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

Ref: AIMCAT1212

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 4:* Answer the questions independently of each other.

1. In a school, 20 students play cricket, 30 play basketball and 50 play hockey. If the number of students who play exactly one game is 30 and the number of students who play exactly two games is 20, find the number of students who play all the three games.
(1) 15 (2) 10
(3) 16 (4) Cannot be determined

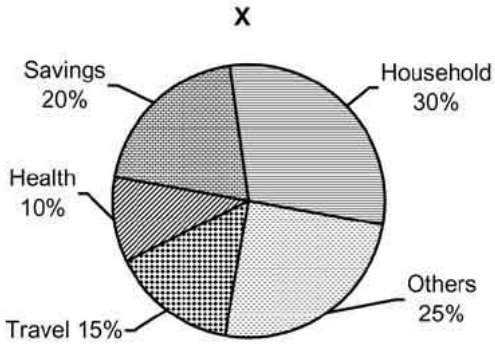
2. A circle is inscribed in an equilateral triangle ABC of side 6 cm. A tangent is drawn to the circle from a point D on AB such that the tangent from D meets BC perpendicularly at E. Find area (in sq. cm) of the triangle BDE.
(1) $3\sqrt{3}\left(2-\sqrt{3}\right)$ (2) $3\sqrt{3}\left(2+\sqrt{3}\right)$
(3) $2\sqrt{3}\left(2-\sqrt{3}\right)$ (4) $2\sqrt{3}\left(2+\sqrt{3}\right)$

3. In a geometric progression, the sum of the first n terms is 3069 and the first term is 3. If the n^{th} term in the progression is 1536, find the common ratio.
(1) $\frac{1}{2}$ (2) $\frac{3}{2}$ (3) 2 (4) 4

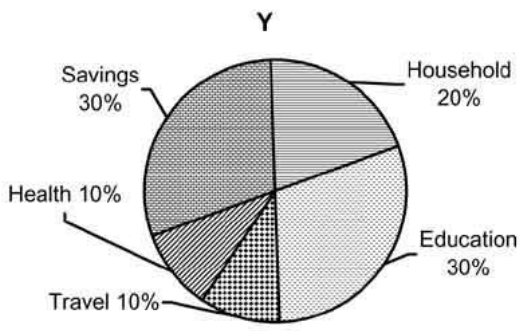
4. There are four green and two red balls in a box. If two balls are randomly drawn from the box, one after the other, without replacement, then what is the probability that the balls drawn will be of different colours?
(1) $\frac{7}{30}$ (2) $\frac{7}{15}$ (3) $\frac{8}{15}$ (4) $\frac{23}{30}$

DIRECTIONS *for questions 5 to 7:* Answer the questions on the basis of the information given below.

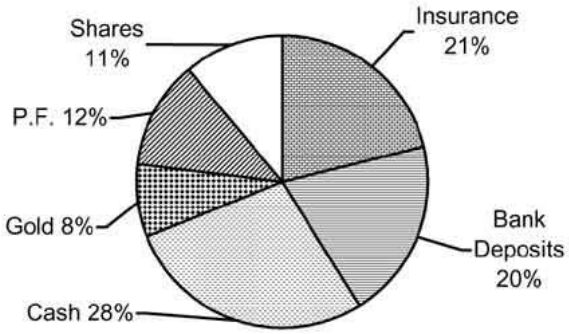
Pie Charts I and II show the break up under different heads of expenses and the savings of the total income of X and his son Y, respectively, in the year 2007. Pie Chart III shows the allocation of their combined savings, in that year.



Pie Chart I



Pie Chart II



Pie Chart III

5. If the ratio of the incomes of X and Y is 3 : 1, then the number of heads under which X has invested his savings, is at least
(1) 2 (2) 1 (3) 4 (4) 3

6. If the total amount invested in Bank Deposits is the same as Y's expenditure on travel, then what is the ratio of the total expenditures of X and Y?
(1) 4 : 5
(2) 1 : 1
(3) 8 : 7
(4) Cannot be determined

7. If Y invests his savings equally under each of the six heads, while X invests his saving under only five heads, what percentage of his income did X invest in insurance?
(1) 6% (2) 5% (3) 7% (4) 8%

DIRECTIONS *for questions 8 to 14:* Answer the questions independently of each other.

8. Akhil started from Surat at 11:00 a.m. and reached Ahmedabad at 4:00 p.m. Rahim started from Ahmedabad at 1:00 p.m. and reached Surat at 5:00 p.m. One hour after Akhil started, his friend Ritika, whose speed is 25% more than that of Akhil, started from Surat towards Ahmedabad. Assume that each of them maintains a steady speed and uses the same route.

Which of the following statements are true?

I. Ritika meets Rahim 10 minutes after Akhil meets Rahim.
II. Rahim reaches Surat 90 minutes after he meets Ritika.
III. Akhil and Ritika reach Ahmedabad at the same time.

(1) Only I and III (2) Only III
(3) Only II and III (4) Only I and II

9. Find the number of pairs of positive integers which satisfy the equation $x^y = y^{60}$.
(1) 15 (2) 1 (3) 6 (4) 12

10. $\frac{4^5+5^5+6^5+7^5+8^5}{15}$ leaves a remainder
(1) 1 (2) 5
(3) 0 (4) None of these

11. Given that $-2 \le p \le 2$, $-4 \le q \le -0{\cdot}25$, $-4 \le r \le -0{\cdot}25$ and $s = pq/r$, then which of the following is necessarily true about the possible values that s can assume?
(1) $0 \le s \le 16$ (2) $-16 \le s \le 16$
(3) $16 \le s \le 36$ (4) $-32 \le s \le 32$

12. Paresh borrowed an amount of `23170 from Munna at an interest rate of 10% p.a., compounded annually, and repayed the entire amount in three equal annual instalments. Find the value of each instalment.
(1) Rs.9317 (2) Rs.9268
(3) Rs.7896 (4) Rs.9648

13. There are two pipes P_1 and P_2, through which water flows into a tank at speeds of 2 m/s and 6 m/s respectively. If the cross-sectional areas of the pipes are 15 cm^2 and 25 cm^2 respectively, and it takes 40 minutes to fill the tank, then find the capacity of the tank (in kilolitres).
(1) 28.8 (2) 32.4 (3) 86.4 (4) 43.2

14. A circular pizza is cut into four identical pieces (or quadrants) with two diametrical cuts made perpendicular to each other. Each piece can be topped with any one of five available toppings but no two adjacent pieces have the same topping. In how many ways can the four pieces be topped?
(1) 260 (2) 160 (3) 70 (4) 240

DIRECTIONS *for questions 15 to 18:* Answer the questions on the basis of the information given below.

A total of 5000 applicants, from three different backgrounds – B.Tech, B.Com and B.Sc – applied for jobs in a certain software company. The table given below lists out, for the applicants from each background, the number of applicants who are experienced and the number of applicants having different types of certifications as a percentage of the total number of applicants from that background. Some of the cells in the table have been left blank intentionally.

Background	Experienced	dot NET Certification Holders	Java Certification Holders	Neither dot NET nor Java Certification Holders.
B.Tech.	40%		60%	40%
B.Com.	30%	60%		20%
B.Sc.		40%		10%
Total	44%	52%		20%

For example, according to the table above, 40% of the applicants from B.Tech background are experienced, while 60% of the applicants from B.Tech background hold a Java certification.

It was observed that some of the applicants with experience did not have any certification, but all those without any experience had either a dot NET or a Java certification or both. Further, 20% of the total applicants are from B.Tech. background. The total number of applicants who have both a dot NET and a Java certification is 1400, of which 200 are from B.Com background.

15. What percentage of the total applicants hold a Java certification?
(1) 28% (2) 42% (3) 56% (4) 14%

16. How many Java certification holders are from B.Com. background?
(1) 600 (2) 800 (3) 400 (4) 1000

17. How many applicants from B.Sc. background are experienced?
(1) 1400 (2) 800 (3) 1000 (4) 1200

18. How many applicants from B.Tech background do not have dot NET certification?
(1) 300 (2) 400 (3) 500 (4) 600

DIRECTIONS *for questions 19 to 23:* Answer the questions independently of each other.

19. The least common multiple of N distinct natural numbers is 2520. Which of the following is the best description of N?
(1) $1 \le N \le 10$ (2) $1 \le N < 50$
(3) $1 < N < 24$ (4) $1 < N \le 40$

20. Consider the expression
$$\left(1-\frac{1}{4}\right)\left(1-\frac{1}{9}\right)\left(1-\frac{1}{16}\right)....\left(1-\frac{1}{n^2}\right)$$
The largest value of *n* for which the value of the expression is not less than 0.51 is
(1) 49 (2) 51 (3) 25 (4) 50

21. Find the area (in square units) of the region in which all the following inequalities are satisfied $|x-y| \le 1, |x| \le 1 \text{ and } |y| \le 1$.
(1) 2.5 (2) 3 (3) 2 (4) 1

22. A change dispensing machine contains 1 rupee, 2 rupee and 5 rupee coins. The total number of coins in the machine is 200. The total amount in the machine adds up to Rs.450. If the number of 1 rupee and 2 rupee coins are interchanged, the total amount comes down to Rs.325. The number of 5 rupee coins in the machine is
(1) 25 (2) 20 (3) 30 (4) 15

23. Find the value of $0! (1^2 + 1 - 1) + 1! (2^2 + 2 - 1) + 2! (3^2 + 3 - 1) + \text{-----+ } 20! (21^2 + 21 - 1)$.
(1) 19! + 20! – 2 (2) 21! + 20! – 1
(3) 22! + 20! – 2 (4) 22! + 21! – 2

DIRECTIONS *for questions 24 to 27:* Answer the questions on the basis of the information given below.

T-mail is an e-mail service provider that provides internet users with two types of e-mail services – Free and Premium. The free users, 20 million in number, can use the basic e-mail services without paying any user fee, while the premium users, 0.4 million in number, pay a monthly fee of $10 for availing premium services in addition to the basic e-mail services. T-mail conducted a study among its users to ascertain the possible avenues for revenue growth. The study estimated that the monetary equivalent or the *perceived value* of its services was $120 per annum for each free user and $480 per annum for each premium user.

T-mail's major source of income is from its advertisements (also known as ads), targeted at its free users, while the services provided to its premium users are free of ads. However, the study noted that the free users experienced a dissatisfaction from being exposed to ads. The study quantified the monetary equivalent of this dissatisfaction and termed it as the '*Tolerance price*'. This *tolerance price* was estimated to be $40 per annum per free user. Also, the *tolerance price* was estimated to go up linearly with an increase in the quantum of ads displayed to each free user and would reach $120 per annum per free user when the quantum of ads reaches thrice the present level. The study then defined a parameter called *consumer surplus* for each user which was the difference between the *perceived value* (PV) of its services to the user and the *user cost* (UC). The UC for the free users was the *tolerance price*, while that for the premium users was simply the user fee charged. Hence, the annual *consumer surplus* for each free user, at the existing quantum of ads, was $120 – $40 = $80 and that for each premium user was $480 – ($10) 12 = $360.

