

INSTRUCTIONS

1. Read the instructions given at the beginning/end of each section or at the beginning of a group of questions very carefully.
2. This test has three sections with 60 questions – 20, 20, and 20 respectively in the first, second and third sections. The TOTAL TIME available for the paper is **135 minutes**. The student may apportion this time among various sections as he/she wishes. However, the student is expected to show his/her competence in all the three sections.
3. All questions carry three marks each. Each wrong answer will attract a penalty of one mark.

SECTION – I
Number of Questions = 20

DIRECTIONS for questions 1 to 20: Answer the questions independently of each other.

1. In a race A beats B by 40 m and C by 60 m. If B's speed is 40% higher than that of C, then find the distance over which the race was run (in metres)?
(1) 90 (2) 110 (3) 140 (4) 220
2. If $S = \frac{1}{2} + \frac{1}{12} + \frac{1}{30} + \frac{1}{56} + \dots + \frac{1}{4032}$, then which of the following statements is true?
(1) $S = \frac{1}{17} + \frac{1}{18} + \frac{1}{19} + \dots + \frac{1}{64}$
(2) $S = \frac{1}{33} + \frac{1}{34} + \frac{1}{35} + \dots + \frac{1}{64}$
(3) $S = \frac{1}{16} + \frac{1}{17} + \frac{1}{18} + \dots + \frac{1}{64}$
(4) None of these
3. If $f(x) = \frac{25^x}{25^x + 5}$, then find the value of $f\left(\frac{1}{99}\right) + f\left(\frac{2}{99}\right) + \dots + f\left(\frac{98}{99}\right)$?
(1) 49 (2) 48 (3) 99 (4) 1
4. A series is defined such that

$$\frac{C_{n+2} + C_{n+1}}{2} = C_{n+1} + \frac{C_n}{2} \quad (n \geq 1)$$
where C_i is the i^{th} term. Given $C_2 = C_1 = 1$. If C_k is prime, then
(1) k must be prime
(2) k = 4
(3) k must be a perfect square
(4) Either (1) or (2)
5. An open chain consists of 33 diamonds with the diamond in the middle being the largest and the best. Starting from the left end, each successive diamond till the largest diamond costs 75 euros more than the previous one and starting from the right end, each successive diamond till the largest diamond costs 175 euros more than the previous one. Find the value of the largest diamond (in euros)
6. $f(x)$ and $g(x)$ are two quadratic functions such that $f(1) - g(1) = 1$, $f(2) - g(2) = 2$ and $f(3) - g(3) = 5$. Find the value of $f(4) - g(4)$?
(1) 8 (2) 9
(3) 10 (4) Cannot be determined
7. Water flows at a speed of 2 cm/sec from a pipe of square cross-section of side 3 cm into an empty tank and fills the entire tank in 30 minutes in the absence of any leaks. A leak at the bottom of the tank can empty a full tank at the rate of 6 cm³/sec. In how much time does the empty tank get filled in the presence of the leak?
(1) 35 minutes (2) 45 minutes
(3) 40 minutes (4) 25 minutes
8. The number of common roots for the equations $y = x^3 + 5x^2 + 6x + 8$ and $y = x^3 + 4x^2 + 10x + 4$ is
(1) 0 (2) 1 (3) 2 (4) 3
9. A real valued function $f(x)$ is such that $f(x+y) = f(x) + f(y) + 6xy + 3$ for all real values of x and y. Find the value of $f(3)$ if $f(-1) = 6$.
(1) 0 (2) -6 (3) 6 (4) -3
10. The remainder obtained when 12345678987654321 is divided by 1001 is
(1) 10 (2) 309 (3) 692 (4) 995
11. The sum of two natural numbers when added to their LCM, gives a total of 143. How many such pairs of numbers exist?
(1) 6 (2) 8 (3) 9 (4) 12
12. In a triangle ABC, if P_a , P_b and P_c , represent the perpendiculars drawn to sides, BC, AC, and AB respectively such that $\frac{P_a}{P_c} = \frac{P_b - P_a}{P_c - P_b}$, then which of the following relations is true regarding the sides a, b, and c of the triangle.
(1) $a^2 = bc$ (2) $b^2 = ac$
(3) $2b = a + c$ (4) $b(a + c) = 2ac$

13. If the sum of four consecutive positive odd integers is a perfect cube, which of the following can be one of the numbers?
 (1) 253 (2) 133 (3) 49 (4) 343

14. If a, b, c are real, $ac > 0$ and $cx^2 - ax + b = 0$, which of the following is true about the roots of the equation given that $\frac{2b}{a} - \frac{a}{2c} < 0$?
 (1) If one of the roots is rational, the other root is also rational.
 (2) If one of the roots is of the form $a + \sqrt{b}$ then the other root must be of the form $a - \sqrt{b}$.
 (3) The equation has no real roots.
 (4) If one of the roots is rational the other root can be irrational.

15. If the highest power of 20 in $n!$ is x , then x can take all the following values except
 (1) 27 (2) 28 (3) 30 (4) 31

16. Sita starts at 9 a.m. from A towards B, which is 24 km away from A, at a constant speed of 6 km/hr while Gita starts at 10 a.m. from B towards A at a constant speed of 12 km/hr. When they reach their respective ends, they turn back and start walking in the opposite direction without any change in their speeds. In this manner, they travel back and forth between A and B.
 How far is Sita from B, when she meets Gita for the second time?
 (1) 6 km (2) 12 km (3) 8 km (4) 4 km

17. The question below is followed by some information and two statements I and II.

Is the side of the cube an odd integer?

