

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 three sections with 70 questions – 20, 30, and 20 respectively in the first, second and third sections. The TOTAL TIME available for the paper is **135 minutes**. The student may apportion this time among various sections as he/she wishes. However, the student is expected to show his/her competence in all the three sections.
3. All questions carry three marks each. Each wrong answer will attract a penalty of one mark.

SECTION – I
Number of Questions = 20

DIRECTIONS for question 1: Each question is followed by two statements, I and II, giving certain data. You have to decide whether the information provided in the statements is sufficient for answering the question.

- Choose 1 if the question can be answered by using statement I alone, but cannot be answered by statement II alone.
 Choose 2 if the question can be answered by using statement II alone, but cannot be answered by using statement I alone.
 Choose 3 if the question can be answered by using either statement alone.
 Choose 4 if the question can be answered by using both the statements together, but cannot be answered by using any one statement alone.

1. Any student who can crack the CAT can also ace the ACT. If there are 42 students in the class, how many of them can ace the ACT but not crack the CAT?
 - I. 23 students in the class can ace the ACT.
 - II. The number of students in the class who can either crack the CAT or cannot ace the ACT is 35.

DIRECTIONS for questions 2 to 5: Answer the questions on the basis of the information given below.

Eight county teams – Kent, Essex, Somerset, Durham, Hampshire, Yorkshire, Derbyshire and Lancashire participated in a Twenty20 tournament held in London. In the first round, these eight teams were divided into two groups of four teams each. Each team has to play two matches against each of the other teams in its group. The teams with the highest and the second highest number of wins in both the groups will move to the next round, i.e., semi-finals. It is known that, Essex, Yorkshire, Lancashire and Derbyshire reached the semi-finals.

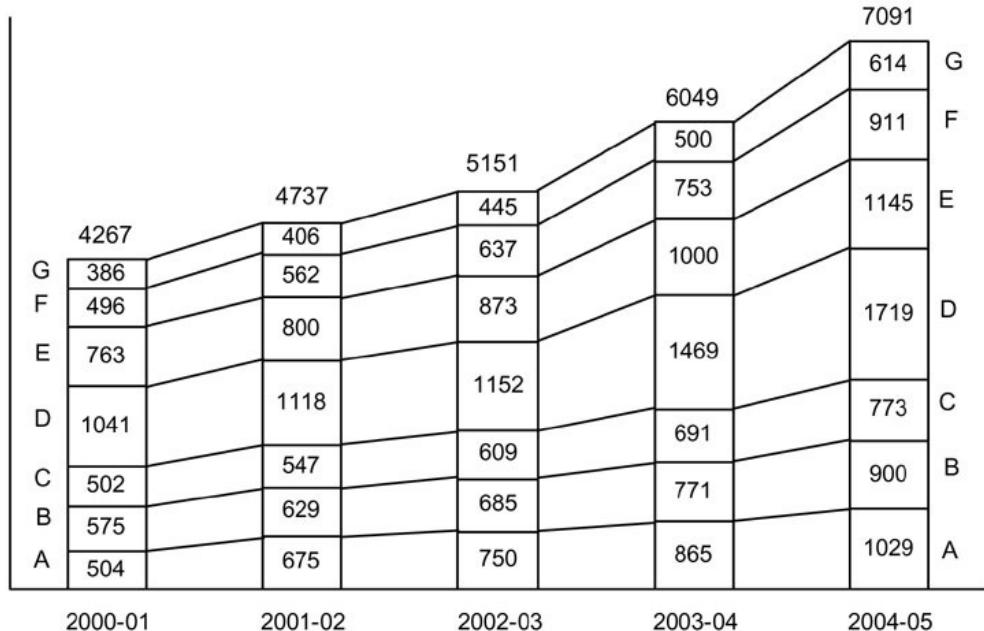
It is also known that, in the first round

- (i) No match ended in a tie and in each of the groups, each of the four teams won a different number of matches.

- (ii) Yorkshire lost both its matches against Derbyshire.
 - (iii) Kent won the same number of matches that by Lancashire.
 - (iv) In its group, Somerset lost both of its matches against all the other teams, except Durham, which, in turn, won at least one match against each of the other teams, except one.
2. Which team won the highest number of matches in the first round?
 - (1) Yorkshire
 - (2) Derbyshire
 - (3) Essex
 - (4) Cannot be determined
 3. Which team won the least number of matches in the first round?
 - (1) Hampshire
 - (2) Somerset
 - (3) Durham
 - (4) Cannot be determined
 4. What was the total number of matches won by Durham in the first round?
 - (1) 4
 - (2) 3
 - (3) 2
 - (4) 1
 5. Which team/s lost at least one match against Kent in the first round?
 - (1) Only Hampshire
 - (2) Only Yorkshire
 - (3) Only Yorkshire and Hampshire
 - (4) Only Hampshire and Derbyshire

DIRECTIONS for questions 6 to 9: Answer these questions based on the chart given on the next page.

6. If for each year, the group companies are ranked in terms of the descending order of sales revenues, how many of the group companies do not change the ranking more than once over the five years?
 - (1) 1
 - (2) 4
 - (3) 3
 - (4) 5
7. Which of the following companies has changed its relative ranking most number of times when you rank the companies in terms of descending value of sales revenue each year?
 - (1) A
 - (2) F
 - (3) C
 - (4) E



The above chart indicates the sales revenue (Rupees in millions) of seven companies – A, B, C, D, E, F and G of an industrial group, for the years 2000 to 2005. The value given at the top of each bar represents the total revenue of the group in that year.

8. Identify the company whose sales revenue increased exactly by the same amount in two successive pairs of years?
 (1) C (2) G (3) F (4) E

9. Which of the following companies has been maintaining a constant rank over the years in terms of its contribution to total revenues of the group?
 (1) A (2) C (3) E (4) F

DIRECTIONS for questions 10 to 12: Answer the questions on the basis of the information given below.

Eight members – Amit, Chaitanya, Dheeraj, Gayatri, Jeevan, Laxman, Mani and Naveen – of a family stay in a certain house. It is also known that,

- (i) these eight persons belong to exactly three generations.
- (ii) Gayatri's son is the nephew of each of Mani's sons.
- (iii) Laxman is Dheeraj's nephew and only one of Dheeraj's parents stays in the house.
- (iv) Amit, Jeevan and Dheeraj are siblings. Also, Laxman and Chaitanya are siblings.
- (v) Naveen is the father of Chaitanya.

10. How is Naveen related to Mani?
 (1) Son-in-law (2) Son
 (3) Nephew (4) None of these

11. Who among the following belongs to the same generation as Mani?
 (1) Amit (2) Chaitanya
 (3) Gayatri (4) None of these

12. Who are the children of Gayatri?
 (1) Laxman and Chaitanya
 (2) Amit, Jeevan and Deeraj
 (3) Only Naveen
 (4) Cannot be determined

DIRECTIONS for question 13: Each question is followed by two statements, I and II, giving certain data. You have to decide whether the information provided in the statements is sufficient for answering the question.

- Choose 1 if the question can be answered by using statement I alone, but cannot be answered by statement II alone.
 Choose 2 if the question can be answered by using statement II alone, but cannot be answered by using statement I alone.
 Choose 3 if the question can be answered by using either statement alone.
 Choose 4 if the question can be answered by using both the statements together, but cannot be answered by using any one statement alone.

13. Is the perimeter of the rectangle more than 29 cm?
 I. The diagonal of the rectangle is more than 12 cm.
 II. The diagonal of the rectangle is less than 10 cm.

DIRECTIONS for question 14: Each question is followed by two statements, I and II, giving certain data. You have to decide whether the information provided in the statements is sufficient for answering the question.

- Choose 1 if the question can be answered by using one of the statements alone, but cannot be answered by using the other statement alone.
 Choose 2 if the question can be answered by using either statement alone.
 Choose 3 if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.
 Choose 4 if the question cannot be answered even by using both the statements together.

14. Among Gita, Sita and Rita, two are twins of the same age and the third is of a different age. Is Sita older than Rita?
 I. Gita is older than Rita.
 II. Gita is older than Sita.

DIRECTIONS for questions 15 and 16: Answer the questions on the basis of the information given below.

Ramu and Somu are the two best students in a class and one of them was to be given a scholarship based on

their performance in three tests. As the mark lists were not available, the teacher had to compare their marks with the following information, which Ramu and Somu remembered about their performances in the tests:

- (i) The total score of Somu in the first two tests was the same as that of Ramu.
 - (ii) The score of Somu in the third test was half of his score in the first test.
 - (iii) The score of Ramu in the third test was 30 less than that of Somu in the first test.
 - (iv) In the second test, Ramu scored 40 less than that in the first test, in which Somu scored 104, which, in turn, was the average score of Ramu in the three tests.

15. The total score of Somu in the three tests is
(1) 260 (2) 250 (3) 275 (4) 290

16. The difference between the highest score of Ramu and the least score of Somu is
(1) 79 (2) 67 (3) 66 (4) 100

DIRECTIONS for questions 17 to 20: Answer the questions on the basis of the information given below.

All the production from the six factories – P, Q, R, S, T and U – of the company ABC Ispat Ltd. is first transported to the company's six storage units – A, B, C, D, E and F – and then it is transported to the company's six dealers – G, H, I, J, K and L. Table - I gives the distances (in km) between different factories and storage units and Table - II gives the distances (in km) between different storage units and dealers.

Table - I

Storage unit	Factory					
	P	Q	R	S	T	U
A	168	1042	872	891	752	502
B	1385	187	856	981	562	812
C	305	967	1753	474	157	1927
D	685	1537	1710	711	385	102
E	579	689	1089	211	798	586
F	1347	785	111	1523	813	830

SECTION – II
Number of Questions = 30

DIRECTIONS for questions 21 to 25: Read the following passage and answer the questions that follow it.

Digital media have made creating and disseminating text, sound, and images cheap, easy and global. The bulk of publicly available media is now created by people who understand little of the professional standards and practices for media.

Instead, these amateurs produce endless streams of mediocrity, eroding cultural norms about quality and acceptability, and leading to increasingly alarmed predictions of incipient chaos and intellectual collapse.

But of course, that's what always happens. Every increase in freedom to create or consume media, from paperback books to YouTube, alarms people accustomed to the restrictions of the old system, convincing them that the new media will make young people stupid. This fear dates back to at least the invention of movable type.

As Gutenberg's press spread through Europe, the Bible was translated into local languages, enabling direct encounters with the text; this was accompanied by a flood of contemporary literature, most of it mediocre. Vulgar versions of the Bible and distracting secular writings fuelled religious unrest and civic confusion, leading to claims that the printing press, if not controlled, would lead to chaos and the dismemberment of European intellectual life.