The following observations were also made while analysing the results of the survey:

(i) The number of free users was estimated to fall linearly with a decline in their *consumer surplus*, and reach 20% of the existing number, i.e., 20 million, at zero *consumer surplus* and then immediately fall to zero with any further decline in the *consumer surplus*.

(ii) Similarly, the number of premium users was estimated to fall linearly with a decline in their *consumer surplus*, and reach zero at zero *consumer surplus*, beyond which there would be no premium users.

(iii) At the existing quantum of ads displayed, T-mail charged its advertisers (i.e, those whose ads were displayed) an average annual *ad fee* of $1 per free user, while the advertisers, on the other hand, perceived an average annual *benefit from ads* of $2 per free user. The *ad fee* charged and the perceived *benefit from ads* are both directly proportional to the quantum of ads displayed. The advertisers would decrease the quantum of ads displayed linearly, if their surplus per free user, i.e., *benefit from ads – ad fee* (both on a per free user basis), decreases, and stop their ads altogether when their surplus per free user reaches zero.

24. What is the maximum percentage by which the quantum of ads displayed to the free users can be increased, beyond which the free user base would be completely eroded?
(1) 100% (2) 200% (3) 300% (4) 150%

25. If Total Annual Advertisers' Surplus, T, = (Number of free users) × (Annual advertisers' surplus per free user), what is the maximum value of T that can be obtained by varying the quantum of ads displayed?
(1) $20.8 million (2) $27.2 million
(3) $24.5 million (4) $12.5 million

26. For what percentage increase in the monthly fee charged for premium users will the number of premium users fall to 0.1million?
(1) 225% (2) 300% (3) 175% (4) 125%

27. The study made a few additional observations. If T-mail were to stop its free services altogether, then the percentage of the existing free users who will migrate to premium services is estimated to be only 0.9%. On the other hand, if T-mail were to downgrade its free services, then the percentage of the existing free users who will stop using T-mail's free services is 90%, of which only 0.8% will choose to migrate to premium services and continue with T-mail.

In the light of the above observations, which of the following is the best course of action to effect a maximum increase in T-mail's revenues?
(1) Stop the free services altogether.
(2) Downgrade the free services.
(3) Increase the ad fee by 60%.
(4) Increase the premium user fee by 60%.

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

28. If $f(x) = \log\left(\frac{x^2+1}{x^2-1}\right)$ and $xy = 2$, then which of the following is equal to $f(x) + f(y)$?

(1) $f(x+y)$
(2) $\log\left(\frac{1+(x+y)^2}{1-(x-y)^2}\right)$
(3) $f(xy)$
(4) $\log\left(\frac{(x+y)^2+2}{(x+y)^2-1}\right)$

29. If $x = -0.2$, which of the following is the largest?
(1) $-\left(x^{-1/x}\right)$ (2) $250x^2$
(3) $\frac{10}{\left(\sqrt{-x}\right)^3}$ (4) $5^{\frac{-1}{2x}}$

30. Rinku goes to a shop with Rs.60 to purchase two types of chocolates – 'Tik-Tak' and 'Rock-n-Roll', each costing Rs.2 and Rs.3 respectively. If Rinku buys at least one chocolate of each type and the number of Rock-n-Roll chocolates purchased are more than those of Tik-Tak, then the number of possible combinations of the two types of chocolates that Rinku could have bought spending the entire amount is
(1) 4 (2) 3 (3) 10 (4) 9

SECTION – II
Number of Questions = 30

DIRECTIONS *for questions 1 to 3:* There are two blanks in each of the following sentences. From the pairs of words given below each sentence, choose the pair that fills the blanks most appropriately.

1. The Eleventh Plan's strategy was to ensure that key sectors of the economy grew at _____ rates and, secondly, to make _____ in the social sector.
(1) remarkable . . . arbitration
(2) exceptional . . . interference
(3) approachable . . . interposition
(4) acceptable . . . interventions

2. Even when the _____ generated by the exit of the oligarch was in full flow, many among Egypt's more _____ protesters observed that they had brought down the dictator, not the dictatorship.
(1) elation . . . passionate
(2) exhilaration . . . naive
(3) euphoria . . . seasoned
(4) excitement . . . young

3. It is now obvious that Nato's _____ mission, under the United Nations Security Council Resolution to protect civilians in Libya is expanding into a _____ illegal attempt at regime change.
(1) dedicated . . . notoriously
(2) purported . . . flagrantly
(3) sincere . . . strikingly
(4) proxy . . . perceptibly

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

Some people would say it was tantamount to foxes asking to be consulted about the welfare of chickens. But the global tobacco industry, while no longer denying that its products do terrible damage, has long insisted that in any discussion about how to limit the medical effects of the weed, it is a legitimate partner.

That claim was emphatically rejected by health officials from 160 countries after a week's deliberation in South Africa which concluded on November 22nd. In a statement that grew steadily tougher in the course of the meeting–to the dismay of cigarette firms and the delight of their adversaries–it was proclaimed that there is a "fundamental and irreconcilable conflict" between the interests of the tobacco industry and the cause of public health.

Isn't the reference to "irreconcilable conflict" simply a statement of the obvious? Far from it, whichever side of the trenches you occupy. Tantalising but outrageous attempts to glamorise smoking through billboards and films may largely be a thing of the past, but these days the industry uses subtler tactics to burnish its image as a business that, despite everything, cares about its consumers. How much credence governments give these tactics is an important issue.

In countries where governance is weak and people are poor, tobacco companies can make themselves useful by organising "conferences" where, for example, the value of advertising bans is mocked. And ministers can be induced to water down bans on smoking in public places by decreeing more areas where people can still puff away. In what critics call a subtle form of self-promotion, companies can engage in campaigns against "youth smoking" which actually serve to publicise their brands. In Zambia, for example, British American Tobacco (BAT), the second-largest player in the global business, has been involved in a campaign to stop the sale of cigarettes to people under 18.

And BAT, as it happens, was quick off the mark in denouncing the outcome of the South African meeting. It emphasised what may be one of the industry's more plausible arguments in favour of being treated as a legitimate partner: the need to crack down on cigarette smuggling (as urged by the global treaty) which tends to rise as high taxes are slapped on tobacco (also recommended by the treaty).

The guidelines adopted in South Africa, so BAT complained, could ban most public communication by tobacco companies, minimise contact between them and governments and ban the display of tobacco products in shops. Such "extremism" would obstruct the efforts of the "legitimate tobacco industry" to block illegal sales to children, fight illicit commerce and invest in "safer" products. (For health advocates, the very idea of "safe" forms of tobacco is misleading.) Another proposal that won an approving mention at the South African meeting–plain packaging for all cigarettes–would help counterfeiters and smugglers, BAT says.

Some critics would say Big Tobacco has been a latecomer to the war against smuggling. In years past, the European Commission used to accuse well-known firms of colluding with smugglers by slipping them merchandise that was destined to enter the European Union illegally. European officials at the South African meeting said they couldn't fight contraband without at least talking to legal producers. (Other foot-draggers at the gathering were the governments of Japan and China, both of which have big stakes in the tobacco business.)

The United States is a conspicuous absentee from the WHO's war against smoking. The tobacco treaty is one of many instruments of international law that America helped to design, only to hold off from ratifying it because of stiff opposition on Capitol Hill. For example, Richard Burr, a senator from North Carolina, calls the treaty a surrender of sovereignty which would punish the United States by forcing it to fund the lion's share of a global anti-tobacco drive with no corresponding rise in influence. Moreover, he says, the drafters of the treaty refused to listen to the "producers of tobacco"–a sure sign that their purpose was not "to bring a safer product to market" but to eliminate the production of tobacco altogether. On the last point, at least, tobacco's sternest foes might concur with the senator.

4. We can understand from the passage that:
- (a) Some critics of tobacco would like the abominable product to be eliminated from the market altogether.
- (b) China and Japan are reluctant to endorse the more stringent measures related to tobacco.
- (c) Tobacco firms may have aided the smuggling of related merchandise into Europe.
- (d) Keeping tobacco producers out of the loop in the fight against contraband may have detrimental effects.

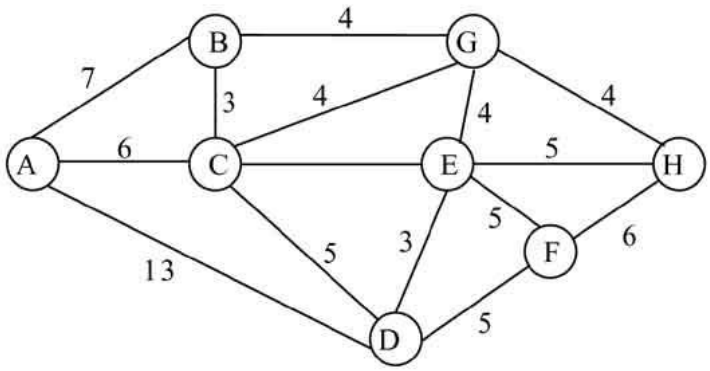
(1) Only (a) (2) (a) and (b)
(3) (a), (b) and (c) (4) (a), (b), (c) and (d)

5. Which of the following statements about politicians, known to be corrupt, is in line with the author's perception of the fox and chicken allegory?
(1) Such politicians, in power, distributing largesse to their kith and kin.
(2) Such politicians shedding crocodile tears over the poor man's plight.
(3) Such politicians contesting elections.
(4) Such politicians continuing in positions of authority.

6. One of the following supports the tobacco industry's argument that they be treated as legitimate partners to combat cigarette smuggling. Identify the statement.
(1) High taxes are imposed on tobacco.
(2) Legal producers can cooperate with governments to block illegal sales to children.
(3) Most of the cigarettes smoked in Canada are illegal.
(4) Cigarettes are smuggled into the rich parts of Europe where the retail price of cigarettes are very high.

DIRECTIONS *for questions 7 to 9:* Answer the questions on the basis of the information given below.

A, B, C, D, E, F, G and H are eight places which are interconnected by roads as given in the figure below.



The value given alongside each road represents the distance (in km) between the two places connected by that road. The exact distance between C and E is not known, but it is known that it is at least d_1 km and at most d_2 km. No roads other than those given above exist between any two of these eight places.

7. If d_1 = 7 km and d_2 = 10 km and no place can be visited more than once, then what is the longest distance (in km) one has to travel for going from A to H?
(1) 36
(2) 40
(3) 39
(4) Cannot be determined

8. If due to road repairs, no journey can be undertaken on the direct road from A to C, and no journey is possible through E as there is a procession going on, then in how many ways can one travel from A to C without visiting any place more than once?
(1) 8 (2) 5 (3) 6 (4) 7

9. If d_1 = 4 km and d_2 = 7 km and all roads to G are blocked, then what is the shortest distance (in km) one has to travel for going from H to B by visiting each city (other than G) exactly once?
(1) 31
(2) 32
(3) 33
(4) Cannot be determined

DIRECTIONS *for questions 10 to 12:* 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.

