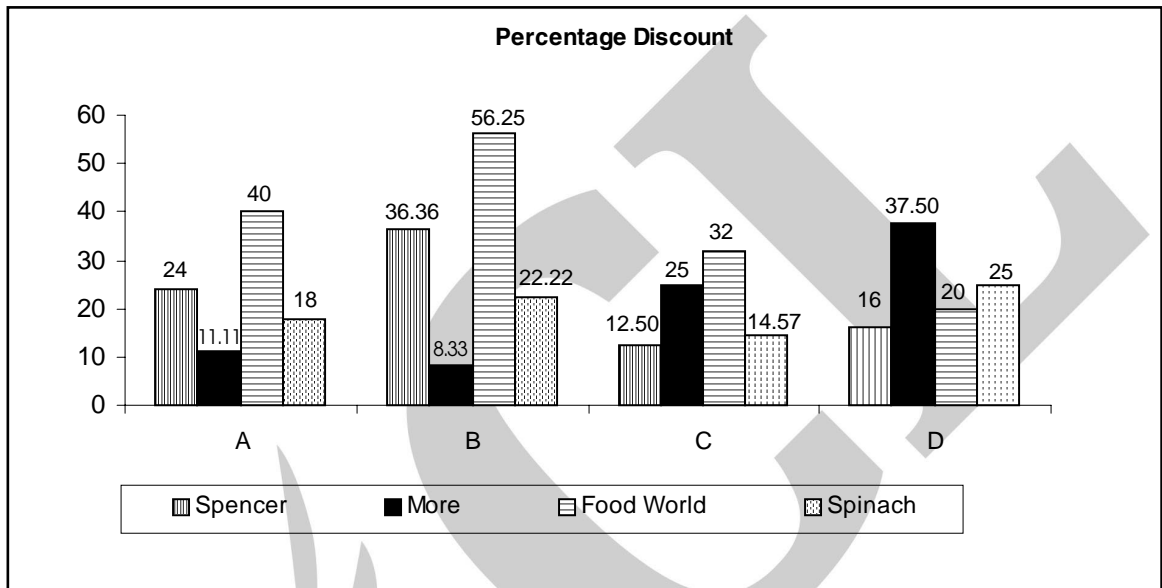
14. The areas (in cm^2) of two circles are 576π and 729π . If the distance between their centres is 54 cm, what is the number of common tangents?
 (a) 4 (b) 3 (c) 2 (d) 1
15. The longest diagonals DE and PQ of two regular hexagons each of side 2 cm bisect each other perpendicularly. What is the area (in cm^2) of the shaded triangle ABC?



- (a) $8\sqrt{3} - \sqrt{2}$ (b) $7\sqrt{3} - 12$ (c) $9\sqrt{3} - 14$ (d) None of these
16. Bells B_1 and B_2 ring 8 times and 48 times in a minute respectively. If they start ringing simultaneously, after how much time (in seconds) will B_2 ring exactly 10 times more than B_1 ?
 (a) 8 (b) 10 (c) 15 (d) 20
17. Find the number of digits in 3^{150} . (Given $\log 3 = 0.4771$)
 (a) 71 (b) 72 (c) 66 (d) 67

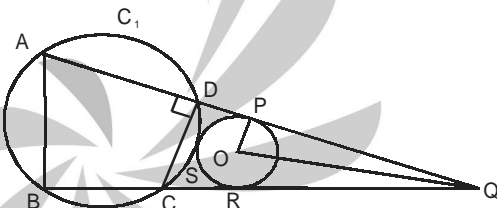
Directions for questions 18 to 20: Answer the questions on the basis of the information given below.

The first bar diagram below shows the percentage discounts offered by four retail outlets on four different commodities – A, B, C and D. After allowing these discounts, the percentage profits earned by the outlets on selling these commodities are given in the second bar diagram.



18. If the marked price of A is same at all the four outlets, which outlet must have purchased A at the least price?
- (a) Spencer (b) More
(c) Food World (d) Spinach

19. If the marked prices of all the four commodities are same at More, which commodity must have been purchased at the highest price by More?
 (a) D (b) C
 (c) B (d) A
20. What is the mark-up percentage for commodity B at Spencer?
 (a) 84.84 (b) 80.71
 (c) 87.67 (d) Cannot be determined
21. In triangle PQR, right angled at Q, a perpendicular QS is drawn on PR. Perpendiculars ST and SU are drawn on PQ and QR respectively. If $ST = 3$ cm and $SU = 4$ cm, find the approximate area (in cm^2) of triangle PQR.
 (a) 19.53 (b) 15.67 (c) 26.04 (d) 36.67
22. Consider four lines in the coordinate plane:
 (i) $4x + 7y = 10$,
 (ii) $5x + 8y = 11$,
 (iii) $x + y = 4$ and
 (iv) $2x + 3y = 5$.
 Which three of them are concurrent?
 (a) (i), (ii) and (iii) (b) (i), (ii) and (iv) (c) (ii), (iii) and (iv) (d) None of these
23. In the figure given below, quadrilateral ABCD is inscribed in a circle C_1 . AD and BC are extended to meet at Q. A circle with centre O is placed inside $\triangle ABQ$ such that it touches C_1 , BQ and AQ at S, R and P respectively. If $AB = \sqrt{3} DC$, $BQ = 8$ cm, $\angle OQP = 15^\circ$ and $\angle ADC = 90^\circ$, what is the radius (in cm) of C_1 ?



- (a) $\frac{16}{3}$ (b) $\frac{8}{3}$ (c) $4\sqrt{3}$ (d) $\frac{16\sqrt{3}}{3}$
24. Consider two sequences S_1 and S_2 :
 $S_1 = \{1, 3, 6, 10, 15, \dots, 15 \text{ terms}\}$
 $S_2 = \{1, 5, 14, 30, 55, \dots, 10 \text{ terms}\}$
 The number of common elements between S_1 and S_2 is
 (a) 3 (b) 2 (c) 4 (d) 5

25. X can do a piece of work in 60 days while Y can do the same work in 80 days. Nine persons as efficient as X and 8 persons as efficient as Y were hired to complete the work, but some of them did not turn up. As a result, the work took 25% more time to be completed. Which of the following statement(s) can be true?
Statement I: Three persons as efficient as X and 4 persons as efficient as Y did not turn up.
Statement II: Only 4 persons, all of whom were as efficient as Y, did not turn up.
Statement III: Three persons as efficient as X and 2 persons as efficient as Y did not turn up.
- (a) I only (b) II only (c) III only (d) Both I and III
26. Let m and \sqrt{n} be the roots of the quadratic equation $x^2 - (p - 4)x + p = 6$. What is the minimum value of $m^2 + n$?
 (a) 5 (b) 3 (c) 2 (d) None of these
27. Let $f(x) = ax^2 + bx + c$ and $g(x) = dx^2 + ex + f$, where a, b, c, d, e and f are real numbers such that
 (i) the minimum value of $f(x)$ is less than the minimum value of $g(x)$
 (ii) $f(a_1) = f(a_2) = 0$; $g(a_3) = g(a_4) = 0$
 (iii) $a_1 < a_2 < a_3 < a_4$; $0 < a$; $0 < d$; $a_2 - a_1 = a_4 - a_3$
 If it is also known that p and q are the solutions of the equation $f(x) = g(x)$ and $k = \max(p, q)$, which of the following is true?
 (a) $a_3 < k < a_4$ (b) $a_2 < k < a_3$ (c) $a_1 < k < a_2$ (d) $a_4 < k$

Directions for questions 28 to 30: Answer the questions on the basis of the information given below.

The natives of a city the total population of which is 80,000 are aware of only three newspapers – TOI, HT and DC – and only three mobile brands – NOK, SAM and SE.

