

13 October 2011
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(All-India Mock CAT)

(Test Ref.: AIMCAT1202)

INSTRUCTIONS

1. Read the instructions given at the beginning/end of a section or group of questions very carefully.
2. The test has two sections, I and II. The time available for each section is 70 minutes. You cannot return to section I once you have started to answer section II.
3. **Pattern of the test and marking scheme**

Section	Number of questions	Marks per question	Negative marks
Quantitative Ability + Data Interpretation	30	3	1
Verbal Ability + Logical Reasoning	30	3	1
Total	60	—	—

4. You are expected to show your competence in both the sections.
5. Each wrong answer will attract a penalty of one mark.
6. There are no negative marks for unattempted questions.
7. You can navigate to any question of your choice within a section.
8. During the test, you can mark questions for review and return to them at a convenient time.
9. An answer once marked can be changed any number of times before submitting the test. However the last marked answer will be considered as the final answer.
10. Do not carry calculators, slide rules or any other calculating devices. Do not carry any other papers with you except your HALL TICKET. Rough papers for calculations will be provided.

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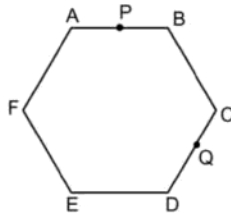
INSTRUCTIONS

1. Read the instructions given at the beginning/end of each section or at the beginning of a group of questions very carefully.
2. This test has two sections with 60 questions – 30 questions in each section. The TOTAL TIME available for the paper is **140 minutes**. The time available for each section is 70 minutes and you cannot return to the first section once you have started the second section.
3. You are expected to show your competence in both the sections.
4. All questions carry three marks each. Each wrong answer will attract a penalty of one mark.

SECTION – I
Number of Questions = 30

DIRECTIONS for questions 1 to 19: Answer the questions independently of each other.

1. A quadratic function $f(x)$ attains its minimum value of -15 at $x = 3$. If $f(0) = 5$, find the value of $f(9)$.
(A) 65 (B) 55 (C) -25 (D) 75
2. On a square PQRS, the mid-points of PQ, QR, RS and SP are marked as T, U, V, W respectively. A line is drawn through the points U and W and points X and Y are marked on the line such that angles PXS and QYR both equal 60° . If point A is intersection of PX and QY while point B is the intersection of SX and RY, find the ratio of the area of AXBY to that of PQRS.
(A) $\frac{2-\sqrt{3}}{\sqrt{3}}$ (B) $\frac{2+\sqrt{3}}{2\sqrt{3}}$
(C) $\frac{2\sqrt{3}-1}{2}$ (D) $\frac{2-\sqrt{3}}{3}$
3. Consider a regular hexagon ABCDEF as shown below. P and Q are points on AB and CD respectively such that the reflection of the line BC about the line PQ coincides with the line AD. Find the ratio of the area of the quadrilateral APQD to that of the hexagon ABCDEF.

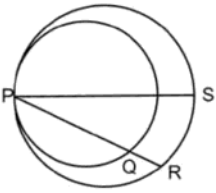


- (A) $\frac{3\sqrt{3}}{8}$ (B) $\frac{7\sqrt{3}}{12}$ (C) $\frac{7}{24}$ (D) $\frac{7}{12}$
4. What is the least possible value of the expression $E = (x-1)(x-3)(x-4)(x-6) + 10$, for real values of x ?
(A) 1 (B) 10 (C) 9 (D) 0

5. Which of the equations given best describes the data provided?

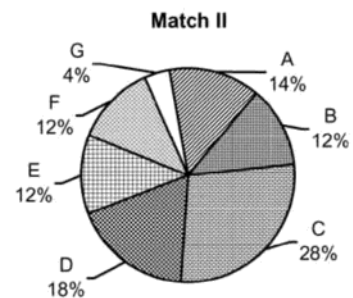
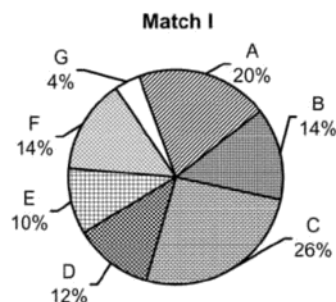
t	-2	-1	0	2	3
v	2.5	1	-0.5	-3.5	-5

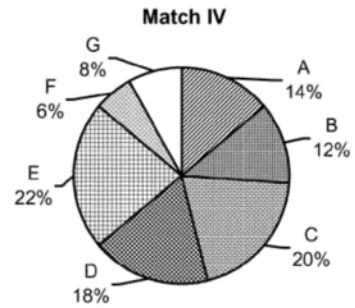
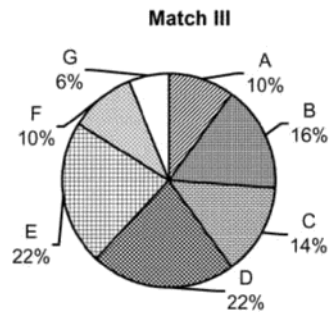
- (A) $v = -1.5t - 0.5$ (B) $v = 1.5t - 0.5$
(C) $v = -2.5t - 2.5$ (D) $v = -1.5t + 0.5$
6. Out of n consecutive natural numbers, four numbers are selected such that the differences of all the possible pairs are distinct. What is the least value of n for which this is possible?
(A) 6 (B) 7 (C) 8 (D) 9
7. For how many four-digit numbers is the thousands digit greater than the tens digit and the tens digit greater than the units digit?
(A) 840 (B) 1200 (C) 960 (D) 1440
8. Ajay and Bhavan are two friends who have a certain number of marbles with them. Ajay has m marbles and Bhavan has n marbles. The number m is a two-digit number whose square root is a perfect square. The number n is a two-digit prime number whose units digit and tens digit are both distinct perfect squares. Considering the following statements independently, which of the statements is/are definitely false?
I. $m < n$, if the tens digit of m is less than its units digit.
II. $|m - n|$ is a perfect square.
III. $m + n$ is a perfect square.
(A) Only I and III (B) Only II
(C) Only I (D) None of the above
9. If ' a ' is positive and $a^4 - 62a^2 + 1 = 0$, find the value of $a^3 + \frac{1}{a^3}$.
(A) 424 (B) 648 (C) 392 (D) 488
10. Given $N = 98765432109876543210$ upto 1000 digits, find the smallest natural number n such that $N + n$ is exactly divisible by 11.
(A) 6 (B) 5 (C) 1 (D) 10

11. Two cars start simultaneously from cities A and B, towards B and A respectively, on the same route. Once the two cars reach their destinations they turn around and move towards the other city. The two cars continue shuttling in this manner for exactly 20 hours. If the speed of the car starting from A is 60 km/hr and the speed of the car starting from B is 40 km/hr and the distance between the two cities is 120 km, find the number of times the two cars meet in this duration, after they start. (Assume that throughout the journey, A and B travel at their respective uniform speeds)
(A) 12 (B) 8 (C) 10 (D) 20
12. In the figure below, the smaller circle touches the larger circle internally at P, such that the centres of the two circles lie on PS. The diameter of the smaller circle is $\frac{4}{5}$ th of the diameter of the larger circle. If PR is a chord of the larger circle, intersecting the smaller circle at Q, such that QR = 3 cm, find the length PQ.
- 
- (A) 12 cm (B) 3 cm
(C) 15 cm (D) Insufficient data
13. Find the value of $\frac{3^{20}}{\log_3 4^{400}} + \frac{3^{20}}{\log_4 4^{400}} + \frac{3^{20}}{\log_5 4^{400}} + \dots + \frac{3^{20}}{\log_{100} 4^{400}}$.
- (A) $\frac{3^{20}}{400} \log_4 100! + \frac{3^{21}}{800}$ (B) $\frac{3^{20}}{400} \log_4 100! - \frac{3^{20}}{800}$
(C) $\frac{3^{20}}{400} \log_4 100!$ (D) $\frac{3^{20}}{400} \log_4 100! - 3^{21}$
14. If the fractions, $\frac{x+3}{5}, \frac{x+9}{6}, \frac{x+17}{7}, \frac{x+27}{8}, \frac{x+39}{9}, \dots, \frac{x+753}{30}$, $\frac{x+809}{31}$ are all in their simplest terms, what is the smallest possible value of x?
(A) 37 (B) 41 (C) 38 (D) 34
15. The units digits in $(103)^{85} + (67)^{48} + (32)^{61} + (76)^{18}$ is
(A) 4 (B) 2 (C) 0 (D) 8
16. The number of ordered triplets (x, y, z), such that x, y, z are distinct prime numbers and $xy + yz + zx = 120$ is
(A) 9 (B) 3
(C) 0 (D) infinitely many
17. If $p = (2^{123}) (3^{96}) (7^{28})$, $q = (2^{120}) (3^{95}) (7^{32})$, $r = (2^{126}) (3^{97}) (7^{26})$, $s = (2^{124}) (3^{94}) (7^{30})$, then the order of p, q, r, s, from the smallest to the largest is:
(A) q, s, r, p
(B) r, p, q, s
(C) p, r, q, s
(D) r, p, s, q
18. Statistics show that 30% of the people who drink are heart patients and 80% of heart patients are those who drink. If 40% of the population drink, then what percentage of the population are heart patients?
(A) 15 (B) 20 (C) 12 (D) 10
19. Of four drinks A, B, C and D, A and B are mixed in the ratio 1 : 2, C and D are mixed in the ratio 1 : 2. The mixture of A and B is mixed with the mixture of C and D in the ratio 1 : 2. What is the final proportion of A, B, C and D in the mixture?
(A) 1 : 2 : 2 : 4
(B) 1 : 2 : 4 : 8
(C) 1 : 2 : 4 : 6
(D) Cannot be determined

DIRECTIONS for questions 20 to 22: Answer the questions on the basis of the information given below.