10. The soldiers were losing the battle when they heard the sound of hooves; the **cavalry** [a] **/ calvary** [b] had arrived.
Her vivid pictures come easily to life; we taste the soggy tomato sandwiches she takes to school and **exult** [a] **/exalt** [b] in her first glimpse of the ocean.
Let the other party leaders get paranoid about internal **dissent** [a] **/ descent** [b].
Luckily a routine test allowed my doctor to catch it at a very early stage, and the **diagnosis** [a] **/ prognosis** [b] is excellent — we expect a full and speedy recovery.
The watchman became **weary** [a] **/wary** [b] when he heard of robbery in the neighbourhood.
(1) a b a a b (2) b a a b b
(3) a a a b b (4) b a b b a

11. Matteo lifted his eyes to the matrix of seeming disorder, and wondered at the venerable sow, ill-nurtured and slack with **inanity** [a]**/ inanition** [b], who yet could produce robust litters on demand.
Alliterative [a] **/ Tautological** [b] implicatures which actually arise in a language are not ones that audiences can work out.
What emerges is a tale of misspent fortunes and murderous **revenge** [a] **/ avenge** [b] among the crumbling ruins of an old film set.
Making it much more difficult to retire on grounds of ill-health was a rather **callous** [a] **/callus** [b] way of dealing with part of the problem.
As the two planes entered the mission area, they were briefed by departing aircraft who had been receiving anti-aircraft **flak** [a] **/ flack** [b] from the northern edge of the mission area.
(1) b b a a a (2) b a b b b
(3) a b b a a (4) a b a b a

12. The curtain of magic at the entrance rippled, letting in crowd-howls, a heavy bass beat and a **minion** [a] **/ minyan** [b] -vampire.
It is suggested that the introduction of a work place parking **levee** [a] **/ levy** [b] may lead to the introduction of car clubs at work.
I am a **poseur** [a] **/ poser** [b], I'm really not sincere or authentic, so I just act like one who is, and hope I am accepted by others.
The worst thing we can do for peace is to **abstain** [a] **/ refrain** [b] from a resolution condemning the settlements.
My **ideal** [a] **/ idyll** [b] is to provide services to those who need them and those who choose to participate in them.
(1) a b a a a (2) a a b b a
(3) a a b a a (4) b a b a a

DIRECTIONS *for questions 13 to 15:* Read the following passage and answer the questions that follow it.

Over the next 30 years cities in the developing world are set to grow by an extra 2 billion. But many governments have become doubtful of their ability to cope with urbanisation on such an enormous scale; some have concluded that they ought to slow the process down in order to minimise social upheaval. This view owes as much to anti-urban bias as it does to sober analysis.

New research published by the World Bank in its annual flagship World Development Report suggests that pessimism over the future of huge cities is wildly overdone. The bank argues that third-world cities grow so big and so fast precisely because they generate vast economic advantages, and that these gains may be increasing. Slowing urbanisation down, or pushing it towards places not linked with world markets, is costly and futile, the bank says. At a time of contagion and bail-outs, the research also reaffirms the unfashionable view that the basic facts of geography – where people live and work, how they get around – matter as much as financial and fiscal policies.

The bank's research yields lots of new insights. It argues, for example, that the share of humanity that lives in cities is slightly lower than what most people think. The report's main point is that, whatever their exact dimensions, the huge cities of the poor world should not be written off as a disaster simply on grounds that they are too big, too chaotic, too polluted and too unequal.

It is true that they are unprecedented in size. Mexico City, Mumbai, Sao Paulo and Shanghai each have over 15m people, whereas Paris and London, after their surge in the 19th century, had less than half that. The average population of the world's 100 largest cities now exceeds 6m. In 1900, it was only 700,000.

But relative to the size of countries' populations, the current growth is far from unusual. Between 1985 and 2005 the urban share of the population of developing countries rose by eight percentage points. Between 1880 and 1900, the bank says, the urban share in then-industrialising Europe and America went up by about the same amount. Over time, cities as disparate as Santiago (in Chile), Seoul, Lisbon and São Paulo have all followed strikingly similar paths, rising fast until they made up about a quarter of their countries' populations, then stabilising when the country's income hit about $5,000 per person. This path roughly tracks the transition of a country from an agricultural to an industrial base. Many countries are undergoing that sort of transition now, and therefore urbanisation is accelerating. But history suggests it will not go on rising at this rate for ever.

History also suggests that the income gaps that worry governments will narrow. As people move to the city, urban wages are typically 40-50% higher than unskilled farm earnings (that was the premium in Europe in the 19th century; it is about the same in developing countries today). But the income gaps of rich countries have narrowed, so living standards in the West today are roughly the same between town and country.

That convergence is starting in poor countries, too: in poorer Malawi and Sri Lanka, city dwellers account for a much bigger share of consumption than of population (20% compared with 10%). But in richer Chile and Brazil, urbanites account for only slightly more consumption than population.

So one answer to the question – why are third-world cities so big – is that they are not, in relative terms, all that large. But another answer, suggests the World Bank, is that they are big because they do an economic job that is becoming more, not less, important.

If it is so important where economic activity takes place, what should countries do if they lack big cities – perhaps because they are landlocked, or cut off from world markets or have many poor people living in rural areas? These, the bank thinks, are the real problems of urbanisation, not the multiplication of slums or congestion. The answer, in the bank's view, depends on why people are cut off. If they are trapped in underemployment in remote rural areas, the main task is to establish land markets and basic services (schools, streets, sanitation) to help cities grow. This is the situation in much of Africa and remote parts of China.

Where urbanisation has started but pockets of the population are trapped far away, governments have to focus more on transport and other sorts of infrastructure to connect lagging regions with fast-growing ones. It is not until a more advanced stage of urbanisation is reached – with 75% of the population in cities (like, say, northern Egypt or Rio de Janeiro) – that it makes any sense to spend a lot on such policies as slum clearances, lest the now-teeming city is split apart by crime and grime.

13. The passage suggests that the 'real problems of urbanization' can be tackled by
(1) establishing special economic zones to decluster production in cities.
(2) arresting the flow of credit to business services in cities.
(3) clearing the slums in the city and rehabilitating the displaced in cheap housing sectors in less congested areas.
(4) establishing land markets as well as infrastructure that connects places.

14. It can be understood from the passage that the World Bank report indicates concern about large cities more in the aspect of
(1) consumption rather than population.
(2) size rather than economic activity.
(3) access rather than prevalence of slums.
(4) crime rather than congestion.

15. The World Bank allays third world fears that the huge cities would spiral out of control by giving all the following reasons EXCEPT:
(1) The rates of urbanization would stabilize after a certain level of urbanization is reached.
(2) The share of consumption of urbanites would remain higher than that of country dwellers.
(3) Income gaps between urban and rural wages would reduce over time.
(4) The rates of urbanization are quite normal in developing countries.

DIRECTIONS *for questions 16 to 19:* Answer the questions on the basis of the information given below.

Five friends – Navandar, Chandekar, Waradkar, Bholanekar and Edwankar – purchased five books – *The Kite Runner*, *Simoqin Prophecies*, *The God of Small Things*, *Paddy Clarke Ha Ha Ha* and *The Finkler Question*. As none of the friends had read any of the five books, they decided to finish reading the books in exactly five days, with each of them reading exactly one book per day. At the end of each day, all the friends met together and exchanged the books among themselves so that each of them got a new book to read. The following information is also known about the order in which the books were read:

(i) All the friends, except Chandekar, read *Simoqin Prophecies* before they read *The Finkler Question*.

(ii) *The Kite Runner* was the third book read by Bholanekar and he read it after he read *Paddy Clarke Ha Ha Ha*.

(iii) Waradkar was the third person to read *Paddy Clarke Ha Ha Ha* and after reading it, he gave the book to Navandar.

16. What was the first book read by Chandekar?
(1) *The God of Small Things*
(2) *The Finkler Question*
(3) *Paddy Clarke Ha Ha Ha*
(4) Cannot be determined

17. Who read *Simoqin Prophecies* on the fourth day?
(1) Bholanekar
(2) Navandar
(3) Chandekar
(4) Cannot be determined

18. Which of the following is the order of the persons who read *The God of Small Things* (from the first day to the fifth day)?
(1) Bholanekar, Navandar, Chandekar, Waradkar, Edwankar.
(2) Waradkar, Edwankar, Navandar, Chandekar, Bholanekar
(3) Edwankar, Bholanekar, Chandekar, Waradkar, Navandar.
(4) Cannot be determined

19. After reading *The Finkler Question*, Navandar gave the book to
(1) Bholanekar.
(2) Edwankar.
(3) Chandekar.
(4) Cannot be determined

DIRECTIONS *for questions 20 and 21:* 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.

20. Those who are able to be proactive can often overcome stressors and are more likely to be able to cope well with unexpected situations. On the other hand, those who are more reactive will often experience more noticeable effects from an unexpected stressor. In the case of those who are passive, victims of a stressful event are more likely to suffer from long term traumatic effects and often enact no intentional coping actions. _____
(1) Trauma can be caused by man-made and natural disasters, including war, abuse, violence or earthquakes.
(2) These observations may suggest that the level of trauma associated with a victim is related to such independent coping abilities.
(3) A number of psychotherapy approaches have been designed with the treatment of trauma in mind.
(4) People who go through these types of extremely traumatic experiences often have certain symptoms and problems afterward.

21. The main arguments against sanctions is illustrated by their role in propping up Mr. Castro. They have provided the dictator with a convenient excuse for all that is wrong with his country. They are also woefully indiscriminate weapons: plenty of poor Cubans, not to mention perfectly respectable foreign business people, have suffered needlessly. And sanctions are as difficult to get rid of as they are easy to invent, since giving up sanctions nearly always involves a climb-down by the sanctioner. _____
(1) The President came to office pledging to simplify and reduce America's use of sanctions.
(2) Besides, with America's sanctions there is an added injustice: their extra-territoriality.
(3) Were an embargo to be withdrawn, Mr.Castro would claim victory.
(4) None of this suggests that sanctions should be altogether banned.

DIRECTIONS *for questions 22 and 23*: Each question consists of five statements followed by options consisting of three statements put together in a specific order. Choose the option, which indicates a valid argument, that is, where the third statement is a conclusion drawn from the preceding two statements.

22. A. All men are Martians.
B. All women are from Venus.
C. Some from Venus are non-vegetarians.
D. All Martians are vegetarians.
E. All men are vegetarians.
(1) ABE (2) BCD (3) AEC (4) ADE

23. A. No Rose is a Bud.
B. Thorns are Flowers.
C. Some Flowers are not Buds.
D. No Thorn is a Bud.
E. Roses don't have Thorns.
(1) BDC (2) ABE (3) ADE (4) DEC

DIRECTIONS *for question 24:* Each question consists of a statement followed by four choices. Identify and mark as your answer, the choice which NEGATES the statement given in the question.