Several unit cubes are used to construct a larger cube. The large cube is now cut perpendicular to one of its faces along both the diagonals of that face. K is a natural number.

- I. The total number of unit cubes cut is $2k^2 + 3k + 1$
 II. The total number of unit cubes cut is $72K^2$

Which of the two statements can be used to answer the above the question?

18. A beaker contained V litres of a mixture of milk and water with milk and water ratio of 3 : 2. The volume of liquid in the mixture was increased by 60% by adding water. Next 38.4 litres of the solution in the beaker was replaced by water. If the final ratio of milk and water in the beaker is 3 : 7, then find the value of V . (in litres)
(1) 80 (2) 96 (3) 120 (4) 192

19. How many nine-digit numbers exist such that when a single digit is crossed out, a given telephone number, comprising eight digits is obtained?
 (1) 90 (2) 89 (3) 72 (4) 99

SECTION – II
Number of Questions = 20

DIRECTIONS for questions 21 to 23: The sentences given in each of the following questions (when properly sequenced), form a coherent paragraph. Each sentence is labelled with a letter. From among the four choices given below each question, choose the most logical order of sentences that constructs a coherent paragraph.

23. (a) It provided an ideal forum for 27 major players, though no consensus was reached on how to deal with terrorism.

(b) The ARF had no hesitation in condemning terrorism and endorsing Jakarta's appeal for increased intelligence sharing.

DIRECTIONS for questions 24 to 26: Read the following passage and answer the questions that follow it.

At the neurological level, cultivating a competence means extinguishing the old habit as the brain's automatic response and replacing it with the new one. The final stage of mastering a competence comes at the point when the old habit loses its status as the default response and the new one takes its place. At that point, the behaviour change has stabilized, making a relapse into the old habit unlikely.

Generally, underlying deep attitudes and related values are harder to change than work habits. For example, an ethnic stereotype is less readily altered than what a person says and does in the presence of someone from that group. Motives like the need for achievement and personality traits like affability can be upgraded or modified, but the process is lengthy. So, too, with building underlying capacities like self-awareness, managing distressing emotions, empathy, and social skills.

Beyond the complexity of the competence being learned, the distance from the person's baseline behaviour to the new matters immensely. For people who are already fairly empathic, learning to give performance feedback artfully or to attune themselves to customers' needs may come quite easily, since these competences represent specific applications of a capability they already have. But for those who struggle to empathize, this mastery requires more determined and lengthy effort.

Training programmes that offer people a chance to practise the desired competence through well-focused simulations, games, role-playing, and other such methods can offer a strong beginning for practice. But with more complicated simulated job tasks, computerized business games, role-playing, team problem-solving exercises, and large-scale simulations of an entire organizational reality, the results tend to be mixed.

It is often unclear precisely what skills such simulations are meant to cultivate; there typically is little or no attention paid to exactly what competencies are being practised. Moreover, merely taking part in a game or an exercise is not the same as learning. The overall recommendation for such simulations and games is that they be carefully planned, focus on specific competencies that are clearly described to participants, and end with a debriefing of the experience. They should also be used in conjunction with (rather than as a replacement for) coaching and feedback, reinforcement, and on-the-job practice.

Computer-aided instruction, a current vogue in training, has limits when it comes to offering practice for emotional competence. While it has real promise in terms of individualized instruction, self-pacing, private opportunities for rehearsal and practice, immediate feedback on progress and remedial assistance, and the like, computer-aided techniques are generally better suited for training in technical skills than for developing personal and interpersonal capabilities.

"People say you can sit at your computer, assess yourself, and find out how to develop a competency," observes Richard Boyatzis, of Case Western Reserve University. "But you can't do this without relationships – you can't learn this in isolation."

24. Which of the following significantly determines the prowess for acquiring a new competence?

 - The complicatedness of the competence to be learnt and the sources of such learning.
 - The usefulness of the competence to be learnt and the nature of team mates.
 - A person's natural qualities and the values estimated as high by the learner.
 - The intricacy of the competence and the gap between the possessed and desired level of competence

25. The use of technology for training in competence such as emotional intelligence is, according to the author,

 - counterproductive as it makes the trainees more like machines.

(2) useful as long as it is coupled with programmes involving human contact.

(3) perfectly suited especially in the modern work environment.

(4) highly expensive and hence unsuited for organizations.

26. Training programmes that are meant to develop competencies such as business games, role-playing etc. do not unfailingly lead to desired objectives because

 - they are ill designed.
 - people taking part in them are not enthusiastic about the programmes.
 - the duration of the programmes is usually short.
 - of lack of clarity of the desired goals.

DIRECTIONS for questions 27 to 29: In each question, there are five sentences or parts of sentences that form a paragraph. Identify the sentence(s) or part(s) of sentence(s) that is/are correct in terms of grammar and usage. Then, choose the **most appropriate** option.