The following pie charts give the break-up of points, all positive integers, scored by the seven members – A, B, C, D, E, F and G – of a basketball team, in each of the four matches in a tournament.





The total points scored by the team in all the four matches was 400. Further, the team scored at least 50 points and at most 150 points in any match.

20. At most how many points did player B score in the tournament?
(A) 50 (B) 52 (C) 57 (D) 58
21. In the tournament, the sum of the total points scored by A and C, forms at least what percentage of the total points scored by the team?
(A) 33.25% (B) 31.5%
(C) 32% (D) 32.75%
22. In the tournament, the difference between the total points scored by D and the total points scored by F is at most
(A) 32 (B) 35 (C) 38 (D) 40

DIRECTIONS for question 23: Select the correct alternative from the given choices.

23. Professor Theodore Bumblebee of IIM-A gave five assignments – I, II, III, IV and V – to five of his students – Super Subbu, Cunning Chetan, Lazy Laxman, Morose Mary and Reckless Rani, as part of a group assignment. The following table shows

the times taken by each of the students to complete the assignments.

Student	I	II	III	IV	V
Super Subbu	2	5	1.5	3	5
Cunning Chetan	4	2	3	1	4
Lazy Laxman	1	3	4	2	1.5
Morose Mary	1.5	2.5	3.5	3	3
Reckless Rani	5	4	3.5	2	4

In a group assignment, all the assignments given have to be completed and it is not necessary that every person does each and every assignment. Thus, this group arrives at a consensus and decides that each of them would do exactly one of the assignments.

What is the cumulative time spent by all the students in completing the group assignment, if they finish it in the least possible time?

- (A) 8 hours (B) 8.5 hours
(C) 10 hours (D) 11.5 hours

DIRECTIONS for questions 24 to 26: Answer the questions on the basis of the information given below.

The following tables give the information about the number of matches played, runs scored and the number of centuries made in international matches by 60 players of a country.

Table A

Number of matches played (more than)	Number of players
200	54
220	48
240	40
260	36
280	30
300	24
320	18
340	14
360	8
380	3

Table B

Total runs scored (less than)	Number of players
15000	56
14000	49
13000	43
12000	39
11000	33
10000	28
9000	22
8000	15
7000	10
6000	5

Table C

Number of centuries scored (more than)	Number of players
70	5
63	11
58	15
50	22
44	26
36	31
28	37
20	44
15	49
10	53

In each table, the value in any row in the second column denotes the number of players for whom the value of the parameter mentioned at the top of the first column is correspondingly less/more than the corresponding value given in the first column.

For example, the first row of table A shows that there are 54 players who have played more than 200 matches.

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Each of these players played a distinct number of matches and further, between any two players X and Y, if the number of matches played by X is more than that by Y, then X should have scored more number of centuries and more total runs than Y, and vice versa.

24. How many of the given players scored more than 11000 runs but scored fewer than 63 centuries?
(A) 14
(B) 15
(C) 16
(D) Cannot be determined
25. What is the least number of players who played fewer than 260 matches but scored more than 8000 runs?
(A) 7 (B) 8 (C) 15 (D) 24
26. What is the number of players who played more than 300 matches, scored at least 12000 runs, but scored not more than 58 centuries?
(A) 8 (B) 6 (C) 5 (D) 9

DIRECTIONS for questions 27 and 28: Answer the questions on the basis of the information given below.

Peoplereach.com is an internet company which is in the business of collecting details of potential employees and selling these details to other organisations. The company collects data regarding people of different categories based on their job profile. For each person in each category, the company collects the details of one or more of the six features – name, age, address, experience, phone number and e-mail ID. The following table gives the information available in the database of the company about the number of people in each category, and the percentage of people in that category for whom the details of each feature are available.

Category	Number of people	Percentage of people for whose details of the feature are available					
		Name	Age	Address	Experience	Phone number	E-mail ID
School Teachers	16000	100%	85%	70%	90%	65%	80%
Pharmacists	3000	100%	75%	95%	80%	70%	60%
Doctors	60000	100%	50%	60%	70%	65%	100%
Professors	10000	100%	70%	75%	60%	85%	90%
Civil Engineers	25000	100%	40%	60%	50%	65%	85%
MBAs	150000	100%	50%	55%	70%	65%	100%
CAs	2600	100%	80%	50%	40%	50%	90%
Mechanical Engineers	42000	100%	85%	70%	95%	60%	80%
Nurses	18000	100%	50%	40%	60%	75%	40%
Accountants	12000	100%	40%	70%	75%	90%	85%
Ex-Servicemen	15000	100%	65%	75%	40%	80%	60%
Electrical Engineers	22000	100%	70%	65%	60%	70%	90%
Computer Engineers	26000	100%	80%	60%	65%	50%	100%

In the above table, for example, the phone numbers of 65% of the School Teachers in the database (i.e., 65% of 16000) are available. Assume that no person belongs to more than one category.

27. The number of doctors, each of whose name, phone number and address are available, is at least
(A) 15000. (B) 12000.
(C) 18000. (D) 24000.

28. The number of mechanical engineers, for whom the details of exactly four of the six features are available, is at least
(A) 2100. (B) 6300.
(C) 10500. (D) None of these

DIRECTIONS for questions 29 and 30: Answer the questions on the basis of the information given below.

The following table gives the data of production and consumption of rice in six countries in the year 2007.

Country	Production (in billion kg)	Population (in millions)	Annual per capita consumption (in kg)	Projected annual rice production growth rate (in %)	Projected annual population growth rate (in %)	Projected annual per capita rice consumption growth rate (in %)
P	10.50	120	110	10	3	6
Q	49.0	300	140	5	5	4
R	38.0	450	120	10	2	5
S	40.0	600	100	10	1	8
T	28.0	180	130	5	2	5
U	70.0	360	160	0	1	2

29. What is the approximate average of the projected per capita rice consumption (in kg) of all the six countries together in 2009?
(A) 132.7 (B) 139.0 (C) 149.2 (D) 156.3
30. The population (in millions) of the given six countries in 2008 would be closest to
(A) 2020 (B) 2137 (C) 2102 (D) 2050

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SECTION – II

Number of Questions = 30

DIRECTIONS for questions 1 to 3: Select the correct alternative from the given choices.

1. It is often contended that consuming alcohol is not as harmful to society as smoking is. This is because, while consumption of alcohol harms only the health of the drinker, smoking pollutes the air and hence causes harmful diseases to others.
Which of the following, if true, weakens the above argument?
(A) It is generally found that those who drink are also given to smoking.
(B) A majority of road accidents which result in fatalities, the world over, are reported to happen due to drunken driving.
(C) Some persons who regularly smoke are found to live for several years.
(D) While smoking affects the lungs, alcohol consumption affects the liver primarily.
2. Highway No. 7 is the busiest highway in the nation. It has eight lanes and allows for speedy transit, at speeds of 100 to 120 kmph. The number of vehicles that use highway No. 7 is more than those on any

other highway. Even so, advertisement billboards are fewer on highway 7 than on any other highway.

Which of the following, if true, can account for the paradox?

- (A) Highway No. 7 is longer than any other highway in the nation.
 - (B) Highway No. 7 connects some of the most important trade centers of the nation.
 - (C) Advertisement through billboards is considered less useful than advertisement through the electronic media.
 - (D) It is not possible to read a billboard at speeds over 60 kmph.
3. A win-win situation is one which is advantageous to all parties involved. Firms should always encourage deals leading to win-win situations.
The above concept of a win-win situation is recommended on the basis that
(A) a trade deal has only two stake holders.
(B) it is possible to arrive at a win-win situation in business deals.
(C) the business firms are only interested in maximizing their own advantage in any deal.
(D) a business firm's primary duty is to work towards the social good.

DIRECTIONS for questions 4 to 6: Read the following poem and answer the questions that follow it.