These claims were, of course, correct. Print fuelled the Protestant Reformation, which did indeed destroy the Church's pan-European hold on intellectual life. What the 16th century foes of print didn't imagine—couldn't imagine—was what followed: We built new norms around newly abundant and contemporary literature. Novels, newspapers, scientific journals, the separation of fiction and non-fiction, all of these innovations were created during the collapse of the scribal system, and all had the effect of increasing, rather than decreasing, the intellectual range and output of society.

Table – II

Dealer	Storage Unit					
	A	B	C	D	E	F
G	265	56	371	189	485	265
H	471	583	139	72	211	189
I	52	171	345	781	505	352
J	402	680	412	272	621	89
K	239	187	123	367	511	267
L	385	365	582	289	77	685

Note: The cost of transportation per tonne of steel, from factory to storage unit (or) storage unit to dealer, depends only on the distance between the places and is Rs.35 per km.

To take a famous example, the essential insight of the scientific revolution was peer review, the idea that science was a collaborative effort that included the feedback and participation of others. Peer review was a cultural institution that took the printing press for granted as a means of distributing research quickly and widely, but added the kind of cultural constraints that made it valuable.

We are living through a similar explosion of publishing capability today, where digital media link over a billion people into the same network. This linking together in turn lets us tap our cognitive surplus, the trillion hours a year of free time the educated population of the planet has to spend doing things they care about. In the 20th century, the bulk of that time was spent watching television, but our cognitive surplus is so enormous that diverting even a tiny fraction of time from consumption to participation can create enormous positive effects.

Wikipedia took the idea of peer review and applied it to volunteers on a global scale, becoming the most important English reference work in less than 10 years. Yet the cumulative time devoted to creating Wikipedia, something like 100 million hours of human thought, is expended by Americans every weekend, just watching ads. It only takes a fractional shift in the direction of participation to create remarkable new educational resources.

Similarly, open source software, created without managerial control of the workers or ownership of the product, has been critical to the spread of the web. Searches for everything from supernovae to prime numbers now happen as giant, distributed efforts. Ushahidi, the Kenyan crisis mapping tool invented in 2008, now aggregates citizen reports about crises the world over. PatientsLikeMe, a website designed to accelerate medical research by getting patients to publicly share their health information, has assembled a larger group of sufferers of Lou Gehrig's disease than any pharmaceutical agency in history, by appealing to the shared sense of seeking medical progress.

Of course, not everything people care about is a high-minded project. Whenever media become more abundant, average quality falls quickly, while new institutional models for quality arise slowly. Today we have The World's Funniest Home Videos running 24/7 on YouTube, while the potentially world-changing uses of cognitive surplus are still early and special cases.

That always happens too. In the history of print, we got erotic novels 100 years before we got scientific journals, and complaints about distraction have been rampant; no less a beneficiary of the printing press than Martin Luther complained, "The multitude of books is a great evil. There is no measure of limit to this fever for writing." Edgar Allan Poe, writing during another surge in publishing, concluded, "The enormous multiplication of books in every branch of knowledge is one of the greatest evils of this age; since it presents one of the most serious obstacles to the acquisition of correct information."

The response to distraction, then as now, was social structure. Reading is an unnatural act; we are no more evolved to read books than we are to use computers. Literate societies become literate by investing extraordinary resources, every year, training children to read. Now it's our turn to figure out what response we need to shape our use of digital tools.

21. The parallel drawn between the information explosion on the net and the same on the press a century or so ago includes all of the following EXCEPT:
 - (1) Both gave people a greater freedom to acquire and disseminate information widely.
 - (2) People used to the restrictions of traditional ways felt threatened by the freedom offered by the new medium.
 - (3) Both were/are feared as negative influences on the young.
 - (4) In both cases, cultural norms have helped in increasing the quantity and scope of intellectual output in society.
22. 'Cognitive surplus', as used in the passage, refers to
 - (1) excess of information available on the net.
 - (2) the free time of educated people put to productive use.
 - (3) making the best use of the information accessible through the net.
 - (4) the cumulative time spent watching ads on T.V.
23. When the author says, 'These claims were, of course, correct', he suggests that
 - (1) the claims turned out to be true precisely as expected by the predictors.
24. The emergence of Wikipedia stands testimony to
 - (1) the ability of the new medium to influence those who access it.
 - (2) the potential of the new medium to shape the youth.
 - (3) the ability of a cultural institution to shape the content in the new medium.
 - (4) the ability of a high minded project to overshadow what is below average.
25. What does 'that' stand for in the sentence 'that always happens too'?
 - (1) Proliferation of poor quality stuff.
 - (2) Development of high minded stuff.
 - (3) Popularity of a new medium.
 - (4) Suspicion of anything new.

DIRECTIONS for questions 26 to 30: Read the following passage and answer the questions that follow it.

Before we discuss the subject of moral authority, we need to say something of a more general nature about authority. The term is used in at least two distinct, though related, senses. First, there is authority of a purely theoretical kind. If we want to know something about the Corn Laws in nineteenth century Britain, we are likely to consult a historian whom we

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think of as an authority in the field. Doubtless he or she will not have the last word – there may be other authorities with a different perspective on the matter. But at least we are more likely to find out reliable information by consulting an authority in the area, than by asking anyone else. In this sense, then, an authority is an expert, someone who is usually a reliable source of information. But there is a different meaning of the word, brought out well in the distinction between "being an authority" and "being in authority". The historian is an authority, but an army drill sergeant is in authority (however nonsensical the procedures that placed him in this position). To be in authority entails having the right to obedience, at least in certain specific circumstances. It is different from power, which is simply the ability to enforce your wishes regardless of your right to do so. At the same time, the position of being in authority does not necessarily bring with it wisdom, justice or any particular expertise. A foolish person may be in authority over others, through being placed in that position by some agreed procedure, for instance, by being put there ("Authorized") by somebody already in authority. Whether the authority he claims is genuine usually depends more on the legitimacy of the procedures which put him in this role than on his own personal qualities.

One who is in authority, then, has a legitimate claim to the obedience of others in some particular context. It is perhaps this idea of having a claim to others' compliance that explains the revulsion some people feel to the idea of moral authority. In fact, it is better to construe the idea of moral authority in the way mentioned first rather than the second. To speak of moral authority is really to speak of individuals whose moral guidance may reliably be sought. This does not mean your compliance is a duty owed to them. To see this point, it is useful to distinguish two ways in which the guidance of authority may be said to oblige you to act in a particular way.

When people demand reasons why they should act in some particular way, they may be met with the impatient riposte "Because x says so". But this conceals an important contrast between two ways in which the utterance of x is relevant to what should be done. In one, simple way, the obligation to perform some action is created by the utterance of the supposed authority. The reason for acting is just the fact that x has told you to do so; if he had not, that reason would not exist. But there is another, more subtle and acceptable way in which listening to an authority makes one aware of an obligation. Perhaps there is, quite independently of the fact that x issues such guidance, a reason why this course of action should be followed. Such a reason would exist whether or not x told you to act in that way. At the same time, perhaps you would not be aware of such a reason unless x had told you about it. To speak of x being an authority, in this case, is only to say that he is a reliable guide as to what you are morally obliged to do. It is not the fact that he urges the action that makes it obligatory; on the contrary, he urges it because it is already obligatory.

The authority in question, then, is an authority rather than someone in authority. This is not to deny that those who seek his guidance are morally obliged to do as he says. The point is that compliance is not a duty they owe to him. He has only pointed out an obligation which existed anyway.

26. It can be understood from the passage that a moral authority is

 - an expert on matters pertaining to morality and should be obeyed.
 - in authority by virtue of the high moral principles he holds.
 - a reliable guide who prescribes a certain path we must follow on moral issues.
 - one who makes us aware of our moral obligations.

27. All of the following fit the definition of 'an authority' as provided in the passage EXCEPT:

 - A scientist
 - A savant
 - Spiritual teacher
 - Head of state

28. According to the passage, people do not like the idea of moral authority because

 - they feel that morals are relative.
 - they are of the view that no person is competent on the subject.
 - they do not take kindly to the suggestion that a moral authority can demand obedience.
 - they feel it is easier for anyone to preach than to practise what they say.

29. The passage suggests that those who are in authority

 - owe their position to those in power.
 - occupy that place due to set norms or systemic patterns.
 - enforce their wishes on others.
 - are not known for their intelligence.

30. In this passage, the author primarily

 - draws a distinction between being in authority and being an authority.
 - explains the relationship between being in power, being in authority and being an authority.
 - discusses how the concept of moral authority can be made more acceptable.
 - clears the misconception regarding the idea of moral authority.

DIRECTIONS for questions 31 to 35: Read the following passage and answer the questions that follow it.

I have been writing about it for years. But it's only now, when I'm caught in the middle of it, that the full force of this injustice hits me. Like everyone else here I feel powerless, unstrung as I watch disaster unfold in slow motion.

I live in the last small corner of Gaul still holding out against the Romans. In other words, a small market town (Machynlleth in mid-Wales) which has yet to be conquered by the superstores. No one expects us to hold out for much longer. Last month Tesco submitted an application to subjugate us. It wants to build a store of 27,000 square feet on the edge of the town centre. This is twice the size of all our grocery stores put together, and bigger than our tiny settlement

– 2100 souls – can support. Tesco will prosper here only if other shops close and customers come from miles away. Over 300 people – roughly one fifth of the adult population – have sent letters of objection. The cause against the store and the strength of local feeling is so strong here that if we can't beat Tesco, no one can. But, being deficient in magic potion, we have precious little chance of stopping it.

This town's tragedy has been precisely foretold. In 1998, the government commissioned a study of the impact of big stores on market towns. It found that when a large supermarket is built on the edge of the centre, other food shops lose between 13 and 50% of their trade. The result is "the closure of some town centre food retailers; increases in vacancy levels; and a general decline in the quality of the environment of the centre." Towns are hit especially hard where supermarkets "are disproportionately large compared with the size of the centre". In these cases the superstore becomes the new town centre, leaving the high street to shrivel.

If this monster is built, everything that is special, and precious and distinctive about this town – the quirky shops, the UK's oldest farmers' market, the busy community – falls under its shadow. Tesco will suck the marrow out of us.

The prospects for small shops were dim enough during the boom. As the supermarkets closed in, independent stores in the UK shut at the rate of 2,000 a year between 1997 and 2004. Now they're in much bigger trouble. A report by the Local Data Company at the end of July suggests that 12,000 independent shops have already closed in England and Wales this year. Tesco, by contrast, has been mopping up. In April, for the first time, its turnover exceeded £1bn a week.