- (i) The number of natives in the city who like exactly two newspapers is five times the number of natives who like all the newspapers.
 (ii) The sum of the number of natives who like TOI and 42% of those who like HT but not TOI is equal to the number of natives who like NOK.
 (iii) The number of natives who like SAM is equal to the sum of 37.5% of the number of natives who like HT and 50% of those who like DC.
 (iv) 30,000 natives like all the mobile brands and 7,000 like all the newspapers.
 (v) 37,000 natives like TOI.
 (vi) 28,000 natives do not like TOI but DC.
 (vii) 22,000 natives like TOI and exactly one more newspaper.
 (viii) 12,000 natives like only HT and the same number of natives like TOI and DC but not HT.
 (ix) The number of natives who like SE is same as the number of natives who like SAM.
28. How many natives in the city do not like any of the three newspapers?
 (a) 1,000 (b) 3,000 (c) 5,000 (d) 7,000
29. What is the minimum number of natives in the city who like at least one of the three mobile brands?
 (a) 48,000 (b) 52,000
 (c) 55,000 (d) Cannot be determined
30. At least how many natives in the city do not like any of the three mobile brands?
 (a) 10,000 (b) 12,000
 (c) 14,000 (d) Cannot be determined

Section II: VA&LR

31. Four sentences are given below labeled a, b, c and d. Of these, three sentences need to be arranged in a logical order to form a coherent paragraph/passage. From the given options, choose the one that does not fit the sequence.
- (a) It seems to strum with glee when you make swift gains in the market; it's a sentient savant when you suffer losses; it can be an irksome sprinter for the ageing saver; a sluggish bore for a young trader.
 - (b) For an intangible entity, time is starkly palpable.
 - (c) Time and tide wait for no one.
 - (d) But mostly, time is a capricious companion, loyal to none, yet equanimous to all.
32. Four sentences are given below labeled a, b, c and d. Of these, three sentences need to be arranged in a logical order to form a coherent paragraph/passage. From the given options, choose the one that does not fit the sequence.
- (a) He had studied art in the streets of Paris and had learnt from the great masters.
 - (b) On all other subjects I believe he is tolerably sane.
 - (c) He nurses the illusion that he is one of the lost arms of the Venus de Milo, and hopes that the French Government may be persuaded to buy him.
 - (d) In the quieter streets of Paris, especially in the neighborhood of the Ministry of Fine Arts, you may sometimes meet a depressed, anxious-looking man, who, if you pass him the time of day, will answer you with a slight Luxemburgian accent.
33. There are two gaps in the sentence/paragraph given below. From the pairs of words given, choose the one that fills the gaps most appropriately.
- Notwithstanding the role of politics in influencing this decision, any criticism of the Modi government's latest stand must be _____ with the view that the death penalty is no answer to _____ crimes.
- (a) laden, magnificent
 - (b) tempered, heinous
 - (c) raunchy, stinking
 - (d) execrable, villainous
34. Given below are five sentences or parts of sentences that form a paragraph. Identify the sentence(s) or part(s) of sentence(s) that is/are incorrect in terms of grammar and usage. Then, choose the most appropriate option.
- A. Three pro-Telangana students created tension at Basheerbagh and Moosapet by going up towers and threatened to commit suicide for a separate Telangana.
 - B. The Abids police rushed to the spot and tried to persuade the agitating youngsters to come down.
 - C. As the students refused, the police called in TRS leader Sravan and appeal to the youngsters through him.
 - D. Finally, the trio yielded and were seen climbing down.
 - E. The three youngsters now face legal action for attempting suicide.
- (a) A, C and E
 - (b) B, C and D
 - (c) A, C and D
 - (d) A, B and C

35. Given below are five sentences or parts of sentences that form a paragraph. Identify the sentence(s) or part(s) of sentence(s) that is/are incorrect in terms of grammar and usage. Then, choose the most appropriate option.
- A. Rarely have I seen an entire nation get so angry, so outraged and so bitter about something that were no more than a sporting encounter.
 - B. For the first few days as India began to rave and rant, I thought we were just being silly.
 - C. But having thought about it, I think our response to the World Cup debacle tell us a few things about our national character.
 - D. We are a nation of dreamers.
 - E. Even before the team left for the West Indies, most cricket commentators conceded that we had, at best, only an outside chance of winning the World Cup.
- (a) A and D (b) A and C (c) A, C and E (d) B, D and E

Directions for questions 36 to 38: Answer the questions on the basis of the information given below.

A renowned TV channel airs nine daily shows – BB, NA, BV, LS, CC, CP, JM, TM and IM – each of duration 30 minutes such that the first show starts at 7 p.m. and the last show starts at 11 p.m. every day. Each of them is of a distinct genre – Family, Mythology, History, Reality, Horror, Comedy, Crime, News and Science – not necessarily in that order. The sequence in which the shows are aired in a day is the same throughout the week.

- (i) The Reality show starts at 8.30 p.m. and is not immediately preceded by JM or IM. The News show ends at 8 p.m.
 - (ii) CP starts at 7 p.m. and NA ends at 10.30 p.m. TM is the Mythology show which starts after 9 p.m.
 - (iii) The Horror show starts exactly 3 hours after the end of the Science show and neither of them is JM.
 - (iv) CC is immediately followed by BB and neither of them is a Family show or a News show.
 - (v) Exactly two shows are aired between BB and JM.
 - (vi) IM is neither immediately preceded nor immediately followed by NA.
 - (vii) Exactly four shows are aired between the Family show and the Horror show.
36. BV is a
- (a) Family show
 - (b) Horror show
 - (c) Crime show
 - (d) Either (a) or (b)
37. Mythology show starts at
- (a) 9.30 p.m.
 - (b) 10 p.m.
 - (c) 11 p.m.
 - (d) Cannot be determined
38. The show which starts at 9 p.m. can be
- (a) JM, a Comedy show
 - (b) IM, a History show
 - (c) BB, a Crime show
 - (d) None of these

Directions for questions 39 to 41: The passage given below is followed by a set of three questions. Choose the most appropriate answer to each question.

American photorealist Audrey Flack has once said and I quote, “There is an instinct for realism, a powerful drive to reproduce oneself. The fascination of photorealistic paintings lies partly in their apparent replication of life, but these are not merely replications. These paintings are often out of life scale, varying from over life-size to under life-size, from brilliant, heightened color to pale, undertone hues.”

Flack’s thoughts sum up what Photorealism is all about. Known as a painting movement of the mid-20th century which began in the late 1960s, scenes are painted in a style closely resembling photographs in Photorealism. Artists painted from photographs or depicted objects and people as close to real life as possible, including every minute detail. However, the true subject of a photorealist’s work is the way we unconsciously interpret photographs and paintings in order to create a mental image of the object represented.

The movement’s center is located in the United States. Among the most highly-regarded American photorealist painters are Flack, Richard Estes, Chuck Close, Charles Bell, and Ralph Goings. Estes and Close are the leading members of the Photorealist movement. Estes specializes in street scenes with elaborate reflections in window-glass while Close does enormous portraits of neutral faces. The Photorealism movement was also strong in Europe from the late 1960s into the 1970s, where this type of illusionism is known principally as Superrealism. The style is tight and precisionistic. Some of the renowned Russian photorealists include Andrew Abramov, Soryn Codytsa and Arlette Steenmans.

Photorealists typically specialize in a particular subject matter. Very ordinary, as you might think but then, Photorealism will always be a part of our lives. After all, ordinary things and events around us are what make photorealism artists so great and impressive.

39. Which of the following options can be inferred about Photorealism from the given passage?
- (a) The paintings are realistic and powerful because of being out of scale with life, from over life-size to under life-size, from brilliant, heightened color to pale, undertone hues.
 - (b) The depth of photorealistic thought can be seen in the variety of ways the same painting is seen, interpreted, analyzed and discussed.
 - (c) The depiction of ordinary events, people and objects makes photorealistic paintings unique and impressive.
 - (d) The representation of the mental image created by the viewer of an object is the true subject of photorealistic work.
40. It can be inferred that the main purpose of the third paragraph is to
- (a) discuss the history of the Photorealist movement and inspirational artists from Europe.
 - (b) introduce Photorealism’s supportive locations and also reputed photorealist painters.
 - (c) discuss the importance of the Photorealism movement in the United States.
 - (d) introduce the various specializations of renowned photorealists.
41. According to the passage, the allure of Photorealism can be partly explained by which of the following statements?
- (a) It presents before us an imitation of life.
 - (b) It is a representation of reality.
 - (c) It has every minute detail of the image from real life.
 - (d) It is versatile and allows for interpretations from all aspects of life.

Directions for questions 42 to 45: The passage given below is followed by a set of four questions. Choose the most appropriate answer to each question.