The farmhouse lingers, though averse to square
With the new city street it has to wear
A number in. But what about the brook
That held the house as in an elbow-crook?
I ask as one who knew the brook, its strength
And impulse, having dipped a finger length
And made it leap my knuckle, having tossed
A flower to try its currents where they crossed.
The meadow grass could be cemented down
From growing under pavements of a town;
The apple trees be sent to hearth-stone flame.
Is water wood to serve a brook the same?
How else dispose of an immortal force
No longer needed? Staunch it at its source
With cinder loads dumped down? The brook was thrown
Deep in a sewer dungeon under stone
In fetid darkness still to live and run –
And all for nothing it had ever done
Except forget to go in fear perhaps.
No one would know except for ancient maps
That such a brook ran water. But I wonder
If from its being kept forever under,
The thoughts may not have risen that so keep
This new-built city from both work and sleep.

4. How does the poet view the 'immortal force'?
(A) As a flow of energy that, though it may not be needed, continues to be generated and needs attention.
(B) As a flow of energy that is not needed even though it continues to be generated.
(C) As a flow of energy that, unwanted though it may be, cannot be stemmed and prompts anxiety.
(D) As a flow of energy that, unwanted yet unstemmable, must be coped with.
5. In what context has the poet used the words "except forget to go in fear perhaps"?
(A) The poet points to the ability of the strong to suppress that which is not as strong, merely for the independence that it may display
(B) The poet points to the propensity of the strong to rein in that which is apparently not as strong merely for the absence of humility.
(C) The poet points to the propensity of the strong to rein in that which is apparently not as strong merely for the independence that it may display
(D) The poet points to the fact that the strong tend to rein in that which is not as strong unless it displays humility.

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6. Which of the following statements presents the most appropriate interpretation of this poem?
- (A) In the building of a new city, the features of the countryside are built over or effaced, or, where this is not possible, suppressed. Would anything so suppressed be the cause of difficulties in the future?
 - (B) In the building of a new city, aren't the features of the countryside rendered mere memories, recalled only when old maps of the area are referred to?
 - (C) When a village expands into a city, its original features undergo significant transformation. Wouldn't such transformation be the cause of possible difficulties in future?
 - (D) In the building of a new city, features of the countryside are built over or effaced, or, where this is not possible, suppressed. Wouldn't something so suppressed hold the potential for irksomeness?
- DIRECTIONS** for questions 7 to 9: The following question has a paragraph from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.
7. When eating escargots de Bourgogne at a five-star restaurant, diners are consuming the world's oldest "cattle". Indeed, snails have been bred for food for more than five thousand years, everywhere from Sumeria to ancient Rome to prehistoric Scotland. The nutmeg customarily sprinkled on eggnog was, once upon a time, the cause of a war between the Dutch and the English. The oysters with which a gourmet's meal begins are, uniquely, eaten uncooked and unkilld – a food that unites twenty-first-century humanity with our hominid ancestors.
- (A) It's no surprise then, that we occasionally ask ourselves - "Have we really evolved as much as we like to think we have?"
 - (B) The contents of our plates are therefore, as good as ingredients of the past and present of our civilisations.
 - (C) Whatever have been the developments in the ways that we relate to each other, there have, obviously, been no changes in the ways that we relate to our food.
 - (D) We must pay more attention to the study of eating habits – this would enable us to understand our social and political structures better than we currently do.
8. In general, medieval defensive strategy was based on avoiding, rather than offering, battle. This was because the great number of castles and fortified towns allowed the defenders to shut themselves up and wait patiently to see what happened. Fortresses were nearly always strong enough to stand up to the attackers, whose siege engines were often inefficient. Putting them together on the spot wasted a lot of time, and they were often feeble or else were rendered ineffective by the defenders' countermeasures.
- (A) Most often it was treachery, and not the superior strength of the invader, that caused the fall of fortresses.
 - (B) Building a fortress, however, was something that usually took years and could, therefore, be carried out only in peacetime.
 - (C) As long as the fortresses themselves were well provisioned, there was not much for a stout-hearted garrison to fear.
 - (D) "Attack is the best form of defence" is an adage the origin of which pre-dates the era of the medieval fortress.
9. When the same number of men fight with sufficiently different technologies, the better equipped side is likely to win. Similarly, when the same technology is employed by armies of sufficiently different size, the larger force is likely to win. And when equal-sized armies with equal technologies fight, the better trained, led, and motivated force is likely to prevail. In general, human elements of warfare, such as leadership, morale, and surprise, have become the important determinants of battle outcome despite technological progress in weapons.
- (A) The most likely reason is that battle technology is imitated as it spreads whereas leadership and morale depend strongly on whether things are worth fighting for.
 - (B) With military technology tending to uniformity, at least among those given to flexing muscle, effective training of personnel is now the paramount need.
 - (C) Leadership – to use a phrase that is now almost hackneyed – is, truly, what separates the men from the boys.
 - (D) The outcome of this is that the advantage gained from new and exclusive technologies, even when they help achieve significant successes, can only be short-lived.

DIRECTIONS for questions 10 to 12: Read the following passage and answer the questions that follow it.

The latest James Bond adventure is at number one, 'Finding Nemo' at number 12, and 'The Lord of the Rings' at number 18. A chart of DVD sales or box-office receipts? No, this is the British video-games chart in March 2004, a vivid illustration of how the once-separate worlds of movies and games have become increasingly intertwined. Film actors, even famous ones, now voice their characters in games too. Animators, artists and model-makers move freely between the two worlds; the same companies produce trailers both for games and for films. People in the booming games business are fond of pointing out that worldwide games sales, at around \$20 billion a year, now exceed movie box-office revenues. With every passing day, gaming seems less like Hollywood's poor relation.

The convergence between films and games makes sense for many reasons. Both special-effects-laden blockbusters and shoot-'em-ups rely on computer power, and as games consoles become more capable, their output becomes ever

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more cinematic. Indeed, modern games based on Star Wars look even better than the original films, since today's games consoles far outperform any special-effects technology available back in the 1980s. Costs have increased as the production values of games have improved: the typical budget is now \$5m-8m.

Where tie-in games used to be an afterthought, they are now integrated into the film-making process from the start, says Robert Kotick, the boss of Hollywood-based Activision, the second largest games publisher. "Studios used to regard game licenses like T-shirt licenses," he says, "and only provide access to artwork late in the film-making process." But no longer. His firm had a dozen people inside the studios of DreamWorks working on the game of Shrek 2, an animated film released in May 2004.

10. 'Film actors...now voice their characters in games too.' The author uses these words to
- bring home the clout gained by gaming in recent times.
 - show how successful movies translate into popular games.
 - demonstrate the demand for authenticity by players of video games.
 - exemplify how movies and games now overlap each other.
11. Which of the following can be understood from the passage?
- Games now help in increasing the popularity of movies.
 - Movies and games share ideas, artists, advertisers and production centers.
 - Games now make almost as much as films in monetary terms.
 - Technology often helps games to outshine their inspiration.
- b and d
 - a and c
 - a and b
 - c and d
12. The passage
- is a comparison between movies and games in terms of popularity and impact.
 - is an indirect warning to the movie industry to pull up its socks and face the competition posed by games.
 - points to the increasing sophistication and growing importance of the games business.
 - describes the symbiotic relationship between the movie and the games industry.
- DIRECTIONS for questions 13 to 15:** Each question presents a paragraph broken up into 5 segments. Each segment contains sentence parts. Some of the segments have errors of grammar or inappropriate construction. Select as your answer the option that indicates the grammatically incorrect and inappropriate segments.
13. (1) Every so often, I feel the need to grow my hair, to bear the discomforts of picking strands off my lips, and to force
- (2) them into the imprisonment of a pony tail. Once I reach the pony tail stage, however, I realise that I just want the hair
- (3) off my face and it's easiest to achieve that when there is none. So I unsheathe the scissors and chop it all away. In the initial
- (4) hours thereafter, I'm ecstatic: I feel freer, taller, and thinner. Then comes what can be described as only an
- (5) existential crisis, who is a woman who has no hair? Then follows panic: where's my lip gloss?
- 1, 2, 4 and 5
 - 3 and 4
 - 2 and 3
 - 1, 3, 4 and 5
14. (1) They took places opposite to each other at the table under the light, but George did not shuffle the cards. He rippled the
- (2) edge of the deck nervously, and, when he realised the snapping noise drew the eyes of all the men in the room, he stopped
- (3) doing it. Silence fell on the room again and, as the minutes passed, the players sat still, staring at the ceiling. Slim looked around
- (4) for a moment and then looked down at his hands, subduing one hand with the other. There came little gnawing sounds
- (5) from under the floor and all the men looked down towards them gratefully. Only Candy continued to stare at the ceiling.
- 3 and 4
 - 1, 2 and 5
 - 2, 3 and 5
 - 1, 2 and 4
15. (1) Our deepest fear is not that we are inadequate but that we are powerful beyond measure; it is our light, not our darkness
- (2) that frightens us most often. We ask ourselves how we can be brilliant or talented. Actually, why not? We are children of God.
- (3) There is nothing so enlightened about shrinking that other people won't feel insecure around us. We are all meant to shine, as
- (4) children do, and to make manifest the glory of God that is within us. As we let our own light shine, we unconsciously give
- (5) other people permission to do the same. As we are liberated from our own fear, so our presence automatically liberates others.
- 2 and 5
 - 1, 2 and 4
 - 3 and 5
 - 3, 4 and 5

DIRECTIONS for questions 16 to 20: Read the following passage and answer the questions that follow it.