- c. could lead the inspectors to another damning evidence.
- d. Such knowledge may be being held back to disclose at a time when war
- e. could plausibly be launched at a moments

31. According to the author, social competencies of individuals in an organization lead to
 (1) a better working atmosphere.
 (2) a pooling of individual competencies.
 (3) solutions to problems related to human interactions.
 (4) a better image of the organization.
32. According to the author, which of the following is not taught in schools?
 (1) Perseverance at work, in any job
 (2) How organizations function now-a-days
 (3) Leadership qualities
 (4) Effective communication skills
- DIRECTIONS** for questions 33 to 35: There are two blanks in each of the following sentences. From the pairs of words that follow them, choose the pair that fills the blanks most appropriately.
33. The beaver has long been _____, along with the bee and the ant, as a paragon of intelligence and industry, but most of the _____ are untrue.
 (1) exulted . . . laments
34. The mountains that rise from these _____ plains are _____ green – but with scrub and thorn, seldom with grass; their harsh skylines are almost constantly veiled in curtains of intense heat.
 (1) innocuous . . . duplicitously
 (2) impervious . . . deceitfully
 (3) impoverished . . . beguilingly
 (4) impecunious . . . salubriously
35. No exact statistics exist on the _____ killing of innocent animals, but it is _____ an important factor in the deaths of bears, foxes and other animals.
 (1) inadvertent . . . undoubtedly
 (2) blithesome . . . iridescently
 (3) comradely . . . contentiously
 (4) unctuous . . . tenuously

DIRECTIONS for questions 36 to 38: Read the following passage and answer the questions that follow it.

In the financial life of every culture built upon faulty monetary policy, there are points at which the thin thread of economic faith; the thread that ties the entire failing system together, the thread made tangible by the hopes (and sometimes ignorance) of the general populace, finally snaps. From Ancient Rome, to Weimar Germany, to Argentina, to modern day America, no society fuelled by unsustainable debt and fiat inflation can duck the 'Fiscal Reaper' for very long. The U.S. alone has survived since the early 1970s (after Nixon removed the last vestiges of the gold standard) on nothing but questionable credit practices and baseless optimism, but there is a limit to the power of fantasy. This is a fact that most mainstream financial analysts and some in the American public refuse to grasp. Mere belief in the enduring nature of the marketplace is not enough; the fundamentals must also support that belief.

Today, we face an atmosphere in which the fundamentals are fiercely opposed to the publicly promoted perception of the economy, and it is moments in history like this that present a clear primer for total collapse. Financial disaster is bad enough when it is at least partially anticipated. When the masses are caught completely unaware and unprepared in the midst of misguided conviction, this leads to the worst kind of tragedy: the ironic and Shakespearian kind. To avoid this brand of tragedy is one of the primary reasons why we in the Liberty Movement do what we do. We may not be able to stop the current crisis from developing, but we can create awareness, and through this we can lessen the cultural shock, and thereby lessen the impact.

Mainstream economists crowded about the "invincible" rise of globalism and the unstoppable U.S. financial juggernaut for years while more level headed and intelligent men tried to warn the public of danger. The initial derivatives collapse in 2007/2008 should have put all of these pathetic establishment cheerleaders to shame, not to mention out of work. Yet three years later, amazingly, we are asked, even expected, to continue to look to such sad and useless people for predictions on market stability that always turn out absolutely inaccurate, and advice on savings and investment that they are not equipped to give.

I suppose we should not be surprised by the continued lifespan of Main stream media parrots and puppets. They may not be helpful to the average American, but they are very helpful to international banks and the globalist companies that pay their salaries. They distract and confuse us. They comfort when they should caution, and contradict when they should pay heed. Our financial house is burning from the bottom floor up, and they assure us that the warm orange glow is just the dawn of a new and beautiful day. We are told to "look to the future", a return to normalcy is "just around the corner". Never would they dare to weigh the cold hard factors of the present, or the ruse would be up. Whether they are aware of it or not, the lies media pundits perpetuate set the stage for even greater upheaval, to the detriment of most, and the benefit of only a handful.

It is necessary that we examine those lies, as well as the truths they are meant to hide. The most important truth of all being that not only are we not in the middle of a recovery but that the final phase of the economic meltdown is about to commence.

36. In the context of the passage, what can be understood from the phrase 'Fiscal Reaper'?
- (1) Accumulating monetary deficits
 (2) Questionable government policies
 (3) The inevitable result of debatable fiscal policies
 (4) The losses resulting from globalization

37. Which of the following can be a suitable title for the passage?
 (1) Globalization – A Radical perspective
 (2) Financial Meltdown – The Road Ahead
 (3) Recovering from Financial Meltdown?
 (4) Financial Meltdown- The Road Taken
38. The author, in this passage, is
 (1) Cautioning. (2) Advising.
 (3) Analysing. (4) Condescending.

DIRECTIONS for questions 39 and 40: Each of the following two questions 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.

39. The government of India should make the integration of research and teaching, particularly in science and education, mandatory. It should incentivize knowledge and innovation making the academic community alive to the demands of industry. While the government must step up its allocations to higher education and research there is enormous scope to supplement these with private funds, by way of grants and research funding from industry and tuition fees by those who can afford them.

- (1) Merely spending money will not ensure improvements.
 (2) Intervention is necessary to disrupt the close correlation between socio-economic status and educational attainment.
 (3) India cannot hold back serious educational reforms any longer.
 (4) A change would mean empowering people at every level and de-centralizing administration.
40. To ensure that the benefits of market liberalization reach the poor, the planning commission has aptly adopted "inclusive growth" as a guiding principle. The good news is that inclusive growth is achievable: all it needs is a trigger to spark a nationwide revolution in innovation. Competition law can provide that spark. By curbing the abuse of dominance, it opens the terrain for radical innovators.
 (1) Industry outsiders have little to lose in pursuing radical innovations.
 (2) They have every economic incentive to overturn the existing order.
 (3) They have abundant reasons to be slow in developing radical innovations.
 (4) They can achieve the twin objective of offering new technologies and better products at lower costs and throw out old technology incumbents.

SECTION – III

Number of Questions = 20

DIRECTIONS for questions 41 to 44: Answer the questions on the basis of the information given below.

