T.I.M.E.
Triumphant Institute of Management Education Pvt. Ltd.

Ref: AIMCAT1206

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 3:* Answer the questions on the basis of the information given below.

The following table gives the purchasing power of 100 rupees after 5, 10, 15 and 20 years, at four different rates of inflation – *a*, *b*, *c* and *d* – in terms of today's equivalent amount. Answer the questions that follow with approximate values.

Rate of Inflation	Purchasing power* of 100 rupees after			
	5 years	10 years	15 years	20 years
a%	78	61	48	37.5
b%	62	38	24	15
c%	68	46	31	21
d%	57	32	18	10

* In terms of today's equivalent

Note: Inflation is defined as the annual percentage increase in prices.

For example, the table shows that an item that costs Rs.61 currently would cost Rs.100 after 10 years, at a rate of inflation of *a*%.

1. Find the approximate current monthly expenses of a person, if his monthly expenses after 15 years, maintaining his current standard of living, at an inflation of *a*% for the first five years and *c*% for the next ten years, will be Rs.42,000.
(A) Rs.10,150 (B) Rs.11,800
(C) Rs.15,000 (D) Rs.17,500

2. A person deposited an amount as fixed deposit for 10 years in a bank which stipulated a rate of interest of *b*% p.a., compounded annually. However, if he decides to withdraw the amount after 5 years itself, the bank will consequently pay an interest of only *a*% p.a., compounded annually. If the original fixed deposit would amount to Rs.10 lakh in its due term, i.e., 10 years, what will be the purchasing power of the amount (in terms of today's equivalent amount) that he will get if he were to withdraw the amount after 5 years itself, assuming that inflation is *d*%?
(A) Rs.2.77 lakh (B) Rs.3.61 lakh
(C) Rs.4.54 lakh (D) Rs.6.24 lakh

3. If a bank offers a 'Flexi-Interest Scheme' in which a fixed deposit would yield *d*% for the first five years, *c*% for the next five years, *b*% for the five years after that and *a*% for the five years following that, then what would the approximate purchasing power (in today's equivalent amount) of Rs.20,000 invested in the scheme, become after 20 years, at an inflation of *b*%?
(A) Rs.8,500 (B) Rs.10,000
(C) Rs.14,000 (D) Rs.16,000

DIRECTIONS *for questions 4 to 7:* Answer the questions independently of each other.

4. T is a right angled triangle whose perpendicular sides are a, b and hypotenuse is c. The minimum possible value of $\frac{c}{a}+\frac{c}{b}$ is
(A) 2.5 (B) 2 (C) $\frac{35}{12}$ (D) $2\sqrt{2}$

5. A four-digit number gets reversed when it is multiplied by 4. Find the sum of the digits of the number.
(A) 18 (B) 19 (C) 20 (D) 21

6. In triangle ABC, D and E are points on AB and AC respectively, such that DE is parallel to BC. BE and CD intersect at M. If the area of triangle ADE is 7/3 times the area of triangle MDE, find BC / DE.
(A) $\frac{7}{3}$ (B) $\frac{8}{3}$ (C) $\frac{5}{2}$ (D) $\frac{12}{5}$

7. D_1, D_2, D_3 and D_4 are recurring decimals given by $D_1 = 0.\overline{q_1q_2q_3q_4}$, $D_2 = 0.q_1\overline{q_2q_3q_4}$, $D_3 = 0.\overline{q_1q_2q_3q_4}$ and $D_4 = 0.q_1q_2q_3\overline{q_4}$, where q_1, q_2, q_3 and q_4 are four digits from 1 to 9. Which of the following numbers when multiplied by at least one of the above mentioned decimals will result in an integer, for any values of q_1, q_2, q_3 and q_4?
(A) 1800 (B) 19980 (C) 198 (D) 1111

DIRECTIONS *for questions 8 and 9:* Answer the questions on the basis of the information given below.

Several runners, numbered 1, 2, 3, ... and so on, start simultaneously from the same point on a circular

track and run continuously, in the same direction, around the track. They run such that the speed of the runner numbered n ($n > 1$) is n times that of the runner numbered 1.

8. If there are exactly six runners, then at how many distinct points on the track is the runner numbered 1 overtaken by any of the other five runners?
(A) 15 (B) 11 (C) 9 (D) 10

9 If there are exactly four runners, then at how many distinct points on the track do two or more runners meet?
(A) 3 (B) 4 (C) 5 (D) 6

DIRECTIONS *for questions 10 and 11:* Answer the questions independently of each other.

10. If x is real, what is the maximum possible value of the expression $\frac{x+2}{2x^2+4x+8}$?
(A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) $\frac{1}{4}$ (D) $\frac{1}{12}$

11. Six people have to go to attend an event in three different vehicles each of which can accommodate a maximum of six persons. In how many ways can they go, so that they use all the three vehicles?
(A) 540 (B) 1080 (C) 960 (D) 3240

DIRECTIONS *for questions 12 and 13:* Each question below is followed by two statements, I and II. Answer the questions using the following instructions:

Mark A if the question can be answered by using any one of the two statements alone but not by the other statement alone.
Mark B if the question can be answered by using either of the two statements alone.
Mark C if the question can be answered only if both the statements are taken together.
Mark D if the question cannot be answered even if both the statements are taken together.

12. In the month of August, the French celebrate the birth anniversary of Napolean in a grand manner. If Napolean who was born in the 19th century, in which year was he born?
I. The 77th birthday and 84th birthday of Napolean were celebrated on the same day of the week.
II. The 87th birthday and 93rd birthday of Napolean were celebrated on the same day of the week.

13. Five persons – Arjun, Bharat, Chary, Dilip and Eswar, each of whom belongs to a different profession among athelete, banker, clerk, doctor and engineer, are sitting in a row. If it is known that the name of a person and his profession does not start with same letter, then what is the profession of the person who is sitting two places away to the right of the clerk?
I. Arjun, who is not a banker, is sitting two places away from each of Dilip and the doctor.
II. Chary, who is not an athelete, is not adjacent to Arjun, who, in turn, is to the right of the engineer but not to the immediate right.

DIRECTIONS *for questions 14 and 15:* Answer the questions independently of each other.

14. Let P denote the set of the 55 natural numbers from 1 to 55. Q is a subset of P such that the arithmetic mean of any three elements of Q is at least equal to 55/3. The maximum number of elements in any such subset of P is
(A) 36 (B) 37 (C) 38 (D) 55

15. A, B and C have some chocolates among themselves. A gives to each of the other two, half the number chocolates they already have. Similarly B and C, in that order, give each of the other two half the number of chocolates each of them already has. Now, if each of them has the same number of chocolates, what could be the minimum total number of chocolates they have among themselves?
(A) 243 (B) 81 (C) 27 (D) 729

DIRECTIONS *for questions 16 and 17:* Answer the questions on the basis of the information given below.

The World Wildlife Fund is at the forefront of the global efforts towards the conservation of the Flora and Fauna of the world. The following table represents the data collected by the Fund regarding the plant species in selected countries.

Category→ / Country↓	Extinct	Possibly Extinct	Endangered	Vulnerable	Rare	Indeterminate	Threatened	Total No. of species
Argentina	3	0	61	3	136	19	247	9372
Australia	71	0	246	630	1366	3	2245	15638
Brazil	5	10	406	280	596	66	1358	56215
CIS	5	0	16	17	158	18	209	22281
Canada	2	3	58	110	106	1	278	3270
China	2	1	86	108	102	15	312	32200
Costa Rica	2	3	103	179	217	25	529	12119
Cuba	23	0	330	319	163	76	888	6522
Ethiopia	0	3	69	31	46	14	163	6603
Ghana	0	1	30	63	5	4	103	3725
India	19	41	152	102	251	690	136	16000
Kenya	0	3	31	79	97	30	240	6506
Madagascar	0	19	91	57	85	54	306	9505
Mexico	11	5	234	443	801	110	1593	26071
New Zealand	7	0	42	42	115	12	211	2382
Puerto Rico	0	4	97	71	40	11	223	2493
South Africa	53	0	226	368	1264	357	2215	23420
Thailand	0	0	27	21	33	304	385	11625
USA	22	181	1178	1783	1495	32	4669	19473

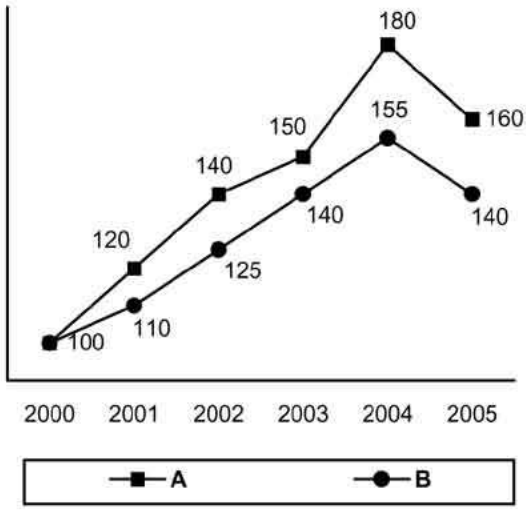
16. How many countries in the given list have fewer than five species each in both the Extinct as well as the Possibly Extinct categories?
(A) 7 (B) 8 (C) 9 (D) 10

17. If the cumulative total of the number of endangered species and number of vulnerable species comprises the total number of sensitive species in a country, then the number of sensitive species in which of the following countries is fewer than that in Kenya?
(A) Canada (B) Puerto Rico
(C) India (D) Thailand

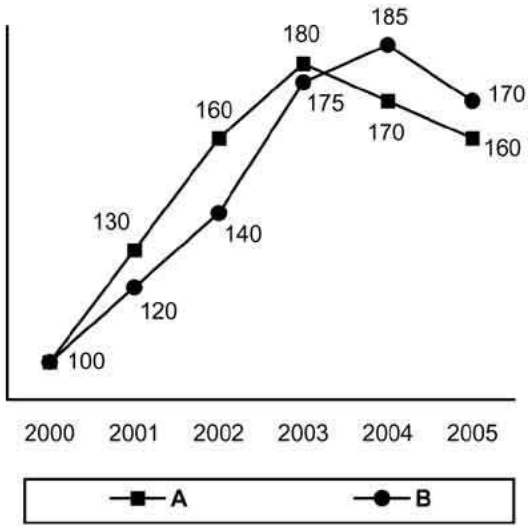
DIRECTIONS *for questions 18 to 20:* Answer the questions on the basis of the information given below.