But in seeking to oppose its application, we find ourselves fighting bound and gagged. Tesco launched its campaign with an exhibition and "consultation", which seemed to me to be wildly biased in favour of the development. I asked its PR man whether the consultation would be independently audited. The answer was no. Tesco announced that the great majority of residents were in favour of the store. A door-to-door survey by local people discovered the opposite, but I think you can guess which study made the headlines.

We waited, but we had no idea when Tesco would submit its application. Like all developers, it is not obliged to give prior notice. It submitted its plans to the county council on June 24th. The council didn't release them until July 14th. From Tesco's point of view, the timing was perfect. This was the week in which the county's schools broke up and many of its opponents were setting off on holiday. We had until July 31st to register our objections (we lost four days due to council fumbling). People are now returning from their holidays to discover that it's too late to object.

To compound the unfairness, there is no legal requirement for the developer to ensure that the claims it makes are accurate. Tesco's application is riddled with questionable statements. It maintains that the new store "will provide a minimum of 140 additional full and part time jobs" But the superstores' own research shows that every large outlet causes the net loss of 276 jobs. That's hardly surprising: independent shops employ five times as many people per unit of turnover. Tesco maintains that it will buy local produce "wherever possible". But when its representatives were challenged on this point, they said that local suppliers would have to sell their produce to the company as a whole. It would be trucked to the nearest distribution centre – now 120 miles away in Avonmouth – and then trucked back across Wales to Machynlleth. Incredibly, Tesco proposes that its new store will reduce the traffic on our congested roads. It appears to be relying on a radical misinterpretation of the evidence.

But the real issue is this: if the county council turns it down, Tesco can appeal. The cost to the council would be astronomical. As John Sweeney, leader of North Norfolk District Council observed, Tesco "are too big and powerful for us. If we try and deny them they will appeal, and we cannot afford to fight a planning appeal and lose. If they got costs it would bankrupt us." Hardly any local authority is prepared to take this risk. Tesco can keep appealing and resubmitting, using its vast funds until it gets what it wants. Objectors, by contrast, have no right of appeal. The inequality of arms means that we scarcely stand a chance.

Once the store is built, we will quickly be deprived of choice. As the first wave of customers peel off and the income of the independent stores declines, the quality and range of their produce falls, driving more people into Tesco's arms. From that point on, the collapse becomes unstoppable.

The question that occurs to me is this: why should people who don't live here be making this decision? Why do the planning laws not permit us to hold a referendum? I understand why decisions about essential services should not be made by the community alone. I know that rich villages try to shut out social housing and that local people campaign against hostels for the homeless and mental health units. But in this case we are not talking about essential services. We are talking – or so we are told – about choice. You can already buy all the food you need in this town, including (from the market stalls) much cheaper produce than the superstores sell. By voting against Tesco we would not be depriving anyone of the means of subsistence.

So why should we hand this decision to a remote and frightened county council? The choice should be ours and ours alone, and it should be final. If planning had worked like this, I'm sure that Britain would be a very different country, in which independent shops still thrived and communities still deserved the name. This might look like a battle over diversity and local character. Underneath it is a struggle for democracy.

31. What is the 'real issue', according to the author?
- (1) The inability of small stores to fight the large ones on equal terms.
 - (2) The ability of superstores to pump in money till they turn the corner.
 - (3) The ability of large stores to misinterpret evidence and get away with it.
 - (4) Financially the dice are loaded in favour of the superstores.

32. 'From Tesco's point of view the timing was perfect'. In what way?
 (1) The opening during vacation time attracted more people and ensured high footfall.
 (2) The release of the application when people were away on vacation ensured that there would be no objections.
 (3) The opening occurred at boom time thus helping the store to establish itself.
 (4) The opening during summer ensured greater business since the days are long.
33. What does the author suggest when he says that "Tesco would 'suck the marrow out of us'"?
 (1) It would destroy the business of all the small shopkeepers in the town.
 (2) It would make the production and distribution decisions of the town.
 (3) It would gradually destroy the unique features of the town.
 (4) It would influence the economic, political and social life of the people.
34. Why does the author feel that the struggle against the superstore is a struggle for democracy?
 (1) Because decision-making should be based on people's choices.
 (2) Because the superstore wants to offer conveniences to the people whether they want it or not.
 (3) Because the superstore wants to control the economy of the town indirectly.
 (4) Because the town wants to hold on to its decadent lifestyle.
35. The first three lines, in the context of the passage
 (1) are melodramatic.
 (2) give an inkling of the seriousness of the issue.
 (3) set the stage for the drama.
 (4) set an ominous tone.
- DIRECTIONS** for questions 36 to 39: Identify the incorrect sentence or sentences.
36. A. Tom Perkins, the legendary Silicon Valley venture capitalist had a dream.
 B. It wasn't to get rich, acquire power, or marry into fame.
 C. He'd done all that, as part of larger-than-life life.
 D. His firm, Kleiner Perkins Caufield and Byers, remains the most celebrated money machine since the Medicis.
 (1) A, B and D (2) Only C
 (3) B and C (4) Only B
37. A. Apart from the usual dryness and heat, there was danger lurking in the year.
 B. The Gulf of Aden is the favourite haunt of the dreaded Somali pirates.
 C. Four days earlier, M.V. Victoria, a vessel loaded with 10,000 tonnes of rice, had left the Gujarat port of Kandla, heading towards Jeddah.
 D. The ship was an easy prey for pirates as her board railings were rather low, more than three metres above water.
 (1) B and C (2) C and D
 (3) Only C (4) B, C and D
38. A. The sun hinted towards signs of retreating.
 B. Its golden rays gleamed across the water.
- C. The clock struck five and within minutes the splendour of the surroundings was concealed in a veil of darkness.
 D. A pathway hewn between a cluster of trees led us to a resort on which we had heard rave reviews.
 (1) Only C (2) A and B
 (3) B and D (4) A, B and D
39. A. On the other side of the wood, the fighters soared and looped in a bright blue sky.
 B. I was standing in a cornfield and thought of how, at another time, that sound would have sent me running out of terror for any cover I could find.
 C. But I was not in South Lebanon now, or Iraq or Afghanistan.
 D. When the French military jets, practising for an air show, eventually wheeled away, the song of a skylark rent the air.
 (1) B and C (2) B and D
 (3) A and D (4) C and D

DIRECTIONS for questions 40 to 43: In each of the following questions, the word at the top is used in four different ways, numbered 1 to 4. Choose the option in which the usage of the word is INCORRECT or INAPPROPRIATE.

40. HARD
 (1) The new director is giving all his subordinates a hard time at work.
 (2) If you don't listen to my advice, you will learn things the hardway.
 (3) The teachers were advised not to be too hard with the new students.
 (4) It was raining hard the whole of yesterday.
41. STORE
 (1) None can predict accurately what the future holds in store.
 (2) My neighbourhood pharmacy stores not only medicines but also health food.
 (3) She sets great store on her singing skills and hopes to become an opera singer one day.
 (4) Most hibernating animals store up food for the winter months.
42. STRIKE
 (1) The employees threatened to go on strike if the management did not accede to their demands.
 (2) Being a very sociable person she can strike a conversation even with a complete stranger.
 (3) The modern woman knows how to strike a balance between home and work.
 (4) The two contiguous states managed to strike a deal on the sharing of river waters.
43. CUT
 (1) The salaries of most of the employees was cut by almost twenty percent, due to the recession.
 (2) Babies generally cut their first tooth when they are around six or seven months old.
 (3) She is not cut out to be a nurse, she lacks the patience which the profession demands.
 (4) His officious behaviour is becoming increasingly unbearable, I wish someone could cut him to size.

DIRECTIONS for questions 44 to 46: Each of the following questions has seven sentences which are jumbled up and given. Each sentence is labelled with a letter. Of the seven sentences only four sentences can make a logically coherent paragraph. Choose the option which has a logical order.

44. A. The Union Ministry of Environment and Forests must be commended for recognising, and acting on, the fast-spreading crisis that threatened the future of three species – the oriental white-backed, slender-billed and long-billed vultures.
B. The challenge before conservationists now is to create 'safe zones' in areas where both rare population and captive-bred birds can survive.
C. The action plan it formulated and adopted four years ago for their protection has begun to deliver.
D. The successful captive breeding of vultures belonging to three critically endangered species in the flagship conservation centre at Pinjore in Haryana could be a turning point in the struggle to save these birds from extinction in the subcontinent.
E. Although they may not be the birds of heaven that cranes are to some, there is tremendous interest in watching these alert scavengers of nature in their natural setting.
F. For many years now, conservation organisations such as the Bombay Natural History Society and its international partner agencies have been working diligently to bring the carion feeders back from the brink.
G. Combined with a strong captive breeding programme, this should go a long way towards stopping the tragic decline in vulture numbers.
(1) DACB (2) DFAG (3) AEFG (4) DFAC
45. A. Obama tried to deliver some concrete results as well, to demonstrate his focus on Asia.
B. Though the Gulf of Mexico oil spill and the firing of General Stanley Mc Chrystal had distracted him before the summit, the President spent much of his time at the meeting with Asian leaders, including private sit-downs with the leaders of Japan, Indonesia, China, India and South Korea.
C. "You will note that five out of the six bilaterals mentioned are with Asia-Pacific countries", one senior administration official told reporters in a briefing about the G20 meeting.
D. While European leaders squabbled over the right kind of deficit reduction and whose country boasts the finest football side, Barack Obama used the recent G20 summit of leading economic powers in Toronto to make a different case: that the United States is dedicated to building a closer relationship with Asia.
E. In the early days of his administration, Barack Obama declared himself the first "Pacific President" and said he wanted to distinguish himself from George W. Bush by sending the message to the World's fastest-growing and most populous region that America is once again engaged in Asia.
F. After a year of suggesting the administration might just scuttle the US – South free-trade deal signed during the Bush administration, in late June Obama announced that the White House would push for its ratification, which would

create the most important American trade deal since the North American Free Trade Agreement was passed early in the Clinton administration.