One way to encapsulate the agreement in positions and values among feminist philosophers, regardless of their methodological inclinations, is to say that for feminist philosophers, both philosophy and gender *matter* — both are important to the lives of human beings. Feminists recognize that philosophy and philosophers are part of the wider set of institutions of culture in which human beings live, understand themselves, and, only sometimes, flourish. Among the many functions of philosophy are the following: to help us to understand ourselves and our relations to each other, to our communities, and to the state; to appreciate the extent to which we are counted as knowers and moral agents; to uncover the assumptions and methods of various bodies of knowledge, and so on. These kinds of philosophical insights—ones that concern our methods, assumptions, theories and concepts — can contribute to the oppression of human beings as well as to their liberation. Given the current imbalances of power and privilege with which people live, philosophy has social effects when it “leaves everything as it is.” Feminists seek philosophy that can generically be called “engaged,” that is, philosophy that is potentially useful to empower human beings rather than contribute to the perpetuation of a status quo in which people are subordinated by gender, race/ethnicity, class, sexual orientation, and so on. This is not to say, of course, that feminist philosophers all agree over the appropriate ways to work this out, but they do agree that philosophy can influence lives and should influence them for the better.

A second area of agreement among feminist philosophers is that gender has effects not only on our lives, but also on philosophy itself. Feminists criticize the misogyny of philosophers and the overt and covert sexism, andro-centrism, and related forms of male bias in philosophy. For example, philosophers have through the centuries made a variety of false and demeaning claims about “the nature of woman”; they have defined central concepts such as reason in ways that excluded women of their cultures; they have made allegedly universal claims about human nature, desire, or motivation that were, in fact, claims more likely to be true of men of their social class; and they have believed methods and positions to be “value-neutral” and “objective” that were instead promoting the interests of only the privileged groups. Once again, while feminist philosophers agree on the existence of such kinds of male bias, they differ over the best ways to criticize it, the extent to which various philosophical approaches can be reconstructed for feminist use, and so on.

42. What is the central idea of the passage?
- (a) Feminist philosophers' perspective on philosophy and gender
 - (b) The common thought that exists between analytical feminists and feminine philosophers
 - (c) Feminism and philosophy and their intertwined relationship with culture
 - (d) The philosophy of feminism and the interrelationship with culture
43. It can be inferred from the passage that feminist philosophers would most likely agree with a philosophy that
- (a) allows for change to take place at its own pace.
 - (b) overlooks the subordination of people according to their gender.
 - (c) has a positive effect on the lives of human beings.
 - (d) helps us understand ourselves better.

44. According to the passage, the feminist philosophers' main point of criticism is
- (a) that philosophy has further demeaned the status of women in society.
 - (b) that philosophy has many forms of male bias and incorrect assumptions made about women.
 - (c) that philosophical thought has been dominated by men and women have been kept away from its annals.
 - (d) the manner in which philosophical thought originates and the way in which it is presented.
45. According to the passage, the argument that has not been made by the feminist philosophers is that
- (a) philosophy has been distorted or limited by the absence of feminist influence.
 - (b) although gender is only one facet, it is nevertheless an important one with a wide variety of implications for the way we should study philosophy.
 - (c) a good philosophical theory or method would systematically disadvantage neither men nor women from any social group.
 - (d) the philosophers have not appreciated the extent to which their theories and methods have perpetuated cultures that have prevented the flourishing of women.

Directions for questions 46 to 48: Answer the questions on the basis of the information given below.

Five boys – Tanay, Rohan, Sanjeev, Ravi and Atul – and four girls – Shraddha, Ankita, Nidhi and Neelam – are to be divided into three teams such that no team is made up entirely of boys or entirely of girls. The teams will have exactly four, three and two members. Shraddha and Nidhi have to be in the same team, but they cannot be in the same team as Ravi. Exactly one among Neelam and Rohan has to be there in the team which has three members. If Sanjeev is selected in a team, Ravi has to be selected in the same team.

46. In how many ways can the group be divided into three teams?
- (a) 5 (b) 7 (c) 6 (d) 8
47. How many different 2-member teams are possible?
- (a) 8 (b) 7 (c) 5 (d) 3
48. If Neelam is in the team which has three members, who among the following cannot be with Ankita in the same team?
- (a) Tanay (b) Atul (c) Rohan (d) Ravi

Directions for questions 49 to 51: The passage given below is followed by a set of three questions. Choose the most appropriate answer to each question.

"I cannot live in Prague... I do not know if I can live anywhere else. But that I cannot live here - that is the least doubtful thing I know," wrote Franz Kafka in the Letter to His Father (1918). Prague's most famous literary figure who wrote in German talked incessantly about the city in his letters and diaries just like James Joyce did about Dublin. "If you follow the perimeter of Old Town, this narrow circle encompasses my entire life," he said. In the city of his birth, one catches glimpses of the writer everywhere. Old Town Prague is a tourist haven with outdoor cafes, cobblestone streets, and the famous Astronomical clock. By the Old Town Hall is the Minuta House. Kafka lived here between 1889 and 1896 and walked with his Czech cook to elementary school. On Charles Bridge and on Karlova Street, his gaunt face is emblazoned on T-shirts, souvenir mugs and key chains.

"Kafka absorbed all of Prague's humours and poisons and descended into its demonic nature," explains Angelo Maria Ripellino in his book *Magic Prague*. My guide Georgina explains that Kafka had a deep interest in the city's history - the beheadings, the anarchy, the horrors of German invasion and tortures. His personal demons too influenced his writing. Kafka is said to have had a dominating father and impotence and rebellion were pervasive themes in his writing. Many feel Kafka's famous novella, *Metamorphosis*, in which a travelling salesman, Gregor Samsa, wakes up one day to find himself transformed into a giant cockroach, was an autobiographical work - he felt like an insect in his father's presence and even stammered when he spoke to him.

In his lifetime, Kafka was not known as a writer but as a lawyer who worked for the Workers Accident Insurance Company. We walk to Wenceslaus square, the scene of the most defining moments in Prague's history - the Nazi occupation, the Communist takeover and the Velvet Revolution. Today it has stylish cafes, bars and glitzy shopping. The beautiful Art Nouveau building of the Grand Hotel Europa was where Kafka had a reading of his book *The Judgement*, the tale of a young man's conflict with his father. For 14 years, he walked down the road past the Municipal House and the Powder Tower with his briefcase and umbrella. Today, the Art Nouveau Municipal House has a swish restaurant and hosts musical performances.

49. Which of the following is best inferred from the passage?
- (a) Franz Kafka abhorred living in Prague.
 - (b) Franz Kafka was obsessed with Prague even though he had an abomination for it.
 - (c) Franz Kafka was sure of his inability to live in Prague.
 - (d) Franz Kafka felt suffocated in Prague because of the many memories of his life.
50. All of these have been mentioned as sources of inspiration for Kafka's writing, **except**:
- 1. Pervasive themes reflecting rebellion
 - 2. The darker side of Prague's history
 - 3. His individual experiences and struggles
 - 4. The dominating presence of his father
- (a) Only 1 (b) 2 and 3 (c) 1 and 3 (d) 2, 3 and 4
51. It can be inferred that the purpose of the last paragraph is to
- (a) assert that Kafka was known as a lawyer and not a writer in his lifetime.
 - (b) mention Kafka's years of struggle when he worked as a lawyer.
 - (c) present the importance of the Art Nouveau building and the role it has played in history.
 - (d) illustrate the changing face of Prague and the contrast between the past and the present.

52. A paragraph is given below from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

That is when you stop laughing and start worrying about a team that was virtually invincible in Test cricket from the early Nineties to mid-2005 when Australia surrendered the Ashes to England in a stirring series at the home of cricket. The setback was followed by yet another period of domination up till 2008 after which Australian cricket went into a tailspin and continues to hurtle from one disaster to another. Ironically, Arthur seems to have woken up to the reality only after his team found itself 0-2 down in the series after playing some pretty ordinary cricket. _____

- (a) He handed out 'homework' that was meant to make players more responsible for their own deeds and improve on-field performances.
 - (b) The coach had himself shunned doing his own bit prior to the opening Test match against India in Chennai.
 - (c) Both Arthur and skipper Michael Clarke surely need to tell cricket lovers what prompted their bizarre decision making that was bound to backfire on them.
 - (d) He owes his position of eminence to the Argus report that recommended an enhanced role for the coach.
53. A paragraph is given below from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

But the biggest change was recording the sound on the new, multi-channel Dolby Stereo that could be played to great effect even in small theatres with the old mono sound system. Allen and his team convinced more than 40 theatres to upgrade their audio systems, but the advantage was that the new technology could be adapted to the old set-up. The sound thrilled and the successes of Star Wars and Close Encounters of The Third Kind gave way to more inventions, though Allen's focus remains on creating new technology that is compatible with older formats. _____

- (a) The 73-year-old, who is currently in India, has been instrumental in several major sound engineering innovations in Hollywood.
- (b) It's never been easy to convince hard-nosed studio executives and tight-fisted theatre owners of the benefits of the new technology.
- (c) Over the years, Allen and his colleagues had struck up a personal equation with the more powerful filmmakers and producers.
- (d) Studio heads have said that the old sound system was not good enough.