The following line graphs give the values of sales and expenses for two automobile manufacturers, A and B, from 2000 to 2005. The values of sales and expenses of both the companies are each indexed to 100 in the year 2000.

Sales index



Expenses index



In the above graph, the values of the sales and expenses of company A are indexed to the corresponding values in the year 2000 and same is the case with B. For example, if the sales value of A is 100*k* in 2000, it is 120*k* in 2001 and so on and if the sales value of B is 100*p* in 2000, it is 110*p* in 2001 and so on.

It is also known that neither A nor B made a loss in any of the years.

Profit = Sales – Expenses

$$\text{Profitability (in \%)} = \frac{\text{Profit}}{\text{Sales}} \times 100$$

18. The profitability (in %) of company A in the year 2005 was at least
(A) $12^1/_2$ (B) 15
(C) $16^2/_3$ (D) 20

19. If the profit earned by company B in 2002 was Rs.12 crore, then in how many years from 2001 to 2005, did the sales of company B increase by more than 10%, when compared to the previous year?
(A) 0 (B) 1 (C) 2 (D) 3

20. If in the year 2004, the profits earned by companies A and B were in the ratio 5 : 12 and the expenses of the companies were in the ratio 1 : 2, then what was the ratio of their sales values?
(A) 5 : 12
(B) 7 : 5
(C) 5 : 7
(D) Cannot be determined

DIRECTIONS *for questions 21 to 23:* Answer the questions independently of each other.

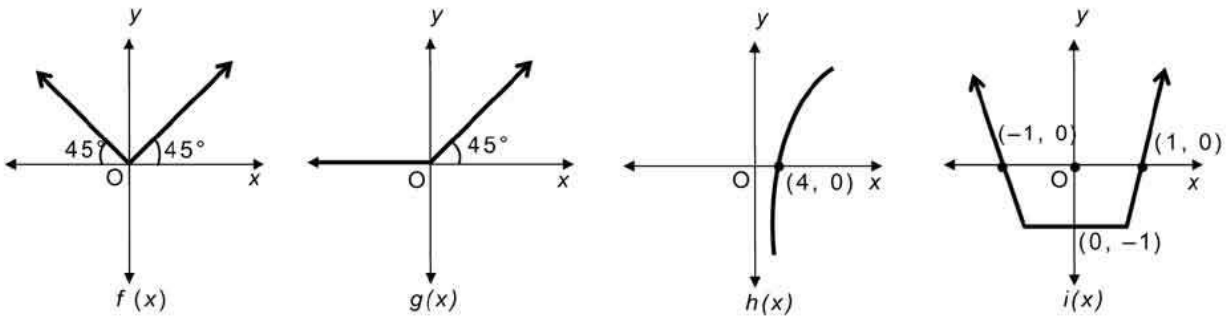
21. How many four-digit natural numbers exist such that the sum of the first two digits equals the sum of the last two digits?
(A) 770 (B) 615
(C) 660 (D) 670

22. If N = 123412341234….upto 400 digits, what is the remainder when N is divided by 909?
(A) 685 (B) 684
(C) 327 (D) 654

23. Find the units digit of the product $(1)^{101}$ $(2)^{202}$ $(3)^{303}$ …… $(9)^{909}$.
(A) 1
(B) 2
(C) 6
(D) None of these

DIRECTIONS *for question 24:* Answer the question on the basis of the information given below.

Consider the following graphs, each representing a function of x.



24. The KEATS function K(x) is defined as follows:
K(x) = x ; if $x \geq 0$
= 0 ; if $x < 0$.
For how many of the functions F(x) above, is K[F(x)] = F(x)?
(A) 1 (B) 2 (C) 3 (D) 4

DIRECTIONS *for questions 25 to 27:* Answer the questions on the basis of the information given below.

Value of Assets (in Rs.lakh)

Name	2008	2009
Anil	120	96
Bhaskar	144	168
Chaitanya	80	90
Daljit	72	74.88
Emanuel	88	95.92
Fayaz	96	88.32

The above table shows the value of assets owned by six friends – Anil, Bhaskar, Chaitanya, Daljit, Emanuel, Fayaz – for the years 2008 and 2009. It is known that the six friends work one each in Banking, Construction, Finance, IT, Marketing and Manufacturing firms, not necessarily in that order. It is known that two of the six firms are owned by the government and known as Public Sector Undertakings (PSUs)

The following additional information is given.
(a) The highest percentage change in the value of assets from 2008 to 2009 is observed in case of the person working for a Manufacturing firm.
(b) The persons whose asset values witnessed a negative growth rate work with the IT firm and a PSU.
(c) The person who asset value displayed the lowest positive growth rate does not work with Finance firm.
(d) There are exactly two persons the first letters of whose names coincide with the respective type of firm they work in.
(e) The person whose asset value showed the highest single digit growth rate works in a PSU.

25. Which of the following firms does Daljit work in?
(A) Manufacturing (B) Finance
(C) Marketing (D) Banking

26. The types of firms which experienced a decrease in their asset values are
(A) Marketing and Manufacturing
(B) Finance and Construction
(C) Finance and IT
(D) IT and Manufacturing

27. Which of the following firms is a PSU?
(A) IT (B) Finance
(C) Marketing (D) Construction

DIRECTIONS *for questions 28 to 30:* Answer the questions independently of each other.

28. Let S_1, S_2 and S_4 be the sums to the first n, $2n$ and $4n$ terms respectively of an arithmetic progression, with a as the first term and d as the common difference. If $M = 2S_1 + S_2 - S_4$, then which of the following is true?
(A) M is dependent on only n and d
(B) M is dependent on only d and a
(C) M is dependent on only a and n
(D) M is dependent on a, d and n

29. If P = (111111....upto $2n$ times) – (8888.....upto n times), where $n > 11$, find the sum of the digits of P.
(A) $2n$ (B) $3n$
(C) $4n$ (D) n

30. A cuboid whose base is a square of side 4 inches and height 6 inches is placed in a cylinder whose radius is $2\sqrt{2}$ inches and height is 6 inches. The gap between the cylinder and cuboid is filled with n spheres of radius 0.4 inches. What could be the maximum value of n?
(A) 16 (B) 18
(C) 20 (D) 28

SECTION – II
Number of Questions = 30

DIRECTIONS *for questions 1 to 3:* Read the following passage and answer the questions that follow it.

In computer gaming, the term Artificial Intelligence (AI) has always been used with a straight face. The gaming community got interested in AI in the late 1980s when personal computers started to get more powerful, says Steven Woodcock, a programmer who has worked in both the defence and games industries. As graphics improve, he says, a game "needs other discriminators, like whether it plays smart." Game reviews routinely refer to the quality of the AI – well, what else would you call it? – and some games are renowned for the lifelike quality of their computer opponents.

Mr.Woodcock says there is now quite a lot of traffic in both directions between AI programmers in the academic and gaming worlds. Military simulations, he notes, are increasingly based on games, and games programmers are good at finding quick and dirty ways to implement AI techniques that will make computer opponents more engagingly lifelike. Gaming has also helped to advertise and popularise AI in the form of such impressive games as *The Sims, Black & White* and *Creatures*.

Another factor that may boost the prospects for AI is the demise of the dotcoms. Investors are now looking for firms using clever technology, rather than just a clever business model, to differentiate themselves. In particular, the problem of information overload, exacerbated by the growth of e-mail and the explosion in the number of web pages, means there are plenty of opportunities for new technologies to help filter and categorise information – classic AI problems. That may mean that artificial-intelligence start ups – thin on the ground since the early 1980s – will start to emerge, provided they can harness the technology to do something useful. But if they can, there will be no shortage of buzzwords for the marketing department.

Not everyone is rushing to embrace this once-stigmatised term, however IBM, for example, is working on self-healing, self-tuning systems that are more resilient to failure and require less human intervention than existing computers. Robert Morris, director of IBM's Almaden Research Centre in Silicon Valley, admits this initiative, called "autonomic computing", borrows ideas from AI research. But, he says, where AI is about getting computers to solve problems that would be solved in the frontal lobe of the brain, autonomic computing has more in common with the autonomic nervous system. To some extent, he suggests, the term AI has outgrown its usefulness. He notes that it was always a broad, fuzzy term, and encompasses some fields whose practitioners did not regard their work as AI. And while IBM continues to conduct research into artificial intelligence, Dr.Morris does not link autonomic computing to such work. "This stuff is real," he says.

1. Which of the following about AI is/are NOT true?
   a. The applications of AI are found in widely diverse areas of life.
   b. The term AI was, at one time in the past, besmirched.
   c. Companies are now keen to research on AI and use the term to sell their products.
   d. Firms dealing in AI use innovative technology to beat competition.