24. Unless Ajay or Sujay do not go to school, Vijay will not go to school.
(1) Vijay, Sujay and Ajay went to school.
(2) Ajay went to school but Sujay and Vijay did not.
(3) Sujay went to school though both Ajay and Vijay did not go to school.
(4) Vijay went to school though both Ajay and Sujay did not go to school.

DIRECTIONS *for questions 25 to 27:* Each question consists of five sentences on a topic. Some of the sentences are grammatically incorrect or inappropriate. Select as your answer the option that indicates the grammatically correct and appropriate sentence(s).

25. A. Indians naturally make excellent sports presenters primarily because of two basic traits.
B. First is their knowledge of the game, which one might guess comes naturally to them and secondly and more important, a deep and abiding passion.
C. Alan Wilkins, a cricket analyst and commentator, was in Mumbai as the judge of Mumbai auditions for Cricket commentators and was taken aback by both the quality as well as the depth that some of the participants had.
D. Youngsters, software and corporate professionals, and others were there to prove that they have it in them to be the next face of cricket presentation in India.
E. It was fascinating though some of them actually brought out a uniquely fresh perspective to the art of cricket presentation.
(1) A, B and D (2) B, D and E
(3) Only A (4) A and D

26. A. Many people believe that high BP can be cured; they stop drugs when the BP levels fall.
B. What they need to understand is that hypertension is incurable, but can be kept within limits with the right lifestyle changes and drug therapy.
C. The goal for most patients should be to lower the systolic BP below 130 mm Hg and the diastolic BP below 90 mm Hg.
D. And it is wise not to forget that high BP is the first – and easily measurable – irreversible sign that many organs in the body are on attack.
E. BP levels can be kept lower by adopting a healthy lifestyle, positive outlook with low stress levels and making the right changes in diet.
(1) Only B (2) B, C and E
(3) A and D (4) A, D and E

27. A. Customers are a critically important part of 'Demand Strategy'.
B. But demand goes far deep and involves a greater array of forces and factors than customers alone can supply.
C. It was seen that companies that relied only on their customers wouldn't have got themselves into trouble if they set a context within which they heard, understood and evaluated what customers told them.
D. Thus, though listening to customers provides enormous value, there must have been a system of checks and balances through which you can validate all that you are being told by customers.
E. Before the companies even talk to a customer, in 'Demand Strategy', they gather a fact-base on past, current and emergent demand, a process they call a demand forces and industry factors analysis.
(1) A and D (2) A, C and E
(3) A, C and D (4) A and E

DIRECTIONS *for questions 28 to 30:* Read the following passage and answer the questions that follow it.

Two of the oddest things about people are morality and culture. Neither is unique to humans, but Homo sapiens has both in an abundance missing from other species. Indeed, that abundance – of concern for the well-being of others, (even unrelated others), and of finely crafted material objects both useful and ornamental – is seen by many as the mark of man, as what distinguishes humanity from mere beasts.

How these human traits evolved is controversial. But two papers in 'Science' may throw light on the process. In one, Samuel Bowles of the Santa Fe Institute in New Mexico fleshes out his paradoxical theory that much of human virtue was forged in the crucible of war. Comrades in arms, he believes, become comrades in other things, too.

In the other paper, Mark Thomas and his colleagues at University College, London, suggest that cultural sophistication depends on more than just the evolution of intelligence. It also requires a dense population. If correct, this would explain some puzzling features of the archaeological record that have hitherto been put down to the arbitrary nature of what has survived to the present and what has not.

Dr Bowles has focused the argument on war, since it is both highly collaborative and often genetically terminal for the losers. To gather his data, Dr Bowles trawled through ethnographic and archaeological evidence about warfare between groups of hunter-gatherers. This is rarely war in the modern sense of planned campaigns. It is more a matter of raids, ambushes and fights between groups who have met accidentally. It is, nevertheless, quite lethal. Dr Bowles identified eight ethnographic and 15 archaeological studies that met his criteria of reliability and abundance of data. They suggest that 12-16% of mortality is the result of such low-level warfare. This is a figure much higher than, for example, the mortality caused in Europe by two world wars, and is certainly enough to drive evolution.

Dr Thomas and his colleagues rely on a mathematical model. They are trying to explain the pattern of apparent false-starts to modern human culture. The species is now believed to have emerged 150,000-200,000 years ago in Africa and

to have begun spreading to the rest of the world about 60,000 years ago. But signs of modern culture, such as shell beads for necklaces, the use of pigments and delicate, sophisticated tools like bone harpoons, do not appear until 90,000 years ago. They then disappear, before popping up again (and also sometimes disappearing), until they really get going around 35,000 years ago in Europe.

The team drew on an earlier insight that it requires a certain number of people to maintain skills and knowledge in a population. Below this level, random effects can be important. The probability of useful inventions being made is low and if only a few have the skills to fabricate the new inventions, they may die without having passed on their knowledge.

Their model suggested that once more than about 50 groups were in contact with one another, the complexity of skills that could be maintained did not increase as the number of groups increased. Rather, it was population density that turned out to be the key to cultural sophistication. The more people there were, the more exchange there was between groups and the richer the culture of each group became.

Dr Thomas therefore suggests that the reason there is so little sign of culture until 90,000 years ago is that there were not enough people to support it. It is at this point that a couple of places in Africa—one in the southernmost tip of the continent and one in eastern Congo—yield signs of jewellery, art and modern weapons. But then they go away again. That, Dr Thomas suggests, corresponds with a period when human numbers shrank. Climate data provides evidence this shrinkage did happen.

28. The two central arguments in the passage are:
(1) People are militaristic because they are altruistic, and societies are populous because they are cultured.
(2) People are militaristic because they are selfish, and innovative because they are survivors.
(3) People are altruistic because they are militaristic, and societies are cultured because they are populous.
(4) People are selfish because they are altruistic, and societies are populous because they are innovative.

29. The passage presents a seeming contradiction. Which of the following statements presents it?
(1) Altruism and craftsmanship are the hallmark of man.
(2) Intelligence is not sufficient to create culture.
(3) Individuals are genetically predisposed to act in self-sacrificial ways.
(4) Aggression gave rise to altruism.

30. The pattern of apparent false-starts can be attributed to
(1) the random nature of archaeological excavations.
(2) the hitherto lack of mathematical models.
(3) the deficit in numbers to sustain cultural development.
(4) the precedence of useful artefacts to ornamental ones.

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(Key and Solutions for AIMCAT1212)

Key

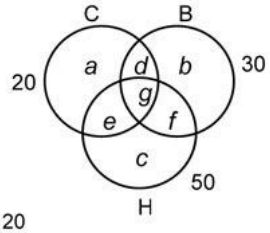
1. 2	7. 2	13. 4	19. 2	25. 3	31. 4	37. 4	43. 4	49. 2	55. 4
2. 1	8. 1	14. 3	20. 4	26. 1	32. 3	38. 3	44. 3	50. 2	56. 1
3. 3	9. 4	15. 3	21. 2	27. 4	33. 2	39. 4	45. 2	51. 3	57. 4
4. 3	10. 3	16. 1	22. 1	28. 2	34. 4	40. 3	46. 2	52. 4	58. 3
5. 4	11. 4	17. 4	23. 4	29. 3	35. 3	41. 1	47. 1	53. 1	59. 4
6. 3	12.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

Solutions

SECTION – I

Solutions for questions 1 to 4:

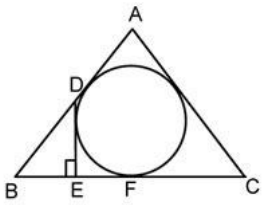
1. Consider the diagram below.

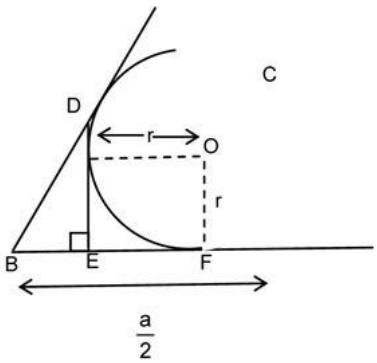


$d + e + f = 20$
$a + b + c = 30$
$a + d + g + e = 20$
$b + d + g + f = 30$
$c + e + g + f = 50$
Adding the above three equations
$a + b + c + 2(d + e + f) + 3g = 100$
$30 + 2 \times 20 + 3g = 100 \Rightarrow g = 10.$

Alternative solution:
The number of students who play cricket, basketball and hockey is 20, 30, 50 respectively.
The number of students who play exactly 1 game, 2 games and 3 games is 30, 20 and x (say). Therefore number of student games (a student playing a game) is $20 + 30 + 50 = 30 + 2(20) + 3x$
$\Rightarrow x = 10$ Choice (2)

2.





BE = BF – EF = $\frac{a}{2} - r$, where r is the inradius.

DE = BE tan 60° = $\left(\frac{a}{2} - r\right)\tan 60°$

$\therefore$ Area of triangle BDE = $\frac{1}{2}$BE . DE

$= \frac{1}{2}\left(\frac{a}{2} - r\right)^2 \tan 60°$

In an equilateral triangle, inradius r = $\frac{a}{2\sqrt{3}}$

$\therefore$ Area of Δle BDE = $\frac{1}{2}\left(\frac{a}{2} - \frac{a}{2\sqrt{3}}\right)^2 \tan 60°$

$= \frac{\sqrt{3}a^2}{12}\left(2 - \sqrt{3}\right)$

Since a = 6, area = $\frac{\sqrt{3}}{12} \times 6^2\left(2 - \sqrt{3}\right) = 3\sqrt{3}\left(2 - \sqrt{3}\right)$

Choice (1)

3. Consider
$S = a + ar + ar^2 + ..+ ar^{n-2} + ar^{n-1}$
$S - a = ar + ar^2 + ...+ar^{n-2} + ar^{n-1}$
$= r(a + ar + ...+ ar^{n-3} + ar^{n-2})$
$= r(S - ar^{n-1})$

$\Rightarrow r = \frac{S-a}{S-ar^{n-1}} = \frac{S-T_1}{S-T_n}$

$\Rightarrow r = \frac{3069-3}{3069-1536} = \frac{3066}{1533} = 2$

Alternative Solution:
Given $ar^{n-1} = 1536$ and $a = 3$.

$\Rightarrow r^{n-1} = \frac{1536}{3} = 512.$

Now, by looking at the choices, none of the values of r given, except 2, when raised to a natural number can give 512. Choice (3)

4. Since the two balls one of different colours, we can pick a green ball first followed by a red ball or vice versa.

The required probability = $\frac{4}{6} \times \frac{2}{5} + \frac{2}{6} \times \frac{4}{5} = \frac{8}{15}$.

Alternately we can see that either the two balls are of different colours or they are of the same colour.
Therefore the probability that they are of different colours will be 1 – probability that they are of the same colours.

The required probability = $1-\left[\frac{4}{6}\times\frac{3}{5}+\frac{2}{6}\times\frac{1}{5}\right]$

$= 1-\frac{14}{30} = \frac{8}{15}$

Alternative Solution:

For the balls to be of different colours we have a total of 4×2 i.e., 8 pairs. As we pick one ball at a time, so we need to take the number of ordered pairs which is 8×2 i.e., 16.