54. A paragraph is given below from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

It is precisely this effect that Satya Paul hoped Masaba's touch would generate when it hired her as fashion director last November. With her, the 28-year old fashion brand, traditionally patronised by older women, wants to break into the youth segment. "I think the reason I was chosen for the job is that I am a gutsy designer. I am fearless in my choice of prints, colours and presentation," said Masaba. Love for prints is another thing that connects the brand to her. But her choice is more edgy and quirky. _____

- (a) These motifs she chooses represent the journey of a woman.
(b) Eclectic prints, however, are nothing new to fashion, not even in India.
(c) Satya Paul appeals both to the young and those who desperately want to look young.
(d) Palms, cows, cameras, timepieces are some wacky motifs that have been spotted on her creations, especially saris.
55. Five sentences are given below labeled A, B, C, D and E. They need to be arranged in a logical order to form a coherent paragraph. From the given options, choose the most appropriate one.
- A. South Africa is heading in the opposite direction.
B. Most of all, South Africa needs political competition.
C. The best hope for the country in the years to come is a real split in the ANC between the populist left and the fat-cat right to offer a genuine choice for voters.
D. Its neighbours to the north are moving away from the one-party systems that dragged them to corruption and stagnation for decades.
E. Until that happens, South Africa is doomed to go down as the rest of Africa goes up.
- (a) BDACE (b) BEDAC (c) EDACB (d) BCEDA
56. Five sentences are given below labeled A, B, C, D and E. They need to be arranged in a logical order to form a coherent paragraph. From the given options, choose the most appropriate one.
- A. He leads me through a door in a wall to a windowless, white-tiled office reminiscent of an Eastern-bloc interrogation centre.
B. The depot turns out to be a tarmac yard tucked between Shaftesbury Avenue and Charing Cross Road.
C. Men in luminous overalls smoke and exchange genial insults.
D. I'm approached by the only person in a suit: the night-shift manager, Lawrence.
E. Carts and street-sweepers are parked up, as well as Madvacs, the powered sweepers that wheel along pavements between cursing pedestrians.
- (a) ACD BE (b) ABECD (c) BECDA (d) DACBE

57. Five sentences are given below labeled A, B, C, D and E. They need to be arranged in a logical order to form a coherent paragraph. From the given options, choose the most appropriate one.
- A. The recent cabinet approvals may have consequences similar to the RBI Amendment Act of 2006, which established the RBI as a regulator of the bond market and the currency market.
 - B. In all the OECD countries but one, a single government agency — the securities regulator or the unified financial regulator — deals with all aspects of organised financial trading.
 - C. Apart from this, the OECD practice involves a single agency that regulates all organised financial trading, with a unified treatment of equities, commodity futures, interest rate, currencies, corporate bonds and derivatives.
 - D. In the US, the treatment of organised financial trading is split between the CFTC, which deals with all derivatives, and the SEC, which deals with the spot market.
 - E. This was a step in the wrong direction, given India's reform agenda on the regulation and supervision of securities markets.
- (a) AEDBC (b) BDCAE (c) DBCAE (d) AEBDC

Directions for questions 58 to 60: Answer the questions on the basis of the information given below.

Each of the five friends – Harsha, Abhishek, Pawan, Shailendra and Vijay – has exactly one distinct item among Pen, Eraser, Pencil, Paper and Sharpener. When questioned about the item they possess, each of them makes two statements such that exactly one of the two statements is true. The statements made by them are given below.

Name	Statement 1	Statement 2
Harsha	I have Pen.	I don't have Eraser.
Abhishek	I don't have Pencil.	I don't have Paper.
Pawan	I have Sharpener.	I have Pen.
Shailendra	I don't have Pen.	I have Pencil.
Vijay	I have Paper.	I have Eraser.

58. Who has the Pen?
(a) Shailendra (b) Pawan (c) Harsha (d) Cannot be determined
59. Who among the following cannot have the Eraser?
(a) Harsha (b) Vijay (c) Shailendra (d) None of these
60. If Harsha has the Paper, which item is possessed by Shailendra?
(a) Eraser (b) Pencil (c) Pen (d) Sharpener

Proctored Mock CAT-3 2013

Answers and Explanations

1	b	2	d	3	a	4	a	5	c	6	b	7	d	8	b	9	a	10	c
11	d	12	a	13	d	14	a	15	b	16	c	17	b	18	c	19	d	20	b
21	c	22	c	23	b	24	a	25	b	26	b	27	b	28	b	29	a	30	c
31	c	32	a	33	b	34	c	35	b	36	d	37	a	38	c	39	d	40	b
41	a	42	a	43	c	44	b	45	a	46	b	47	c	48	d	49	c	50	a
51	d	52	a	53	b	54	d	55	a	56	c	57	d	58	b	59	a	60	d

1. b $(n! + a)$ is always divisible by a for $a \leq n, a \in \mathbb{N}$.
If $a = 1$, then $n! + 1$ is divisible by 1, but $n! + 1$ can be a prime number.
Hence, there can be at the most 1 prime number in set P .

2. d $\left(x + \frac{16}{x}\right) > 0 \Rightarrow x > 0$

$$\log\left(x + \frac{16}{x}\right) > 1$$

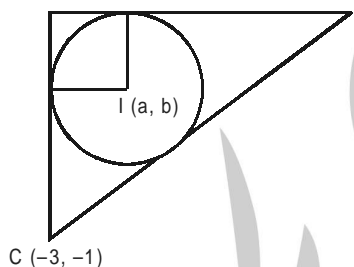
$$\Rightarrow \left(x + \frac{16}{x}\right) > 10^1$$

$$\Rightarrow x^2 + 16 > 10x \quad [\because x > 0]$$

$$\Rightarrow (x - 8)(x - 2) > 0$$

Hence, $0 < x < 2$ or $x > 8$.

3. a A $(-3, 2)$ B $(1, 2)$



C $(-3, -1)$

Drawing the triangle in the coordinate plane, we observe that the triangle ABC is a right angled triangle with $AB = 4$, $AC = 3$ and $BC = 5$.

Let 'I' be the incentre with coordinates (a, b) .

We know,

$$\text{Inradius} = \frac{\text{Area of triangle}}{\text{Semi-perimeter}} = \frac{\frac{1}{2} \times 3 \times 4}{\frac{1}{2} \times (3 + 4 + 5)} = 1$$

$$\therefore a = -3 + 1 = -2 \text{ and } b = 2 - 1 = 1$$

Hence, the coordinates of the incentre is $(-2, 1)$.

4. a Let the track be of length 'L' metres and the speeds (in m/s) of A, B and C be a , b and c respectively.

A and C meet each other for the first time after $\left(\frac{L}{a+c}\right)$ seconds.

In the same time, distance between A and B is $\frac{L}{2}$.

$$\therefore \left(\frac{L}{a+c}\right) \times (a-b) = \frac{L}{2}$$

$$\Rightarrow a = 2b + c$$

Out of the given options, only $5 : 2 : 1$ satisfies this condition.

5. c The given information can be tabulated as below.

	Contents of A			Contents of B			Contents of C		
	Water	Milk	Alcohol	Water	Milk	Alcohol	Water	Milk	Alcohol
Initially	100	0	0	0	100	0	0	0	100
After 1 st pouring	75	0	0	25	100	0	0	0	100
After 2 nd pouring	75	0	0	20	80	0	5	20	100
After 3 rd pouring	76	4	20	20	80	0	4	16	80

The final quantity of alcohol in beaker A is 20 ml and the quantity of milk in beaker C is 16 ml.
Hence, the required ratio is $5 : 4$.

6. b $N = 3a^3$ and $N < 200$, therefore, possible values of N are 3, 24, 81 and 192.

$$\text{Also, } N = 6b^2 = \frac{6c}{5}, a + b + c = N.$$

These conditions are satisfied only by $N = 24$.

Hence, there is only 1 possible value of N .

7. d $c^2 - b^2 = 20^2$

$$\Rightarrow (c+b)(c-b) = 400$$

Therefore, both $(c+b)$ and $(c-b)$ have to be even factors of 400, as c and b are natural numbers.