   (A) Only c (B) Only d
   (C) a and c (D) b and d

2. As inferred from the passage, when Dr.Morris says, "This stuff is real", he means that
   (A) the things that were done under the umbrella of AI had no real value.
   (B) what IBM is doing is superior to things that went by the name of AI.
   (C) what was classified as AI was not really intelligent by any stretch of imagination.
   (D) the research at IBM is focussed on the autonomic nervous system rather than the frontal lobe of the brain.

3. What does the author mean when he says that "In computer gaming the term AI has always been used with a straight face"?

   He means that in computer gaming
   (A) the producers have had no hesitation in misleading people with current, catchy names.
   (B) AI has been used freely with little thought of its negative outcomes.
   (C) clever technology has been used successfully to lure customers.
   (D) the term has been used freely to describe smart applications and lifelike quality.

DIRECTIONS *for questions 4 to 6:* In each question, there are five sentences. Each sentence has pairs of words / phrases that are italicized and highlighted. From the italicized and highlighted words / phrases select the most appropriate words /phrases to form correct sentences. Then from the options given choose the best one.

4. Part of being liberal is a willingness to question every part of faith at the risk of being called a **hermetic** [a] **/ heretic** [b].
For many managers for whom the accounting year was not **concurrent** [a] **/ consecutive** [b] with the tax year, this meant an additional audit visit.
The palmist made a **prophecy** [a] **/ prophesy** [b] that the man would become rich and have a good life.
Certain **esoteric** [a] **/ exoteric** [b] rituals and traditions are manifest in hysterical and apocalyptic cults.
There are many unknowns, in the recycling of **affluent** [a] **/ effluent** [b] gases such as carbondioxide.

   (A) abaab (B) baaab
   (C) ababb (D) babba

5. It is a way, to **prostate** [a] **/ prostrate** [b] before the heavens, to impress the powers that be with nobly endured pain, to offer up suffering as sacrifice, and to beg indulgence and mercy.

The young man, unable to **disassemble** [a] / **dissemble** [b], admitted to having committed the crime.
He admits that this may result in the **gibe** [a] / **jibe** [b] that you are only making a fool of yourself but it is, at least to me, the most practical and the most practicable of all his advice.
My guess is that you have read far too much into the results of the recent **factious** [a] / **fractious** [b] polls.
I could not bear to watch the rest of this predictable, **meritorious** [a] / **meretricious** [b] garbage.

(A) babbb (B) bbabb
(C) bbaab (D) ababa

6. Mr. Dercon is a **staunch** [a] / **stanch** [b] believer in the public museum's role as a unique testing ground, a place of learning and development.
The European Central Bank threw down the **gauntlet** [a] / **gantlet** [b] to euro-zero governments, challenging them to stop or slow down the European Union's disciplinary processes against countries with excessive deficit.
The ones who stood firm had their homes bulldozed and could do nothing but look on **aghast** [a] / **agape** [b] as it happened.
I grew up with an awareness of terrorism, because my grandpa did **emigrate** [a] / **immigrate** [b] from a war-torn country, a country which is to this day being ripped apart through terrorist acts.
The narratives penned by survivors of the encampment **collaborate** [a] / **corroborate** [b] the extent of the Army's decline.

(A) aaaab (B) aabab
(C) bbbba (D) abbaa

DIRECTIONS *for questions 7 to 9:* Read the following passage and answer the questions that follow it.

The so-called static gains from trade – the effects of a once-and-for-all shifts in the pattern of production and consumption – are well known. Modern economics also emphasizes the importance of dynamic gains, arising especially from the economies of scale that freer trade makes possible. The aggregate long-term gain for rich and poor countries alike is likely to be far bigger than the simple arithmetic would suggest.

Moreover, few displaced rich-country workers are likely to be permanently out of work. Most will move to other jobs. Also, new jobs will be created by the economic opportunities that trade opens up. Overall, trade neither reduces the number of jobs in the economy nor increases them. In principle, there is no reason to expect employment or unemployment to be any higher or lower in an open economy as compared to a poor economy. Still, none of this is to deny that the displaced rich country workers lose out: many, perhaps most, of those who find alternative work will be paid less than they were before.

In thinking through the economic theory of liberal trade, it is helpful to draw a parallel with technological progress. Trade, allows a country to shift its pattern of production in such a way that, after exporting those goods it does not want and importing those it does, it can consume more without there having been any increase in its available resources. Advancing technology allows a country to do something very similar: to make more with less. You can think of trade as a machine (with no running costs or depreciation): goods you can make cheaply go in at one end, and goods that would cost you a lot more to make, come out at the other. The logic of protectionism would demand that such a miraculous machine be dismantled and the blueprint destroyed, in order to save jobs.

No question, technological progress, just like trade, creates losers as well as winners. The Industrial Revolution involved hugely painful economic and social dislocations - though nearly everybody would now agree that the gains in human welfare were worth the cost. Even in far milder periods of economic transformation, such as today's, new machines and new methods make old skills obsolete,. The Luddites understood that, which made them more coherent on the subject than some of today's skeptics, who oppose integration but not technological progress. Logically, they should oppose both or neither.

Politically, of course, it is essential to keep the two separate. Skeptics can expect to win popular support for the view that freer trade is harmful, but could never hope to gain broad backing for the idea that, so far as possible, technological progress should be brought to a halt. Still, it might be better if the scepitcs concentrated not on attacking trade as such, but on demanding help for the workers who suffer as a result of economic progress, whether the cause is trade or technology.

7. This passage
(A) analyses the impact of free trade and steps to be taken to mitigate their effect on workers.
(B) argues in favour of free trade while recognizing its positive and negative effects.
(C) compares free trade and technological progress to bring out their similarities.
(D) traces the growth of globalization over the past couple of decades.

8. With which of the following would the author of this passage disagree?
(a) The long term benefits of free trade increase exponentially.
(b) In general, progress in trade and technology does not hurt workers.
(c) Free trade leads to better utilization of available resources.
(d) There are no two opinions on the need for technological progress.

(A) Only b (B) a and b
(C) c and d (D) a and d

9. The author draws a comparison between liberal trade and technological progress
(A) to show why it is necessary to keep the two apart in considering their impact on society.
(B) to emphasize that the two are inextricably intertwined and their effects cannot be analyzed in isolation.
(C) to exemplify that while the latter is always beneficial, the same is not true about the former.
(D) to strengthen his argument that the former, like the latter, contributes to people's welfare in the long run.

DIRECTIONS *for questions 10 and 11:* Each of these tasks presents a passage and 5 sets of 4 statements each that relate to the passage. In each set is a statement that correctly presents an idea, or ideas, that are provided in, implied in, or can be inferred from, the passage. Read the passage carefully, identify the relevant statement from each set and, from the choices provided, pick that which presents the correct statements in sequence.

10. We have been witness, in recent years, to rapid and unprecedented changes in our society, economy, and polity. These have also transformed the Indian mass media system. The growth in its scale, reach, and influence, however, has not been matched by corresponding sensitivity towards non-commercial and non-market dimensions. This aspect is of relevance because the media is the fourth estate in a democracy. It plays a major role in informing the public and thereby shaping perceptions, and, through this, the national agenda. Its centrality is enhanced manifold by increased literacy levels and by the technological revolution of the last two decades and its impact on the generation, processing, dissemination and consumption of news.

Two other consequences of the change need to be noted. Convergence between news media, entertainment, and telecom has meant that the demarcation between journalism, public relations, advertising and entertainment has been eroded. Increases in per capita income and in discretionary spending capability, and the attractiveness of India as a market and as a destination of foreign investment, have all reinforced the centrality of the Indian mass media system.

Set 1.
(a) The growth in scale, reach and influence of the mass media has not been very remarkable.
(b) The growth in scale, reach and influence of the mass media has been remarkable.
(c) The growth in scale, reach and influence of the mass media has not been very rapid.
(d) The growth in scale, reach and influence of the mass media has been rapid.

Set 2.
(a) The media does not play a direct role in shaping the national agenda.
(b) The media plays a direct role in shaping the national agenda.
(c) The media has a significant hand in shaping the national agenda.
(d) An important objective of the media is to shape the national agenda.

Set 3.
(a) Technological progress has had little effect on the processing and dissemination of information.
(b) Technological progress has enhanced effectiveness in the processing and dissemination of information.
(c) Technological progress has played the major role in the effectiveness of the media.
(d) Technological progress has enabled the processing and dissemination of information.

Set 4.
(a) The boundary lines between journalism, public relations, advertising, and entertainment can no longer be seen.
(b) The boundary lines between journalism, public relations, advertising, and entertainment have shifted.
(c) Journalism, public relations, advertising, and entertainment are no longer distinct fields.
(d) Journalism, public relations, advertising, and entertainment are now a unified field.

Set 5.
(a) The emergence of India as a destination of foreign investment is a factor that emphasises the pivotal role of the Indian media system.
(b) The emergence of India as a destination of foreign investment is the factor that confirms the pivotal role of the Indian media system.
(c) The emergence of India as a destination of foreign investment is a factor which has made possible the centrality of the Indian media system.
(d) The emergence of India as a destination of foreign investment is a factor which contributes to the centrality of the Indian media system.

(A) bbdba (B) dbcbb
(C) bcbca (D) dadcb

11. If we need further proof of the pernicious social consequences of persisting food inflation, a recent study by Crisil provides it. It says soaring inflation cost Indian households an added burden of Rs.5.80 lakh crores over the last 3 fiscal years. And it's primarily owing to food inflation that annual private consumption spending grew to almost 17% during this time from 14% earlier. Spending mainly on eatables, low-income groups – with little or no disposable income – have been hardest hit by soaring food prices. Yet, there's marked official apathy vis-a-vis the broader structural problems food inflation highlights.