Five friends Akash, Billu, Chunky, Dilip and Emily, who stay in five different houses in the same colony, order cakes from *Bakers Out* for their new year party. They arrange for their cakes to be delivered before 11:45 p.m. The following table gives the distances (in km) between their houses.

	Akash	Billu	Chunky	Dilip	Emily
Akash	0	6	3	3	1
Billu	6	0	2	7	8
Chunky	3	2	0	5	4
Dilip	3	7	5	0	3
Emily	1	8	4	3	0

It is also known that the distance (in km) from the bakery to the houses of Akash, Billu, Chunky, Dilip, and Emily is 4, 7, 5, 6, and 3 respectively.

The delivery boy travels at a constant speed of 12 km/hr and takes 3 minutes at each house to deliver the cake.

41. What is the latest time by when which the delivery boy can leave the bakery and complete delivery of all the cakes before 11:45 p.m.?
 (1) 10:23 p.m.
 (2) 10:20 p.m.
 (3) 10:10 p.m.
 (4) 10:15 p.m.
42. Suppose Billu and Chunky ordered a Pizza each along with the cakes. If the pizzas are to delivered hot, i.e., within 42 minutes after removing from the oven in the bakery, what is the minimum time taken by the delivery boy to deliver the pizzas as well as all the cakes? [Assume the time lag between the removal of Pizza from oven and starting from bakery is nil]
 (1) 102 minutes
 (2) 100 minutes
 (3) 97 minutes
 (4) The pizza can never be delivered hot.
43. As a part of maintenance work, the telecom department dug up the road directly connecting Akash's house to Emily's house, making it unusable for commuting. If all the other roads are available for commuting, what is the minimum time taken by the delivery boy to deliver all the cakes?
 (1) 107 minutes (2) 92 minutes
 (3) 85 minutes (4) 82minutes

- 44.** If the road which connects Billu's house and Chunky's house is rendered unusable and all the other roads are usable then which of the following is true?
- (I) The difference between the maximum and minimum time taken to deliver all the cakes is 45 minutes.
- (II) In case of minimum time of delivery, Billu was not the last one to be delivered his cake.
- (1) Only I is true
 (2) Only II is true
 (3) Both I and II are true
 (4) Neither I nor II is true

DIRECTIONS for questions 45 to 47: Answer the questions on the basis of the information given below.

A website allows its customers to download films from its database. The audio and video quality of a film is rated, each on an integer scale of 0 – 10. The product of the Audio and Video ratings gives the final rating. The following table gives the partial information of the ratings of 8 films A, B, C, D, E, F, G and H.

	Audio Rating	Video Rating	Final Rating
A	6		
B			24
C		7	
D	7		
E		9	
F		4	
G	5		
H		10	

Further it is known that

- No film has a final rating of less than or equal to 10.
- The films are categorised based on the final rating as 'Bad', 'Average', 'Good' and the 'Best'.
- If final rating is in the range of 0 – 20 then the film quality is 'Bad'.
- If the final rating is in the range of 21 – 50 then the film quality is 'Average'.
- If the final rating is in range of 51 – 75 then the film quality is 'Good'.
- If the final rating is in range of 76 – 100 then the film quality is 'Best'.
- Exactly two films got equal video ratings.
- G is categorised as a 'Bad' quality film.
- The number of films under each category is the same.
- E obtained a higher video rating than A and a higher final rating than H.
- Exactly two films obtained equal audio rating.
- The audio rating of B was higher than its video rating.

- 45.** What is the video rating obtained by A?

- (1) 5
 (2) 6
 (3) 7
 (4) Cannot be determined

Mark (1) if the question cannot be answered even by using both the statements together

Mark (2) if the question can be answered only by using both the statements together but not each statement alone

Mark (3) if the question can be answered by using either statement alone

Mark (4) if the question can be answered by one statement alone but not by the other statement alone.

- 46.** What is the final rating obtained by D?

- (1) 42 (2) 56 (3) 63 (4) 70

- 48.** Four friends-Ajay, Bharat, Charan and Dinesh, stand in a line one behind the other in increasing order of their heights. Ajay does not stand behind Bharat and Dinesh does not stand in front of Charan.

Who is the tallest among the four friends?

Statement I: Charan stands behind at least one of the three friends and Bharat stands before at least one of the three other friends.

Statement II:Bharat does not stand in front of Charan and Ajay does not stand behind Dinesh.

- 47.** Which of the following is true?

- (I) Film F obtained the lowest final rating.
 (II) The final rating of A is at least 30.

- (1) Only I is true
 (2) Only II is true
 (3) Both I and II are true
 (4) Neither I nor II is true.

DIRECTIONS for question 48: The question below is followed by two statements, A and B. Answer the question using the following instructions:

DIRECTIONS for questions 49 to 52: These questions are based on the following information.

Food and Agricultural Organization (FAO) conducted a study to analyze the price behaviour of various food commodities for the years 2008-09 and 2009-10 across emerging, developing and developed countries. To enable comparison of price behaviour across the three regions, a food basket, of a total weight of 30 kg, comprising 5 kg of each of six commodities, commonly consumed across the three regions, was defined.

The average annual base price (in Rs./kg) in 2008-09 of the six commodities across the three regions is given below.

Average price (in Rs./kg) of the six commodities in 2008-09.

	Corn	Rice	Wheat	Rapeseed	Soyabean oil	Palm Oil
Emerging Countries	20	25	28	15	30	32
Developing Countries	30	38	34	24	34	40
Developed Countries	35	42	35	29	38	46

For each region, a representative value of the basket, known as the 'Basket value', was calculated as follows.