Four subjects can be relied upon for abiding public interest: crime, love, money and food. Only the last of these is fundamental and universal. Crime is a minority interest, even in the worst regulated societies. It is possible to imagine an economy without money, and reproduction without love, but not life without food. Food, moreover, has a good claim to be considered the world's most important subject. It is what matters to most people for most of the time.

Yet, food history remains relatively unappreciated. Most academic institutions still neglect it. Many of the best contributions to its study are made by amateurs or antiquarians. There is no consensus about how to approach it. For some people, it is all about nutrition and malnutrition, sustenance and sickness; for others, less anxious to avoid condemnation for frivolity, it is essentially about cuisine. Economic historians see food as a commodity to be produced and traded. When it gets to the stage of being eaten, they lose interest. For social historians, diet is an index of differentiation and changing class relations. Cultural historians are increasingly interested in how food nourishes societies as well as individual bodies – how it feeds identities, defines groups. In political history, food is the stuff of tributary relationships and its distribution and management are at the heart of power. The small but gallant and growing band of environmental historians see food as linkage in the chain of being: the substance of the ecosystems which human beings strive to dominate. Our most intimate contact with the natural environment occurs when we eat it. Food is a subject of pleasure and peril.

16. To lay persons, those who are not of special-interest groups, food is a subject of interest in some of the following aspects. Identify these aspects.

- (1) It is something that can be the object of appreciation.
 - (2) It is something that can generate anxiety of different levels.
 - (3) It is something that is to be considered with seriousness.
 - (4) It is something that is related to physical well-being.
- (A) 1, 2 and 3 (B) 2, 3 and 4
(C) 1, 3 and 4 (D) 1, 2 and 4

17. Which of the following statements apply to those who are interested in cuisine?

- (1) They are not hesitant to let others know of their interest.
 - (2) They are not unduly perturbed by the thought that they may not be appreciated.
 - (3) They are not as interested in any of the other aspects related to food.
 - (4) They are not concerned about the hungry, the undernourished, and the sick.
- (A) 1, 2 and 3 (B) 2, 3 and 4
(C) 1, 3 and 4 (D) 1, 2 and 4

18. Who, among the following, are all those who see food as an indicator of distinctions between people?

- (A) Political historians, Cultural historians.
- (B) Political historians, Cultural historians, Social historians.
- (C) Cultural historians, Social historians.
- (D) Social historians, Economic historians, Cultural historians.

19. From the reference made to economic historians we understand that, when it comes to food, they focus on

- (A) end-use, yield and exchange.
- (B) yield, exchange and distribution.
- (C) exchange, distribution and end-use.
- (D) distribution, end-use and yield.

20. In the context, the phrase "tributary relationship" is used to mean:

- (A) one where bodies provide each other collaborative support.
- (B) one where bodies co-operate with each other by pooling their resources.
- (C) one where bodies draw support and sustenance from the strong.
- (D) one where bodies are in allegiance to the strong.

DIRECTIONS for questions 21 to 23: Answer the questions on the basis of the information given below.

The table below represents the runs scored by four batsmen in three matches in a series. The four batsmen Sehwag, Gambhir, Rohit and Dhoni are disguised in the table as Player 1, Player 2, Player 3 and Player 4, in no particular order.

Matches	Player 1	Player 2	Player 3	Player 4
Match 1	49	48	45	50
Match 2	50	50	45	44
Match 3	56	34	38	57

Further it is known that,

- (A) In match 2, Sehwag scored a half century (50 runs)
- (B) Dhoni scored four runs more than Gambhir in the three matches combined.

21. What can be said regarding the following two statements?

Statement 1: In match 2, Rohit scored the lowest runs among the four.

Statement 2: Gambhir scored more runs than Rohit in the three matches combined.

- (A) If statement 1 is true, then statement 2 is necessarily true.
- (B) If statement 1 is true, then statement 2 is necessarily false.
- (C) Exactly one of the statements is true.
- (D) Both (B) and (C)

22. What can be said regarding the following two statements?

Statement 1: In match 3, Gambhir scored the highest runs among the four.

Statement 2: Dhoni scored the highest runs among the four in the three matches combined.

- (A) Both statements could be true.
- (B) At least one of the statements must be true.
- (C) Exactly one of the statements must be true.
- (D) At most one of the statements could be true.

23. If in the three matches, Rohit had his lowest score in match 3, then which of the following statements is definitely true?

- (A) Sehwag had his lowest score in match 2.
- (B) Sehwag had his lowest score in match 1.
- (C) Sehwag had his lowest score in match 3.
- (D) Sehwag scored the highest number of runs, in the three matches combined.

DIRECTIONS for questions 24 and 25: Answer the questions on the basis of the information given below.

Five executives of a company, namely A, B, C, D and E are to be seated around a circular table for a meeting. Two of them are from Delhi and the remaining three are from Mumbai. They must be seated under the following constraints:

- (i) Both the persons from Delhi cannot be seated together.
- (ii) The persons adjacent to E must be either both A and C or neither of A and C.
- (iii) E must have a person from Delhi to his immediate right.

Any additional information provided in a particular question pertains to that individual question only.

24. If both the persons adjacent to A are from Delhi, then which of the following statements is/are definitely TRUE?

- (i) B and D are adjacent to E.
- (ii) C is to the immediate right of A.
- (iii) A is two places away to the right of E.
- (A) Only (i) (B) Only (i) and (ii)
- (C) Only (ii) and (iii) (D) All the three

25. If A is from Mumbai and is sitting to the immediate left of E, who among the following is definitely from Delhi?

- (A) B (B) C
- (C) D (D) None of these

DIRECTIONS for questions 26 and 27: Each question is followed by two statements, I and II. Answer each question using the following instructions:

- Choose A if the question can be answered by one of the statements alone but not by the other.
- Choose B if the question can be answered by using either statement alone.
- Choose C if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.
- Choose D if the question cannot be answered even by using both the statements together.

Information common to questions 26 and 27:

College X has classes for only two academic years – Year I and Year II – and each student has to choose exactly one of the only two courses offered – Science and Commerce. The total number of students in the college is 480, of which 180 girls study Science. Also, it is known that 60 girls study Science in year II. The following two questions pertain to the students in college X.

26. What is the number of girls studying commerce in Year I?

- I. There are 300 boys studying commerce in Year II.
- II. The total number of students in year II is 360.

27. How many boys study science?

- I. There are 80 students studying commerce in Year I.
- II. 160 second year students do not study science.

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

Twenty one teams, from four states – Kerala, Tamil Nadu, Karnataka and Andhra Pradesh – participated in the South Zone rural sports meet, held in Tamil Nadu. Competitions were held in four events – Football, Kabbadi, Kho-Kho and Handball – and each team participated in exactly one of the events. The following information is also known about the teams which participated in the meet.

- (a) The number of teams which participated in kho-kho was exactly half the number of teams participating in each of the other three events.
- (b) All events had at least one team from each state, except kho-kho, which did not have any team participating from Kerala.
- (c) In any event, the maximum number of teams participating from the same state was three.
- (d) Had the number of teams from Karnataka been one less, then the number of teams from Tamil Nadu would have been twice as many as that from each of the other states.
- (e) Karnataka United and Bangalore FC were two of the teams participating in football from Karnataka.

28. Which of the following, about the number of teams that participated in the meet, cannot be determined from the information given?

- (A) The number of teams participating in kabbadi from Karnataka.
- (B) The number of teams participating in handball from Tamil Nadu.
- (C) The number of teams participating in kho-kho from Andhra Pradesh.
- (D) The number of teams participating in kho-kho from Tamil Nadu.

29. If the number of teams from Tamil Nadu participating in football was only one, then which of the following is not true about the teams that took part in the meet?

- (A) The number of teams from Tamil Nadu participating in kabbadi is three.
- (B) Only one team from Kerala participated in the handball.
- (C) Two of the four events had exactly three teams each from Tamil Nadu participating in them.
- (D) None of the above.

30. If Tamil Nadu United was one of the teams from Tamil Nadu participating in handball, then the number of teams from Tamil Nadu which participated in handball was

- (A) either one or three.
- (B) exactly two.
- (C) either one or two.
- (D) either two or three.