- G. During the summit Obama also invited Chinese President Hu Jintao to Washington for a late visit, the kind of formal occasion Chinese leaders crave.
(1) EAFC (2) DBCG (3) FCAD (4) DBGC
46. A. The new symbol is also symbolic of India's new-found self-confidence.
B. Will the new symbol launch the rupee into another currency league?
C. The days of the good old INR (Indian rupees) will become a memory as the world starts using the new rupee symbol.
D. Some people think that the rupee will become a greatly preferred currency if it is allowed to be fully convertible.
E. Symbols are important, and the United Progressive Alliance government has done well to choose one for the rupee.
F. But for a single geographic and cultural entity with a more or less unified currency for a few thousand years, a decade or so won't matter much.
G. Of course, millions of computers all over the world will have to pick up the ASCII or American Standard Code for Information Interchange for the symbol and that could take time.
(1) EGCF (2) ECGF (3) EDFA (4) DCBE

DIRECTIONS for questions 47 and 48: Select the correct alternative.

47. Upcoming filmstar: My heart goes out to the poor and needy children who abound in our city. Now that I'm earning well, I'm always ready to contribute to community programmes that are directed towards food for the poor, whether at festival time or otherwise.
Investigative journalist: Are you sure it's not that your last film, in which you play a broker who arranges for underaged labourers, would be particularly damaging to your newfound public image, so important in your line of work?
The journalist's conclusion would be properly drawn if it were true that
(1) contribution to community programmes for poor children always draws attention and approval from the public.
(2) poor children are fed only with contributions from well-meaning donors.
(3) the artiste is known to look for, and accept, roles in films produced and directed by big names, even if the roles are small.
(4) the authorities have been highlighting, over the past 12 months, the fact that healthcare programmes for destitute children are the ones languishing for paucity of funds.

48. Advertisement: Attention pet owners! Ninety-eight percent of the ticks and fleas on the coat of your pet would die within minutes after you bathe her with Banzai! Shampoo. Banzai! will not, in any way, effect your pet's coat - no irritation to the skin or discolouration or loss of hair. So, the regular use of Banzai will contribute towards your pet's happiness, and keep her coat healthy.

Which one of the following is an assumption on which the argument depends?

- (1) The most effective way to control ticks and fleas on a pet is to kill them.
- (2) Ticks and fleas are not dependent only on animals, for their sustenance and development.
- (3) Ticks and fleas are the only pests that bother pets.
- (4) Coat condition, on pets, is impacted on only by ticks and fleas.

DIRECTIONS for questions 49 and 50: 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.

49. However loudly you protest, you still have to check your gun at the restaurant's door. Guards in tight jeans and tighter shirts patrol the entrance, toting that ubiquitous paraphernalia of authority here: a walkie-talkie. Even cavalier guests cast leery glances down the road for a car that could be rigged with a bomb. Antonie al Hage, capitalism's equivalent of a soldier of fortune, smiles at it all the danger, the risk and, of course, the payoff of bringing nightlife to Iraq.
- (1) A slew of new restaurants have opened in Baghdad this year, offering a respite for a city spectacularly bereft of nighttime destinations.
 - (2) "Where there's war," he said, "there's lots of money."

- (3) Baghdad these days seems to crave a respite from dreary years of curfews, when locales shut down before nightfall and streets were deserted by dark.
- (4) "Baghdad is changing," said Amir Razaq, drawing deep on a water pipe near the big screen TV – "It's really changed. Now if they would only form a government."

50. Carbon emission, carbon credits, sounds too big for every individual to think deeply and seriously about. But when we analyse reports and research about carbon emission and its ill effects, we definitely need to think twice. This may be our only chance that nature would confer upon us and we need to act quickly.

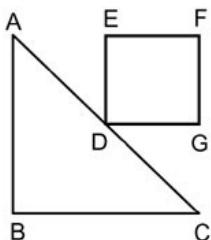
- (1) It makes us pause and think, 'how important is our concern about carbon emission?'
- (2) So any step big or small towards reduction of carbon emission would at this point of time be a boon to mankind.
- (3) Conventional lights are one of the major avenues whereby a huge amount of electrical energy can be saved and carbon emission caused due to this can subsequently be avoided.
- (4) If every individual can save even a negligible amount of carbon emission, or think twice before doing anything which pollutes the environment it would make a huge difference.

SECTION – III

Number of Questions = 20

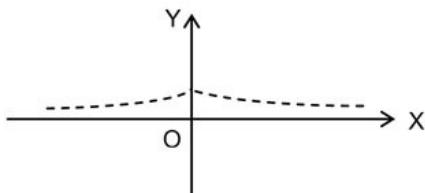
DIRECTIONS for questions 51 to 56: Answer the questions independently of each other.

51. The LCM of two numbers is 315. Which of the following cannot be sum of the numbers, given that their HCF is a prime number, greater than 3?
- (1) 322
 - (2) 98
 - (3) 320
 - (4) 216
52. In the figure below, ABC is a right-angled isosceles triangle, with $\angle B = 90^\circ$. If BD is the altitude to AC and DEFG is a square such that EF, when extended, would pass through A and FG, when extended, would pass through C, find the ratio of the perimeters of ABC and DEFG.



- (1) $\sqrt{2} + 2$
- (2) $2\sqrt{2} + 1$
- (3) $\frac{\sqrt{2} + 1}{\sqrt{2}}$
- (4) $\sqrt{2} + 1$

53. Which of the following functions corresponds to the graph shown below?



54. If in a class the number of students who passed in at most 0, 1, 2, 3, 4 and 5 subjects is 3, 7, 9, 14, 15 and 22 respectively, find the number of students who passed in at least 3 subjects.

- (1) 8
- (2) 13
- (3) 14
- (4) 15

55. If the equation $px^2 + qx + p = 0$, where $p > 0$, has positive roots, then which of the following must be true?

- (1) $q - 2p > 0$
- (2) $2p + q \geq 0$
- (3) $q - 2p < 0$
- (4) $p + q \geq 0$

56. Last week, four friends went, two at a time, and bought some toys for some children. Naresh and Bhagat together bought 5 toys, Anil and Preethi together bought 5 toys, Naresh and Anil together bought 4 toys and Bhagat and Preethi together bought 4 toys. They all met on Sunday and pooled the 18 toys. In how many ways can 8 of the 18 toys be selected such that for each selection, each of the four friends was involved in buying an equal number of toys?

- (1) 5626
- (2) 5625
- (3) 4626
- (4) 4824

DIRECTIONS for questions 57 and 58: Answer the questions on the basis of the information given below.

There is a circular track in a square playground. The centre of the track coincides with the centre of the square ground, and the diameter of the track equals the

length of the side of the ground, which is $4\sqrt{2}$ m. The track touches the sides of the square ground at the points A, B, C and D. Rakesh runs on the circular track and Ramesh along the perimeter of the square ground.

The ratio of their speeds is $11 : 14$. Take value of $\pi = \frac{22}{7}$.

57. If they start simultaneously from point A and run in the same direction, find the maximum distance between them at any point of time.

(1) 2.344 m (2) 2.272 m
(3) 5.656 m (4) 1.172 m

58. If they start simultaneously from point A and run in opposite directions, find the maximum distance between them at any point of time.

(1) 3.516 m (2) 5.656 m

DIRECTIONS for questions 59 to 70: Answer the questions independently of each other.

59. How many words can be written using all the letters of the word EDUCATION, such that only two of the vowels are together and none of the other vowels are together?
(1) 57600 (2) 115200 (3) 460800 (4) 508400

60. Eleven persons, P_1 , P_2 P_{11} , have m coins each. P_1 first distributes 1 coin to each of the remaining 10 persons. P_2 then takes 2 coins from each of the remaining 10 persons. Later, P_3 distributes 3 coins to each of the remaining 10 persons and this process continues until P_7 completes his turn. If P_7 is left with no coins after distributing coins to the remaining persons, find the total number of coins with the four persons P_8 , P_9 , P_{10} and P_{11} after P_7 completes his turn.
(1) 308 (2) 292 (3) 280 (4) 318

61. There are three cards on which the numbers 1 to 3 (one number on each card) are written and two cards on both of which the number 4 is written. Also there are three boxes of three different colours and two boxes of a fourth colour. In how many distinguishable ways can the five cards be placed in the five boxes, with exactly one card going into each box?
(1) 21 (2) 33 (3) 28 (4) 22

62. A mathematics teacher wrote n positive numbers on the black board and asked the students in her class to find the product of all the n numbers. One of her students, Rajith, randomly chose one of the n numbers and increased it by a certain quantity and found that the original product increased by 9%. Two other students, Satish and Tarun, also carried out a similar calculation and found that the original product increased by 12% and 18% respectively. If all the three students increased the number that they chose by the same quantity, then find the ratio of the numbers that they chose.
(1) 3 : 4 : 6 (2) 6 : 4 : 3 (3) 4 : 3 : 2 (4) 2 : 3 : 4

63. How many values of x satisfy the equation $9\{x\} = 2x + [x]$, where $[x]$ denotes the greatest integer less than or equal to x and $\{x\}$ denotes the fractional part of x .
(1) 1 (2) 2 (3) 3 (4) 4

64. A shopkeeper bought an article for Rs.1000 and marked its price as Rs.2160. He gave three successive discounts of $a\%$, $b\%$ and $c\%$, where $a + b + c = 50$. If he made a profit of $x\%$ finally, how many of the following ranges contain values which are not possible values of x ?