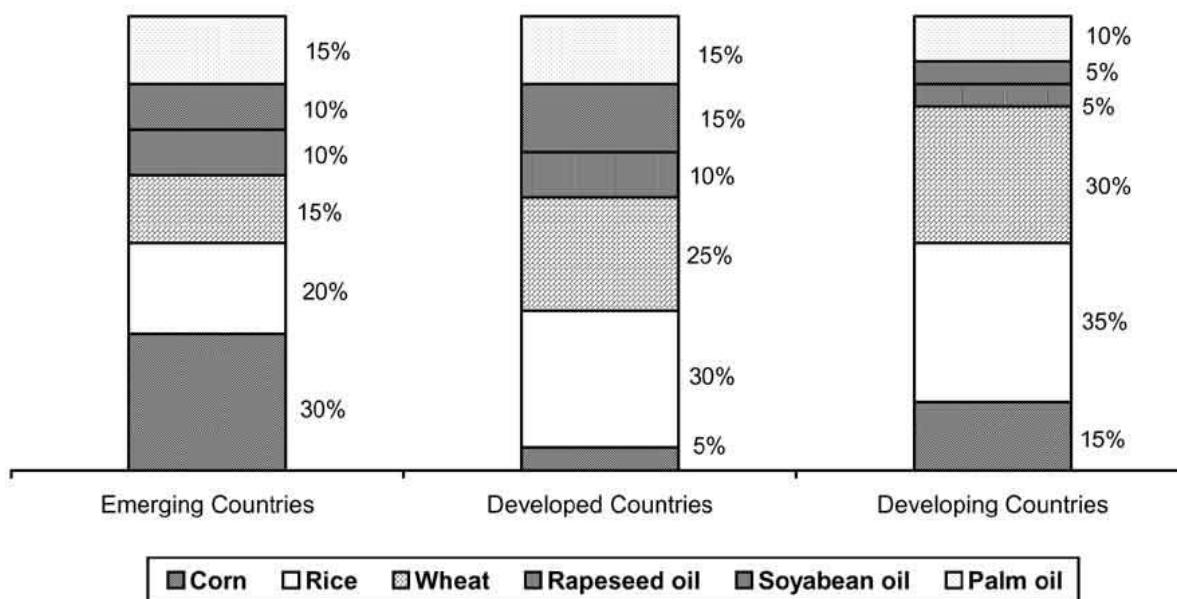
$$\text{Basket value} = \sum_{i=1}^6 P_i W_i$$

where P_i and W_i are the average price (in Rs./kg) and the weight (in kg) of the i^{th} commodity respectively.

During the study, it was observed that from 2008-09 to 2009-10, the basket value showed an increase of 40%, 24% and 32% in emerging, developing and developed countries respectively.

The bar graph below shows the contribution (in %) of each commodity to the actual increase (in Rs.) in the basket value of each region.

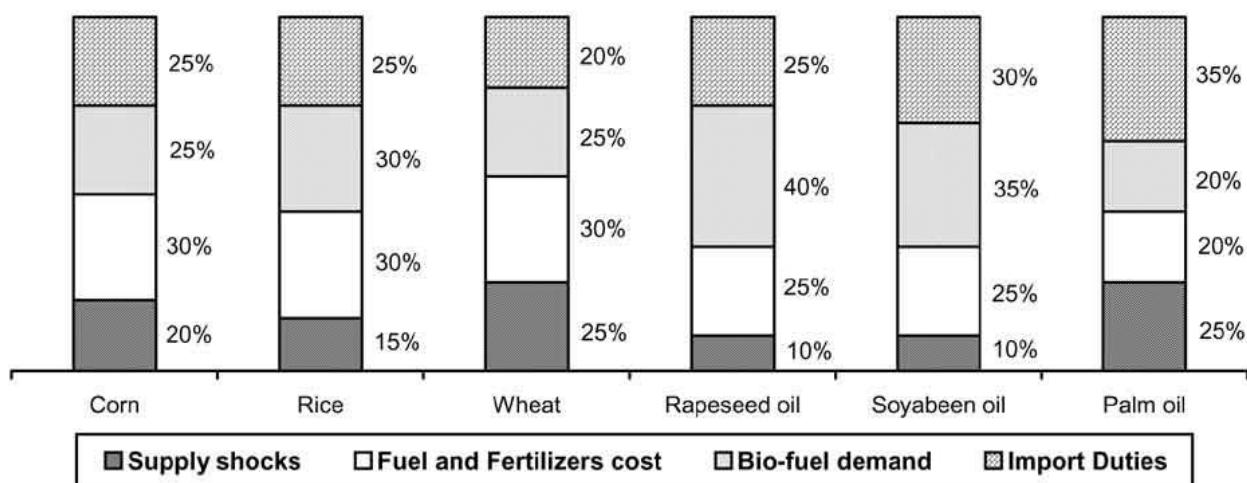
Commodity-wise contribution to increase in basket value from 2008-09 to 2009-10



FAO also analysed the reasons for increase in the basket value in case of emerging countries and identified four major factors—Supply shocks, Fuel and Fertilizer cost, Bio-Fuel demand, and import duties, for the price increase.

The bar graph below shows the contribution (in %) of each factor to the increase in the price of 5 kg of each commodity in emerging Countries.

**Factor-wise contribution to increase in basket value in emerging countries
from 2008-09 to 2009-10**



For the questions that follow, it may be assumed that the price paid for purchasing 1 kg of a food commodity in a particular country belonging to a given region in a certain year is equal to the average price (in Rs./kg) of the commodity in the region in that year.