400 can be written as 2×200 , 4×100 , 8×50 , 10×40 , 20×20 .

But, 20×20 is not admissible since $b \neq 0$.

Hence, the ordered pairs are $(99, 101)$, $(48, 52)$, $(21, 29)$ and $(15, 25)$.

For questions 8 to 10

For A, the number of right answers in

QA + VA = 14 ... (i)

LR + RC = 32 ... (ii)

DI + QA = 23 ... (iii)

VA + LR = 29 ... (iv)

RC + DI = 30 ... (v)

Adding these equations, we get

$$QA + VA + LR + RC + DI = \frac{14 + 32 + 23 + 29 + 30}{2} = 64$$

Therefore, number of right answers by A in DI = $64 - (14 + 32) = 18$ [by equations (i) and (ii)]

Similar calculations will yield the following table that shows the number of questions attempted correctly by each one of them in each of the five sections.

Persons → Sections ↓	A	B	C	D	E	Total
QA	5	21	16	7	25	74
VA	9	13	14	35	9	80
LR	20	15	22	12	22	91
RC	12	8	13	32	10	75
DI	18	4	15	11	27	75
Total	64	61	80	97	93	395

8. b The number of wrong answers by C = $200 - 80 = 120$.

9. a Since the number of attempted questions is the same for all of the friends, the highest scorer will be the one with the maximum number of right answers. Hence, D is the highest scorer.

10. c The total number of wrong answers will be the same in two sections only if the total number of right answers are also same. Hence, the answer is RC and DI.

11. d Any positive integer x , which is not divisible by 7, can be represented as $7n + k$, where $k = 1, 2, 3, 4, 5$ or 6 .
 $x^3 = (7n + k)^3 = 7n_1 + k^3$
 Therefore, the remainder when x^3 is divided by 7 is equal to that of k^3 when divided by 7.

$$\text{Rem} \left[\frac{1^3}{7} \right] = 1, \text{Rem} \left[\frac{2^3}{7} \right] = 1, \text{Rem} \left[\frac{3^3}{7} \right] = 6,$$

$$\text{Rem} \left[\frac{4^3}{7} \right] = 1, \text{Rem} \left[\frac{5^3}{7} \right] = 6, \text{Rem} \left[\frac{6^3}{7} \right] = 6.$$

So the possible remainders when $a^3 + b^3 + c^3 + d^3 + e^3$ is divided by 7 are:

$$\text{Rem} \left[\frac{1+1+1+1+1}{7} \right] = 5$$

$$\text{Rem} \left[\frac{1+1+1+1+6}{7} \right] = 3$$

$$\text{Rem} \left[\frac{1+1+1+6+6}{7} \right] = 1$$

$$\text{Rem} \left[\frac{1+1+6+6+6}{7} \right] = 6$$

$$\text{Rem} \left[\frac{1+6+6+6+6}{7} \right] = 4$$

$$\text{Rem} \left[\frac{6+6+6+6+6}{7} \right] = 2$$

Hence, the sum of all the possible values of 'r' = $1 + 2 + 3 + 4 + 5 + 6 = 21$.

12. a The total number of four-digit numbers formed using the given digits which are less than 5000 = $4 \times 7 \times 6 \times 5 = 840$

Similarly, the number of four-digit numbers between 5000 and 5200 = $6 \times 5 = 30$;

and the number of four-digit numbers between 5200 and 5280 = $5 \times 5 = 25$.

Hence, the rank of 5283 is $840 + 30 + 25 + 2 = 897$.

13. d If $\left[\frac{x}{4} \right] = \left[\frac{x}{6} \right] = 0$, then $x = 0, 1, 2$ or 3 .

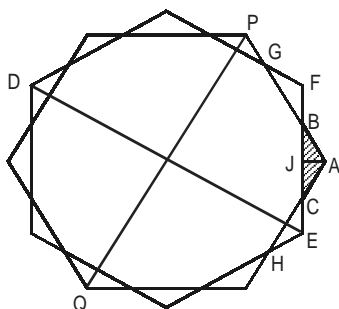
If $\left[\frac{x}{4} \right] = \left[\frac{x}{6} \right] = 1$, then $x = 6$ or 7 .

No other value of 'x' is possible.

$$\left(\because \text{For } x \geq 8, \left[\frac{x}{4} \right] > \left[\frac{x}{6} \right] \right)$$

14. a The areas of two circles are 576π and 729π , therefore, the radii of the two circles are 24 cm and 27 cm respectively.
Sum of radii = $24 + 27 = 51 < 54 =$ distance between the centres
Therefore, the two circles do not intersect each other.
Hence, there are 4 common tangents.

15. b



Let us drop a perpendicular from A to BC at point J.
Since PQ and DE bisect each other perpendicularly, triangles ABC, FGB and ECH are congruent triangles.
 $\therefore GF = FB = BA = AC = CE = EH = 'x'$ cm (say)
Angles ABJ and BAJ are 30° and 60° respectively.

$$\therefore AJ = \frac{x}{2} \text{ cm and } BJ = \frac{\sqrt{3}x}{2} \text{ cm}$$

$$\therefore BC = \sqrt{3}x \text{ cm}$$

$$\text{Again, } FB + BC + CE = 2 \text{ cm}$$

$$\Rightarrow x + \sqrt{3}x + x = 2$$

$$\Rightarrow x = \frac{2}{2 + \sqrt{3}} = 2(2 - \sqrt{3})$$

$$\text{Area}(\triangle ABC) = \frac{1}{2} \times AJ \times BC$$

$$= \frac{1}{2} \times (2 - \sqrt{3}) \times 2\sqrt{3}(2 - \sqrt{3})$$

$$= (7\sqrt{3} - 12) \text{ cm}^2.$$

16. c B_2 will ring $48 - 8 = 40$ times more than B_1 in a minute.

Hence, to ring 10 times more, it will take $\frac{10}{40} \times 60 = 15$ seconds.

17. b Let $x = 3^{150}$.

Taking log on both sides,

$$\log x = 150 \log 3 = 71.565$$

Hence, the number of digits is $71 + 1 = 72$.

For questions 18 to 20

18. c Let the Marked Price (MP) of A be ₹100 at each of the four outlets. Selling price (SP) and cost price (CP) of A at each of the four outlets can be calculated as shown in the table below.

	MP (in ₹)	SP (in ₹)	CP (in ₹)
Spencer	100	76	69.09
More	100	88.89	79.37
Food World	100	60	55.56
Spinach	100	82	58.57

Hence, it can be concluded that Food World must have purchased A at the least price.

19. d Let the Marked Price (MP) of each of the four commodities at More be ₹100. Selling prices (SP) and cost prices (CP) of all the four commodities at More can be calculated as shown in the table below.

	MP (in ₹)	SP (in ₹)	CP (in ₹)
A	100	88.89	79.37
B	100	91.67	73.34
C	100	75	62.50
D	100	62.5	56.82

Hence, it can be concluded that A must have been purchased at the highest price by More.

20. b Let the marked price of commodity B at Spencer be x.

$$\therefore \text{Selling price} = x - 36.36\% \text{ of } x = x - \frac{4}{11}x = \frac{7}{11}x$$

Again, profit percentage = 15%

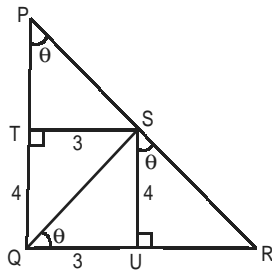
$$\therefore \text{Selling price} = 1.15 \text{ C.P.}$$

$$\therefore \frac{7}{11}x = 1.15 \text{ C.P.}$$

$$\Rightarrow x = \frac{115 \times 11}{100 \times 7} \text{ C.P.} = 1.8071 \text{ C.P.}$$

Hence, the mark-up percentage for commodity B at Spencer is 80.71%.