Total number of ordered pairs = $({}^6C_2)2 = 30$.

The required probability = $\frac{16}{30} = \frac{8}{15}$ Choice (3)

Solutions for questions 5 to 7:

5. Ratio of incomes of X and Y is 3:1.

Assume the incomes are 300 *k* and 100 *k*.

∴ Savings of X = 60*k*

Savings of Y = 30*k*

∴ Savings X = $\frac{60k}{90k}\times 100\% = 66.67\%$ of total savings.

To have his savings invested under the least number of heads, he needs to invest his savings in insurance, bank and cash, i.e., under three heads. Choice (4)

6. Let us assume the income of X and Y are 100 *a* and 100 *b* respectively.

It is given that,

$$\frac{10}{100}\times(100b) = \frac{20}{100}\left(\frac{20\times 100a}{100}+\frac{30\times 100b}{100}\right)$$

$\Rightarrow 10y = 4a + 6b$

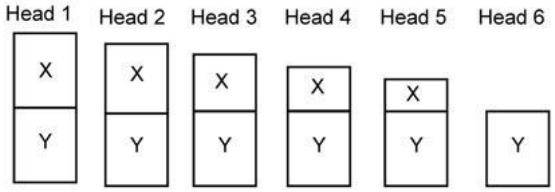
$\Rightarrow 4a = 4b$

$\therefore a = b$

∴ Ratio of expenditures of X and Y is 80 : 70 = 8 : 7

Choice (3)

7. According to the given information, the way in which they invested under different heads of savings can be understood graphically as follows.



Y invested (30% / 6) = 5% of his savings under each head.

As, X did not invest in exactly one head, all the amount in that head (i.e. head 6) must be of Y and that head must be gold.

∴ 8% of total savings = 5% of Y's income.

∴ Y's income = 160% of total savings or Y's savings = 48% of total savings.

X's savings = 52% of total savings

= 20% of his income

∴ X's savings in insurance = $\frac{13}{52}$ X 20%of his income = 5%

Choice (2)

Solutions for questions 8 to 14:

8. Given that Akhil starts from Surat at 11.00 a.m. and reaches Ahmedabad at 4:00 p.m., i.e., he takes 5 hours to travel from Surat to Ahmedabad. Also, given that Rahim starts from Ahmedabad at 1:00 p.m. and reaches Surat at 5:00 p.m., i.e., he takes 4 hours to travel from Ahmedabad to Surat. Since for a given distance, the ratio of the speeds is the ratio of the reciprocals of times taken, the ratio of the speeds of Akhil and Rahim is $\frac{1}{5}:\frac{1}{4}$ i.e., 4 : 5

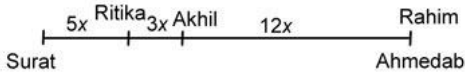
Let the speeds of Akhil and Rahim be 4*x* km/hr and 5*x* km/hr. Given that Ritika started from Surat at a speed which is 25% more than that of Akhil at 12:00 noon. So the speed of Ritika is $\frac{5}{4}\times 4x$

i.e., 5*x* km/hr.

∴ The distance between Surat and Ahmedabad

= 4x(5) = 20*x* km

Positions of the three of them at 1:00 p.m.



The above positions are obtained as by 1:00 p.m., Akhil and Ritika have travelled for 2 hours and 1 hour respectively, starting from Surat, while Rahim has just started from Ahmedabad.

Consider statement I

Akhil and Rahim cross each other at 1:00 p.m. + $\frac{12x}{4x+5x}$

= 1:00 p.m. + $\frac{4}{3}$ = 2:20 a.m.

Ritika and Rahim cross each other at 1:00 p.m. + $\frac{15x}{5x+5x}$

= 1:00 p.m. + $\frac{3}{2}$ = 2:30 p.m.

So, Ritika crosses Rahim 10 minutes after Akhil crosses Rahim.

∴ Statement I is true.

Consider statement II

We have already found that Ritika crosses Rahim at 2:30 p.m. and it is given that Rahim reaches Surat at 5.00 p.m. So, he still has to travel for 150 minutes to reach Surat.

∴ Statement II is not true.

Consider statement III

Time at which Akhil reaches Ahmedabad

= 1:00 p.m. + $\frac{12x}{4x}$ = 4:00 p.m.

Time at which Ritika reaches Ahmedabad

= 1:00 p.m. + $\frac{15x}{5x}$ = 4:00 p.m.

∴ Statement III is true.

Statement I and statement III are true. Choice (1)

9. Given x and y are positive integers and $x^y = y^{60}$.

If $a^x = b^y$ and x, y are integers, one of them should be a factor of the other.

For example $2^6 = 64 = 8^2 = 4^3$

1, 2, 3, 6, are all factors of 6.

$60 = 2^2 \times 3 \times 5$

Number of factors of 60 = $3 \times 2 \times 2 = 12$

∴ y can take 12 values. For each y, there will be a corresponding value of x.

For instance, $y = 20 \Rightarrow x^{20} = 20^{60} = (20^3)^{20} \Rightarrow x = 20^3$

Choice (4)

10. $4^5 + 8^5$ is divisible by 4 + 8 = 12.

$5^5 + 7^5$ is divisible by 5 + 7 = 12.

6^5 is divisible by 12.

∴ The given expression is divisible by 12.

Units digits of 4^5, 5^5, 6^5, 7^5 and 8^5 are 4, 5, 6, 7, 8 respectively.

Sum of units digits = 4 + 5 + 6 + 7 + 8 = 30.

∴ Sum of the powers ends is zero.

$\Rightarrow 4^5 + 5^5 + 6^5 + 7^5 + 8^5$ is also divisible by 10.
$\therefore$ The expression is divisible by both 10 and 12
$\Rightarrow$ It is divisible by 60 and hence by 15.
$\therefore$ Remainder is zero.
Another, more direct approach to solving this question is by directly calculating the actual values of 4^5, 5^6, 6^5, 7^5 and 8^5 as 1024, 3125, 7752, 16407 and 32768. Hence, the sum = 61,500, which is divisible both by 3 and 5 and hence by 15.
Choice (3)

11. $-2 \le p \le 2$
$-4 \le q \le -0{\cdot}25$
$-4 \le r \le -0{\cdot}25$

$$s = \frac{pq}{r}$$

As q and r are negative, the sign of s depends on p.
s has minimum value at $p = -2$ and maximum value at $p = 2$.
(q/r) has maximum value at $q = -4$ and $r = -0{\cdot}25$
s will be minimum when p is negative and (q/r) is maximum and it will be maximum when p is positive and (q/r) is maximum.

$$\therefore (s)\ \text{min} = \frac{(-2)(-4)}{-0\cdot 25} = -32$$

$$(s)\ \text{max} = \frac{(+2)(-4)}{-0\cdot 25} = 32$$

$\therefore -32 \le s \le 32$ Choice (4)

12. Let us consider the amount borrowed by Paresh to be Rs.P and let each instalment be Rs.x.
After 1 year the amount becomes P(1.1)
He pays the first instalment of x at the end of the first year, so the balance amount is P(1.1) – x.
Proceeding in a similar manner, we get the following equation:
((P(1.1) – x) 1.1 – x) 1.1 – x = 0

$$\Rightarrow (P(1.1) - x)1.1 - x = \frac{10}{11}x$$

$$\Rightarrow (P(1.1) - x)\frac{11}{10} = \frac{21}{11}x$$

$$\Rightarrow 1.1P - x = \frac{210}{121}x \Rightarrow 1.1P = \frac{331x}{121}$$

$$\therefore P = \frac{3310}{1331}x$$

It is given that the amount borrowed was Rs.23170.

$$\therefore x = \frac{1331}{3310}(P) = \frac{1331}{3310}(23170) = 9317\ .$$

Thus the value of each instalment was Rs.9317.
Choice (1)

13. The total volume of water that flows through the pipes P_1 and P_2 per second $= \left\{2\left(\frac{15}{10000}\right) + 6\left(\frac{25}{1000}\right)\right\}\ m^3 = 0.018\ m^3$.
Therefore every second 0.018 m^3 of water will flow through the pipes into the tank.
Thus in 40 minutes $40 \times 60 \times (0.018)\ m^3$ or 43.2 kilolitres of water will be filled.
So the capacity of the tank is 43.2 kilolitres. (since 1 m^3 = 1 kilolitre) Choice (4)

14. In such cases, it would be advisable to identify the number of ways of selection and arrangement independently and then multiply.
The toppings can be selected and arranged on the pizza in the following ways.
(1) All the four slices have distinct toppings.
(2) Two of the slices have identical topping while the other two have distinct toppings.
(3) Two of the slices have one identical topping while the other two have another identical topping distinct from the one used previously.

Case 1: All four different toppings.
Selection – 4 toppings can be selected out of 5 in $^5C_4$ ways
Arrangement – 4 distinct toppings can be arranged in 3! ways.
$\therefore$ Total number of ways of having 4 distinct toppings on a four-slice pizza is $^5C_4 \times 3! = 30$

Case 2: Two identical and two distinct.
Selection: The identical topping to be used on two slices can be selected in $^5C_1$ ways and the toppings to be used on the remaining two slices can be selected in $^4C_2$ ways.
$\therefore$ Selection can be done in $^5C_1 \times {}^4C_2 = 30$ ways.
Arrangement: Once the toppings are selected, there is only one way to arrange the slices in which no two adjacent slices have identical toppings.
$\therefore$ Total number of ways in this case $= 30 \times 1 = 30$.

Case 3: Two identical and two identical.
Selection: The two toppings to be used on the four slices can be selected in $^5C_2$ ways.
Arrangement: There is only one way to arrange the slices in which no two adjacent slices have identical toppings.
$\therefore$ Total number of ways in this case $= {}^5C_2 \times 1 = 10$
$\therefore$ For all the three cases combined, total number of ways $= 30 + 30 + 10 = 70$ Choice (3)

Solutions for questions 15 to 18:

Given, the proportion of B.Tech students is 20% or 0.2
$\therefore$ The proportion of B.Com and B.Sc students put together is 80% or 0.8
Let the proportion of B.Com students be k.
The proportion of B.Sc students is $(0.8 - k)$.
Let us consider the last column.
The total number of students of neither dotnet nor Java certification holders (i.e. 20% of total) constitutes 40% of B.Tech, 20% of B.Com and 10% of B.Sc.
40% of B.Tech + 20% of B.Com + 10% of B.Sc = 20% of Total
$\therefore (0.4)(0.2) + k(0.2) + (0.8 - k)\,0.1 = 0.2$
$\Rightarrow k(0.1) = 0.04 \Rightarrow k = 0.4$.
$\therefore$ The proportion of total applicants from B.Sc. background is 0.4.
$\therefore$ We have the following values:

Background	Exp	dot NET	Java	Neither dot NET nor Java	Both dot NET and Java
B.Tech. (1000)	400	A	600	400	B
B.Com. (2000)	600	1200	C	400	200
B.Sc. (2000)	D	800	E	200	F
Total (5000)	2200	2600	G	1000	1400

$\therefore$ A = 2600 – 1200 – 800 = 600.
$\Rightarrow$ B = 600 + 600 + 400 – 1000 = 600.
C = 2000 – 1200 + 200 – 400 = 600.
G = 5000 – 2600 + 1400 – 1000 = 2800.
$\therefore$ D = 2200 – 400 – 600 = 1200.
E = 2800 – 600 – 600 = 1600.
F = 1400 – 600 – 200 = 600.