(i) $6 < x < 10$ (ii) $14 < x < 20$
 (iii) $20 < x < 24$ (iv) $24 < x < 26$
 (1) 1 (2) 2 (3) 0 (4) 3

65. There are two poles which are 2 metres apart. A cow is tied at each pole with a rope of length 2 metres. Find the common area (in sq.m) over which the two cows can graze.
 (1) 1.25 (2) 4.92 (3) 2.46 (4) 2.55

66. A fuel merchant purchased 20 litres of petrol at Rs.50 per litre and sold 12 litres of it at Rs.55 per litre. To the remaining petrol, he added 40% kerosene, the cost of which is Rs.20 per litre. If he sold this new mixture at the same rate at which he sold the first 12 litres, the total profit made by him would be
 (1) Rs.380 (2) Rs.212
 (3) Rs.340 (4) Rs.240

67. If x and a are integers and $\log_a(-4x^2 + 32x - 60) + \log_x(-2a^2 + 8a - 6) = \frac{5}{2}$, then find the value(s) of $x + a$.
 (1) 6
 (2) 4
 (3) 8
 (4) More than one value is possible

68. Find the remainder when $5 + 5^2 + 5^3 + \dots + 5^{55}$ is divided by 13.
 (1) 0 (2) 1 (3) 7 (4) 12

69. Two trains T_1 and T_2 are travelling on parallel tracks and in opposite directions. M_1 and M_2 are two persons who are travelling in T_1 and T_2 respectively. When the two trains just start to cross each other, M_1 , who is at the tail end of T_1 , starts running towards the front end of T_1 , at a speed of 2 m/s, and M_2 , who is at the front end of T_2 starts running towards the tail end of T_2 , at a speed of 3 m/s. If the lengths of T_1 and T_2 are 340 m and 500 m respectively, and the speeds of T_1 and T_2 are 54 km/hr and 72 km/hr respectively, in how much time (from the time T_1 and T_2 start to cross each other) will the two persons cross each other?
 (1) 10 seconds (2) $\frac{4}{9}$ seconds
 (3) 20 seconds (4) 17 seconds

70. N is the product of the first hundred multiples of five starting from 5. What is the rightmost non-zero digit in the number N?
 (1) 2 (2) 4
 (3) 6 (4) None of these

(Key and Solutions for AIMCAT1108)

Key

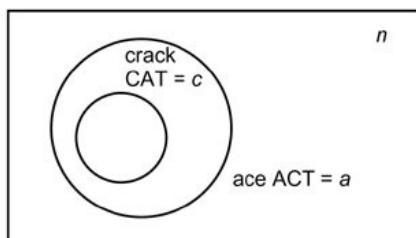
1. 2	8. 1	15. 4	22. 2	29. 2	36. 2	43. 4	50. 2	57. 4	64. 2
2. 3	9. 3	16. 2	23. 4	30. 3	37. 2	44. 4	51. 4	58. 2	65. 2
3. 1	10. 1	17. 4	24. 3	31. 4	38. 4	45. 4	52. 3	59. 1	66. 2
4. 3	11. 4	18. 2	25. 1	32. 2	39. 2	46. 2	53. 3	60. 1	67. 1
5. 4	12. 1	19. 3	26. 4	33. 3	40. 3	47. 4	54. 2	61. 2	68. 4
6. 4	13. 2	20. 3	27. 4	34. 1	41. 3	48. 4	55. 3	62. 3	69. 1
7. 2	14. 1	21. 4	28. 3	35. 2	42. 2	49. 2	56. 1	63. 3	70. 4

Solutions

SECTION – I

Solution for question 1:

1. From the main statement, the following representation is possible.



Let n be the total number of students and let c students be able to crack the CAT and a students be able to ace the ACT. We need to find $a - c$.

Using I alone : $a = 23$, but we still cannot find c .

\therefore I alone is not sufficient.

Using II alone : $c + (n - a) = 35$

$$\Rightarrow c + 42 - a = 35 \quad (\because n = 42, \text{ is given})$$

$$\Rightarrow a - c = 7$$

\therefore II alone is sufficient.

Choice (2)

Solutions for questions 2 to 5:

Given that, Essex, Yorkshire, Lancashire and Derbyshire reached the semi finals.

Hence, Kent, Somerset, Durham and Hampshire are eliminated in the first round.

It is also given, Yorkshire played against Derbyshire. Hence, Yorkshire and Derbyshire must be the two top teams of one group.

\therefore Lancashire and Essex must be the top two teams of the other group.

As Kent has same number of wins as Lancashire, they must be in different groups.

\therefore Kent and Hampshire are the losing teams in the group from which Yorkshire and Derbyshire qualified and Durham and Somerset are the eliminated teams in the group from which Essex and Lancashire qualified.

The groups can be classified and follows.

Qualified for Semis	Lancashire Essex	Yorkshire Derbyshire
Eliminated in 1 st round	Somerset Durham	Kent Hampshire

Total number of matches in each group = 12

Given, each of them has a different number of wins, so the possibilities are as follows.

	Number of wins			
	Qualified teams		Eliminated teams	
	Highest	2 nd highest	3 rd highest	4 th highest
(i)	6	4	2	0
(ii)	6	3	2	1
(iii)	5	4	2	1
(iv)	5	4	3	0

As Kent, which is eliminated has the same number of wins as Lancashire, which qualified, the only possibilities that can be considered are (ii) and (iv).

In the group of Kent,

Yorkshire must have lost only the matches against Derbyshire i.e. it must have won 4 matches. Derbyshire must have won both the matches against Yorkshire, both against Hampshire and one against Kent.

Kent won both the matches against Hampshire and one against Derbyshire and Hampshire lost all the matches.

In the group of Lancashire,

Essex won all the matches, Lancashire won both the matches against Somerset and one against Durham. Durham won one against Lancashire and one against Somerset and Somerset won against Durham.

2. Essex won the maximum number of matches in the first round. Choice (3)

3. Hampshire has the least number of wins. Choice (1)

4. The number of matches won by Durham is two.

Choice (3)

5. Hampshire and Derbyshire lost at least one match against Kent. Choice (4)

Solutions for questions 6 to 9:

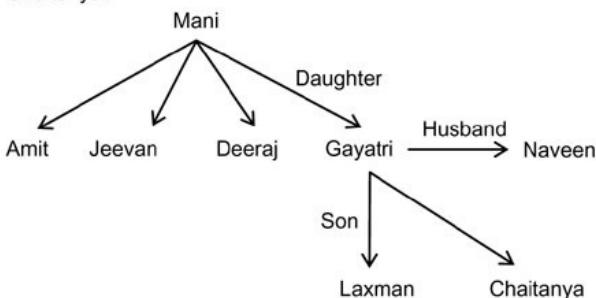
6. Companies D, E, G, C and A don't change their ranks more than once in the five year period. Choice (4)

7. F has changed its rank most number of times in the given period. Choice (2)

8. For company C, in the last two years the increase in sales revenue is exactly the same.
Choice (1)
9. Company E has been maintaining its rank constant at 2, in the given period.
Choice (3)

Solutions for questions 10 to 12:

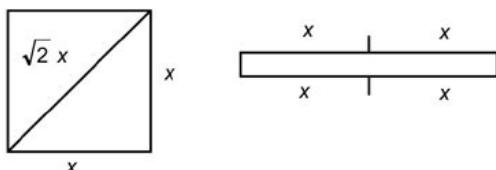
Given that Laxman is Dheeraj's nephew and Laxman and Chaitanya are siblings and Amit, Dheeraj and Jeevan are siblings. Hence, the two groups have one generation gap. As each of Mani's sons is the uncle of Gayatri's child, Gayatri is the daughter of Mani. Also Mani belongs to the first generation, Gayatri to the second and Gayatri's child to the third generation. Now Amit, Dheeraj and Jeevan are the uncles of Laxman and Chaitanya.



10. Naveen is the son-in-law of Mani.
Choice (1)
11. None of the given persons belongs to the same generation as Mani.
Choice (4)
12. Laxman and Chaitanya are the children of Gayatri.
Choice (1)

Solution for question 13:

13. Consider two cases in which a string of a fixed length (say $4x$) is folded into two different rectangles. First, have a square of side x and the other is a rectangle of diminishing breadth.



\therefore The shortest diagonal is $\sqrt{2}x$ and the longest is $2x$. i.e., if d is the length of the diagonal and P is the perimeter.

$$\frac{\sqrt{2}P}{4} < d < \frac{P}{2} \quad (\text{A})$$

$\Rightarrow P < 2\sqrt{2}d$ and $P > 2d$ i.e. $2d < P < 2\sqrt{2}d$. From I, if $d > 12$, we can conclude that $24 < P$ definitely but we cannot say whether or not $P > 29$.

I is not sufficient.

From II, if $d = 10$, we can conclude that $P < 20\sqrt{2}$ definitely.

Clearly, if $d < 10$, P is definitely less than $20\sqrt{2}$, i.e., $28.284 \dots$

Hence, P is not more than 29 cm.

II alone is sufficient.

Choice (2)

Solution for question 14:

14. Using I alone, Sita can be of the same age of Gita or Rita. Hence, cannot be answered.
Using II alone, Rita must be either older than Sita or of equal age as Sita.
Hence, Sita cannot be older than Rita.
 \therefore II alone is sufficient.
Choice (1)

Solutions for questions 15 and 16:

Let the scores of Ramu in the first three tests be R_1 , R_2 and R_3 respectively and the corresponding scores of Somu be S_1 , S_2 and S_3 respectively.

Ramu's score in the second test (R_2) = $R_1 - 40$

Also given that $S_1 = 104$ and $\frac{R_1 + R_2 + R_3}{3} = 104$

$$\Rightarrow R_1 + (R_1 - 40) + R_3 = 312$$

$$\Rightarrow 2R_1 - 40 + 74 = 312$$

$$\Rightarrow R_1 = 139$$

$$R_2 = 99$$

$$\text{Given } S_1 + S_2 = R_1 + R_2$$

$$\Rightarrow S_2 = 139 + 99 - 104 = 134$$

$$\text{Also } S_3 = \frac{S_1}{2} = 52$$

$$15. S_1 + S_2 + S_3 = 104 + 134 + 52 = 290 \quad \text{Choice (4)}$$

$$16. \text{Required difference} = R_1 - S_3 = 139 - 52 = 87 \quad \text{Choice (2)}$$

Solutions for questions 17 to 20:

17. As the cost of transportation is Rs.35/km for all routes, to find the least cost of transportation from only factory to any dealer, we have to find the shortest path.

Comparing all the shortest paths, we have

$$P - A - I = 168 + 52 = 220$$

$$Q - B - G = 187 + 56 = 243$$

$$R - F - J = 111 + 89 = 200$$

$$S - E - L > 200$$

$$T - C - K > 200$$

$$U - D - H = 102 + 72 = 174$$

The least cost of transportation is $174 \times 35 = 6090$
Choice (4)

18. The shortest distance between factory T and dealer K, if storage unit C should not be used is through T - B - K = $562 + 187 = 749$ kms.

$$\text{Total cost} = 749 \times 35 = 26215$$

Choice (2)

19. The longest distance from any factory to any dealer is through U - C - L = $2509 \times 35 = 87815$.
Choice (3)

20. This can be done in $3 \times 6 \times 4 = 72$ ways.
Choice (3)

Difficulty level wise summary - Section I	
Level of Difficulty	Questions
Very Easy	-
Easy	6, 7, 8, 9, 14
Medium	10, 11, 12, 15, 16, 17, 18, 19, 20
Difficult	1, 2, 3, 4, 5, 13
Very Difficult	-

SECTION – II

Solutions for questions 21 to 25:

Number of words and Explanatory notes for RC:

Number of words : 817

21. Refer to para 3 which backs all the choices. Choice 4, however, is true only of the press-cultural norms for the net, are yet to evolve. (Refer last para).
Choice (4)