21. c



In $\triangle PQR$,
 $QU = TS = 3$ cm
 $TQ = SU = 4$ cm
 $\triangle QUS \sim \triangle SUR$

$$\therefore \frac{QU}{SU} = \frac{SU}{UR}$$

$$\Rightarrow UR = 4 \times \frac{4}{3} = \frac{16}{3}$$

Similarly, $\triangle PTS \sim \triangle STQ$

$$\therefore \frac{ST}{TQ} = \frac{PT}{ST} \Rightarrow PT = 3 \times \frac{3}{4} = \frac{9}{4}$$

$$\therefore PQ = PT + TQ = 4 + \frac{9}{4} = \frac{25}{4}$$

$$\text{and } QR = QU + UR = 3 + \frac{16}{3} = \frac{25}{3}$$

$$\therefore \text{Area of } \triangle PQR = \frac{1}{2} \times PQ \times QR$$

$$= \frac{1}{2} \times \frac{25}{4} \times \frac{25}{3} \approx 26.04 \text{ cm}^2$$

22. c The four given lines are

- $4x + 7y = 10$... (i)
- $5x + 8y = 11$... (ii)
- $x + y = 4$... (iii)
- $2x + 3y = 5$... (iv)

Solving equations (i) and (ii), we get
 $x = -1, y = 2$

$(-1, 2)$ doesn't satisfy equations (iii) and (iv).

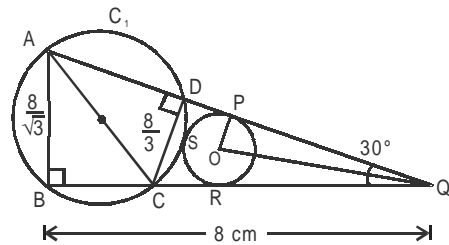
Therefore, lines (iii), (iv) and exactly one among (i) and (ii) are concurrent.

Solving equations (iii) and (iv), we get
 $x = 7, y = -3$

The point $(7, -3)$ satisfies equation (ii).

Hence, lines (ii), (iii) and (iv) are concurrent.

23. b



In cyclic quadrilateral ABCD,
 $\angle ABC + \angle ADC = 180^\circ$ (opposite angles are supplementary)

$$\Rightarrow \angle ABC = 90^\circ$$

Since QP and QR are tangents to the smaller circle,

$$\angle OQP = \angle OQR = 15^\circ$$

$$\Rightarrow \angle BQA = \angle OQP + \angle OQR = 30^\circ$$

In $\triangle ABQ$,

$$\tan 30^\circ = \frac{AB}{BQ}$$

$$\Rightarrow AB = \frac{8}{\sqrt{3}}$$

$$\therefore DC = \frac{AB}{\sqrt{3}} = \frac{8}{3}$$

In $\triangle CDQ$,

$$\sin 30^\circ = \frac{DC}{QC}$$

$$\Rightarrow QC = \frac{16}{3}$$

$$\therefore BC = BQ - CQ = 8 - \frac{16}{3} = \frac{8}{3}$$

Now, in $\triangle ABC$,

$$AC^2 = AB^2 + BC^2 \quad (\text{By Pythagoras Theorem})$$

$$= \left(\frac{8}{\sqrt{3}}\right)^2 + \left(\frac{8}{3}\right)^2$$

$$\Rightarrow AC = \frac{16}{3}$$

Hence, the radius of C_1 is $\frac{8}{3}$ cm.

24. a The terms of sequence S_1 represent the sum of first 'n' natural numbers. Therefore, the 15th term of S_1 will be $\frac{15 \times 16}{2} = 120$.

The terms of sequence S_2 represent the sum of the squares of first 'n' natural numbers. Therefore, the

10th term of S_2 will be $\frac{10 \times 11 \times 21}{6} = 385$, which is too

high as compared to 120. It gives us a hint that the common terms are much before the 10th term of S_2 . Therefore, we calculate the 7th term of S_2 which is

$\frac{7 \times 8 \times 15}{6} = 140$. This implies that the common terms

must occur before the 7th term of S_2 . Now we can count the common terms manually. The three common terms are 1, 55 and 91.

25. b Let the total work be of 240 units.

Then, X can do $\frac{240}{60} = 4$ units of work per day and Y

can do $\frac{240}{80} = 3$ units of work per day.

Nine persons as efficient as X and 8 persons as efficient as Y can complete $(9 \times 4 + 8 \times 3) = 60$ units of work per day.

Number of days required to complete the work $= \frac{240}{60} = 4$.

When some of the persons did not turn up, the work was completed in 125% of 4 = 5 days.

If Statement I is true, the amount of work that would have been completed in a day = $4 \times 6 + 3 \times 4 = 36$ units. Therefore, the number of days taken to complete the

work $= \frac{240}{36} \approx 6.67$ – a contradiction.

Hence, Statement I is not true.

If Statement II is true, the amount of work that would have been completed in a day = $4 \times 9 + 3 \times 4 = 48$ units. Therefore, the number of days taken to complete the

work $= \frac{240}{48} = 5$.

Hence, Statement II is true.

If Statement III is true, the amount of work that would have been completed in a day = $4 \times 6 + 3 \times 6 = 42$ units. Therefore, the number of days taken to the work

$= \frac{240}{42} \approx 5.71$ – a contradiction.

Hence, Statement III is not true.

26. b It is given that m and \sqrt{n} are the roots of the equation $x^2 - (p - 4)x + p - 6 = 0$.

$$\therefore m + \sqrt{n} = p - 4, \quad m\sqrt{n} = p - 6$$

$$\therefore m^2 + n = (m + \sqrt{n})^2 - 2m\sqrt{n}$$

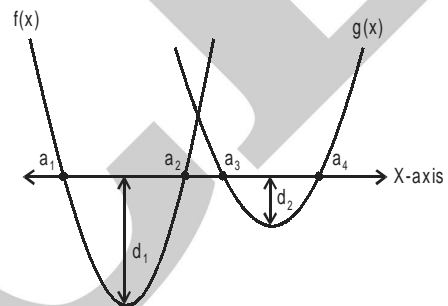
$$= (p - 4)^2 - 2(p - 6)$$

$$= p^2 - 10p + 28$$

$$= (p - 5)^2 + 3$$

\therefore The minimum value of $m^2 + n = 3$.

27. b Let us draw the graphs of $f(x)$ and $g(x)$ with the given conditions.



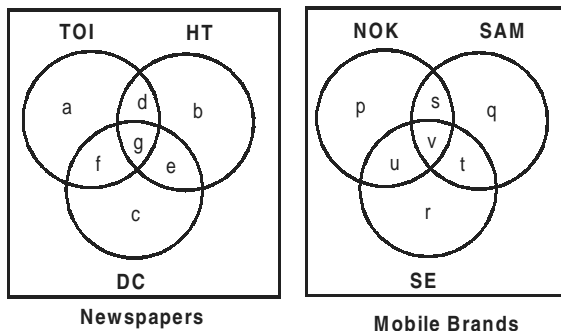
From the given information, it can be deduced that both $f(x)$ and $g(x)$ are upward parabolas.

Since the minima of $f(x)$ is less than that of $g(x)$, i.e. $d_1 > d_2$ and $a_2 - a_1 = a_4 - a_3$, we can deduce that $f(x)$ has steeper slope compared to $g(x)$.

Therefore, one of their intersection points lies between a_2 and a_3 and another point is less than a_1 . In other words, $\max(p, q) = k$ lies between a_2 and a_3 . Note that for $x > a_3$, the difference between $f(x)$ and $g(x)$ will keep on increasing.

For questions 28 to 30:

Following two Venn diagrams can be drawn with the information provided to us.



Given, total number of natives = 80000;

$$(d + e + f) = 5g;$$

$$n(\text{NOK}) = n(\text{TOI}) + 42\% \text{ of } (b + e);$$

$$n(\text{SE}) = n(\text{SAM}) = 37.5\% \text{ of } n(\text{HT}) + 50\% \text{ of } n(\text{DC});$$

$$v = 30000;$$

$$g = 7000;$$

$$a + d + f + g = 37000;$$

$$c + e = 28000;$$

$$d + f = 22000;$$

$$f = b = 12000.$$

Solving the above equations, we get

$$a = 8000, c = 15000, d = 10000, e = 13000$$

$$\text{Also, } n(\text{HT}) = 42000; n(\text{DC}) = 47000;$$

$$n(\text{NOK}) = 37000 + 10500 = 47500$$

$$\Rightarrow p + s + u = 47500 - 30000 = 17500$$

$$n(\text{SAM}) = n(\text{SE}) = 15750 + 23500 = 39250$$

$$\Rightarrow q + s + t = 9250 \text{ and } r + t + u = 9250$$

$$\text{Therefore, } (p + s + u) + (q + s + t) + (r + t + u) = 17500 + 9250 + 9250 = 36000$$

$$\Rightarrow (p + q + r) + 2(s + t + u) = 36000 \dots(i)$$

28. b The number of natives who do not like any newspaper
 $= 80000 - (a + b + c + d + e + f + g)$
 $= 80000 - 77000 = 3,000.$