15. Required percentage $= \frac{G}{5000} \times 100 = \frac{2800}{50} = 56\%$
Choice (3)

16. C = 600. Choice (1)

17. D = 1200. Choice (4)

18. The number of applicants from B.Tech background who have dot NET certification = 600.

∴ The number of applicants B.Tech background who do not have dot NET certification = 1000 – (600) = 400.
Choice (2)

Solutions for questions 19 to 23:

19. If N is the LCM of two numbers a and b, then a and b are the factors of N.
For instance, LCM of 2 and 3 is 6.
2 and 3 are factors of 6. 6 is also the LCM of 1, 2, 3, 6 i.e., factors of 6. Thus, the maximum number of values whose LCM is N, is nothing but the number of factors of N.
∴ $2520 = 2^3 \times 3^2 \times 5 \times 7$.
Number of factors $(3 + 1)(2 + 1)(1 + 1)(1 + 1) = 48$
∴ LCM of at least one and at most 48 numbers can be 2520.
Hence, choice (2) best describes N. Choice (2)

20. $\left(1-\frac{1}{4}\right)\left(1-\frac{1}{9}\right)\left(1-\frac{1}{16}\right)\ldots\left(1-\frac{1}{n^2}\right)$

$= \left(1+\frac{1}{2}\right)\left(1-\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1-\frac{1}{3}\right)\left(1+\frac{1}{4}\right)\left(1-\frac{1}{4}\right)\ldots\left(1+\frac{1}{n}\right)\left(1-\frac{1}{n}\right)$

$= \left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right)\ldots\left(1+\frac{1}{n}\right)\times\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right)\ldots\left(1-\frac{1}{n}\right)$

$= \left(\frac{3}{2}\cdot\frac{4}{3}\cdot\frac{5}{4}\ldots\frac{n}{n-1}\cdot\frac{n+1}{n}\right)\cdot\left(\frac{1}{2}\cdot\frac{2}{3}\cdot\frac{3}{4}\ldots\frac{n-2}{n-1}\cdot\frac{n-1}{n}\right)$

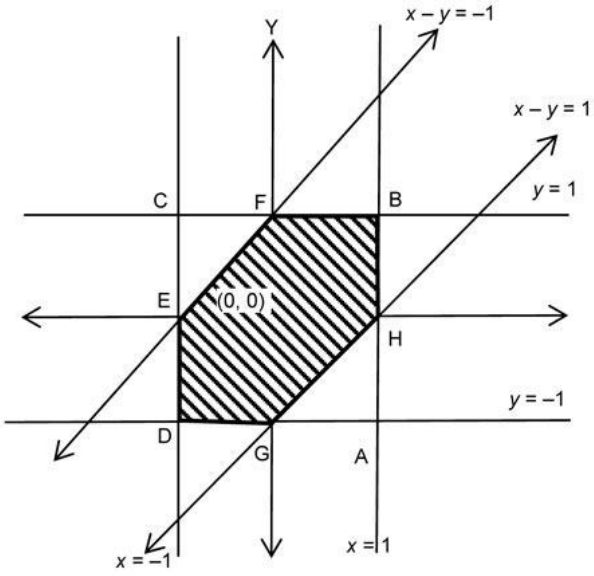
$= \frac{n+1}{2}\cdot\frac{1}{n} = \frac{n+1}{2n}$

If $\frac{n+1}{2n} \geq 0.51 \Rightarrow \frac{1}{2}+\frac{1}{2n} \geq 0.51$

$\Rightarrow \frac{1}{2n} \geq 0.01$

$\Rightarrow n \leq \frac{1}{2\times 0.01} \Rightarrow n \leq \frac{1}{0.02} \Rightarrow n \leq 50$ Choice (4)

21. $|x - y| = 1$
For $x - y > 0$, $|x - y| = x - y$. So, the curve takes the form $x - y = 1$
and for $x - y < 0$, $|x - y| = y - x$. So, the curve takes the form $x - y = -1$
The rough sketch of the given curves is



Shaded portion is the required region.
∴Required area = Area of the square ABCD – (Area of ΔCEF + Area of ΔAGH)

$= 2\times 2 - \left(\frac{1}{2}\times 1\times 1+\frac{1}{2}\times 1\times 1\right)$

= 4 – 1 = 3 square units. Choice (2)

22. Let x, y and t be the number of 1 rupee, 2 rupee and 5 rupee coins respectively. Then,.
$x + y + z = 200$ ---------- (1)
$x + 2y + 5z = 450$ --------- (2)
After interchanging the 1 rupee and 2 rupee coins, we have
$2x + y + 5z = 325$ --------- (3)
Solving (1), (2), and (3),
we get $x = 25$, $y = 150$ and $z = 25$.
Hence, the number of 5 rupee coins is 25. Choice (1)

23. We have the n^{th} term as
$(n - 1)! [n^2 + n - 1]$
$= (n - 1)! [n (n + 1) - 1]$
$= (n + 1) (n) (n - 1)! - (n - 1)!$
$= (n + 1)! - (n - 1)!$
$0! [1^2 + 1 - 1] = 2! - 0!$
$1! [2^2 2 + - 1] = 3! - 1!$
Hence the given sum is
(2! – 0!) + (3! – 1!) + (4! – 2!) + (5! – 3!) + (6! – 4!) + -----+ (19! – 17!) + (20! – 18!) + (21! – 19!) + (22! – 20!) (There are a total of 21 terms)
= – 0! – 1! + 21! + 22! = 22! + 21! – 2. Choice (4)

Solutions for questions 24 to 27:

24. The free user base is eroded once the consumer surplus falls below zero. Therefore, the quantum of ads can be at most increased to the point when the consumer surplus becomes zero.
Since consumer surplus = perceived value – user cost / tolerance price, the magnitude of rise in tolerance price always equals magnitude of fall in consumer surplus. Since a three-fold increase in the quantum of ads results in a three-fold increase in the tolerance price (from $40 to $120), a 100% increase in the quantum of ads results in 100% rise in tolerance price.

Given that the initial annual consumer surplus for free users is $80. Therefore, the tolerance price can increase at most by a further $80, beyond which consumer surplus becomes negative. An increase of $80 in tolerance price corresponds to 200% increase in tolerance price and hence, is equivalent to 200% increase in the quantum of ads.
Choice (2)

25. At the existing quantum of ads, the advertisers' surplus per user = $1. If the quantum of ads increases by a factor n, the advertisers surplus per user = $1.(n + 1) = $ (n + 1)

Given, the number of free users was estimated to fall linearly with decline in consumer surplus till it reached 20% of 20 million. Consumer surplus is initially $80 for each free user. When the consumer surplus falls from $80 to 0, the number of free users falls from 100% to 20% i.e, by 80 percentage points.

Therefore, a $1 decline in consumer surplus results in a 1 percentage point fall in number of free users.
A 100% increase in the quantum of ads results in a $40 increase in the tolerance price. Hence, when the quantum of ads increases by a factor n, the tolerance price increases by $40n and the consumer surplus falls by $40n.
∴ Number of free users = (100 – 40 n)% of 20 million.
∴ Total annual advertisers' surplus = (100 – 40 n)% of 20 million × $ (n + 1)
$= 0.20(100 - 40n^2 + 60n)$

$= 0.20\left[100 - 10\left[\left(2n-\frac{3}{2}\right)^2 - \frac{9}{4}\right]\right]$

$= 20 + \frac{18}{4} - 2\left(2n - \frac{3}{2}\right)^2 = 24.5 - 2\left(2n - \frac{3}{2}\right)^2$

$\therefore$ maximum surplus = \$24.5 million

Alternative Solution:
Initial annual advertisers' surplus = \$2 – \$1 = \$1 per user.
Number of free users = 20 million.
$\therefore$ Initial value of total annual advertisers' surplus, T
= 20 million $\times$ \$1 = \$20 million.
$\therefore$ Maximum value of T will be definitely more than \$20 million.
$\therefore$ Choice (4) is eliminated.
If the quantum is ads is doubled, i.e., increased by 100%, fall in number of free users is 40 percentage points.
$\therefore$ Number of free users now = (100% – 40%) of 20 million
= 12 million.
When the quantum of ads is doubled, advertisers' surplus per user also doubles, i.e., it becomes \$2.
$\therefore$ Total annual advertiser's surplus = 12 million $\times$ \$2
= \$24 million.
$\therefore$ Choice (1) is also ruled out.
It is given that when the quantum of ads increases by 200%, the number of free users falls by 80 percentage points, beyond which it becomes zero.
Say the quantum of ads increases by 50%.

$\Rightarrow$ Decrease in the number of free users = $\frac{50}{200} \times 80$

= 20 percentage points
$\therefore$ Number of free users = (100 – 20)% of 20 million
= 16 million.
Advertisers' annual surplus = \$1 $\times$ 1.5 = \$1.5 per user
$\therefore$ Total annual advertisers' surplus = 16 million $\times$ \$1.5
= \$24 million.
Since the value of T is \$ 24 million at both 50% and 100% increase in the quantum of ads, and T is an increasing function, T will reach a maximum at the mean of 50% and 100%, i.e., 75%.
When the quantum of ads increases by 75%, the fall in number of free users is $\frac{75}{200} \times 80$ = 30 percentage points.
$\therefore$ No. of free users = (100 – 30)% of 20 million
= 14 million.
Advertisers' surplus = \$1 $\times$ 1.75 = \$1.75 per user
$\therefore$ Total annual advertisers' surplus = 14 million $\times$ \$ 1.75
$= 14 \times \frac{7}{4}$ = \$24.5 million. Choice (3)

26. The number of premium users falls linearly with decline in consumer surplus. When annual consumer surplus per user falls from \$360 to 0, the number of users falls from 0.4 million to 0.
Therefore, for the number of users to reach 0.1 million, i.e., a fall of 0.3 million, the consumer surplus has to fall by \$270 per user $\Rightarrow$ a monthly fall of $\$\left(\frac{270}{12}\right)$ = \$22.5 which is equal to the price increase.
$\therefore$ Percentage increase in price = 225% Choice (1)

27. Let us consider each option individually. All the amounts calculated below are on an annual basis.

Option (1): Stop the free services altogether.
Resulting loss: The ad revenues from the advertisers will cease to accrue.
$\therefore$ Loss = 20 million free users $\times$ \$1 per free user
= \$20 million
Resulting gain: Gain due to increase in number of premium members = 0.9% of 20 million $\times$ \$10 per month $\times$ 12 months = \$21.6 million
$\therefore$ Net gain in revenue = (\$21.6 – \$20) million
= \$ 1.6 million.