22. Refer to para 7 where the meaning of cognitive surplus is given as '..... the trillion hours a year care about'.
Choice (2)
23. Refer to para 5 which begins with the words in quote. What follows in the next sentence, 'what the 16th century foes of print didn't imagine' shows that the claims were fulfilled in a manner not thought of.
Choice (4)
24. Refer to para 8 – Wikipedia took the idea of 'peer review' while para 6 talks of a 'cultural institution'. From this, we can arrive at choice (3) as the answer.
Choice (3)
25. Refer to the penultimate para which begins with the words in quote. 'That' refers to what is said in the previous para that average quality suffers since there is a surge in poor quality stuff, which gets churned out faster.
Choice (1)

Solutions for questions 26 to 30:

Number of words and Explanatory notes for RC:

Number of words : 704

26. Choice (4) is the answer. Refer to the last para, which supports choice (4). Choice (1) is negated by the ideas conveyed in the last two paras. Choice (2) is not suggested. Choice (3) is a distortion. (who prescribes a path we must follow is incorrect. The path or norm already exists). He makes us aware of them.
Choice (4)
27. Head of State is in authority, not necessarily an authority. The procedures placed him in that position. The others could be consulted for their expertise in their respective subjects.
Choice (4)
28. Refer to the second para which supports Choice (3) as the answer. Other options can't be inferred.
Choice (3)
29. Choice (1) is distorted (owe their position to those in power is sweeping). Choice (2) is correct. Choice (3) relates to power, not being in authority. Choice (4) is a categorical statement which has not been suggested in the passage.
Choice (2)

30. Choices (1) and (2) are aspects which have been covered, but do not qualify as the key idea. Refer to the opening sentence of the passage and second para, where the author states why people are opposed to the idea of moral authority and proceeds to explain how the concept could be made more acceptable. So, choice (3) is the answer. Choice (4) can be ruled out because the passage does not suggest that there is a misconception. People understand the idea of moral authority but do not like the idea of the authority demanding obedience. So, the author does not clear a misconception.
Choice (3)

Solutions for questions 31 to 35:

Number of words and Explanatory notes for RC:

Number of words : 1,162

31. Refer to the fourth para from the end. If the council turns the application down, Tesco can appeal, and if it wins the appeal, the council might have to bear the cost which would bankrupt it. The last sentence refers to 'inequality of arms'.

Hence the financial strength that Tesco has, has been referred to. Choice (1) is not apt because the author does not say the small stores do not have the ability. The focus is on the 'super ability' of the superstores.
Choice (4)

32. Para 7 refers to the timing being perfect and it shows how. The council released the notice when schools had vacation and people were going on holiday. By the time they returned, it was too late to object.
Choice (2)
33. Refer to para 4 – the context clearly shows that choice 3 is the answer (... everythingspecial and precious and distinctive – falls under its shadow).
Choice (3)
34. The last sentence calls this a struggle for democracy. The passage shows that the people of the town don't want the superstore to come up but are helpless because the council is timid and does not want to take any risky decision.
Choice (1)

35. Choice (2) is the best pick. The author addresses an issue which cause concern in this passage and his tone is sincere. So, choices (1) and (3) can be ruled out. 'Ominous' does not go with the manner in which he discusses the issue and his conclusion. "Why should we hand this council" indicates that we can stand up and fight in a democracy.
Choice (2)

Solutions for questions 36 to 39:

36. Only statement C is erroneous. Here, the expression 'larger than-life' should be preceded by the article 'a'. The correction is '..... a larger than life, life'.
Choice (2)
37. Statements C and D are grammatically incorrect. In statement C the name of the ship 'M.V. Victoria' should be preceded by the definite article. The correction is 'four days earlier, the M.V. Victoria'. Statement D is incorrect because the expression 'easy prey' should not be preceded by an. Someone can be an easy prey for someone or something. To be easy prey is to be easy to deceive or be taken advantage of.
Choice (2)
38. Statement A is incorrect because the word hinted should be followed by at. Statement B is incorrect because of the usage of the apostrophe in the word its. Here, the reference is to the personal pronoun its and not it is which is written, along with the apostrophe, as it's. You hear rave reviews about something and not on something. Hence the usage of 'on' is incorrect in statement D. Hence statements A, B and D are incorrect.
Choice (4)
39. Statement B is incorrect because the expression 'running out of terror' is incorrect. The correction is '-----running in terror'. Statement D is erroneous because of the usage of the word 'rent'. The word 'rent' which is a past participle of rend is inappropriate because we can say sounds of protests rend the air or slogans rent the air but here, we are talking about the sky lark's song so '-----filled the air' would be apt.
Choice (2)

Solutions for questions 40 to 43:

40. In choice 3, the word hard should be followed by 'on'. To be hard on someone is to criticise someone severely or to treat them unfairly.
Choice (3)

41. "In option B, the word "stores" is used as a verb, synonymous with "stocks" to mean that the shop holds stocks of something." The usage of store is inappropriate in choice 3. Here, store should be followed by the preposition by. 'Store by something is to believe in something', to consider something to be important. The correction is 'she sets great store by her'. Choice (3)

42. Choice 2 is incorrect. In this case, strike should be followed by up. 'Strike up a conversation' is the correct expression. Choice (2)

43. The usage of cut is inappropriate in choice 4. The correction is 'His officious behaviour -----cut him down to size.' 'To cut someone down to size' is to show someone that they are not as clever or as important as they think they are. Choice (4)

Solutions for questions 44 to 46:

44. While compared to statement D, A is rather abrupt as the opening sentence hence ideally D can begin the paragraph. F follows D by saying conservation organisations have been working diligently to save the 'carrion-feeders' from extinction. The carrion-feeders refer to the vultures mentioned in D.

Statement A follows F by talking about the efforts of the Union Ministry of Environment and Forests in protecting three major species of vultures. C concludes the para by saying that the action plan formulated by the Ministry has now become more effective. Hence statements DFAC form a coherent paragraph. Statement B can follow the para but cannot be a part of it. E and G are unrelated.

Choice (4)

45. Statement D begins the para by talking about how Barack Obama made use of the G20 summit as an opportunity to build a closer relationship with Asia. B reiterates what is stated in D by saying how the President of the U.S. spent much of his time with the Asian leaders despite the distractions stated. G, which states that Obama invited Chinese President Hu Jintao to Washington, is an extension of the idea expressed in B. C which is conclusive in nature is an emphasis of what is stated in the previous statements. Hence DBGC is the correct sequence.

Choice (4)

46. Statement E states the topic, i.e., the choosing of a symbol for the Indian rupee. C is a continuation of E. G which says it would take time for the computers all over the world to pick up the symbol follows C. F follows G by saying that the delay would not matter much for a single geographic and cultural entity with a more or less unified currency. Hence ECFG is the correct sequence. Statements A, B and D are irrelevant.

Choice (2)

Solutions for questions 47 and 48:

47. The situation: The filmstar claims to have the needy at heart, and claims to demonstrate this through participation in community programmes that provide food for the poor. The journalist questions this, suggesting that the star participates in these programmes not so much with a genuine interest in the upliftment of the poor as for a good image.

The task: To pick, from the choices, the information that would validate the journalist's view.

The choices :

- (1) Inappropriate - While it may be true that programmes for poor children always draw attention, the possibility of genuine concern on the part of the star cannot be ruled out.
- (2) Inappropriate – This is only a statement of how the programmes are funded, and has no bearing on the donor's intentions.
- (3) Inappropriate – This is what the star is known to do at work and could very well be for the experience of working with and learning from the big producers and directors, and those playing the major roles in those films. Playing small roles may not provide much by way of publicity or positive image.
- (4) Appropriate – If the authorities have been indicating, for the past 12 months that healthcare programmes are 'the ones' that suffer for want of funds, this would imply that other programmes are not suffering. If the filmstar truly wanted to help the poor he would donate his money to the causes that need it most. With this in mind, the journalist would feel that it is not so much the concern for the poor as the desire for a good image that prompts the donations. Choice (4)

48. The situation: The ad claims that the shampoo will take care of ticks and fleas without any adverse effects on the coat, and suggests that use of the shampoo will thus reduce the pet's discomfort (contribute to its happiness), and keep its coat healthy. A direct connection is therefore drawn between removal of pests and ensuring a healthy coat.

The task: To pick, from the choices, the assumption that would complete the argument.

The choices:

- (1) Inappropriate – The argument does not draw a comparison with other methods of pest control and removal.
- (2) Inappropriate – The argument does not say that the pests will never come back from elsewhere. In fact, regular use of the shampoo is recommended, which means that pests can still be expected and need to be dealt with.
- (3) Inappropriate – Since the argument only talks of reducing the pet's discomfort on account of pests (and not eliminating it altogether), there is no thought that ticks and fleas are the only pests that bother pets.
- (4) Appropriate – As mentioned above, a direct connection is drawn between removal of pests and ensuring a healthy coat. This would be possible only if the pet's coat is affected by nothing other than ticks and fleas.

Choice (4)

Solutions for questions 49 and 50:

49. The last sentence of the passage calls Antonie al Hage as capitalism's equivalent of a soldier of fortune. Antonie smiles at the risk and the pay off of bringing nightlife to Iraq. Statement 2 which states "Where there's war, there's lots of money" expresses the same idea stated in the last statement and is therefore the best conclusion of the paragraph. Statement 1 can be a continuation of the paragraph but not a conclusion. Choice 3 is deviating. Choice 4 is unrelated.

Choice (2)

50. The last sentence states that this may be our only chance to save the environment and therefore we need to act quickly because the situation is grim. Choice 2 sums up the

para by saying any step big or small towards reducing carbon emission would be a boon to mankind. Choice 1 is irrelevant. Choice 3 can follow the last sentence but cannot conclude the paragraph. Choice 4 is a repetition of what is stated in the paragraph. Choice 2 is the best concluding statement.

Choice (2)

Difficulty level wise summary - Section II	
Level of Difficulty	Questions
Very Easy	-
Easy	27
Medium	22, 25, 28, 29, 32, 33, 34, 38, 40, 42,
Difficult	21, 23, 24, 26, 30, 31, 35, 36, 37, 39, 41, 43, 44, 45, 46, 48, 49
Very Difficult	47, 50

SECTION – III

Solutions for questions 51 to 56:

51. Let the two numbers be ha and hb , where h is the HCF of the two numbers.

Given, LCM = $hab = 315$

$$315 = 3^2 \times 5 \times 7$$

\therefore HCF is a prime greater than 3, it has to be 5 or 7.