49. The price increase in corn in emerging countries caused due to supply shocks is what percentage of the price increase in emerging countries due to supply shocks?

(1) 34.1% (2) 32.4% (3) 31.6% (4) 30.4%

50. Benazir, a resident of Bahrain, an emerging country, bought 8 kg of rice in 2008-09 and 10 kg of rice in 2009-10. How much more did Benazir have to pay for her purchases in 2009-10 as compared to that in 2008-09?

(1) Rs.70 (2) Rs.160 (3) Rs.170 (4) Rs.230

51. Kwazul is an ambitious man of 25 years of age and resides in Somalia, an emerging country. In 2009-10, unhappy with the quality of food commodities in his country, he decides to order two samples – each containing 2 kg each of corn, rice and wheat – one

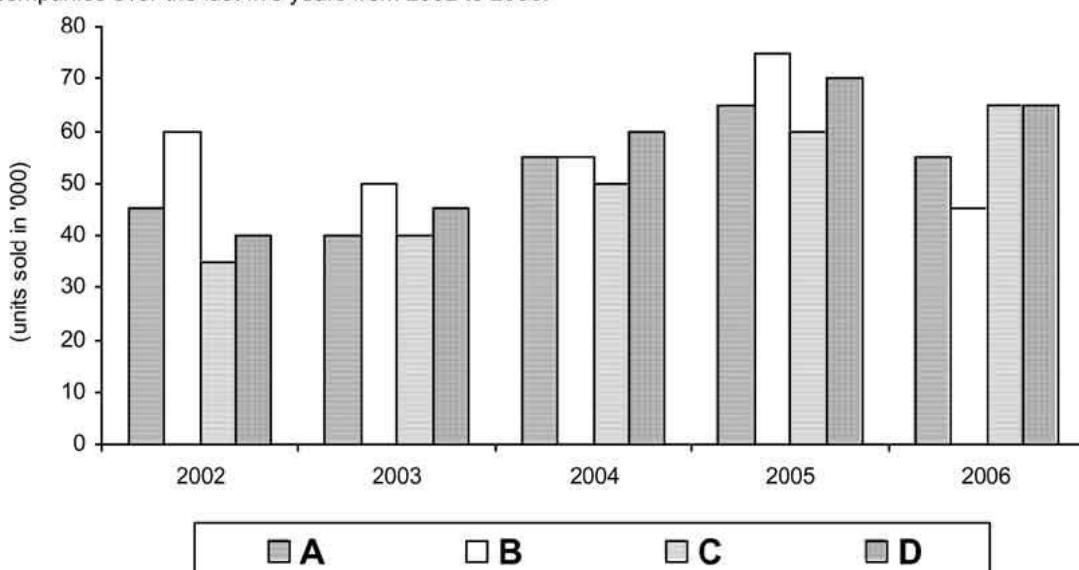
from India, a developing country and the other from France, a developed country. If the cost of importing a sample constitutes 40% and 50% of the cost of the sample from India and France respectively, how much more/less does Kwazul incur in importing the sample from France as compared to India?

- (1) Rs.72.48 less (2) Rs.84.56 less
(3) Rs.84.56 more (4) Rs.72.48 more

52. After the increase in prices of all commodities in 2009-10 from 2008-09, import duties on all types of oil are lifted in all the emerging countries as the governments perceive no shortage in stocks of oils in the domestic market. Find the percentage decrease in the average price of Palm oil in emerging countries in 2009-10, on account of the lifting of import duties.

(1) 10.29% (2) 6.13% (3) 17.76% (4) 7.68%

DIRECTIONS for questions 53 and 54: The following graph shows the sales (in terms of units sold) of automobiles of four companies over the last five years from 2002 to 2006.



53. Which of following companies showed the maximum percentage increase in the units sold in the given period?

- (1) A (2) B (3) C (4) D

54. In which year did the company B show the maximum percentage change in its sales over the previous year?

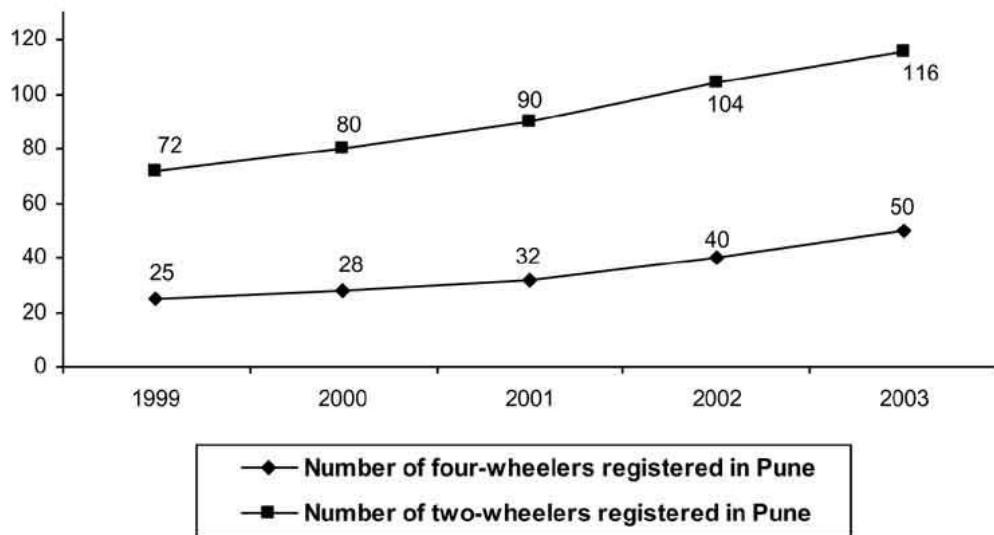
- (1) 2003
(2) 2004
(3) 2005
(4) 2006

DIRECTIONS for question 55: Select the correct alternative from the given choices.