Take the fact that a bumper wheat harvest should normally bring cheer. But courtesy official unpreparedness compounded by export bans, ill-equipped granaries are stretched beyond capacity. Foodgrain stocks exceed the manageable amount for warehouses countrywide. In some FCI godowns, wheat is being kept out in the open because covered facilities have been full up thanks to non-clearance of grain. And due to faulty, business-unfriendly policies, not enough private capital has flowed towards building modern silos and storage. We're in an anomalous situation: a 'problem of plenty' now co-exists with a psychology of want linked to high food costs. The case with fruits and vegetables is similar. Courtesy inadequate cold chains, nearly 40% goes waste annually even as shop prices of onions or apples soar.

Set. 1.
(a) Food inflation mostly affects the low-income groups.
(b) The low-income groups are the most affected by food inflation.
(c) The low-income groups are mostly affected by food inflation.
(d) Most low-income groups are affected by food inflation.

Set 2.

(a) Food inflation has risen steeply over the last 3 financial years.
(b) Food inflation has risen steadily over the last 3 financial years.
(c) Consumption of food has increased rapidly over the last 3 financial years.
(d) Consumption of food has increased considerably over the last 3 financial years.

Set 3.

(a) The 'problem of plenty' is that we have more than we know what to do with.
(b) The 'problem of plenty' is that we have more than we need.
(c) The 'problem of plenty' is that we have more than we're able to deal with.
(d) The 'problem of plenty' is that we have not enough to meet our needs.

Set 4.

(a) The major need, of low-income groups, is food.
(b) The main item of expenditure, for low-income groups, is food.
(c) For many in the low-income groups, food is all they can afford.
(d) For those in the low-income groups, food is all they can afford.

Set 5.

(a) Warehouses, all over India, are poorly managed.
(b) India suffers the twin problems of inadequate food and inadequate warehousing.
(c) In addition to poor management of foodstocks, India suffers the problem of poorly designed warehouses.
(d) India suffers inadequate warehousing capacity and poor management of foodstocks.

(A) cacdad (B) bacbd
(C) cdcbd (D) baabd

DIRECTIONS *for questions 12 to 14:* Read the following passage and answer the questions that follow it.

Say someone in another car cuts dangerously close to you as you are driving on the free way. If your reflexive thought is "That son of a bitch!" it matters immensely for the trajectory of rage whether that thought is followed by more thoughts of outrage and revenge. "He could have hit me! That bastard – I can't let him get away with that!" Your knuckles whiten as you tighten your hold on the steering wheel, a surrogate for strangling his throat. Your body mobilizes to fight, not run –leaving you trembling, beads of sweat on your forehead, your heart pounding , the muscles in your face locked in scowl. You want to kill the guy. Then, should a car behind you honk because you have slowed down after the close call, you are apt to explode in rage at that driver too. Such is the stuff of hypertension, reckless driving, even freeway shootings.

Contrast that sequence of building rage with a more charitable line of thought toward the driver who cut you off: "May be he didn't see me, or may be he had some good reason for driving so carelessly, such as a medical emergency". That line of possibility tempers anger with mercy, or at least an open mind, short-circuiting the buildup of rage. The problem, as Aristotle's challenge to have only *appropriate* anger reminds us, is that more often than not our anger surges out of control. Benjamin Franklin put it well: "Anger is never without a reason, but seldom a good one".

There are, of course, different kinds of anger. The amygdala may well be a main source of the sudden spark of rage we feel at the driver whose carelessness endangers us. But the other end of the emotional circuitry, the neo-cortex most likely foments more calculated angers, such as cool-headed revenge or outrage at unfairness of injustice. Such thoughtful angers are those most likely, as Franklin put it, "have good reasons" or seem to.

Of all the moods that people want to escape, rage seems to be the most intransigent. Tice found anger is the mood people are worst at controlling. Indeed, anger is the most seductive of the negative emotions; the self-righteous inner monologue that propels it along fills the mind with the most convincing arguments for venting rage. Unlike sadness, anger is energizing, even exhilarating. Anger's seductive, persuasive power may in itself explain why some view about it are so common: that anger is uncontrollable, or that, at any rate, *it should not* be controlled, and that venting anger in "catharsis" is all to the good. A contrasting view, perhaps a reaction against the bleak picture of these other two, holds that anger can be prevented entirely. But a careful reading of research findings suggests that all these common attitudes toward anger are misguided if not outright myths.

12. Which of the following can be inferred from the passage ?

(a) Our physical reaction when we are angry depends upon our emotional response to the situation.
(b) Anger harms the person in whose heart the passion rises.
(c) There is no such thing as controlled or balanced anger.
(d) Anger arises in more than one part of the brain.

(A) Only a and b
(B) Only c and d
(C) a and d
(D) a, b and d

13. As understood from the passage, with which of the following would the author agree?

(a) Anger is an emotion which most people can understand and sympathise with.
(b) Some of the commonly held views about anger are incorrect.
(c) We must give vent to our anger to be rid of this negative emotion.
(d) Well thought-out, controlled anger has a sound base.

(A) Only d
(B) only b
(C) a and c
(D) a and d

14. Which of the following best describes the passage?
(A) An event is described and the reaction to it is used to emphasize the importance of that emotion.
(B) Human emotions are studied through one's response to situations beyond one's control.
(C) An out-of-control response is used to study the brain and its functioning.
(D) An everyday experience and the reaction to it form the springboard to analyze an emotion.

DIRECTIONS *for questions 15 to 18:* Select the correct alternative from the given choices.

15. A: Workers in the unorganized sector should be unionized since it gives them collective bargaining power and so helps to increase their wages.
B: But in segment of industry where unionised labour are able to secure high wages their non-unionized counterparts in other organizations soon earn more or less the same wages. Therefore, unionization is not required.

Which of the following, if true, most seriously weakens B's argument that unionization is not required to increase wages?
(A) The unionization of workers in one organization in a given industry prompts the circumspection among employers in other organizations in the same industry.
(B) Increases won by unions representing workers often serve as the factor that prompts equilibrium in an industry segment.
(C) Unions have no meaning in today's world of corporate culture where remunerations vary from one employee to another based on work output and other parameters.
(D) Wages in many industries vary from one part of the country to another, regardless of whether workers are unionized or not.

16. Reviewing historical data, researchers in California found that counties with the largest number of pieces of health and fitness equipment per head have had the lowest incidence of death due to cardiac problems. The researchers have concluded that people in these counties exercise regularly and therefore do not suffer from cardiac problems.

The researchers' conclusion would be most strengthened if which of the following were true?
(A) The more health and fitness equipment one has the more time one spends on using them.
(B) The incidence of cardiac problem in counties with the largest number of health and fitness equipment is likely to decrease further.
(C) Occupations and lifestyle affect the risk of cardiac problems less than does the use of health and fitness equipment.
(D) The more health and fitness equipment people have, the greater is their awareness of the need for exercise to keep cardiac problems away.

17. Poor people are affected more by an increase in sales tax than are the rich. Since sales tax is a fixed percentage of the purchase price of goods, poor people pay a larger proportion of their income in sales tax than wealthy people do.

It can be inferred correctly on the basis of the statements above that
(A) The system of sales tax widens the wedges between economic strata.
(B) Poor people constitute a larger proportion of the sales tax paying population than wealthy people.
(C) The average purchase price of consumer goods bought by wealthy people is higher than that of consumer goods bought by poor people.
(D) The total amount spent by all poor people on purchases of consumer goods exceeds the total amount spent by all wealthy people on consumer goods.

18. Environmentalists have blamed pesticide spraying for the increase in the number of dead birds found in agricultural areas. Pesticide manufacturers claim that the publicity given to bird deaths prompted volunteers to look for dead birds, and that the increase in numbers reported was attributable to the increase in the number of people looking.

Which of the following statements, if true, would help to strengthen the case of the pesticide manufactures?
(a) No provision was made to ensure that dead birds would not be reported by more than one observer.
(b) Initial increase in bird deaths had been noticed by agricultural workers long before any publicity had been given to the matter.
(c) Pesticide sprayings were timed to coincide with various phases of the life cycles of the insects they destroyed.
(d) Dead birds of the same species as those found in agricultural areas had been found along coastal areas where no farming took place.
(A) b and c (B) a and b
(C) c and d (D) a and d

DIRECTIONS *for questions 19 and 20:* Answer the questions on the basis of the information given below.

A gift shop sells attractive gift packages of imported perfumes, each package containing four bottles. The available brands, which are used in the packages are Brut, Camille Rouge, Calvin Klein, Poison, Charmie and Temptation. Each package must conform to the following rules :

(i) Each package must contain either three or four different brands of perfume.
(ii) A package containing any number of bottles of Brut brand must also contain at least one bottle of Poison.
(iii) A package containing any number of bottles of Poison brand must also contain at least one bottle of Brut brand.
(iv) A package containing exactly one bottle of Calvin Klein must contain exactly one bottle of Temptation.
(v) The brands Charmie and Camille Rouge cannot be packed together in the same package.

19. Which of the following is a valid package?
(A) Brut, Poison, Calvin Klein and Temptation
(B) Brut, Poison, Calvin Klein and Charmie
(C) Both (A) and (B)
(D) None of these

20. Which of the following pairs of bottles can be packed along with two bottles of Temptation to make a valid package?
(A) Calvin Klein and Charmie
(B) Charmie and Camille Rouge
(C) Brut and Poison
(D) None of these

DIRECTIONS *for questions 21 to 24:* Answer the questions on the basis of the information given below.

Shonika and Smaraki are playing a game where they pick up coins alternately from the coins kept on a table. The rules of the game say that

-- each person has to pick up at least one coin in her turn
-- no person can pick up more than 6 coins in each turn

The person who picks up the last coin from the table is the loser and the other person is the winner.