29. a In order to minimize the value of $(p + q + r + s + t + u + v)$, $s + t + u$ should be maximum, i.e. $p + q + r = 0$.
 From equation (i),
 $s + t + u = 18000$
 Therefore, the minimum value of $(p + q + r + s + t + u + v) = 18000 + 30000 = 48,000.$

30. c In order to maximize the value of $(p + q + r + s + t + u + v)$, $p + q + r$ should be maximum, i.e. $s + t + u = 0$.
 From equation (i),
 $p + q + r = 36000$
 Therefore, the maximum value of $(p + q + r + s + t + u + v) = 36000 + 30000 = 66000.$
 Hence, the minimum number of natives who do not like any of the mobile brands $= 80000 - 66000 = 14,000.$

31. c The author begins by stating that though time is something that doesn't exist in a physical form (intangible), it is still easily noticed by the mind and the senses. He goes on to explain this by stating that in different situations and circumstances, time goes from buzzing with happiness to becoming a sentient savant or an irksome sprinter. Thus, the sentences in options (b) and (a) form a mandatory pair. Additionally, options (a) and (d) form another pair. As mentioned before, the author calls 'time' different names but settles on it mostly being a capricious companion. Option (c) doesn't fit in the sequence anywhere as the author is not talking about the fact that time doesn't wait for anyone but about how it is very real and noticeable, despite being intangible. Hence, option (c) is correct.

32. a Option (d) begins the sequence as it introduces the man in question. Option (c) follows as it provides details about his response to being greeted, which is his illusion of being one of the lost arms of the Venus de Milo. The sentence in option (b) follows next as the author presents a contrast by calling him tolerably sane on all other subjects. Option (a) doesn't fit in the sequence as the author talks more about the behavioral characteristics of the man than his education. Hence, option (a) is correct.

33. b The first blank requires a verb while the second blank requires an adjective. This rules out options (c) and (d) as *raunchy* and *execrable* are both adjectives and thus do not fit in the first blank. Though *laden*, which means to be loaded with something, fits in the first blank, *magnificent* is not the appropriate adjective for crimes. Hence, option (a) is incorrect. *Tempered*, which means to make something less severe, fits in the first blank. *Heinous*, which means monstrous or horrifying, fits in before crimes in the second blank. Thus, option (b) is the correct answer.

34. c Sentence A has an error of parallelism as "...going up towers and threatened to commit suicide..." is not parallel. The correct sentence should be "...going up towers and *threatening* to commit suicide..." Sentences B and E are correct. Sentence C is incorrect because all the verbs (refused, called and appeal) need to be in the same time frame (past tense) and should have the same parallel form in the sentence. The correction is "...refused, the police called in TRS leader Sravan and *appealed*..." Sentence D is incorrect as 'trio' (a group of three) is singular and should be followed by a singular verb 'was'. The correction is "...the trio yielded and was seen climbing down." Hence, option (c) is correct.

35. b Sentence A is incorrect because the subject (something) disagrees with the verb (were). The correct sentence should be "...something that *was* no more than a sporting encounter." Sentence B is correct. Sentence C is incorrect because *our response* is a united response and hence is singular in nature. The

correction should be "...I think our response to the World Cup debacle tells us..." Sentences D and E are correct. The correct answer is option (b).

For questions 36 to 38:

Preliminary table on the basis of the given information can be drawn as shown below.

Start time	Show	Genre
7 p.m.	CP	
7:30 p.m.		News
8 p.m.		
8:30 p.m.		Reality
9 p.m.		
9:30 p.m.		
10 p.m.	NA	
10:30 p.m.		
11 p.m.		

From condition (iii), the Science show must start at 7 p.m. and the Horror show at 10:30 p.m. From condition (vii), the Family show starts at 8 p.m.

Since TM is a Mythology show which starts after 9 p.m., there are two possible cases.

Case I: TM starts at 9:30 p.m.

From condition (iv), CC starts at either 8:30 p.m. or at 10:30 p.m. If CC starts at 10:30 p.m., then BB starts at 11 p.m. From condition (v), JM must start at 9:30 p.m., a contradiction.

If CC starts at 8:30 p.m., then BB starts at 9 p.m. From condition (iii) and (v), JM starts at 7:30 p.m.

Further analysis gives the following table.

Start time	Show	Genre
7 p.m.	CP	Science
7:30 p.m.	JM	News
8 p.m.	LS/BV	Family
8:30 p.m.	CC	Reality
9 p.m.	BB	History/Comedy/Crime
9:30 p.m.	TM	Mythology
10 p.m.	NA	History/Comedy/Crime
10:30 p.m.	BV/LS	Horror
11 p.m.	IM	History/Comedy/Crime

Case II: TM starts at 11 p.m.

From condition (iv), BB starts at either 9 p.m. or 9:30 p.m. If BB starts at 9 p.m., from conditions (v) and (iii), JM will start at 7:30 p.m. This implies that the starting time of IM is among 8 p.m., 9:30 p.m. and 10:30 p.m., which contradicts either condition (i) or (vi). Therefore, BB cannot start at 9 p.m.

If BB starts at 9:30 p.m., JM starts at 8 p.m. – contradicting condition (i).

Hence, this case is not possible.

36. d BV can be either a Family show or a Horror show.
37. a Mythology show starts at 9:30 p.m.
38. c The show that starts at 9 p.m. is BB, which could be a Crime show, a Comedy show or a History show.
39. d Option (a) is incorrect because photorealistic paintings' realism and power comes from the fact that they are an apparent replication of life, not necessarily because they are out-of-scale and differently colored. Option (b) cannot be inferred because the parameters for judging the depth of photorealistic thought have not been mentioned in the passage. Option (c) is incorrect because the passage states that ordinary events and things make the photorealism artists great and impressive, and not photorealistic paintings. Option (d) is the correct inference about Photorealism, as mentioned in the concluding line of the second paragraph.
40. b The third paragraph mentions the United States, Europe and Russia as well as eminent artists of this genre from these regions of the world. Hence, option (b) is correct in surmising the main purpose of this paragraph. Option (a) focuses on Europe and history, option (c) constrains itself to the United States, and option (d) only talks about specializations, hence these options cover only part of the content of the third paragraph.
41. a Option (a) provides the reason for the attractiveness of Photorealism by drawing on the quote of Audrey Flack in the opening lines of the passage, "The fascination of...replication of life..." Option (b) is incorrect because Photorealism does not entice people by representation of reality, rather it only imitates reality. As mentioned before, the fascination for Photorealism lies in the fact that it is a replication of life, to achieve which the artists capture every minute detail of the image. Thus, it is not the fact that every minute detail of the image is present in the painting but that it depicts images from real life. Option (c), thus, can be negated. Option (d) is negated since versatility and scope of various interpretations can be among the characteristics of Photorealism, but they haven't been mentioned to be the reasons for its allure. Additionally, all art may be interpreted from all aspects of life, so this is not a concrete factor for the allure of Photorealism. Hence, option (a) is correct.
42. a Option (a) correctly identifies the idea of the passage, which is inferable from the first sentences of the paragraphs, which specifically mention philosophy and gender. Option (b) is incorrect because there is no mention of analytical feminists in the passage. Option

(c) is incorrect because feminism and philosophy are not dealt with separately in the passage, and neither is their relation with culture discussed. Option (d) is incorrect because it is not the philosophy of feminism but the views of feminist philosophers that the passage describes. Hence, option (a) is correct.

43. c Option (c) is the best inference, as derived from the last sentence of the first paragraph, as well as the premise that they "...seek...philosophy that is potentially useful to empower human beings". Refer to the lines, "...rather than contribute to the perpetuation of a status quo..." Thus, option (a) is contradictory to the feminist philosophers' views. Option (b) mentions a philosophy that overlooks gender bias, instead of correcting and addressing it, hence feminist philosophers would not agree with it. Option (d) is mentioned as one of the functions of philosophy which continues to be important without requiring the additional impetus by feminist philosophers.

44. b Option (a) assumes that women were already demeaned in society, and philosophy has further enforced this, which is an incorrect assumption. Option (b) is correct, as the second sentence in the second paragraph explicitly draws attention to the criticism of misogyny and male bias, and the last sentence once again states that there are only differences in the "...best ways to criticize [male bias]". Option (c) is incorrect because there is no mention of women having been kept away from philosophical annals, or records. Option (d) is incorrect because the manner of presentation of philosophical thought or its origin has not been mentioned in the passage and thus cannot be a point of criticism for the feminist philosophers.