55. Eight people belonging to different professions among teacher, doctor, engineer, lawyer, typist, driver, pilot and scientist are standing in a row, not necessarily in the same order. It is known that the lawyer is five places away to the left of the pilot. The typist is the only person in between the teacher and the driver. The doctor and the engineer are adjacent to each other. The lawyer is not at any of the extreme ends. If 'D' is the number of persons between the doctor and the teacher, then how many distinct values of D are possible?
(1) Two (2) Three (3) Four (4) Five

DIRECTIONS for questions 56 and 57: These questions are based on the following information.

**Distribution of two-wheelers and four-wheelers (in thousands of units)
registered in Pune (1999-2003)**



56. Find the percentage increase in the total number of registered two-wheelers and four-wheelers in Pune from 2000 to 2002.

- (1) 36% (2) 30% (3) 42.85% (4) 33.33%

36 families read exactly one of tamil and telugu newspapers. The number of families which read only tamil newspaper is 20% less than those who read only a telugu newspaper.

57. In Pune, in 2000, the number of registered four-wheelers were 80% of those in Nashik and in 2001, the number of registered four-wheelers were 57.14% of those in Nashik. Find the percentage increase/decrease in the number of four-wheelers registered in Nashik from 2000 to 2001.

- (1) 60% increase (2) 18.37% decrease
(3) 60% decrease (4) 18.37% increase

58. If native tamil families read only a tamil newspaper while both tamil and telugu newspapers are read only by migrant families from Andhra, the difference between number of native tamil families and the number of families which read all three newspapers is

- (1) 12 (2) 8
(3) 10 (4) Cannot be determined

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

In a locality, there are 91 families, each of which reads at least one of telugu, tamil and english newspapers. It is known that 41 families read a telugu newspaper and an

59. What is the difference in the number of families who read only telugu and english newspapers and those who do not read both tamil and english newspapers?

- (1) 72 (2) 75 (3) 59 (4) 67

60. What proportion of those who read both english and

(Key and Solutions for AIMCAT1215)

Key

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

Solutions

SECTION – I

Solutions for questions 1 to 20:

1. Let the distance over which the race was run be L m.
Let the speeds of A, B and C be U_A , U_B and U_C respectively

$$\frac{U_A}{U_B} = \frac{L}{L-40}, \frac{U_A}{U_C} = \frac{1}{1-60} U_B = \frac{7}{5} U_C$$

$$\frac{U_B}{U_C} = \frac{\left(\frac{U_A}{U_C}\right)}{\left(\frac{U_A}{U_B}\right)} = \frac{L-40}{L-60} = \frac{7}{5} \Rightarrow L = 110 \text{ m} \quad \text{Choice (2)}$$

$$2. S = \frac{1}{2} + \frac{1}{12} + \frac{1}{30} + \dots + \frac{1}{4032}$$

$$\Rightarrow S = \left(1 - \frac{1}{2}\right) + \left(\frac{1}{3} - \frac{1}{4}\right) + \left(\frac{1}{5} - \frac{1}{6}\right) + \dots + \left(\frac{1}{63} - \frac{1}{64}\right)$$

$$\Rightarrow S = 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \dots + \frac{1}{64} - 2 \left[\frac{1}{2} + \frac{1}{4} + \frac{1}{6} + \dots + \frac{1}{64} \right]$$

$$\Rightarrow S = 1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{32} + \frac{1}{33} + \frac{1}{34} + \frac{1}{35} + \dots + \frac{1}{64}$$

$$- \left[\frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{32} \right]$$

$$\Rightarrow S = \frac{1}{33} + \frac{1}{34} + \frac{1}{35} + \dots + \frac{1}{64} \quad \text{Choice (2)}$$

$$3. f(x) = \frac{25^x}{25^x + 5}$$

$$\therefore f(1-x) = \frac{25^{1-x}}{25^{1-x} + 5} = \frac{5}{5+25^x}$$

$$\text{Thus } f(x) + f(1-x) = \frac{25^x}{25^x + 5} + \frac{5}{25^x + 5} = 1$$

$$\therefore f\left(\frac{1}{99}\right) + f\left(\frac{98}{99}\right) = 1$$

$$f\left(\frac{2}{99}\right) + f\left(\frac{97}{99}\right) = 1$$

$$f\left(\frac{49}{99}\right) + f\left(\frac{50}{99}\right) = 1$$

$$\text{Therefore adding, we get } f\left(\frac{1}{99}\right) + f\left(\frac{2}{99}\right) + \dots + f\left(\frac{98}{99}\right) \\ = 49(1) = 49 \quad \text{Choice (1)}$$

4. $C_1 = C_2 = 1$

$$\text{Given } \frac{C_{n+2} + C_{n+1}}{2} = C_{n+1} + \frac{C_n}{2}$$

$$\Rightarrow C_{n+2} = C_{n+1} + C_n \Rightarrow C_3 = C_2 + C_1$$

$$C_4 = C_3 + C_2$$

⋮ ⋮ ⋮

$$\therefore C_3 = 1 + 1 = 2, C_4 = 2 + 1 = 3$$

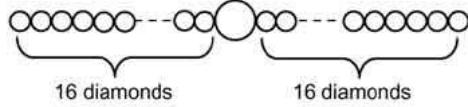
$$C_5 = 5, C_6 = 8, C_7 = 13 \text{ and so on}$$

⋮ The series would be 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ...