Assume that both Shonika and Smaraki play intelligently so as to win the game.

21. If, at some stage of the game, there are 16 coins on the table, and it is Shonika's turn to pick up the coins, how many coins should she pick to ensure her win irrespective of what Smaraki does in later steps?
(A) 1 (B) 2 (C) 3 (D) 4

22. At one stage during the game, when there were 28 coins on the table and it was Smaraki's turn, Smaraki had to leave to attend a phone call. Her sister Sonia who was watching the game volunteered to play for Smarika and picked up 2 coins. Is Sonia's move correct to ensure a win for Smaraki?
(A) Yes
(B) No
(C) She cannot win whatever she picks up when there are 28 coins
(D) Data insufficient

23. Some time during the game when it was Shonika's turn, there were 38 coins on the table. Without Shonika realising it, Smaraki wanted to remove some coins from the table. How many coins should she remove to ensure her own win irrespective of what moves Shonika makes later?
(A) 4 (B) 3 (C) 2 (D) 1

24. What is the least number of coins greater than 20 at the beginning of the game to ensure a win for Shonika if Smaraki makes the first move?
(A) 22 (B) 24 (C) 25 (D) 26

DIRECTIONS *for questions 25 to 27:* Answer the questions on the basis of the information given below.

Four students – A, B, C and D – of a class were in the fray for the election of a representative from the class to the college council. Initially, each of the four names was proposed by exactly one student of the class and supported by exactly two other students of the class and none of A, B, C and D was allowed to propose or support any student. Any student of the class was allowed to either propose or support only a single candidate.

The elections were to be conducted in three rounds of voting. In any round, the candidate getting the lowest number of votes, among those still in the fray, gets eliminated. The survivor after the third round of voting gets elected as the representative.

The elections were conducted according to the following rules. None of the four candidates are eligible to vote as long as they are in the fray, but any candidate who gets eliminated in any round becomes eligible to vote in all the subsequent rounds. Any student who initially proposed or supported a particular candidate, say X, must vote for X in all the rounds in which X is in contention and if X gets eliminated in any round, then that student becomes ineligible to vote in any of the subsequent rounds.

All students who are eligible to vote in any round have to vote for exactly one of the candidates in the fray in that round. In all, a student can vote for at most two of the four candidates in all the rounds of voting put together, and a student becomes ineligible to vote if both the candidates he/she voted for is eliminated.

The following table gives partial information regarding the voting process in the different rounds:

Round	Total votes cast	Maximum votes cast		Minimum votes cast	
		Candidate	No. of votes	Candidate	No. of votes
1		B	36	A	20
2	110	D	45	C	29
3	95				

It is also known that
- All those who voted for candidates B and D in any round, voted for the same candidates as long as they were in contention and exactly 60% of those who voted for C in round 1, voted for him in round 2 as well.
- In the final round, the winner got seven votes more than the other candidate.

25. How many students are there in the class, if all students in the class were part of the election process?
(A) 114 (B) 116 (C) 120 (D) 124

26. How many votes were cast for candidate D in round 1?
(A) 25 (B) 28 (C) 31 (D) 34

27. How many students who voted for candidate A in round 1, voted for candidate C in round 2?
(A) 12
(B) 15
(C) 16
(D) 13

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

Five friends – Pramod, Khan, Naveen, Samuel and Tarun – have Rs.150 among them. The following information is also known about the money with them.

i) None of them has less than Rs.15.
ii) The amount with each of the persons, except one, is odd.
iii) The amounts with no two persons are the same.
iv) The amount with the person who has the highest is not even.
v) The amount (in Rs.) with each person is an integer.

28. What can be the maximum difference between the highest and the least amount held by any of these persons?
(A) Rs.63 (B) Rs.64
(C) Rs.68 (D) None of these

29. If '***s***' is the difference between the highest and the least amounts with the persons, '***s***' can never be
(A) less than 6.
(B) more than 64.
(C) less than 8.
(D) None of these

30. If each of the five amounts is a multiple of 5 and the amount which is an even number is the third highest, then which among the following must be the even amount?
(A) Rs.50 (B) Rs.40
(C) Rs.30 (D) Rs.20

T.I.M.E.
Triumphant Institute of Management Education Pvt. Ltd.

(Key and Solutions for AIMCAT1206)

Key

SECTION – I

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

SECTION – II

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

Solutions

SECTION – I

Solutions for questions 1 to 3:

1. Let the current expenses = Rs.x

After five years the expenses must become $\frac{100x}{78}$ at a% inflation, to maintain the same standard of living. This again must become $\frac{100x}{78}\times\frac{100}{46}$ after another 10 years at c% inflation.

Given final expenses = Rs.42,000

$\Rightarrow 42{,}000 = \frac{100\times100\times x}{78\times46} \Rightarrow x \equiv$ Rs.15,000

Choice (C)

2. If the initial amount is x, it was supposed to become Rs.10 lakh after 10 years at b% rate of interest.

38 rupees now would become Rs.100 after 10 years.

$\therefore$ To get Rs.10 lakh after 10 years Rs.3,80,000 should be invested.

At a% rate of interest 3,80,000 becomes

$3{,}80{,}000\times\frac{100}{78}$ = 4,87,000 after 5 years.

This is equal to $4{,}87{,}000\times\frac{57}{100}$ at d% in 5 years

= 2.77 lakh Choice (A)

3. The amount at the end of 20 years would be

$20{,}000\times\frac{100}{57}\times\frac{100}{68}\times\frac{100}{62}\times\frac{100}{78}$

$\equiv 20{,}000\times1.75\times1.5\times1.6\times1.3 \equiv 1{,}09{,}000$

This amounts to 15/100 × 109000 at an inflation of b%

≡ Rs.16,000 Choice (D)

Solutions for questions 4 to 7:

4. a, b are the legs and c is the hypotenuse

$$\frac{c}{a}+\frac{c}{b} = \frac{\sqrt{a^2+b^2}}{a}+\frac{\sqrt{a^2+b^2}}{b}$$

$$= \sqrt{\frac{a^2+b^2}{a^2}}+\sqrt{\frac{a^2+b^2}{b^2}} = \sqrt{1+\left(\frac{b}{a}\right)^2}+\sqrt{1+\left(\frac{a}{b}\right)^2}$$

A.M. (Two or more positive numbers) ≥ Their G.M.

$$\therefore \frac{\sqrt{1+\left(\frac{b}{a}\right)^2}+\sqrt{1+\left(\frac{a}{b}\right)^2}}{2} \geq \sqrt{\left(\sqrt{1+\left(\frac{b}{a}\right)^2}\right)\left(\sqrt{1+\left(\frac{a}{b}\right)^2}\right)}$$

$$= \sqrt{\frac{b}{a}+\frac{a}{b}} \geq \sqrt{2}$$

$$\therefore \frac{c}{a}+\frac{c}{b} \geq 2\sqrt{2}$$ Choice (D)

5. Let the four digit number be $p\ q\ r\ s$.

Given, 4 ($p\ q\ r\ s$) = $s\ r\ q\ p$ (i.e. $s \geq 4$)

If $p \geq 3$, 4($pqrs$) is a 5-digit number.

$\therefore p = 1$ or 2

$s\ r\ q\ p$ is a multiple of 4, $p \neq 1$

$\therefore p = 2$

As $p = 2$, s has to be 3 or 8. As $s > 4$, $s = 8$

$\Rightarrow 4\ (2\ q\ r\ 8) = 8\ r\ q\ 2$

$\Rightarrow 8000 + 400q + 40\ r + 32 = 8000 + 100\ r + 10\ q + 2$

$\Rightarrow 390\ q + 30 = 60\ r$

$r = \frac{13q+1}{2}$,

$r = 6q + \frac{q+1}{2}$

$\Rightarrow q = 1, 3, 5, 7$ - - - - - - -

$\Rightarrow r = 7, 20$ - - - - - - - - -

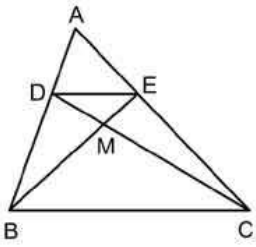
As q and r are single digit numbers

$q = 1$ and $r = 7$

$\therefore p\ q\ r\ s = 2178$

$\therefore$ Sum of the digits = 2 + 1 + 7 + 8 = 18. Choice (A)

6.