Option (2): Downgrade the free services
Resulting loss: Loss will be incurred on account of decrease in ad revenues.
Loss = 90% of 20 million users $\times$ \$1 per user = \$18 million.
Resulting gain: Gain due to increase in the number of premium users = (0.8% of 90% of 20 million users) $\times$ \$10 per month $\times$ 12 months
= \$0.72% of 2400 million
= \$17.28 million
$\therefore$ Net gain = \$(17.28 – 18) million
= –\$0.72 million < 0
$\therefore$ In this case, a loss will result.

Option (3): Increase the ad fee by 60%
It is given that the quantum of ads decreases linearly with decrease in ad surplus per user with a 100% fall in ad surplus resulting in a 100% fall in the quantum of ads.
Initial ad surplus = \$2 – \$1 = \$1 per user.
When ad fee increases by 60%, ad fee becomes \$1.6 per free user and hence ad surplus falls by \$0.6 per user, i.e., by 60%.
$\therefore$ Quantum of ads also falls by 60%.
Resulting loss: All the revenue that would be generated in the absence of a price increase is a loss.
$\therefore$ Loss = (\$1 per free user) $\times$ (20 million free users)
= \$ 20 million
Resulting gain: Gain = 0.40 $\times$ \$1.6 per free user $\times$ 20 million free users.
= \$ 12.8 million
$\therefore$ Net gain = \$(12.8 – 20) million
= –\$7.2 million < 0
$\therefore$ A loss results.

Option (4): Increasing premium user fee by 60%.
Resulting loss: All the revenue that would be generated in the absence of a fee increase is a loss.
$\therefore$ Loss = (0.4 million users) $\times$ (\$10 per user per month) $\times$ (12 months) = \$48 million.
Resulting gain: Gain is due to increased user fee.
User fee after 60% increase = \$16(per month)
$\therefore$ Decline in consumer plus per user = \$6 per month
= \$72 per year.
Initial consumer surplus = \$360 per year.
$\therefore$ Decline in consumer surplus as a proportion of initial consumer surplus = $\frac{72}{360} = \frac{1}{5}$
This is also the proportion of decline in the number of premium users.
$\therefore$ Number of premium users after increase in the user fee as a proportion of the number of premium users before increase in user fee = $\frac{4}{5}$

$\therefore$ Gain $\frac{4}{5} \times$ (0.4 million users) $\times$ (\$16 per user) $\times$ (12 months) = \$ 61.44 million
$\therefore$ Net gain = \$ (61.44 – 48) million
= \$13.44 million
$\therefore$ Highest increase in revenue is in option (4).
Choice (4)

Solutions for questions 28 to 30:

28. Given $f(x) = \log \frac{x^2+1}{x^2-1}$

$f(x) + f(y)$

$= \log\left(\frac{x^2+1}{x^2-1}\right) + \log\left(\frac{y^2+1}{y^2-1}\right)$

$= \log \frac{(x^2+1)(y^2+1)}{(x^2-1)(y^2-1)}$

$$= \log \frac{x^2y^2 + x^2 + y^2 + 1}{x^2y^2 - x^2 - y^2 + 1}$$

$$= \log \frac{2xy + x^2 + y^2 + 1}{2xy - x^2 - y^2 + 1} \quad (\because xy = 2)$$

$$= \log \frac{(x+y)^2 + 1}{1 - [x^2 + y^2 - 2xy]} = \log \frac{1 + (x+y)^2}{1 - (x-y)^2}$$

Alternative Solution:

Let $x = y = \sqrt{2}$

$\Rightarrow f(x) = f(y) = \log \frac{2+1}{2-1} = \log 3$

$f(x) + f(y) = 2 \log 3 = \log 9$

Only option (2) satisfies. Choice (2)

29. If $x = -0.2$, $\left(-x^{-1/x}\right) = -\left((-0.2)^{\frac{-1}{-0.2}}\right)$

$= -\left((-0.2)^5\right) = (0.2)^5$

$250x^2 = 250(-0.2)^2 = 250(0.2)^2 = 10$

$$\frac{10}{\left(\sqrt{-x}\right)^3} = \frac{10}{\left(\sqrt{-(-0.2)}\right)^3} = \frac{10}{(0.2)^{3/2}} = 10 \times 5^{3/2}$$

$$5^{\frac{-1}{2x}} = 5^{\frac{-1}{2(-0.2)}} = 5^{5/2} = 5 \times 5^{3/2}$$

$\therefore$ Clearly, $\frac{10}{\left(\sqrt{-x}\right)^3}$ is the largest. Choice (3)

30. Let x and y be the number of Tik-Tak and 'Rock-n-Roll' chocolates purchased.

Since the entire amount has to be spent

$2x + 3y = 60$

$\Rightarrow x + \frac{3y}{2} = 30.$

Since y is an integer, $y = 2k$ where k is an integer greater than or equal to 1.

$\Rightarrow x = 30 - 3k$ since both $x, y \geq 1$, $30 - 3k \geq 1$

$\Rightarrow k \leq 9.$

Given number of Rock-n-Roll chocolates purchased must be higher than those of Tik-Tak.

$\Rightarrow 2k > 30 - 3k \Rightarrow k > 6$

$\therefore 9 \geq K > 6$

$\Rightarrow K = 7, 8, 9$ i.e., 3 values. Choice (2)

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

SECTION – II

Solutions for questions 31 to 33:

31. For the first blank remarkable, exceptional and acceptable are suitable but for the second blank, only 'interventions' is appropriate. Choice (4)

32. For the first blank all the four words are suitable but for the second blank only 'seasoned' is suitable since only they can have the realization given in the sentence. Choice (3)

33. For the first blank only 'purpoted' is suitable as NATO claims that it means to protect civilians in Libiya but the mission is not doing so in reality. The other words do not fit in with this meaning. The second blank needs a negative word. Only 'notoriously' and 'flagrantly' are negative, between the two 'flagrantly' is suitable in the context. Choice (2)

Solutions for questions 34 to 36:

Number of words and Explanatory notes for RC:

Number of words : 694

34. Statement (a) is supported by '---- drafters ---- purpose ---- to eliminate the production of tobacco -----' (last para). Statement (b) is supported by '--- foot-draggers ---- Japan and China---' (penultimate para). Statement (c) is supported by '---- well-known (tobacco) firms of colluding with smugglers ----' (penultimate para). Choice (d) is supported by 'European officials ---- said they couldn't fight contraband without at least talking to legal producers' (penultimate para). Choice (4)

35. Refer to the first para – the author's perception of the fox and chicken allegory is tobacco firms 'asking to be consulted' about the welfare of chickens. The option in line with this is politicians asking voters to elect them (ostensibly to serve them). Hence choice (3). None of the others are in keeping with this line of reasoning. Choice (3)

36. Choices (2) provides the one clear reason why the companies would want to stop the illicit trade. Choice (2)

Solutions for questions 37 to 39:

37. The longest routes from A to H, without visiting any place twice could be among A – D – C – B – G – E – F – H or A – B – G – C – E – D – F – H or A – D – F – E – C – B – G – H.

If one takes first route, then the distance

= 13 + 5 + 3 + 4 + 4 + 5 + 6 = 40 km

If one takes second route, then the distance

= 7 + 4 + 4 + CE + 3 + 5 + 6 = (29 + CE) km

If one takes the third route then the distance

= 13 + 5 + 5 + CE + 3 + 4 + 4 = (34 + CE) km

But given, that the minimum value of CE is 7 km and maximum value is 10 km.

$\therefore$ If one takes the second route, then distance will be between 36 and 39 km and if one takes the third route, then distance will be between 41 and 44 km.

Therefore the longest route is definitely the third route, i.e., A – D – F – E – C – B – G – H. However the exact value of the longest distance is not known (we only know that it lies between 41 and 44 km). Hence, the correct answer is choice (4), i.e., cannot be determined. Choice (4)

38. The possible routes are ABC, ABGC, ABGHFDC, ADC, ADFHGC, ADFHGBC - a total of 6 routes. Choice (3)

39. The shortest possible routes from H to B, by visiting each other city (other than G) exactly once are

(i) H – E – F – D – C – A – B

(ii) H – F – D – E – C – A – B

(iii) H – F – E – D – C – A – B

The distance traveled by route (i) is

5 + 5 + 5 + 5 + 6 + 7 = 33 km

The distance traveled by route (ii) is

6 + 5 + 3 + CE + 6 + 7 = 27 + CE

The distance traveled by route (iii) is

6 + 5 + 3 + 5 + 6 + 7 = 32 km

The range of distance traveled by route (ii) is from 27 + 4 to 27 + 7 i.e., 31 to 34.

Hence, the shortest distance cannot be found. Choice (4)

Solutions for questions 40 to 42:

40. 'Calvary' means intense mental suffering or an open-air representation of crucifixion of Jesus. 'Cavalry', meaning troops on horsebacks, is apt – a.

Everyone was happy at her first glimpse of the ocean – exult; 'exalt' is to raise in rank which is illogical in the context – a.
Dissent means to differ in opinion. 'Descent' means a downward inclination – a.
'Diagnosis' means to identify a disease from its signs and symptoms. 'Prognosis' means the prospect of recovery as anticipated from the usual course of disease. Hence, the prognosis was excellent – b.
'Wary' is to be cautious, 'weary' is to be tired. The watchman was wary – b. Hence aaabb. Choice (3)

41. 'Inanity' is the quality of being inane or pointless; 'inanition' is the state of being exhausted or empty – b.
'Alliterative' is repetition of initial sounds. This cannot qualify 'implicatures'. 'Tautological' is needless repetition – b.
'Revenge' is to inflict injury in return for. 'avenge' is to someone – a.
'Callous' is a feeling of no emotion 'callus' is hardened skin or bark of a tree – a.
'Flack' is to provide publicity, 'flak' are antiaircraft guns or criticism – a. Hence bbaaa. Choice (1)

42. 'Minion' is a servile dependent and 'minyan' is the quorum required for Jewish communal worship – a.
'Levee' is a reception in honor of someone. 'Levy' is a collection of assessment or an amount – b.
'Poser' is a puzzling question or a person who poses. 'Poseur' is a person who pretends to be what he is not – affected or insincere – a.
You can abstain from voting or passing a resolution. Refrain is not suitable in he context – a.
'Ideal' is perfect, 'idyll' is a simple descriptive work in poetry – a. Hence abaaa. Choice (1)

Solutions for questions 43 to 45:

Number of words and Explanatory notes for RC:

Number of words : 804

43. The passage looks at various scenarios that give rise to 'the real problems of urbanization' and variously suggests' --- to establish land markets and basic services (schools, streets, sanitation) to help cities grow' (penultimate para) and '--- focus more on transport ---- to connect lagging regions with fast-growing ones'. (last para) Choice (4)

44. The passage states '--- 75% of the population in cities ---- makes --- sense ---- spend ---- polices --- slum clearances, lest the now-teeming city is split apart by crime and grime' (last para). This indicates that access to the growing urban centres, from the outlying areas, is more a requirement of urbanization than slums and congestion are. Choice (3)

45. Choice (1) is stated in the passage. '--- urbanization is accelerating. But history suggests it will not go rising at this rate for ever' (para 5). Choice (3) is stated – '--- income gaps of rich countries have narrowed --- That convergence is starting in poor countries ----' (para 6 and 7). Choice (4) is stated 'Between 1985 and 2005 the urban share of the population of developing countries rose by eight percentage points. Between 1880 and 1900 --- the urban share in then – industrializing Europe ----- went up by about the same amount' (para 5). But choice (2) is not rue '---- living standards in the West today are roughly the same between town and country. That convergence is starting in poor countries, too ----' (para 6). Choice (2)

Solutions for questions 46 to 49:

Let us represent the given information in the following table.