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(Key and Solutions for AIMCAT1202)

Key

SECTION – I

1. A	6. B	11. B	16. C	21. D	26. B
2. A	7. B	12. A	17. D	22. C	27. A
3. C	8. D	13. B	18. A	23. B	28. D
4. A	9. D	14. D	19. A	24. D	29. B
5. A	10. B	15. B	20. C	25. A	30. D

SECTION – II

1. B	6. D	11. A	16. C	21. D	26. B
2. D	7. B	12. C	17. A	22. A	27. C
3. B	8. C	13. D	18. B	23. C	28. B
4. C	9. A	14. B	19. B	24. D	29. D
5. B	10. D	15. C	20. D	25. B	30. D

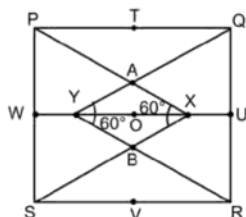
Solutions

SECTION – I

Solutions for questions 1 to 19:

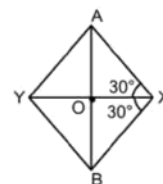
- Any quadratic function can be written as $f(x) = \alpha(x - k)^2 - \beta$ (This format is convenient as opposed to $f(x) = ax^2 + bx + c$, since minimum value of $f(x)$ is given).
Given that minimum value of $f(x)$ is -15 at $x = 3$
 $f(x)$ is minimum when $x = k \Rightarrow k = 3$.
 $\Rightarrow -15 = -\beta \Rightarrow \beta = 15$.
Also, given that $f(0) = 5$
 $\Rightarrow 5 = \alpha(0 - 3)^2 - 15 \Rightarrow \alpha = \frac{20}{9}$
 $\therefore f(9) = \frac{20}{9}(9 - 3)^2 - 15 = 65$. Choice (A)

2.



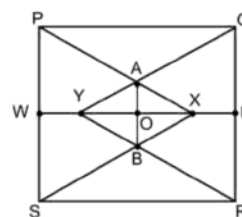
$WX = WY + XY$
 $UY = UX + XY$
 $WX + UY = WY + UX + XY + XY$
 $= WU + XY$
 Let $PS = 2a = PX = XS$
 $WX = 2a \cos 30^\circ = \sqrt{3}a = UY$
 $\therefore WX + UY = 2\sqrt{3}a = WU + XY = 2a + XY$
 $\Rightarrow XY = 2a(\sqrt{3} - 1)$
 Let O be the centre of the square PQRS.

$$\begin{aligned}
 OX &= \frac{1}{2}XY = a(\sqrt{3} - 1) \\
 OA &= OX \tan 30^\circ = \frac{a(\sqrt{3} - 1)}{\sqrt{3}} \\
 \text{Area of } AXBY &= 2(\text{Area of } AOY) \\
 &= 2 \times \frac{1}{2}(OY)(OA) \\
 &= 2a(\sqrt{3} - 1) \frac{a(\sqrt{3} - 1)}{\sqrt{3}} \\
 &= \frac{2a^2}{\sqrt{3}}(\sqrt{3} - 1)^2
 \end{aligned}$$



$$\begin{aligned}
 \text{Area of } PQRS &= 4a^2 \\
 \therefore \text{Ratio of areas of } AXBY \text{ and } PQRS &= \frac{\frac{2a^2}{\sqrt{3}}(\sqrt{3} - 1)^2}{4a^2} = \frac{1}{2\sqrt{3}}(\sqrt{3} - 1)^2 \\
 &= \frac{4 - 2\sqrt{3}}{2\sqrt{3}} = \frac{2 - \sqrt{3}}{\sqrt{3}}
 \end{aligned}$$

Alternative Solution:



It can be inferred from the symmetry of the figure that AXBY is a rhombus.
 Area of AXBY = Area of $\triangle AXB$ + Area of $\triangle AYB$
 $= 2 \text{ Area of } \triangle AXB$.

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AIMCAT1202.Sol/I

It can be observed that Δ les AXB and PXS are similar.

$$\therefore \frac{\text{Area of AXB}}{\text{Area of PXS}} = \left(\frac{OX}{WX}\right)^2$$

Let the side of the square PQRS be 1.

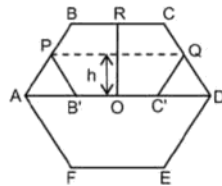
$$\Rightarrow WX = \frac{\sqrt{3}}{2} \Rightarrow OX = WX - WO = \frac{\sqrt{3}}{2} - \frac{1}{2} = \frac{\sqrt{3}-1}{2}$$

$$\therefore \frac{\text{Area of AXB}}{\text{Area of PXS}} = \left(\frac{\frac{\sqrt{3}-1}{2}}{\frac{\sqrt{3}}{2}}\right)^2 = \frac{(\sqrt{3}-1)^2}{3}$$

$$\Rightarrow \text{Area of AXB} = \frac{\sqrt{3}}{4} \times 1^2 \times \frac{(\sqrt{3}-1)^2}{3} = \frac{(\sqrt{3}-1)^2}{4\sqrt{3}}$$

$$\Rightarrow \text{Area of AXBY} = 2 \times \frac{(\sqrt{3}-1)^2}{4\sqrt{3}} = \frac{2-\sqrt{3}}{\sqrt{3}} \quad \text{Choice (A)}$$

3.



Let the side of the regular hexagon be 'a'.

Let B' and C' be the reflections of B and C respectively on AD

\Rightarrow P and Q are the mid-points of AB and CD respectively.
AD = 2a

$$PQ = \frac{BC + AD}{2} = \frac{a + 2a}{2} = \frac{3a}{2}$$

$$\therefore \text{Area of trapezium} = APQD = \frac{1}{2} (PQ + AD)h$$

where h is the height of the trapezium.

$$h = \frac{1}{2} OR = \frac{1}{2} \left(\frac{\sqrt{3}}{2} a \right) = \frac{\sqrt{3}a}{4}$$

$$\therefore \text{Area of trapezium APQD} = \frac{1}{2} \left(\frac{3a}{2} + 2a \right) \frac{\sqrt{3}a}{4}$$

$$\text{Area of the hexagon ABCDEF} = 6 \left(\frac{\sqrt{3}}{4} a^2 \right)$$

$$\therefore \text{Ratio of areas} = \frac{\frac{1}{2} \times \frac{7a}{2} \times \frac{\sqrt{3}a}{4}}{6 \times \frac{\sqrt{3}}{4} a^2} = \frac{7}{24} \quad \text{Choice (C)}$$

4. $E = (x-1)(x-6)(x-3)(x-4) + 10$
 $= (x^2 - 7x + 6)(x^2 - 7x + 12) + 10 \Rightarrow$ Expression
 Let $x^2 - 7x + 6 = y \Rightarrow y(y+6) + 10 =$ expression
 \Rightarrow Expression $= y^2 + 6y + 10 = (y+3)^2 + 1$
 \Rightarrow Minimum value = 1 (when $y = -3$) Choice (A)

5. For $t = 0$, $v = -0.5$.
 We consider choices A and B
 When t increases to 2, v decreases by 3.
 Slope = -1.5 Choice (A)

6. Let the 4 numbers be x_1, x_2, x_3, x_4 where $x_1 < x_2 < x_3 < x_4$.
 Let $x_1 + a_1 = x_2, x_2 + a_2 = x_3$ and $x_3 + a_3 = x_4$.
 The differences of x_1 and each of the other 3, of x_2 and each of the greater two, of x_3 and x_4 are tabulated below.

x_1	x_2	x_3
a_1		
$a_1 + a_2$	a_2	
$a_1 + a_2 + a_3$	$a_2 + a_3$	a_3

We require that n be minimised and these 6 expressions have distinct values. Let $x_1 = 1$

Now, $n = 1 + a_1 + a_2 + a_3$ (because $x_4 = x_1 + a_1 + a_2 + a_3$, i.e., $a_1 + a_2 + a_3 + 1$ consecutive natural numbers are involved).

Now, a_1, a_2, a_3 can be chosen as the least possible values, i.e., 1, 2 and 3. However, the order of choosing should be such that the six expressions (differences) should all be distinct.

By little trial and error, (a_1, a_2, a_3) can be (1, 3, 2) or (2, 3, 1) in which case $n = 7$ and the four numbers can be (1, 2, 5, 7) or (1, 3, 6, 7) respectively.