We need to find BC/DE = r(say). We can get the area of parallelogram DECB in terms of the area of ΔADE, (say a) as well as that of ΔMDE (say 6).
ΔADE ~ ΔABC
∴Ar (ABC) = $r^2 a$ and Ar (DECB) = $(r^2 - 1)a$ ….. (1)
ΔMDE ~ ΔMCB. As BC = rDE, each side of the 'bigger' triangle (MCB) is r times the corresponding side of the 'smaller' triangle (MDE).
Area of ΔMDB = Area of ΔMEC = rb
Area of ΔMBC = $r^2 b$
∴Area of DEBC = $(1 + 2r + r^2)b = (1 + r)^2 b$….. (2)
(1), (2) ⇒ $(r^2 - 1)a = (1 + r)^2 b$

$$\Rightarrow \frac{a}{b} = \frac{r+1}{r-1} = \frac{7}{3}$$

$$\Rightarrow r = \frac{7+3}{7-3} = \frac{5}{2}$$

Choice (C)

7. $D_1 = 0.\overline{q_1q_2q_3q_4} = q_1q_2q_3q_4/9999 \rightarrow (1)$

$D_2 = 0.q_1\overline{q_2q_3q_4} = (q_1q_2q_3q_4 - q_1q_2)/9900 \rightarrow (2)$

$D_3 = 0.q_1\overline{q_2q_3q_4} = (q_1q_2q_3q_4 - q_1)/9990 \rightarrow (3)$

$D_4 = 0.q_1q_2q_3\overline{q_4} = (q_1q_2q_3q_4 - q_1q_2q_3)/9000 \rightarrow (4)$

When any of the above fractions is multiplied with the respective denominator or its multiple, the result is an integer.
From among the given options, 19,980 is double the denominator of D_3.
None of the other three given numbers is a multiple of any of the other denominators. Choice (B)

Solutions for questions 8 and 9:

8. If a runner runs (in the same direction) m times as fast as another runner, and both simultaneously start at the same point on the circular track, then they meet at exactly $(m - 1)$ distinct points on the track. These $(m - 1)$ points will be equally spaced at exactly every $\frac{1^{th}}{(m-1)}$ of the length of the track.
Hence R_1 and R_2 meet at → L (i.e. start only)
R_1 and R_3 meet at → L and L/2
R_1 and R_4 meet at → L, L/3 and 2L/3
R_1 and R_5 meet at → L, L/4, L/2 and 3L/4
R_1 and R_6 meet at → L, L/5, 2L/5, 3L/5, 4L/5
Counting the distinct locations, we have L, L/5, L/4, L/3, 2L/5, L/2, 3L/5, 2L/3, 3L/4, 4L/5, i.e., 10 distinct points.
Choice (D)

9. In the earlier solution the meetings R_1R_2, R_2R_3, R_1R_4 are already found. Now R_2R_3 meet at every $\frac{R}{\left(\frac{3}{2}-1\right)} = 2L$ i.e., at L

R_2R_4 meet at every $\frac{L}{\left(\frac{4}{2}-1\right)} = L$

R_3R_4 meet at every $\frac{L}{\left(\frac{4}{3}-1\right)} = 3L$ i.e., at L

Hence we have only L, L/3, L/2, 2L/3, i.e., four distinct points of meeting. Choice (B)

Solutions for questions 10 and 11:

10. Let $y = \frac{x+2}{2x^2+4x+8} \Rightarrow 2yx^2 + 4yx + 8y = x + 2$
$\Rightarrow 2yx^2 + (4y - 1)x + 8y - 2 = 0$
For the roots to be real,
$(4y - 1)^2 - 8y(8y - 2) \geq 0$ or $(4y - 1)^2 - 16y(4y - 1) \geq 0$
or $(4y - 1)(4y - 1 - 16y) \geq 0$ or $(4y - 1)(-12y - 1) \geq 0$
or $(1 - 4y)(1 + 12y) \geq 0; -\frac{1}{12} \leq y \leq \frac{1}{4}$ Choice (C)

11. The different splits and the number of such splits of the 6 people into 3 groups are tabulated below.

Splits	Selecting vehicles	Selecting persons	
1, 1, 4	3	${}^6C_4\ {}^2C_1$	15(2) (3) = 90
1, 2, 3	6	${}^6C_3\ {}^3C_2$	20(3) (6) = 360
2, 2, 2	1	${}^6C_2\ {}^4C_2$	15(6) (1) = 90

[As the 3 groups have to go in 3 distinct vehicles, we have to count A, B, CDEF and B, A, CDEF separately etc]
∴ Total number of ways = 90 + 360 + 90 = 540
Choice (A)

Solutions for question 12 and 13:

12. From statement I alone, Napolean's 77th birthday and 84th birthday were celebrated on the same day of a week implies in these 7 years there is no leap year. One of the year in these 7 years must be a century year and non-leap year. As he was born in the month of August, his 77th birthday must have been celebrated in the year 1896 and 84th birthday on 1903. So, he must have born in the year 1819.
∴ I alone is sufficient.
From statement II alone, as his birthday was celebrated on the same day of the week within 6 years, there must be one leap year between his 87th and 93rd birthday.
His 87th birthday can be in the year 1887 or 1903, 1907 and so on.
∴ II alone is not sufficient but I alone is sufficient.
Choice (A)

13. Let us represent their names by using their starting letters.
From statement I alone,
We can determine that A can be either the clerk or the engineer and A is sitting in the centre of the row.
∴ I alone is not sufficient.
From statement II alone, we can say that A is not the engineer, but cannot determine who is the clerk.
∴ II alone is not sufficient.
Combining both the statement we can see that
A is the clerk and sitting in the middle of the row and C must be sitting at one of the extreme ends and D at the other end.
∴ The following arrangements are possible.
Case (i):

D _____ A (Clerk) _____ C (Doctor)

Case (ii):

C (Doctor) _____ A (Clerk) _____ D

As Arjun is not to the immediate right of the engineer but to the right, case (ii) is invalid.
∴ The person who is sitting two places away to the right of the clerk is the doctor.
∴ Both I and II are required. Choice (C)

Solutions for questions 14 and 15:

14. The arithmetic mean of any three elements of

$$Q = \frac{\text{Sum of those three elements}}{3}$$

Hence, the sum of any three elements > 55
The sum of the smallest 3 elements in Q exceeds 55, the sum of all other triplets also exceeds 55. The smallest 3 elements having a sum greater than 55 are 18, 19 and 20. Hence Q = {18, 19, 20,..... 55}
Number of elements in Q = 55 – 17 = 38. Choice (C)

15. Let the final number of chocolates with each of them be x.

	A	B	C
Final →	n	n	n
Just before C gives	$\frac{2n}{3}$	$\frac{2n}{3}$	$\frac{5n}{3}$
Just before B gives	$\frac{4n}{9}$	$\frac{13n}{9}$	$\frac{10n}{9}$
Just before A gives	$\frac{35n}{27}$	$\frac{26n}{27}$	$\frac{20n}{27}$

(or initial)

∴The total number of chocolates = $3n$ and $\frac{35n}{27}$, $\frac{26n}{27}$ and $\frac{20n}{27}$ are all integers ⇒ n is a multiple of 27.
∴ Minimum value of $n = 27 \Rightarrow 3n = 81$. Choice (B)

Solutions for questions 16 and 17:

16. The countries which have less than 5 species in both the Extinct and Possibly Extinct categories are Argentina, Canada, China, Costa Rica, Ethiopia, Ghana, Kenya, Puerto Rico and Thailand. A total of nine countries.
Choice (C)

17. By simple observation, only Thailand has fewer number of sensitive species than that of Kenya (among the given choices). Choice (D)

Solutions for questions 18 to 20:

18. The indexed values of sales and expenses are as follows.

Company A	
Sales	Expenses
100	100
120	130
140	160
150	180
180	170
160	160

Company B	
Sales	Expenses
100	100
110	120
125	140
140	175
155	185
140	170

It is said that both the companies made a profit in each of the given years.
∴ For company A, in 2003, 150(Sales) > 180 (Expenses)
∴ (Sales) > 1.2 (Expenses)

∴ Profitability in 2005 is at least $\frac{1.2(160)-160}{1.2(160)}$

$= \frac{32}{192} \times 100 = 16.67\%$ Choice (C)

19. We can directly find the years in which the sales increased by more than 10%, from the indexed values, i.e. in 2002, 2003 and 2004. Choice (D)

20. As the ratios but not the values of profits and expenses are given, we cannot determine the ratio of their sales.
Choice (D)

Solutions for questions 21 to 23:

21. Let 'ABCD' be the four-digit number.
The condition to be satisfied is A + B = C + D = K (say) K can take any value from 1 to 18.
The following table gives the pattern and number of values taken by (A + B) and (C + D).

A + B = C + D = K	Values of (A, B)	Values of (C, D)	Number of values of (A, B)	Number of values of (C, D)	Number of values of 'ABCD'
1	(1, 0)	(0, 1), (1, 0)	1	2	$1 \times 2 = 2^2 - 2$
2	(1, 1), (2, 0)	(0, 2), (1, 1), (2, 0)	2	3	$2 \times 3 = 3^2 - 3$
. . . .	. . . .	. . . .	. . . .	. . . .	. . . .
9	(1, 8) to (9, 0)	(0, 9) (1, 8) to (9, 0)	9	10	$9 \times 10 = 10^2 - 10$
10	(1, 9) to (9, 1)	(1, 9) to (9, 1)	9	9	$9 \times 9 = 9^2$
11	(2, 9) to (9, 2)	(2, 9) to (9, 2)	8	8	$8 \times 8 = 8^2$
. . . .	. . . .	. . . .	. . . .	. . . .	. . . .
17	(8, 9), (9, 8)	(8, 9), (9, 8)	2	2	$2 \times 2 = 2^2$
18	(9, 9)	(9, 9)	1	1	$1 \times 1 = 1^2$

∴The total number of four digit numbers
$= (1^2 + 2^2 + 3^2 + \ldots\ldots + 10^2) - (1 + 2 + \ldots\ldots + 10) + (1^2 + 2^2 + \ldots\ldots + 9^2)$

$= \frac{10 \times 11 \times 21}{6} - \frac{10 \times 11}{2} + \frac{9 \times 10 \times 19}{6}$

$= 385 - 55 + 285 = 615$ Choice (B)

22. N = 123412341234.....400 digits
$= 1234\,(\underbrace{1000100010001.....0001}_{397 \text{ digits}})$

$N = 1234((10{,}000)^{99} + (10{,}000)^{98} + \ldots.(10{,}000)^0)$ — (1)
Now, consider 909 = 101 (9), while 101 (9) (11) = 9999.
Since the terms in the above expression (1) for N are all powers of 10000, it is very easy to first find the remainder R′ when N is divided by 9999. Then, R′ can be divided by 909 to arrive at the required remainder i.e. instead of finding Rem $\left(\frac{N}{d}\right)$, we find it easier to find Rem $\left(\frac{N}{kd}\right)$ say it is R′. Then Rem $\left(\frac{N}{d}\right)$ = Rem $\left(\frac{R'}{d}\right)$

Hence R $\left[\frac{N}{9999}\right]$ = R $\left[\frac{N}{(10{,}000-1)}\right]$

= R $\left[\frac{1234\,(1^{99} + 1^{98} + \ldots.1^0)}{9999}\right]$

$= R\left[\frac{123400}{9999}\right] = 3412$

Now $R\left[\frac{N}{909}\right] = R\left[\frac{3412}{909}\right] = 685$

Alternative solution 1:

$N = 1234\,(10^{396} + 10^{392} + 10^{388} + \ldots 10^{0})$
$= 1234[(10^4)^{99} + (10^4)^{98} + (10^4)^{97} + \ldots (10^4)^0]$
$= 1234 \times A$ (say)

Now, $\text{Rem}\left[\frac{N}{909}\right] = \text{Rem}\left[\frac{1234}{909}\right] \times \text{Rem}\left[\frac{A}{909}\right]$

$= \text{Rem}\left[\frac{325 \times (1+1+1+\ldots.100 \text{ times})}{909}\right]$

$= \text{Rem}\left[\frac{32500}{909}\right] = 685$

Alternative Solution 2:

$\frac{12341234\ldots\ldots\ldots1234 \quad (400\text{times})}{9}$ leaves a remainder 1.