If $h = 5$, then $a = 63$, $b = 1$

$$\text{or } a = 21, b = 3$$

$$\text{or } a = 9, b = 7$$

\therefore Sum of the numbers can be $63 \times 5 + 1 \times 5 = 320$ or $21 \times 5 + 3 \times 5 = 120$, or $9 \times 5 + 7 \times 5 = 80$

If $h = 7$, then $a = 45$, $b = 1$

$$a = 9, b = 5$$

$$a = 15, b = 3$$

\therefore The sum of the two numbers can be $45 \times 7 + 1 \times 7 = 322$ or $9 \times 7 + 5 \times 7 = 98$, or $15 \times 7 + 3 \times 7 = 126$

Among the options, only option (4) is not possible.

Alternative solution:

$$315 = 5 \times 7 \times 9$$

\therefore The only possible prime factors greater than 3 are 5 and 7.

Now, H.C.F should be a factor of the sum of the numbers.

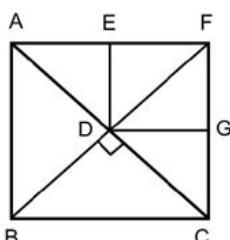
Because, if H is the H.C.F of two numbers N_1 & N_2 , then $N_1 = Ha$, $N_2 = Hb$ where a, b are co-primes, and L.C.M = Hab .

Sum = $H(a + b)$.

In the given choices, 216 is the only number not divisible by either 5 or 7.

Choice (4)

52.



$\triangle ABC$ is isosceles

$$\therefore AB = BC \quad (1)$$

When EF and DG are extended, they would pass through A and C respectively.

$\therefore ABCF$ is a rectangle. (1) $\Rightarrow ABCF$ is a square.

BD is the altitude to AC.

In a right-angled triangle, the altitude drawn from the right-angled vertex to the hypotenuse must be $1/2$ (Hypotenuse)

$$\therefore BD = \frac{1}{2} AC = \frac{1}{2} (\sqrt{2}BC) = \frac{\sqrt{2}BC}{2}$$

$$DF = \sqrt{2} EF$$

$$BF = \sqrt{2} BC$$

$$BF = BD + DF$$

$$\sqrt{2} BC = \frac{BC}{\sqrt{2}} + \sqrt{2} EF$$

$$BC \left(\sqrt{2} - \frac{1}{\sqrt{2}} \right) = \sqrt{2} EF$$

$$\frac{BC}{EF} = 2$$

$$\text{Required ratio} = \frac{(2 + \sqrt{2})BC}{4EF} = \frac{(2 + \sqrt{2})(2EF)}{4EF}$$

$$= 1 + \frac{\sqrt{2}}{2} = \frac{\sqrt{2} + 1}{\sqrt{2}}$$

Alternative solution:

Since ED is parallel to AB, DG is parallel to BC and D is the midpoint of AC, by basic proportionality, $ED = \frac{1}{2} AB$ and

$$DG = \frac{1}{2} BC.$$

\therefore Say $AB = 2$ units = BC

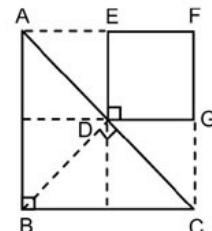
$$\Rightarrow ED = 1 \text{ unit} = DG = FG = EF$$

\therefore Perimeter of $\triangle ABC = 2 + 2$

$$+ 2\sqrt{2} = 2(2 + \sqrt{2})$$

Perimeter of $EFGD = 4$

$$\therefore \text{Ratio of perimeters} = \frac{2(2 + \sqrt{2})}{4} = \frac{\sqrt{2} + 1}{\sqrt{2}} \quad \text{Choice (3)}$$



53. As the graph is symmetric about y-axis, it is an even function.

\therefore Choices 1, 2 and 5 are ruled out.

As $x \rightarrow \infty$, $y \rightarrow 0$

Only choice 3 satisfies the given condition. Choice (3)

54. The number of students who passed in at most 0 subjects is 3 i.e., the number of students who passed in exactly 0 subjects is 3.

The number of students who passed in at most 1 subject is 7, i.e. the number of students who passed in exactly 1 subject is $7 - 3$ or 4.

We can proceed along similar lines and work out the number of students who passed in exactly 2, 3, 4 and 5 subjects.

The data and calculations are tabulated below. The data appears in the second row.

	0	1	2	3	4	5
No. of students who passed in exactly	3	4	2	5	1	7
No. of students who passed in at most	3	7	9	14	15	22
No. of students who passed in at least	22	19	15	13	8	7

Each number in the first row (except the first) is the corresponding number in the second row minus the number to its left.

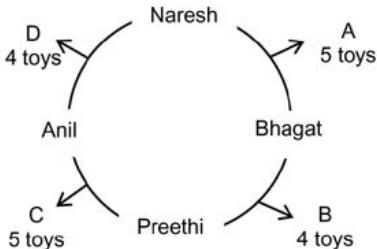
Each number in the third row (except the last) is the sum of all the numbers on top and to the right in the first row.

\therefore The number of students who passed in at least 3 subjects is 13.

Choice (2)

55. Roots are real $\Rightarrow \Delta \geq 0$
 $\Rightarrow q^2 - 4p^2 \geq 0 \Rightarrow (q - 2p)(q + 2p) \geq 0$ ---- (i)
Sum of roots = $\frac{-q}{p} > 0$ [\because Both roots are positive]
But given $p > 0 \Rightarrow q < 0$
 $\therefore q - 2p < 0$ --- (ii) \Rightarrow Also, from (i) and (ii), we get $q + 2p \leq 0$
Now, observing the answer choices only choice (3) is true.
Choice (3)

56. We can represent the data with the following diagram.



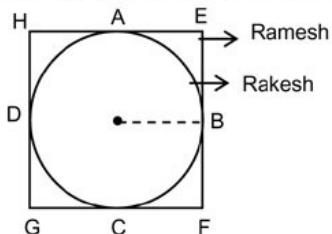
The different ways to select the toys from the four groups (A, B, C, D), so that each person is involved in buying an equal number of toys, are tabulated below.

	A	B	C	D
(1)	2	2	2	2
(2)	3	1	3	1
(3)	4	0	4	0
(4)	0	4	0	4
(5)	1	3	1	3

$$\begin{aligned}
(1) &= {}^5C_2 \times {}^4C_2 \times {}^5C_2 \times {}^4C_2 = 100 \times 36 = 3600 \\
(2) &= {}^5C_3 \times {}^4C_1 \times {}^5C_3 \times {}^4C_1 = 100 \times 16 = 1600 \\
(3) &= {}^5C_4 \times {}^4C_0 \times {}^5C_4 \times {}^4C_0 = 25 \\
(4) &= {}^5C_0 \times {}^4C_4 \times {}^5C_0 \times {}^4C_4 = 1 \\
(5) &= {}^5C_1 \times {}^4C_3 \times {}^5C_1 \times {}^4C_2 = 25 \times 16 = 400 \\
\therefore \text{Total number of ways} &= 3600 + 1600 + 25 + 1 + 400 = 5626 \quad \text{Choice (1)}
\end{aligned}$$

Solutions for questions 57 and 58:

57. The path traced by Rakesh and Ramesh is shown below



Let the side of the square be a .

$$\therefore \text{The radius of the circular track} = \frac{a}{2}$$

The circumference of the track = πa

The perimeter of the square = $4a$

$$\therefore \text{Ratio of the track lengths} = \pi : 4 = 22 : 28 = 11 : 14$$

Ratio of the speeds = $11 : 14$

Ratio of the times = $1 : 1$

The time in which Rakesh covers quarter of a circle.

Both again meet at point B, C, D, A etc. (when both run in same direction).

The distance them will be maximum, when Ramesh is at E (or F, G, H). This distance is

$$\frac{a}{2}(\sqrt{2} - 1) = 2\sqrt{2}(\sqrt{2} - 1)m = 4 - 2\sqrt{2}m = 1.172m$$

Choice (4)

58. When they start in opposite directions the maximum distance will be when Ramesh is at D and Rakesh is at B.
 \therefore The maximum distance is $4\sqrt{2} m \approx 5.656 m$
Choice (2)

Solutions for questions 59 to 70:

59. There are 5 vowels {A, E, I, O, U} and 4 consonants {D, C, T, N}

The 4 consonants can be placed in $4!$ Ways. Only two vowels should be together. These 2 can be selected in 5C_2 ways.

There are 5 positions for the 4 vowel groups – C – C – C – (considering 2 vowels as one group): They can be placed in 5P_4 ways and the 2 vowels which are together can be arranged in $2!$ ways.

$$\therefore \text{The total number of ways} = 4! {}^5C_2 {}^5P_4 2! = 57600.$$

Choice (1)

60. Coins with P_7 after P_1 distributes 1 coin to each person

$$= m + 1$$

Coins with P_7 after P_2 takes 2 coins from each person

$$= m + 1 - 2$$

Proceeding similarly, coins with P_7 after P_6 takes 6 coins from each person = $m + 1 - 2 + 3 - 4 + 5 - 6 = m - 3$

P_7 then distributes 7 coins to each of the 10 persons. Coins left with him after distribution = $m - 3 - 7(11 - 1) = m - 3 - 70 = 0 \Rightarrow m = 73$

Number of coins with each of P_8, P_9, P_{10} and P_{11} , after P_7 is left with no coins, is $m - 3 + 7 = m + 4$

$$\therefore \text{Total number of coins with } P_8, P_9, P_{10} \text{ and } P_{11} = 4(m + 4) = 4 \times 77 = 308 \quad \text{Choice (1)}$$

61. Three of the cards are mutually distinguishable (md), the other two are mutually indistinguishable (mid). Similarly, 3 of the boxes are md, the other 2 are mid.

We can actually distinguish the 2 cards marked 4 from any of the first three, but not from each other. Similarly, the two boxes of the fourth colour can be distinguished from the first three, but not from each other. With this qualification, we can describe the first 3 cards and boxes as md and the other 2 cards and 2 boxes as mid.

The different ways in which the cards can be placed in the 2 sets of boxes are listed below. Let us denote the 3 boxes of the 3 different colours as say red (r), yellow (y), green (g) and the 2 boxes of the fourth colour (say blue) as b_1 and b_2 .

	Boxes md			Boxes mid	
	r	y	g	b_1	b_2
	Balls			Balls	
	md	mid	md	mid	
1	3	0	0	0	2
2	2	1	1	1	1
3	1	2	2	2	0

The first row in the table above shows the case where the 3 md balls go into the 3 md boxes (none of the mid balls go into md boxes) and the 2 mid balls into the 2 mid boxes (none of the md balls go into the mid boxes). Similarly, the other two cases are represented by the second and third rows.

Case (i) :

The 3 md cards can go into the 3 md boxes in 6 ways. The 2 md cards can go into the two mid boxes in only one way. Therefore, the number of ways of placing the balls, in the first case, is 6.