Hence the minimum value of n is 7. Choice (B)

7. Since, thousands digit > tens digit > units digit, we need three distinct digits for these three places. We can select these three digits from any of the 10 digits in ${}^{10}C_3$ ways. And for each of the ${}^{10}C_3$ ways, the digits can be put in the descending order in only one way, i.e. for each triplet selected, the greatest of the digits is taken as the thousands digit, the least as the units digit and the middle digit as the tens digit. So, we have $({}^{10}C_3 \times 1)$ i.e. ${}^{10}C_3$ ways of selecting the thousands, tens and the units digit. Now, there is no restriction on the hundreds digit. So for each of the ${}^{10}C_3$ ways of arranging the remaining digits, the hundreds digit can be filled in 10 ways (i.e. by any of 0 to 9).
 \therefore The number of four-digit numbers that satisfy the given condition

$$= {}^{10}C_3 (10) = \frac{10(9)(8)}{6} (10) = 1200 \text{ ways.} \quad \text{Choice (B)}$$

8. From the common data, we get the following possibilities for m and n .

m	n
16	19
81	41

I. $m < n$, if the ten's digit of m is less than its units digit, i.e. if $m = 16, m < n$. True.

II. $|m - n|$ is a perfect square could be true $|16 - 41|$ is a square.

III. $m + n$ is a perfect square could be true as $81 + 19 = 100$ None of the statements has to be false. Choice (D)

9. Given $a^4 - 62a^2 + 1 = 0$
 Dividing by a^2

$$a^2 - 62 + \frac{1}{a^2} = 0 \Rightarrow a^2 + \frac{1}{a^2} = 62$$

$$\Rightarrow a^2 + \frac{1}{a^2} + 2 = 64 \Rightarrow \left(a + \frac{1}{a}\right)^2 = 64$$

$$\therefore a + \frac{1}{a} = \pm 8$$

$$\text{Since } a > 0, a + \frac{1}{a} = 8$$

$$\text{Now } \left(a + \frac{1}{a}\right)^3 = a^3 + \frac{1}{a^3} + 3\left(a + \frac{1}{a}\right)$$

$$\Rightarrow 512 = a^3 + \frac{1}{a^3} + 24$$

$$\therefore a^3 + \frac{1}{a^3} = 488 \quad \text{Choice (D)}$$

10. If U is the sum of all the alternate digits of N starting from the units place and T is the sum of all the alternate digits of N starting from the tens place, the remainder when N is divided by 11 is same as the remainder when $U - T$ is divided by 11. Note that when difference is being

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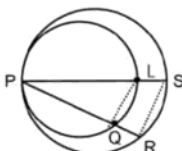
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calculated, it is always $U - T$ not $T - U$. For one group of ten consecutive digits of N , $U - T = -5$. For the 100 groups, it is -500 , i.e. equivalent to a remainder of 6 when divided by 11. Therefore 5 is the least number that has to be added to N , so that the sum is divisible by 11.
[Note: If the remainder when N is divided by p is negative, say $-r$, then the effective remainder is $p - r$.]

Choice (B)

11. The speed of the faster car is 60 km/hr. In 20 hours the car will cover $60 \times 20 = 1200$ km.
 $1200 \text{ km} \rightarrow 1200/120 = 10$ lengths.
So we can expect the faster car to cross the slower car 10 times, either in opposite direction or in the same direction. However, if the two cars meet exactly at either of the cities A or B, then for each such occasion they will have one less point of meeting (or crossing) because, in that case the meeting points pertaining to two lengths will become common.
Now, the faster car is at A at $t = 0, 4, 8, 12, 16$ and 20 hrs and at B at $t = 2, 6, 10, 14$ and 18 hours. Also, the slower car is at A at $t = 3, 9$ and 15 hours and at B at $t = 0, 6, 12$ and 18 hours.
From the above timings, it can be observed that on exactly two occasions the two cars meet at city B and never at city A. Hence, the total number of times the two cars cross each other will be $10 - 2 = 8$.
Choice (B)

12. Let PL be the diameter of the smaller circle.



Let us consider triangles PQL and PRS.
 $\angle RPS$ is common and $\angle PQL = \angle PRS = 90^\circ$.
 \therefore Triangles PQL and PRS are similar triangles.

$$\text{So } \frac{PQ}{PR} = \frac{PL}{PS}$$

We know $PL = 4/5 PS$

$$\text{Let } PQ = x, \therefore PR = x + 3 \Rightarrow \frac{x}{x+3} = \frac{4}{5}$$

$$\Rightarrow 5x = 4x + 12, x = 12.$$

$$\therefore PQ = 12 \text{ cm.}$$

Choice (A)

13. $\frac{3^{20}}{\log_3 4^{400}} + \frac{3^{20}}{\log_4 4^{400}} + \dots + \frac{3^{20}}{\log_{100} 4^{400}}$
 $= 3^{20} \left[\frac{1}{400 \log_3 4} + \frac{1}{400 \log_4 4} + \dots + \frac{1}{400 \log_{100} 4} \right]$
 $= \frac{3^{20}}{400} [\log_3 3 + \log_4 4 + \log_5 5 + \dots + \log_{100} 100]$
 $= \frac{3^{20}}{400} \log_4 (3)(4) \dots (100)$
 $= \frac{3^{20}}{400} \left[\log_4 \frac{(1)(2)(3)(4) \dots (100)}{2} \right]$
 $= \frac{3^{20}}{400} [\log_4 100! - \log_4 2]$
 $= \frac{3^{20}}{400} [\log_4 100! - \frac{1}{2} \log_2 2]$
 $\Rightarrow \frac{3^{20}}{400} \log_4 100! - \frac{3^{20}}{800}$
Choice (B)

14. The given series is

$$\frac{x+3}{5}, 1 + \frac{x+3}{6}, 2 + \frac{x+3}{7}, 3 + \frac{x+3}{8}, \dots, 26 + \frac{x+3}{31}$$

The fractions would be in the simplest terms if $x + 3$ does not have any factor in common with 5, 6, 7, ..., 31. The least value of $x + 3$ is the smallest prime number greater than 31, i.e., 37.

$$\therefore x = 34$$

Choice (D)

15. We know that

The units digit in $3^1, 3^2, 3^3$ and 3^4 are respectively 3, 9, 7, 1. After that these digit appear in a cyclic pattern. The cycle is of length 4.

The unit digits in $(103)^{94}$ is 1 and the units digit in $(103)^{95}$ is 3.

The units digit in $7^1, 7^2, 7^3, 7^4$, are 7, 9, 3, 1 respectively.

7^n is also a cycle of length 4. The units digit of $(67)^{48}$ is 1.

The units digit in $2^1, 2^2, 2^3, 2^4$ are 2, 4, 8, 6 respectively.

2^n is also a cycle of length 4.

\therefore The units digit of $(32)^{51}$ is 2.

The units digit of 6^n is 6, for all n .

\therefore Sum of the units digits of the term in the given expansion is $3 + 1 + 2 + 6 = 12$.
Choice (B)

16. Since, x, y, z are distinct prime numbers; the sum of xy, yz, zx is always an odd number.

Hence, there is no (x, y, z)

Such that $xy + yz + zx = 120$

Choice (C)

17. $p = 2^{120} (8) (3^{94}) (9) (7^{25}) (7^3)$

$$= (8) (9) (7^3) [(2^{120}) (3^{94}) (7^{25})]$$

$$q = (2^{120}) (3^{94}) (3) (7^{25}) (7^7)$$

$$= (3) (7^7) [(2^{120}) (3^{94}) (7^{25})]$$

$$r = (2^{120}) (64) (3^{94}) (27) (7^{25})$$

$$= (64) (27) [(2^{120}) (3^{94}) (7^{25})]$$

$$s = (2^{120}) (16) (3^{94}) (7^{25}) (7^5)$$

$$= (16) (7^5) [(2^{120}) (3^{94}) (7^{25})]$$

$$\text{As } 3(7^7) > 16(7^5) > 8(9) (7^7) > 64(27),$$

$$q > s > p > r.$$

$$\therefore r < p < s < q.$$

Choice (D)

18. Let the total population be x .

$$\text{The number of drinkers is } \frac{40}{100} x.$$

\therefore the number of drinkers who are heart patients

$$= \frac{30}{100} \left(\frac{40}{100} x \right) = \frac{12}{100} x.$$

Given 80% of heart patients are drinkers.

\therefore the number of heart patients

$$= \left(\frac{12}{100} x \right) \left(\frac{100}{80} \right) = \frac{3x}{20}$$

\therefore the percentage of heart patients

$$= \frac{3x}{20} \left(\frac{100}{x} \right) \% = 15\%$$

Choice (A)

19. Let the final mix be 1 litre. $(A + B) : (C + D) = 1 : 2$

$$\therefore (A + B) = \frac{1}{3} \text{ litre} \Rightarrow (C + D) = \frac{2}{3} \text{ litre}$$

$$\therefore A : B = 1 : 2 \Rightarrow A = \frac{1}{3} \times \frac{1}{3} = \frac{1}{9} \text{ litres}$$

$$B = \frac{2}{3} \times \frac{1}{3} = \frac{2}{9} \text{ litres and } C : D = 1 : 2$$

$$\Rightarrow C = \frac{1}{3} \times \frac{2}{3} = \frac{2}{9} \text{ litre and } D = \frac{2}{3} \times \frac{2}{3} = \frac{4}{9} \text{ litre}$$

$$\therefore A : B : C : D = 1 : 2 : 2 : 4$$

Choice (A)

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Solutions for questions 20 to 22:

20. For the points scored by B in the tournament to be maximum, we have to assume that in matches where B's share of points was higher, the team's total points was maximum, i.e. in matches I and III the team scored 150 points each and in the other matches the team scored only 50 points each.

∴ Points scored by B

$$= \frac{14}{100} \times 150 + \frac{12}{100} \times 50 + \frac{16}{100} \times 150 + \frac{12}{100} \times 50$$

$$= 21 + 6 + 24 + 6 = 57 \quad \text{Choice (C)}$$

21. The share of points scored by A and C in the matches are
Match I – 46%
Match II – 42%
Match III – 24%
Match IV – 34%

For the points scored by A and C together to be the least we have to assume that the team scored the maximum (150) points in matches where the contribution of A and C together was minimum, i.e. in matches III and IV.