Say 12341234 ..... 1234 = 909k + r
Since L.H.S. leaves a remainder 1 when divided by 9, R.H.S. should also leave 1 as the remainder.
Check the options.
Only 685 leaves a remainder 1 when divided by 9.
Choice (A)

23. $(5)^{505}$ ends in a 5, and there is at least one even number in the product. Hence the last digit of the entire product will be zero. Choice (D)

Solution for question 24:

24. $K(x) = x$ if $x \geq 0$
$= 0$ if $x < 0$.
For a function $F(x)$;
$K(F(x)) = F(x)$ if $F(x) > 0$
$= 0$; if $F(x) < 0$.
We can see that, only the graphs for which at least a part lies below the x-axis are effected.
As in the graphs $f(x)$ and $g(x)$, no part of the graph is below x-axis, the graphs remain unchanged on applying the KEATS function.
In case of the graph $h(x)$and $i(x)$, as they are negative for some points, the graphs are altered on applying the KEATS function. Choice (B)

Solutions for questions 25 to 27:

Percentage change, from 2008 to 2009, in the value of assets of

Anil $= \frac{24}{120} = -20\%$ Emanuel $= \frac{7.92}{88} = 9\%$

Bhaskar $= \frac{24}{144} = 16.6\%$ Fayaz $= \frac{-7368}{96} = -8\%$

Chaitanya $= \frac{10}{80} = 12.5\%$

Daljit $= \frac{2.88}{72} = 4\%$

The highest percentage change (i.e., magnitude) was witnessed in case of Anil.
$\therefore$ Anil works for a manufacturing firm.
Negative growth was witnessed in case of Anil and Fayaz.
$\therefore$ Anil and Fayaz work with IT firm and a PSU. But since Anil works for a manufacturing firm, Fayaz must work with the IT firm
$\Rightarrow$ Manufacturing firm is a PSU.
From (d), Bhaskar and Chaitanya work with Banking and Construction firms respectively.
The highest single digit growth was demonstrated by Emanuel and hence, Emanuel works with a PSU.
The lowest positive growth was shown by Daljit.
$\therefore$ Daljit from (C) does not work with the Finance firm
$\Rightarrow$ Daljit works with the Marketing firm
$\Rightarrow$ Emanuel works with the Finance firm.

To summarize,
Anil – Manufacturing (PSU)
Bhaskar – Banking
Chaitanya – Construction
Daljit – Marketing
Emanuel – Finance (PSU)
Fayaz – IT

25. Daljit works for the Marketing firm Choice (C)

26. Anil and Fayaz have experienced a decrease in their asset value. Anil works for the Manufacturing firm and Fayaz for the IT firm. Choice (D)

27. Of the given choices, the Finance firm is a PSU
Choice (B)

Solutions for questions 28 to 30:

28. $S_1 = n/2\,[2a + (n-1)\,d]$
$2S_1 = n\,[2a + (n-1)d]$,
$S_2 = n\,[2a + (2n-1)d]$
$S_4 = 2n\,[2a + (4n-1)d]$
$2S_1 + S_2 - S_4 = 4an + 3n^2d - 2dn - 4an - 8n^2d + 2nd = -5n^2\,d.$
So, M is dependent only on n and d. Choice (A)

29. 1111.....$2n$ times
– 888.....n times

P = 111.....$(n-1)$ times 222.....$(n-1)$ times 3

$\therefore$ The sum of the digits of 0 p
$= 1\,(n-1) + 0 + 2(n-1) + 3 = 3n$ Choice (B)

Alternative solution:
Though it is given that $n > 11$, there is a clear pattern that can be observed from $n > 1$ onwards.
Simply put $n = 2$, i.e., 1111 – 88 = 1023
$\Rightarrow$ Sum of digits = 6 = $3n$ (from answer choices)

30. Volume of the cuboid = $(42 \times 6) = 96$

Volume of the cylinder = $\pi r^2 h = \pi \left(2\sqrt{2}\right)^2 (6) = 48\pi$

Unoccupied volume = $48\pi - 96$

The gap between the cylinder and cube = $\left(4\sqrt{2}\right) - 4$

i.e. = 0.8 inches. Hence in the gap only one cylinder can be placed by considering the diameter. As the height is 6 inches, a total of $4 \times \frac{6}{0.8}$ i.e. 28 spheres can be placed.
Choice (D)

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

SECTION – II

Solutions for questions 1 to 3:

Number of words and Explanatory notes for RC:

Number of words : 440

1. The second half of statement c is not true. Refer to the last para '....the term AI has outgrown its usefulness'. The other statements are true. Statement (a) is true – AI is found in gaming as also in the military. Statement b is true – 'stigmatised term' in the first sentence of the last para. Statement (d) is backed by the second sentence of the penultimate para – 'clever technology'. Choice (A)

2. Refer to the last para - the words 'this stuff is real' follows Dr.Morris saying that AI is 'vague' and his separating research into autonomic computing from that into AI and calling the former real. Choice (B)

3. The words in quote form the first sentence of the passage. What follows in the para – intelligent application and lifelike quality – validates choice (D). The question refers to the use of the term in computer gaming and not in other fields. In other fields, the use of the term has been suspect but not in computer gaming where it has been straight forward. Choice (D)

Solutions for questions 4 to 6:

4. 'Hermetic' is air tight, 'heretic' is a disbeliever – b.
'Concurrent' is operating or occurring at the same time, 'consecutive' is following one after the other. Since the sentence says 'accounting year – with the tax year' it can only be concurrent ('consecutive' would be followed by 'to') – a.
'Prophecy' is a noun, a prediction of something to come, 'prophesy' is a verb, the act of predicting – a.
'Esoteric' is exhibiting knowledge that is restricted to a small group 'exoteric' is something suitable to be imparted to the public – a.
'Affluent' is flowing in abundance, 'effluent' is to flow out – b.
Hence baaab. Choice (B)

5. 'Prostate' is related to prostate gland. 'Prostrate' is to stretch out in submission or adoration – b.
'Disassemble' is to separate into different parts, 'dissemble' is to hide under a false appearance – b.
'Gibe' (noun) is to tease with tuanting words, 'jibe; (noun) is to move from one place to another; to shift – a.
'Factious' is pertaining to a faction, 'fractious' is to stubbornly resist authority – a.
'Meritorious' is praiseworthy, 'meretricious' is deceitful or deceptive, garbage can only be meretricious – b.
Hence bbaab. Choice (C)

6. 'Staunch' means to be loyal, 'stanch' is to check or stop the flow of – a believer is staunch – a.
'Gantlet' is a section of railway tracks that overlap, 'gauntlet' as used in the sentence is the idiom 'throw down the gauntlet' which means a challenge – a.
'Aghast' (adjective) is shocked, 'agape' implies 'in wonder' – a.
'Emigrate' is to leave one's place of residence or country to live elsewhere. 'Immigrate' is to come to a country of which one is not a native. You 'emigrate from' and 'immigrate to' – a.
'Corroborate' is to support with evidence 'collaborate' is to work jointly with others or together – b. Hence aaaab.
Choice (A)

Solutions for questions 7 to 9:

Number of words and Explanatory notes for RC:

Number of words : 487

7. Choice (B) is the best answer. Choice (D) is an easy elimination. Choice (C) is not the focus. The second half of choice (A) is incorrect. Only choice (B) is apt. Choice (B)

8. The author would not agree with statement (b) since he recognizes that free trade does hurt some workers (last sentence of para2), statement (a) is the author's view (last sentence of para1)
Statement (c) is backed by the second sentence of para3 (Trade allows a country…)
Statement (d) is validated by the last para. Choice (A)

9. Refer to the third para where the comparison is made. The last two sentences show that his objective is to emphasize the benefits of free trade. Choice (D)

Solutions for questions 10 and 11:

10. **Set 1:** The answer to this is in the first 3 sentences of the passage. While changes in society have been rapid, there is not enough said for us to infer whether or not growth in the media has also been rapid. Thus neither (c) nor (d) can be picked. The media system has been 'transformed', ie. changed completely and substantially, and we can infer from the context that the transformation referred to is in the areas of growth. Thus (b) can be picked, but not (a). Answer: b
Set 2: The answer to this is in the fifth sentence of the passage. The media's work is indicated as a major feature in building public perception, thereby impacting on the national agenda. Thus choices (a) and (b) cannot be picked. (c) can be picked. There is not enough in the context for us to infer that this is an objective of media work. Thus (d) cannot be picked. Answer: c
Set 3: The answer to this is in the sixth sentence of the passage. The technological revolution has had an impact, and the use of 'enhanced manifold' at the start of the sentence indicates that the impact has been positive. Thus (a) can be dropped, and (b) can be picked. (c) cannot be picked, because improved literacy has played a role as well, and we cannot infer that technological progress is the only important element. We cannot pick (d) - to have an impact on something, that something would already have been happening. Answer: b
Set 4: The answer to this is in the first of the 'consequences of change' that are listed. In saying that the demarcation has been eroded, the author is saying that there are no longer separations, which would mean that each of these fields interacts with, and has features in common with, the others. However, this is not enough to infer that they are now one field. Thus (a), (b) and (d) cannot be picked, (c) can be. Answer: c
Set 5: The answer to this is in the last 2 sentences of the second paragraph, which discusses the consequences of the change. India being an FI destination is mentioned as one of the factors (not the only factor) that 'reinforces' the significance of the media system. Thus (b), (c) and (d) cannot be picked. (a) can be. Hence bcbca. Choice (C)

11. **Set 1** – the answer is in the first paragraph, where it says that the low-income groups are the hardest hit. - b.
Set 2 – the answer is in the first paragraph, where it speaks of 'soaring' inflation over the last 3 financial years. - a.
Set 3 – The phrase is used in the context of inadequate storage capacity, resulting in wastage of food. This points to – c.
Set 4 – the answer is in paragraph 1 - "spending mainly on eatables" - b.
Set 5 – We see from para 2 that we have a compound problem, official unpreparedness, export bans, and inadequate warehousing. This points to – d.
Hence bacbd. Choice (B)

Solutions for questions 12 to 14:

Number of words and Explanatory notes for RC:

Number of words : 475

12. Statements a and d can be inferred from paragraph 1 and 2. Statement c is negated by para 3. Statement (b) has not been suggested. Choice (C)

13. Statement (b) is supported by the last sentence of the passage. Statement (a), (c) and (d) are not the author's views but commonly held opinions. Choice (B)

14. Choice A is incorrect since the author does not emphasize the importance of anger. Choice B is not apt since 'situation beyond one's control' is generalized and vague.
Choice C is ruled out since the study of the brain is not the focus.
Choice D is apt. Choice (D)

Solutions for questions 15 to 18:

15. B's argument is that non-unionized workers get wages on par with unionized workers in industries where wages are high. Hence unionization is not required.
This argument is weakened if it can be shown that non-unionized workers get good wages because the unionized workers bargained for higher wages. Choice (B) does this.
Choice (A) is irrelevant since it does not link unionization and wages.
Choice (C) strengthens B's argument. Choice (D) about different regions is irrelevant. Choice (B)

16. The link between health and fitness equipment and absence of cardiac problem would be correct only if we show that the use of these equipments is sufficient to keep problems at bay. This link is provided in choice (C). Choice (A) and (D) talk of awareness, the time spent with the equipment, which is insufficient. Choice (B) talks of likelihood for future which is not relevant. Choice (C) strengthens the argument by saying that exercise has the greatest impact on one's cardiac health. Choice (C)

17. Since sales tax is fixed for all consumers, it affects the poor more than the rich. The burden of the tax is more on poor consumers than on rich consumers. Hence it can be inferred that it is regressive (not progressive, which would benefit the poor more than the rich).
Choice (B) cannot be inferred since no figures are given. Choice (C) may be true (since the rich may buy more expensive items) but cannot be inferred from what is given. Choice (D) cannot be inferred - nothing is known about how much is spent. Choice (A)

18. Environmentalists blame pesticide for the increase in the number of dead birds. Pesticide manufactures question whether there has been an increase. Their stand would be strengthened if it can be shown that there is no increase (statement a) and that there is not link between pesticide and bird deaths (statement d).
Statement b strengthens the case of the environmentalists. Statement c is irrelevant since it does not say anything about birds. Choice (D)

Solutions for questions 19 and 20:

19. Choice (A) is a valid assortment of perfumes as it does not violate any of the given conditions. Choice (B) has Calvin Klein in it but no bottle of Temptation hence (B) is not correct. Choice (A)

20. Choice (A) is ruled out because it contains one Calvin Klein but 2 bottles of Temptation which is not valid as per the given conditions. Choice (B) is incorrect as Charmie and Camille Rouge cannot be packed together. Choice (C) conforms to all rules and hence is our answer.
Choice (C)

Solutions for questions 21 to 24:

The minimum number of coins one can pick is 1 and the maximum is 6.
The Controlling Number (CN) of coins in this game is 7 (i.e., the Min + Max coins one can pick). We also know that the person picking up the last coin is the loser. Hence anyone trying to win the game has to ensure that he/she leaves 1 + 7 (1 coin + Controlling Number of coins) i.e., 8 coins one the table. The coins that have to be picked to be assured of a win are 9^{th} (9 + 7), 23^{rd} (16 + 7), 30^{th} (23 + 7) ..... coins.
We can write this in the general form as $7k + 2$ where $k = 0, 1, 2, 3$ .....
Now let us analyse the game with 9 coins.
Let us assume that Shonika picks up the 9^{th} coin. Smaraki can pick any number of coins in the range of 1 – 6.

I. If Smaraki picks 1 coin
Then Shonika picks 6 coins and leaves 1 coin.
II. If Smaraki picks 2 coins
Then Shonika picks 5 coins and leaves 1 coin.
III. Similarly if Smaraki picks 6 coins
Then Shonika picks 1 coin and leaves 1 coin.

21. The number of coins on the table is 16. To be assured of the win Shonika should ensure that she picks up the $7k + 2$ coins, which in this case is the 16^{th} coin. Hence, Shonika should pick up just 1 coin. Choice (A)

22. Number of coins = 28
Winning strategy = Pick the $7k + 2$ coin.
The $7k + 2$ coin in this case is the 23^{rd} coin.
$\therefore$To win Sonia should have picked 6 coins (i.e., 28^{th}, 27^{th}, ... 23^{rd} coin). Hence the strategy adopted in this case is wrong. Choice (B)

23. Number of coins = 38
Winning strategy = 7k + 2 coin is to be picked. $7k + 2$ coin in this case is 37. Hence Smaraki should remove 2 coins (38^{th} and 37^{th}). Choice (C)

24. Number of coins on the table should be greater than 20.
Winning strategy is $7k + 2$ coin which has to be picked. The number greater than 20 satisfying this is 23. If Smaraki makes the first move (with the number of coins on the table being 23 or greater) then Smaraki can ensure that she picks the 23^{rd} coin to win. However if there are 22 coins on the table Smaraki will not win irrespective of the strategy she uses. Choice (A)

Solutions for questions 25 to 27:

It is given that no candidate was allowed to vote as long as he is in contention. After a candidate is eliminated, he can take part in the voting process, but the student who proposed his name and students who supported the proposal would become ineligible in each round, i.e., 3 students become ineligible to vote and one student becomes eligible to vote, and so the total votes cast in each round, if there are no other cases by which one becomes ineligible, comes down by two. As a total of 110 votes were cast in the second round, a total of 112 votes were cast in the first round.

All those who voted for candidates B and D in any round, continued voting for the same candidates. Also candidate B got 110 – (45 + 29) = 36 votes in the second round, which is same as that in the first round. Now, as the total number of votes cast in the second round is 110, the total votes cast in the third round should have been 108, but as only 95 votes were cast in total, it means that 108 – 95 = 13 students who voted in round 2 became ineligible to vote in round 3 or of the 20 candidates who voted for A in round 1, 13 candidates voted for C in round 2. C would have got 15 (those who voted for C in round 1) + 13 (those who voted for A in round 1) + 1 (candidate A) = 29 votes in the second round. Note that 60% of votes retained by C in round 2 can only be 15 (as total votes polled by C in round 2 is 29 and 13 students who voted for A in round 1 voted for C in round 2.

$\therefore$Candidate C got 25 votes in round 1 and candidate D got 31 votes in round 1 and in round 2. D got 10 votes of those who voted for candidate C in round 1 and 4 votes from those who voted for candidate A in round 1. As the number of votes cast for D cannot decrease and as the difference between the votes secured by the two candidates in the third round is seven, candidate D got 51 votes in the third round and candidate B got 44 votes.

25. The number of students in the class is = 112 + 4 = 116.
Choice (B)

26. The votes cast for candidate D in round 1 was 112 (total votes cast in round 1) – (36 + 25 + 20) = 31.
Choice (C)

27. 13 students who voted for candidate A in round 1 voted for candidate C in round 2. Choice (D)

Solutions for questions 28 to 30:

Following information is given:
(i) None had less than Rs.15 ($\Rightarrow$ each person had $\geq$ Rs.15)
(ii) Four odd numbers, one even number
(iii) No two persons had the same amount.
(iv) Maximum amount = odd.
(v) Total sum = Rs.150.

28. To obtain the maximum difference between the highest and the lowest possible amounts, we should assume the least amount to be 15, which is the bare minimum. Then, the amounts will be 15, 16, 17, 19, 83.
Hence, the desired difference = 83 – 15 = 68.
Choice (C)

29. To maintain the least difference between the five amounts, these should be as close to 30 (as 150/5 = 30) as possible.
Hence the desired numbers are 27, 29, 30, 31, 33 and the required difference is 33 – 27 = 6 Choice (A)

30. From the given condition, the only possible amounts are 15, 25, 35, 45 and 30.
Hence, the even amount is 30. Choice (C)

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