Person	First Day	Second Day	Third Day	Fourth Day	Fifth Day
Navandar				*Paddy Clarke Ha Ha Ha*	
Chandekar					
Waradkar			*Paddy Clarke Ha Ha Ha*		
Bholanekar			*The Kite Runner*		
Edwankar					

It is given that all except Chandekar read *Simoqin Prophecies* before they read *The Finkler Question.* From this, we can say that none except Chandekar read *The Finkler Question* on first day and read *Simoqin Prophecies* on fifth day. But as every book was read by one the five friends on each day, it must be Chandekar who must have read *The Finkler Question* on first day and *Simoqin Prophecies* on fifth day.

Now, one among the remaining four friends, must have read *The Finkler Question* on the second day. As all, except Chandekar, have read *Simoqin Prophecies* before *The Finkler Question,* the person who read *The Finkler Question* on second day must have read *Simoqin Prohpecies* on first day. Another person must have read *The Finkler Question* on third day, and this person must have read *Simoqin Prophecies* on the second day. Similarly, we can say that the person who read *The Finkler Question* on fourth day must have read *Simoqin Prophecies* on third day and the person who read *The Finkler Question* on fifth day must have read *Simoqin Prophecies* on fourth day.
From the above, we can conclude that other than Chandekar, all must have read *Simoqin Prophecies* and *The Finkler Question* on consecutive days.

Also, from (ii), as Bholanekar read *Paddy Clarke Ha Ha Ha* before he read *The Kite Runner,* which was his third book, he must have read *Paddy Clarke Ha Ha Ha* on first two days. So, he must not have read the consecutive pair *Simoqin Prophecies* and *The Finkler Question* on first two days. Therefore, he must have read *Simoqin Prophecies* and *The Finkler Question* on the fourth and fifth days respectively.

Now, from the above conclusion regarding Bholanekar, we can say that Waradkar did not read *Simoqin Prophecies* on fourth day, also he could not have read *Simoqin Prophecies* on second day, (since, according to (iii), he read *Paddy Clarke Ha Ha Ha* on the third day). So, he must have read *Simoqin Prophecies* on first day and therefore, *The Finkler Question* on the second day.

Now, from the above conclusions and from (iii),, we can say that, Navandar could not have read *Simoqin Prophecies* on first day and third day. So, he must have read *Simoqin Prophecies* on second day and *The Finkler Question* on third day and therefore Edwankar must have read *Simoqin Prophecies* on the third day and *The Finkler Quesiton* on the fourth day.

Now, on the third day, *The God of Small Things* must have been read by Chandekar, who must have read *Paddy Clarke Ha Ha Ha* on the second day and *The Kite Runner* on the fourth day. Waradkar must have read *The God of Small Things* on the fourth day and *The Kite Runner* on the fifth day. Bholanekar must have read *Paddy Clarke Ha Ha Ha* on the first day and *The God of Small Things* on the second day. Edwankar must have read *The Kite Runner* on the second day, *Paddy Clarke Ha Ha Ha* on the fifth day and *The God of Small Things* on the first day. Finally, Navandar must have read *The Kite Runner* on the first day and *The God of Small Things* on the fifth day.

The entire representation can be shown as below:

Person	First Day	Second Day	Third Day	Fourth Day	Fifth Day
Navandar	*The Kite Runner*	*Simoqin Prophecies*	*The Finkler Question*	*Paddy Clarke Ha Ha Ha*	*The God of Small Things*
Chandekar	*The Finkler Question*	*Paddy Clarke Ha Ha Ha*	*The God of Small Things*	*The Kite Runner*	*Simoqin in Prophecies*
Waradkar	*Simoqin Prophecies*	*The Finkler Question*	*Paddy Clarke Ha Ha Ha*	*The God of Small Things*	*The Kite Runner*
Bholanekar	*Paddy Clarke Ha Ha Ha*	*The God of Small Things*	*The Kite Runner*	*Simoqin Prophecies*	*The Finkler Question*
Edwankar	*The God of Small Things*	*The Kite Runner*	*Simoqin Prophecies*	*The Finkler Question*	*Paddy Clarke Ha Ha Ha*

46. *The Finkler Question* was the first book read by Chandekar.
Choice (2)

47. Bholanekar read *Simoqin Prophecies* on the fourth day.
Choice (1)

48. Choice (3) is the correct order (from first to last) of the persons who read *The God of Small Things*.
Choice (3)

49. After reading *The Finkler Question*, Navandar gave the book to Edwankar. Choice (2)

Solutions for questions 50 and 51:

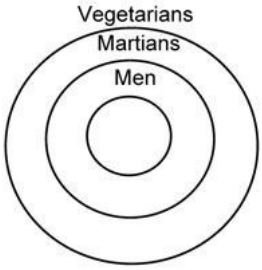
50. The passage draws comparison between those who are proactive to those who are reactive, and the way they handle a stressful situation. (1) merely points at different things that cause trauma. (3) starts a new idea talking about treatment. (4) says 'these types of' the passage does not mention type of trauma. Only choice (2) links to the contents of the para and conclude appropriately.
Choice (2)

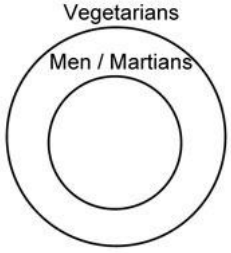
51. Choice (4) can be eliminated as it clearly suggests it is a continuation of certain reasons or happenings. (1) does not conclude the passage. (2) starts a new point. Only (3) links to the penultimate sentence and concludes appropriately.
Choice (3)

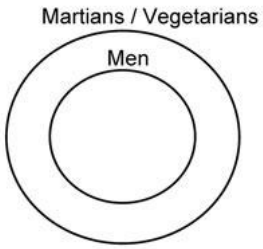
Solutions for questions 52 and 53:

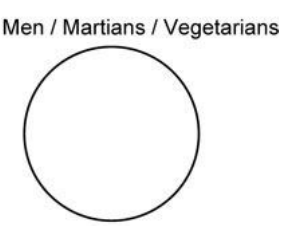
The best and the fastest way of solving these questions is to go through the choices and validate each of them with the rules of syllogism.

52. Choice 1 → ABE →is not a valid set as it contains more than 3 terms in it.
Choice 2 → BCD → is not a valid set as one of the statements is a particular affirmative but the conclusion is an Universal Affirmative which violates the basic rules.
Choice 3 → AEC →is not a valid set as it contains more than 3 terms in it.
Choice 4 → ADE →is a valid set as it conforms to all the rules.
Now, let us analyse choice 4 with the help of Venn Diagrams.





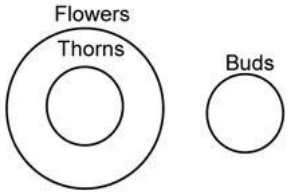




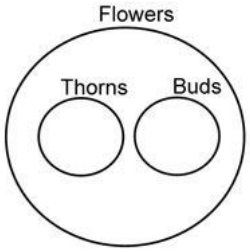
From all the above diagrams, it can be commonly concluded that "All Men are Vegetarians." Choice (4)

53. Choice 1 → BDC → is a valid set as it conforms to all the rules.
Choice 2 → ABE → is not a valid set as it contains more than 3 terms in it.
Choice 3 → ADE → is not a valid set as both the premises are negative and hence no conclusion can be drawn.
Choice 4 → DEC → is not a valid set as both the premises are negative and the rule states that two negative statements will not give any conclusion.
Now, let us analyse choice (1) with the help of Venn diagrams.

(i)



(ii)



From both the above diagrams, it can be commonly concluded that 'Some flowers are not buds.'
Choice (1)

Solution for question 54:

54. The statement is of the form:
Unless ~A or ~B, ~C
The negation of this statement is ~(~A or ~B) and C, (which is nothing but A and B, C).
Only choice (1) is of this form. Choice (1)

Solutions for question 55 to 57:

55. Statements A and D are correct. Statement B is erroneous, – it should be 'second' since the sentence begins with 'first'. Also, a comma is needed after 'them' since the qualifying phrase beginning with 'which' is an insertion. In C, 'the' is required before. 'Mumbai auditions'. In E, the conjunction 'though' distorts the sentence. The latter part of the sentence give the reason why it was fascinating. Hence, 'as' is appropriate and should replace 'though'.
Choice (4)

56. Statement B is correct. In A, they stop 'doing something', that is, they stop 'taking drugs'. In C, 'lower' should be followed by 'to' ……. lower systolic BP to below …….. diastolic BP to below ……..' In D, the correction of the error 'on attack' is 'under attack'. Further, either 'an' or 'most' would be needed before 'easily measurable'. In E, the adjective, 'lower' should be in the positive degree. The correction is – BP levels can be kept 'low'. Choice (1)

57. Statements A and E are correct. In B, there is a comparison between two aspects of business – the customers and demand, hence the adjective should be in the comparative degree. The error "far deep" should be "far deeper". Statement C provides a specific example. The clause 'if they set ….' which is in the past tense should be 'if they had set', i.e. in the past perfect tense, since it is prior to the companies relying. It is clear that statement D draws a conclusion based on statement C and is of a general nature. Hence, the correction of the error 'must have been' is 'must be'. The sentence goes on to say '….. you can validate ……..' which makes 'must be' right. Choice (4)

Solutions for questions 58 to 60:

Number of words and Explanatory notes for RC:

Number of words : 639

58. The evidence from the passage. – '--- much of human virtue was forged in the crucible of war' (para 2) and '--- cultural sophistication ---- requires a dense population' (para 3) supports choice (3) as the answer. Choice (3)

59. Choice (4) is supported by '---- paradoxical theory that much of human virtue was forged in the crucible of war.' (para 2) Choice (4)

60. The passage states 'They are trying to explain the pattern of apparent false-starts to modern human culture --- The team drew on an earlier insight that it requires a certain number of people to maintain skills and knowledge in a population' (para 5). Choice (3)

Difficulty level wise summary - Section II	
Level of Difficulty	Questions
Very Easy	–
Easy	37, 38, 39, 52
Medium	31, 32, 36, 40, 43, 44, 45, 46, 53, 60
Difficult	33, 34, 35, 41, 42, 47, 48, 49, 50, 51, 54, 55, 56, 57, 58, 59
Very Difficult	–