∴ Points scored by A and C

$$= \frac{46}{100} \times 150 + \frac{42}{100} \times 150 + \frac{24}{100} \times 150 + \frac{34}{100} \times 150$$

$$= 23 + 21 + 36 + 51 = 131$$

$$\text{Required percentage} = \frac{131}{400} = 32.75\% \quad \text{Choice (D)}$$

22. The difference between the share of points of D and F (D – F) in different matches are

Match I = –2%

Match II = 6%

Match III = 12%

Match IV = 12%

To have the maximum difference, the team's score in matches III and IV must be 150 each and that in matches I and II must be 50 each.

∴ The required difference

$$= \frac{12}{100} \times 150 + \frac{12}{100} \times 150 + \frac{6}{100} \times 50 - \frac{2}{100} \times 50$$

$$= 18 + 18 + 3 - 1 = 38 \quad \text{Choice (C)}$$

Solution for question 23:

23. Five assignments are to be completed by five students with each doing exactly are of the assignments. By simple observation we can see that fastest that Reckless Rani can complete any assignment is 2 hrs (for assignment IV). From this point let us try to minimize the time taken by the other four. This can be done when we assume that Super Subbu does assignment II, Lazy Laxman completes assignment V, Morose Mary completes assignment I and cunning Chetan does assignment III.

∴ Minimum time required is 2 hours.

Total time spent by all five is 2 + 1.5 + 1.5 + 1.5 + 2

= 8.5 hours.

Hence, total time spent by all students together is 8.5 hours.

Choice (B)

Solutions for questions 24 to 26:

Let the person who played the highest number of matches, the player who played the scored highest number of matches and so on be denoted by T_1 , T_2 , and so on up to T_{60}

24. T_1 to T_{27} scored more than or equal to 11000 runs.

T_{12} to T_{60} made 63 centuries or less.

∴ T_{13} to T_{60} definitely made less than 63 centuries.

∴ depending on whether T_{27} scored exactly 11,000 runs or more than that and whether T_{12} made exactly 63 centuries or less than that, we will get different values for the required number of players.

Choice (D)

25. T_{37} to T_{60} played less than or equal to 260 matches.

∴ T_{38} to T_{60} definitely played less than 260 matches.

T_1 to T_{45} scored more than or equal to 8000 runs.

For the required value to be the least,

T_{37} should play exactly 260 matches and T_{45} should score exactly 8000 runs.

∴ T_{38} to T_{44} i.e., 7 players played less than 260 matches and scored more than 8000 runs.

Choice (A)

26. T_1 to T_{24} played more than 300 matches.

T_1 to T_{21} scored more than or equal to 12,000 runs.

T_{16} to T_{60} made not more than 58 centuries.

6 players i.e., T_{16} to T_{21} played more than 300 matches, scored at least 12000 runs and made not more than 58 centuries.

Choice (B)

Solutions for questions 27 and 28:

27. As the name is available for all the persons i.e. 100%, the least number of doctors for whom the name, phone number and address are available happens when the number of doctors for whom the address and phone numbers are available is the minimum, i.e. (60 + 65) – 100 = 25%, i.e. 15,000

Choice (A)

28. The number of mechanical engineers for whom exactly four of the six details was available can be zero, as the total data available is on an average 4.9 items per person (100 + 85 + 70 + 95 + 60 + 80 = 490) and it can be due to a majority of them having exactly five of their details available and for the others on, two or three of the six details being available.

Choice (D)

Solutions for questions 29 and 30:

29. The projected per capita rice consumption in the different countries in 2009 is

$$P - 110(1.06)^2 = 123.6$$

$$Q - 140(1.04)^2 = 151.4$$

$$R - 120(1.05)^2 = 132.3$$

$$S - 100(1.08)^2 = 116.6$$

$$T - 130(1.05)^2 = 143.3$$

$$U - 160(1.02)^2 = 166.5$$

$$\text{Average} = \frac{834}{6} = 139$$

Instead of performing exact calculations, one can approximate as shown below.

$$(1.06)^2 = (1 + 0.06)^2 \approx 1 + 2 \times 0.06 = 1.12$$

Similarly, $(1.04)^2 \approx 1.08$ and so on.

Choice (B)

30. The approximate population of each country in 2008 would be

$$P - 120(1.03) = 123.6$$

$$Q - 300(1.05) = 315.0$$

$$R - 450(1.02) = 459.0$$

$$S - 600(1.01) = 606.0$$

$$T - 180(1.02) = 183.6$$

$$U - 360(1.01) = 363.6$$

$$\text{Total} = 2050.8$$

Choice (D)

Difficulty level wise summary - Section I	
Level of Difficulty	Questions
Very Easy	–
Easy	12, 30
Medium	1, 2, 3, 5, 7, 8, 9, 10, 13, 15, 17, 18, 19, 20, 21, 27, 28, 29
Difficult	4, 11, 14, 16, 22, 23, 24, 25, 26
Very Difficult	6

SECTION – II

Solutions for questions 1 to 3:

1. The conclusion of the argument relates to the impact on society, not just on the individual. If road accidents occur due to drunken driving, alcohol is no less harmful than smoking. (B) is the correct choice.
(C) is outside the purview of the argument. (A) and (D) do not bring out the comparative harm done by alcohol consumption and smoking.

Choice (B)

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2. If it is impossible to read from a speeding vehicle, there is no point in having billboards. Choice (D) is correct.
(A) cannot explain the paradox adequately. (B) is all the more a reason why there should be more billboards. As the comparison is only among different highways (C) is not relevant. Choice (D)
3. (A) is not relevant as a business deal may have more than 2 parties. (B) is necessary if the recommendation is to be made. (C) contradicts the intent of the statements. (D) is outside the purview of the argument. Choice (B)

Solutions for questions 4 to 6:

Number of words and Explanatory notes for RC:

Number of words : 192

4. The poet's thoughts on the brook, his 'immortal force', when paraphrased, would correspond to – How should this be dealt with, now that it is no longer needed? Blocking it at its source would only force its flow down into the ground, where it would exist and run as a subterranean flow. But if dealt with in this manner, wouldn't its suppressed existence cause us bother (keep us from both work and sleep)? These ideas are best expressed in statement C. Choice (C)
5. We understand from the poem that the city has been built over various features of the countryside. The brook (attributed with life and strength) was doing no harm, flowing on its way, out in the open, without fear. That, if anything, was its fault, causing it to be suppressed. If it had remained subterranean, hiding, humble, the city builders would have let it be. While B and D both point in this direction, B is more accurate in the context of the poem in the use of the word 'apparently'. It is clear from the poem that the suppressed brook may have the potential to disturb the city built over it. Choice (B)
6. We understand from the poem that the meadows are built over, the apple orchards erased, and the brook suppressed. As explained for Q.4, the poet expects that the awareness, of the continued existence of the suppressed, would rattle. Choice (D)

Solutions for questions 7 to 9:

7. The paragraph clearly relates the past to the present through food: a food preference that has not changed over thousands of years; food as a reason for political conflict; food as a connection to our evolutionary ancestors. Sentence B closes the paragraph appropriately by summing up with the thought that food can help us understand our past and our present. Sentence A looks at the idea of evolution (progressive biological, or even social, transformation) and not the juxtaposition of the past and present. Sentence C brings in the idea of relationships (whether with people or with food), which is not the context of the para. Sentence D brings in the idea of eating habits, whereas the para is about the food we eat. Choice (B)
8. The paragraph presents the effectiveness of fortresses in enabling the defenders avoid battle. Sentence C closes the para effectively, by indicating that the effectiveness placed them in a position of security. Sentence A brings in the thought of how this effectiveness could be rendered irrelevant – this would be the start of a new para. Sentence B brings in an unrelated idea of when the fortresses could be built. Sentence D looks at another era altogether. This too, can only be the idea in another para. Choice (C)
9. The paragraph presents the idea that, with all physical parameters tending to uniformity, it is the human elements that now make the difference in battle. This is the author's understanding and could progress to a reason, or to an outcome. Statement A presents a reason for the

prevalence or otherwise of the human element. Statements B and C amount to repetitions of the thoughts in the lines "... the better trained, led and motivated ... etc. have become important determinants..." Statement D speaks of armies that are not matched at some point, whereas the para leads up to those that are matched. Thus, Statement A is appropriate. Choice (A)

Solutions for questions 10 to 12:

Number of words and Explanatory notes for RC:

Number of words : 287

10. Refer to the first para where the words occur. The sentence follows the author's observation that 'movies and games have become.....intertwined'. Choice (D) carries the word, 'overlap' one of the meanings of which is 'to coincide in part'. Hence Choice (D)
11. Statement (a) is incorrect, not backed by the passage. Statement (b) is true – para 1 refer to the sentence- 'Animators, artists and for films.' Statement (c) is incorrect, para 1 penultimate sentence says, '.... games sales.....now exceed movie box-office revenues.' Statement (d) is true, refer to the second para. Choice (A)
12. Choice A is ruled out since impact has nowhere been discussed. Choice B is incorrect as the tone is not of warning. Choice C is supported by para 1 and choice D is ruled out since the passage does not point to movies and games helping each other. Choice (C)