Case (ii) :

The 2 md cards can be selected in 3C_2 are 3 ways. Similarly, 2 of the 3 md boxes can be selected in 3 ways. Each combination of the 2 cards can go into the combination of 2 boxes in 2 ways. Once, 2 of the 3 md cards are selected, there is no choice left for the md card that has go into the mid box. The two mid cards can go into the remaining md box and mid box in only 1 way. ∴ The number of ways of placing the balls, in the second case, is 3(3) (2) or 18.

Case (iii) :

One of the 3 md cards can be selected in 3 ways. It can be placed in the 3 md boxes in 3 ways. The 2 mid balls can go into the remaining 2 md boxes in only 1 way. The 2 md balls can go into the two mid boxes in only 1 way.
∴ The number of placing the cards, in the third case, is 9.
∴ The total number of placing the 5 cards into the 5 boxes is $6 + 18 + 9$ or 33.

Alternative solution:

Let the 5 boxes be A, B, C, D₁, D₂. The cards are 1, 2, 3, 4a, 4b.

We can focus on a particular box, say A. Say we place 1 in A. The possible arrangements are listed below.

	B	C	D ₁	D ₂
1	2	3	4a	4b
2	2	4a	3	4b
3	3	2	4a	4b
4	3	4a	2	4b
5	4a	2	3	4b
6	4a	3	2	4b
7	4a	4b	2	3

Instead of 1 in A, we can also have 2 or 3. In either of those cases there would be 7 arrangements. Thus there are 3(7) or 21 of these arrangements.

If we place a 4 in A, we have 4 distinct balls (1, 2, 3, 4b) to be placed in 4 boxes, two of which (D₁, D₂) are indistinguishable. This can be done in $4! / 2!$ or 12 ways.

∴ The total number of placing the balls in the boxes is 21 + 12 or 33.

Choice (2)

62. Let $p = abcq$, $p_1 = (a+x)bcq$, $p_2 = (b+x)acq$

$$p_3 = (c+x)abq$$

$$\text{Given } \frac{xbcq}{abcq} = \frac{x}{a} = \frac{9}{100}, \quad \frac{xacq}{abcq} = \frac{x}{b} = \frac{12}{100},$$

$$\frac{xabq}{abcq} = \frac{x}{c} = \frac{18}{100} \Rightarrow 9a = 12b = 18c$$

$$\therefore a : b : c = \frac{1}{9} : \frac{1}{12} : \frac{1}{18} = 4 : 3 : 2 \quad \text{Choice (3)}$$

63. As {x} denotes the fractional part of x, $x = [x] + \{x\}$ ---- (1)

$$9\{x\} = 2x + [x] \text{ (given) using (1) we get}$$

$$9\{x\} = 2([x] + \{x\}) + [x] \Rightarrow 3[x] + 2\{x\}$$

$$\Rightarrow 7\{x\} = 3[x] \Rightarrow \{x\} = \frac{3[x]}{7}$$

$$\text{as } 0 \leq \{x\} < 1, 0 \leq \frac{3[x]}{7} < 1, \Rightarrow 0 \leq [x] < 7/3$$

$$[x] = 0, 1 \text{ or } 2 \Rightarrow \{x\} = 0, \frac{3}{7} \text{ or } \frac{6}{7} \text{ respectively and } x = 0,$$

$$\frac{10}{7} \text{ or } \frac{20}{7} \quad \text{Choice (3)}$$

64. The 3 successive discounts are a%, b% and c%, where $a + b + c = 50\%$.

The maximum discount (x%), would occur when $a = 50\%$, $b = c = 0\%$.

In this case, selling price = 1080. Profit % = 8%

The minimum discount would result when $a = b = c = \frac{50}{3}\%$

$$\therefore \text{Selling price} = \left(\frac{5}{6}\right)\left(\frac{5}{6}\right)\left(\frac{5}{6}\right) 2160 = 1250$$

⇒ Profit % = 25%

There two cases are represented below.

Minimum Selling Price 1080	Maximum Selling Price 1250
Minimum Profit Percentage 8%	Maximum Profit Percentage 25%

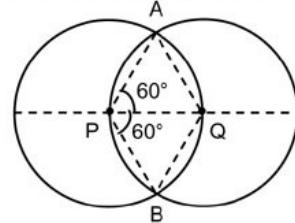
Consider the ranges given in the choices:

- (i) $6 < x < 10$ contains values which are not possible for x.
- (ii) $14 < x < 20$ contains only those values which are possible.
- (iii) $20 < x < 24$ contains only those values which are possible.
- (iv) $24 < x < 26$ contains values which are not possible for x.

∴ 2 of the ranges contain values which are not possible for x.

Choice (2)

65. The area grazed by the two cows is shown below.



APBQ is the common area grazed by the two cows.

Required Area = 2 (Area of APB)

$$= 2 (\text{Area of sector QAB} - \text{Area of triangle QAB})$$

$$= 2 \left[\frac{1}{2} r^2 \theta - \frac{1}{2} r^2 \sin \theta \right]$$

$$\theta = 120^\circ \text{ or } \frac{2\pi}{3}$$

$$\Rightarrow \text{Area} = \left[\frac{1}{2} 2^2 \cdot \frac{2\pi}{3} - \frac{1}{2} \cdot 2^2 \cdot \sin \frac{2\pi}{3} \right] = 4.92 \text{ m}^2$$

Choice (2)

66. The merchant adulterated 8 litres of petrol with 40%(8) or 3.2 litres of kerosene i.e., he sold a total of $12 + 8 + 3.2 = 23.2$ litres of petrol.

Total cost price of petrol and kerosene

$$= \text{Rs.}(20 \times 50 + 3.2 \times 20) = \text{Rs.}1064$$

Total selling price (in Rs.) = $55 \times 23.2 = 1276$

Profit obtained (in Rs.) = $1276 - 1064 = 212$

Choice (2)

67. From the expression both x and a are positive integers.

$$-4x^2 + 32x - 60 = -4(x^2 - 8x + 15) = -4(x-3)(x-5)$$

$$-4x^2 + 32x - 60 > 0, \text{ for } x \in (3, 5).$$

The only integral value of x in (3, 5) is 4.

$$\text{For } n = 4, -4x^2 + 32x - 60 = -4(4-3)(4-5) = 4 \quad \text{----- (1)}$$

$$\text{Now, } -2a^2 + 8a - 6 = -2(a^2 - 4a + 3) = -2(a-1)(a-3)$$

The only integral value of a for which $-2a^2 + 8a - 6 > 0$ is 2.

$$\text{For } a = 2, -2a^2 + 8a - 6 = -2(2)^2 + 8(2) - 6 = 2 \quad \text{----- (2)}$$

$$\log_a(-4x^2 + 32x - 60) + \log_x(-2a^2 + 8a - 6) = \log_2 4 + \log_4 2$$

$$= 2 + \frac{1}{2} = \frac{5}{2} \text{ which satisfies the given expression.}$$

$$\therefore x + a = 4 + 2 = 6$$

Choice (1)

68. $\text{Rem}\left(\frac{5}{13}\right) = 5 \text{ Rem}\left(\frac{5^2}{13}\right) = 12 \text{ or } -1$

$$\therefore \text{Rem} \frac{5^4}{13} = (-1)^2 = 1$$

\therefore It can be seen that

$$\text{Rem}\left(\frac{5^2}{13}\right)^{\text{odd no}} = -1 \text{ and } \text{Rem}\left(\frac{5^2}{13}\right)^{\text{even no}} = 1$$

$$\text{Now, Rem}\left[\frac{5+5^2+5^3+\dots+5^{55}}{13}\right]$$

$$= \text{Rem}\left[\frac{5+5^3+5^5+\dots+5^{55}}{13}\right] +$$

$$\text{Rem}\left[\frac{5^2+5^4+5^6+\dots+5^{54}}{13}\right]$$

$$\text{Consider the 2nd part, i.e., Rem}\left[\frac{5^2+5^4+5^6+\dots+5^{54}}{13}\right]$$

$$= -1 + 1 - 1 + \dots + (-1) = -1$$

27 terms

Consider the 1st part, i.e.,

$$\text{Rem}\left[\frac{5+5^3+5^5+\dots+5^{55}}{13}\right]$$

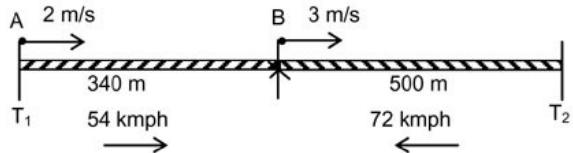
$$= \text{Rem}\left[\frac{5(1+5^2+5^4+5^6+\dots+5^{54})}{13}\right]$$

$$= 5\left(\text{Rem}\left[\frac{1}{13}\right] + \text{Rem}\left[\frac{5^2+5^4+5^6+\dots+5^{54}}{13}\right]\right)$$

$$= 5(1 + (-1)) = 0$$

\therefore Final remainder = $0 + -1 = -1 \equiv 12$ Choice (4)

69. Let the two persons be A and B, as shown below.



The initial distance between the two persons is 340 m.

The speed of person A, with respect to the tracks

$$= \frac{5}{18}(54) + 2 = 17 \text{ m/s (to the right)}$$

The speed of person B, with respect to the tracks

$$= \frac{5}{18}(72) - 3 = 17 \text{ m/s (to the left)}$$

$$\therefore \text{Time taken} = \frac{\text{Relative distance}}{\text{Relative speed}} = \frac{340}{(17 + 17)} = 10 \text{ seconds.}$$

Choice (1)

70. $N = 5 \times 10 \times 15 \times 20 \times \dots \times 500$

$$= 5^{100}(1 \times 2 \times 3 \times 4 \times \dots \times 100)$$

$$= 5^{100} \times (2^{97} \times 5^{24} \times k)$$

(\because Highest powers of 2 and 5 in 100! are 97 and 24 respectively, and k is an odd number.)

$$\Rightarrow 5^{97} \times 2^{97} \times (k \times 5^{27})$$

$N = (10)^{97} \times (k \times 5^{27}) \Rightarrow$ There are 97 zeros at the right end of N .

The first two non-zero digits from the right of N will be 25 or 75. ($\because k$ is odd). And therefore the first non-zero digit from the right will always be 5.

Choice (4)

Difficulty level wise summary - Section III	
Level of Difficulty	Questions
Very Easy	-
Easy	-
Medium	51, 52, 53, 54, 59, 60, 62, 65, 66, 67
Difficult	55, 57, 58, 63, 64, 68, 69, 70
Very Difficult	56, 61