45. a Option (a) is the correct answer, since the argument given therein is incorrect as it assumes that feminist influence was absent in philosophy, which is not mentioned or substantiated in the passage. Option (b) follows from the first sentences of the two paragraphs which emphasize the importance of gender. Option (c) follows from the section of the first paragraph which states "...rather than contribute to...subordinated by gender..." Option (d) is inferable from the second paragraph, "...they have believed methods and positions...instead promoting the interests of only the privileged groups." This means that the philosophers have thought of their methods and positions to be 'value-neutral' and 'objective', when in actual these methods and positions were promoting the interests of only the privileged groups and probably preventing the flourishing of women. Thus, it can be inferred that the philosophers were not aware of the extent to which their theories perpetuated cultures that impacted the flourishing of women.

For questions 46 to 48:

From the given information, it is obvious that Shraddha and Nidhi can be in the team of either 3 or 4 members.

Case I: Shraddha and Nidhi are in the team of 3 members.

Then, Rohan is the male member in the same team.

If Sanjeev is selected in a team, Ravi has to be selected in the same team. Therefore, Sanjeev cannot be selected in the teams of 2 and 3 members.

Since 2 out of 4 girls have been selected in the team of 3 members, the other 2 teams will have one girl each (either Neelam or Ankita).

Therefore, the fourth member of the team with 4 members will be one out of Tanay and Atul.

Number of team members	Team Members	
	Girls	Boys
4	Neelam/Ankita	Ravi, Sanjeev, Tanay/Atul
3	Shraddha, Nidhi	Rohan
2	Ankita/Neelam	Atul/Tanay

Hence, four different combinations are possible in this case.

Case II: Shraddha and Nidhi are in the team of 4 members.

A similar analysis as above gives the following team combinations.

Number of team members	Team Members	
	Girls	Boys
4	Shraddha, Nidhi	Any two of Tanay, Atul or Rohan
3	Neelam	Ravi and Sanjeev
2	Ankita	Any one of Tanay, Atul or Rohan

Hence, three different combinations are possible in this case.

46. b The teams can be formed in 7 different ways.

47. c The team with two members can be formed in 5 different ways, namely (Atul, Ankita), (Atul, Neelam), (Tanay, Ankita), (Tanay, Neelam) and (Rohan, Ankita).

48. d Consider Case II in which Neelam is in the team with 3 members. It can clearly be seen that Ravi cannot be in the same team with Ankita.

49. c The opening quote of Franz Kafka bears testimony to his belief that he couldn't live in Prague, making option (c) the best inference. Since his reasons for this feeling are not disclosed, option (a) cannot be inferred. For the same reason, option (b) is negated since we cannot describe his feelings for Prague as an abomination for it. Option (d) cannot be justified since geographical limits mentioned in the passage as "...the perimeter of Old Town..." cannot be assumed to suffocate him.
50. a Option (a) is correct as (1) mentions the theme of his writing and not the source of inspiration. (2) is apparent from the second sentence of the second paragraph, "...deep interest in...tortures." (3) is mentioned in the subsequent sentence, "...personal demons..." (4) follows from the concluding sentence of the second paragraph, which conjectures Metamorphosis to be an autobiographical work. The other options are incorrect since they incorporate (2), (3) or (4).
51. d The last paragraph presents alternate depictions of the past and present states of Prague; hence option (d) is the purpose of the paragraph. Option (a) is ruled out as the mention of his profession is only a contrast that is mentioned in passing and not the focus of the paragraph. Option (b) mentions his struggles as a lawyer, which is not borne out by the passage or the paragraph. Option (c) focuses on the Art Nouveau building, which is only the setting of a reading of his book and not the intent of the entire paragraph.
52. a The option that logically completes the paragraph should either conclude the paragraph or substantiate the last sentence. Option (a) helps understand how "Arthur seems to have woken up to the reality" since it states what Arthur is doing now (handing out homework 'that was meant to make players more responsible') to bring the Australian cricket back in shape. Option (b) can be ruled out because it logically goes against the last sentence which states that Arthur seems to have woken up to the harsh reality. There is a disconnect between the paragraph and option (c) as the passage doesn't talk about any decision made by Arthur and skipper Clarke that can be termed as a *bizarre* decision. Option (d) is incorrect because it goes beyond the scope of the paragraph to discuss Arthur's position of eminence. Hence, option (a) is the correct answer.
53. b The correct option should either sum up the entire paragraph or elaborate upon the last line of the paragraph. Option (b) does the latter and is hence the correct option. The author begins by talking of one technological innovation that Allen brought about in the field of sound engineering. He adds in the last line that Allen's focus is on creating new technology that is compatible with older formats. Option (b) gives a reason for this by mentioning about the difficulty in convincing hard-nosed executives and tight-fisted theatre owners of the benefits of the new technology. The author has already talked of one new technology created by Allen and his team. Option (a), which states that he has been instrumental in several major sound engineering innovations in Hollywood, doesn't add anything new to the paragraph. Thus, it is more of an introductory sentence and doesn't fit in logically at the end of the paragraph. Option (c) doesn't connect with the last line of the paragraph as the paragraph doesn't talk of or hint at the personal equation of Allen with powerful filmmakers and producers. Option (d) can be ruled out since the focus in option (d) has shifted from Allen and his technological innovations to studio heads that have not been mentioned in the paragraph before. Thus, option (b) is the correct answer.
54. d The main focus of the paragraph is on Masaba and her aesthetic sensibilities. Option (d) is the answer as it elaborates on how Masaba's choice is edgy and quirky. Option (a) is incorrect because there is no antecedent in the paragraph for the pronoun 'these' in option (a). Option (b) is incorrect because it moves into the more general discussion on eclectic prints in Indian fashion, which is completely out of context with the given paragraph. The paragraph focuses on Masaba and her choice. Option (c) goes back to Satya Paul and the segment it appeals to. There's nothing in the paragraph or the option that signals this shift and hence option (c) is disconnected with the paragraph. Option (d) is the correct answer, taking the "edgy and quirky" theme forward with examples of "wacky" motifs.
55. a There are two pairs of sentences which help solve this paragraph jumble. The first one is DA. While D talks of South Africa's neighbours moving away from the one-party systems that dragged them to corruption and stagnation, A gives a contrasting view regarding South Africa's situation. The other mandatory pair is CE. Statement C offers a possibility where the situation improves. Statement E follows with a warning – "*until that happens...*" Statement E makes for a better conclusion. Also, the idea in DA becomes redundant if it comes after E. B best fits in the beginning. Option (a) has the correct sequence and is thus the correct answer.

56. c The paragraph describes the locale first, then the people and then the specific office that the author is being taken to. CE is a mandatory pair as C mentions the depot while E elaborates upon it by talking of carts and street-sweepers that are parked in the depot. This is followed by a general remark about the outlook of the people present there. DA is another mandatory pair as the 'he' in A refers to the person the author is approached by in D. This leads us to option (c) which is the correct answer.

57. d The first mandatory pair is AE. A talks of the recent cabinet approvals and B calls this a step in the wrong direction. After this, the discussion on OECD countries follows. The phrase "*In all the OECD countries but one*" in B is a reference to the US which follows in D. C adds more information to what is stated in B and D. AE has to come before BDC since A and E mention a specific instance related to a legislation concerning securities market regulation in India while BDC go on to explain the general scenario of market regulation.

For questions 58 to 60:

It is evident from the statements that Abhishek has either the Pencil or the Paper, Pawan has either the Sharpener or the Pen and Vijay has either the Paper or the Eraser. Similarly, from the statements made by Harsha and Shailendra, we can conclude that Harsha possesses neither the Pen nor the Eraser and Shailendra possesses neither the Pen nor the Pencil. From the above conclusions, following table can be drawn.

Person	Item possessed	Items not possessed
Harsha		Pen, Eraser
Abhishek	Pencil or Paper	
Pawan	Pen or Sharpener	
Shailendra		Pen, Pencil
Vijay	Paper or Eraser	

58. b Clearly, Pawan has the Pen.

59. a From the table, it is obvious that Harsha cannot possess the Eraser.

60. d If Harsha has the Paper, Vijay will have the Eraser. Since Shailendra can possess neither the Pen nor the Pencil, he will possess the Sharpener.