Solutions for questions 13 to 15:

13. Statement 2 has no error. Statement 1 is wrong in the use of 'discomforts'. There is only one situation being referred to – of taking strands of hair off the lips. The singular 'discomfort' is needed. Statement 3 is wrong – hair would be chopped 'off' not 'away'. Statement 4 is wrong in the placement of "only" - the sentence should read "...what can only be described as...". Statement 5 is wrong in the use of the comma after crisis - there should be a colon, because the following question presents the crisis.
The corrected text would read as follows: Every so often, I feel the need to grow my hair, to bear the discomfort of picking strands off my lips, and to force them into the imprisonment of a pony tail. Once I reach the pony tail stage, however, I realise that I just want the hair off my face and it's easiest to achieve that when there is none. So I unsheathe the scissors and chop it all off. In the initial hours thereafter, I'm ecstatic: I feel freer, taller, and thinner. Then comes what can only be described as an existential crisis; who is a woman who has no hair? Then follows panic: where's my lip gloss? Choice (D)
14. Statements 3 and 4 have no errors. Statement 1 is inappropriate in the use of 'to' after 'opposite'. The phrase "... opposite each other..." would suffice. Statement 2 is inappropriate – 'that' is required after 'realised'. Statement 5 is inappropriate in the use of 'them' – the men looked at the floor, not at the sounds.
The corrected text would read as follows: They took places opposite each other at the table under the light, but George did not shuffle the cards. He rippled the edge of the deck nervously, and, when he realised that the snapping noise drew the eyes of all the men in the room, he stopped doing it. Silence fell on the room again and, as the minutes passed, the players sat still, staring at the ceiling. Slim looked around for a moment and then looked down at his hands, subduing one hand with the other. There came little gnawing sounds from under the floor and all the men looked down towards it gratefully. Only Candy continued to stare at the ceiling. Choice (B)
15. Statements 1, 2 and 4 have no errors. In Statement 3, the placement of 'so' causes distortion in the idea. It is clear from the text that, in shining, we cause others to shine as well. This thought would require the 'so' in this statement to

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be placed after 'shrinking'. In Statement 5 also, the very same thought would require removal of 'so' before 'our presence'.

The corrected text would read as follows: Our deepest fear is not that we are inadequate but that we are powerful beyond measure; it is our light, not our darkness that frightens us most often. We ask ourselves how we can be brilliant or talented. Actually, why not? We are children of God. There is nothing enlightened about shrinking so that other people won't feel insecure around us. We are all meant to shine, as children do, and to make manifest the glory of God that is within us. As we let our own light shine, we unconsciously give other people permission to do the same. As we are liberated from our own fear, our presence automatically liberates others. Choice (C)

Solutions for questions 16 to 20:

Number of words and Explanatory notes for RC:

Number of words : 271

16. This question refers to the line "for some people it is all about nutritionessentially about cuisine". Statement 1 – Appropriate. It can be inferred from the context that 'frivolity' denotes 'in its lighter aspects' ie. 'for pleasure'. (This thought is represented in the last line of the passage as well). Thus, for some people it would be the object of appreciation.

Statement 2 – Inappropriate. The words 'less anxious' refer to the way food is to be considered, and not to any anxiety that food itself generates.

Statement 3 – Appropriate. Since frivolity could be condemned, it would mean that some think that food should be looked at with seriousness.

Statement 4 – Appropriate. The first portion of the line referred to clearly indicates that some look at it as related to health.

Answer: 1, 3 and 4.

Choice (C)

17. This refers to the second half of same line referred to in question 16.

Statements 1 and 2 – Appropriate – since these people are less anxious about condemnation, we understand that they don't mind if people know, and they're not worried about it.

Statement 3 – Appropriate – these people may think 'essentially' (or mainly) about cuisine, but not 'only'. This means that there may be space in their thoughts for other aspects, but not with the same degree of interest.

Statement 4 – Inappropriate – the interest referred to is in food. There is no indication of concern, or the lack of it, for people.

Answer: 1, 2 and 3.

Choice (A)

18. Economic historians see food only as a commodity. Social historians see differentiation and class relations. Cultural historians see identities and groups. Political historians see relationships of subordination (the word tributary is used here in its primary meaning - paying tribute to another to acknowledge submission, to obtain protection, or to purchase peace). Thus the ones who look at distinctions between people are in Statement B.

Choice (B)

19. Economic historians see food as a commodity to be produced and traded, but they are not interested in its consumption. Thus the appropriate statement is B.

Choice (B)

20. As explained for question 18, the word tributary is used here in its primary meaning - paying tribute to another to acknowledge submission, to obtain protection, or to purchase peace. This is evident from the subsequent phrase "the heart of power". Thus statement D is appropriate.

Choice (D)

Solutions for questions 21 to 23:

It is given that in match 2, Sehwag scored a half century and that Dhoni scored four runs more than Gambhir in the three matches combined. There are two possible cases.

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Case 1: Player 1 – Sehwag, Player 2 – Dhoni, Player 3 – Gambhir and Player 4 – Rohit.

Case 2: Player 1 – Dhoni, Player 2 – Sehwag, Player 3 – Rohit and Player 4 – Gambhir.

21. If statement 1 is true, Rohit is player 4, in which case it is the first arrangement which is valid. According to case 1, Rohit scored a total of 151 runs, while Gambhir scored 128 runs and so statement 2 is not true and it is true only in case – 2. ∴ Exactly one of the statements is true and if statement 1 is true, then statement 2 is false and vice versa. Choice (D)

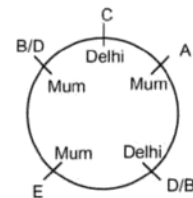
22. If statement 1 is true, case – 2 is valid and in this case, Dhoni who scored 155 runs would have scored the highest among all the four players. If statement 1 is false, then statement 2 is also false. Choice (A)

23. If Rohit had his lowest score in match 3, then the second arrangement is valid. In this case, Sehwag would be player 2 and only choice (3) is true. Choice (C)

Solutions for questions 24 and 25:

24. From (i), (iii) and the information given in the question, We can conclude that A and C cannot be adjacent to E. Hence, B and D must be adjacent to E.

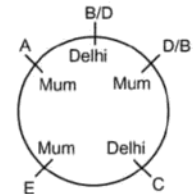
∴ The arrangement will be as follows.



Here, (i), (ii) and (iii) are true.

Choice (D)

25. Here A and C are adjacent to E. Hence, the arrangement is as follows.



C is definitely from Delhi.

Choice (B)

Solutions for questions 26 and 27:

The following table gives the data regarding the number of treadmills in operation at the end of years 2001 through 2007.

2001	2002	2003	2004	2005	2006	2007
X	2x	$3x - \frac{kx}{100}$	$4x - \frac{2kx}{100}$	$5x - \frac{3kx}{100}$	$6x - \frac{4kx}{100}$	$7x - \frac{5kx}{100}$

26. The given information can be represented as

	Boys		Girls	
	Science	Commerce	Science	Commerce
Year 1			120	
Year 2			60	

From statement A, as 300 boys study commerce in year II, the remaining students are $480 - (180 + 300) = 0$.

∴ No student study commerce in year I.

Statement A alone is sufficient.

From statement B, as the number of students in year II is 360 and the number of girls studying Science in year I is 120, the number of girls studying commerce in year II is 0. Statement B alone is sufficient. Choice (B)

27. From statement A alone we cannot determine the number of boys studying science the same is the case with statement B alone.
Using both the statements 240 students study commerce, 180 girls study science and so the remaining $480 - (240 + 180) = 60$ boys study science. Choice (C)

Solutions for questions 28 to 30:

The given information can be represented as follows:

	Kerala	Tamil Nadu	Karnataka	Andhra Pradesh	Total
Kho-kho	0	1	1	1	3
Kabbadi			1	1	6
Football			2	1	6
Handball			1	1	6
Total	4	8	5	4	

28. All values except the number of teams participating in handball from Tamil Nadu can be determined with the given information. Choice (B)
29. If the number of teams participating in football from Tamil Nadu was only one, the number of teams participating in kabbadi and handball from that state must be three each. In this case, the number of teams participating in kabbadi and handball from Kerala have to be one each.
 \therefore All the three given statements are true. Choice (D)
30. The total number of teams participating in handball from Tamil Nadu must be at least two and at most three. Choice (D)

Difficulty level wise summary - Section II	
Level of Difficulty	Questions
Very Easy	–
Easy	1, 2, 3, 26, 27, 28
Medium	10, 11, 21, 22, 23, 24, 25, 29, 30
Difficult	4, 12, 17, 18, 19
Very Difficult	5, 6, 7, 8, 9, 13, 14, 15, 16, 20