The terms of the series which are prime are $C_3, C_4, C_5, C_7, C_{11}, \dots$

⋮ It can be seen that C_k is prime when $K = 4$ or K is prime.
Choice (4)

5. For the sake of convenience and simplicity, the chain can be assumed to be a linear one in horizontal position.



Let the value of the larger diamond be V.

Starting from the centre diamond, each successive diamond on the left decreases by 75 euros and that on right decreases by 175 euros.

Value of the 17 leftmost diamonds

$$= \frac{17}{2}[2V + 16 \times (-75)]$$

Value of the 17 rightmost diamonds

$$= \frac{17}{2}[2V + 16 \times (-175)]$$

⋮ Total value of the 33 diamonds

$$= \frac{17}{2}[2V + 16 \times (-75)] + \frac{17}{2}[2V + 16 \times (-175)] - V$$

$$= 164000$$

$$\Rightarrow \frac{17}{2}[4V - 16 \times 250] = 164000$$

$$\Rightarrow 17[2V - 8 \times 250] - V = 164000$$

$$\Rightarrow 33V = 164000 + 34000 = 198000$$

$$\Rightarrow V = 6000 \text{ euros}$$

Choice (4)

6. The difference between two quadratic expression can be a quadratic expression, a linear expression or a constant.

Let us consider the difference between $f(x)$ and $g(x)$

i.e., $f(x) - g(x) = ax^2 + bx + c$

$$\therefore f(1) - g(1) = a + b + c = 1 \quad \text{--- (1)}$$

$$f(2) - g(2) = 4a + 2b + c = 2 \quad \text{--- (2)}$$

$$f(3) - g(3) = 9a + 3b + c = 5 \quad \text{--- (3)}$$

(2) - (1) gives $3a + b = 1$ where as (3) - (2) gives
 $5a + b = 3$
 $3a + b = 1 \quad \text{---(4)}$
 $5a + b = 3 \quad \text{---(5)}$
Solving (4) and (5), we get $a = 1$ and $b = -2$
Substituting $a = 1$ and $b = -2$ in eqn - (1) we get
 $c = 1 - a - b$
 $\Rightarrow c = 1 - 1 - (-2)$
 $\therefore c = 2$
 $\therefore f(x) - g(x) = x^2 - 2x + 2$
 $\therefore f(4) - g(4) = (4)^2 - 2(4) + 2 = 10$ Choice (3)

7. Rate at which water flows from the pipe into the tank
= speed of flow \times area of cross-section
= $2 \text{ cm/sec} \times 9 \text{ cm}^2 = 18 \text{ cm}^3/\text{sec}$
Capacity of the tank = $18 \text{ cm}^3/\text{sec} \times 30 \times 60 \text{ seconds}$
In the presence of the leak, rate of filling = $18 - 6$
= $12 \text{ cm}^3/\text{sec}$
 \therefore Time taken to fill the tank = $\frac{18 \times 30 \times 60}{12}$ seconds
= 45 minutes Choice (2)

8. $y = x^3 + 5x^2 + 6x + 8 \quad \text{---(1)}$
 $y = x^3 + 4x^2 + 10x + 4 \quad \text{---(2)}$
 $(1) - (2) \Rightarrow x^2 - 4x + 4 = 0$
 $\Rightarrow (x - 2)^2 = 0 \Rightarrow x = 2$
But when, $x = 2$, $x^3 + 5x^2 + 6x + 8 \neq 0$
 $x^3 + 4x^2 + 10x + 4 \neq 0$
Root of an equation is the value of x for which the curve intersects x axis i.e. $y = 0$
 \therefore No common roots exist. Choice (1)

9. It is given, that $f(x+y) - f(x) - f(y) = 6xy + 3$
Putting $x = 1$ and $y = 0$, we get

$$\begin{aligned}f(1-0) - f(1) - f(0) &= 3 \\ \Rightarrow f(0) &= -3 \\ \text{Putting } x = 1 \text{ and } y = -1 \text{ we get,} \\ f(1-1) - f(1) - f(-1) &= 6(1)(-1) + 3 \\ f(1) + f(-1) &= 0 \\ f(1) &= -f(-1)\end{aligned}$$

$$\begin{aligned}\text{Putting } x = 2 \text{ and } y = -1 \text{ we get} \\ f(2-1) - f(2) - f(-1) &= 6(2)(-1) + 3 \\ f(1) - f(-1) &= f(2) - 9 \\ \therefore f(2) &= 2f(1) + 9 [\because -f(-1) = f(1)]\end{aligned}$$

$$\begin{aligned}\text{Putting } x = 2 \text{ and } y = 1, \text{ we get} \\ f(2+1) - f(2) - f(1) &= 6(2)(1) + 3 \\ \Rightarrow f(3) &= 15 + f(2) + f(1) \\ \Rightarrow f(3) &= 15 + 3f(1) + 9 \\ f(-1) &= 6 \therefore f(1) = -6 \\ \therefore f(3) &= 3f(1) + 24 = 3(-6) + 24 = 6\end{aligned}$$

Choice (3)

10. $12, 345, 678, 987, 654, 321 = N$
 $= 12 \times 10^{15} + 345 \times 10^{12} + 678 \times 10^9 + 987 \times 10^6 +$
 $654 \times 10^3 + 321$
 $\frac{1000}{1001}$ leaves a remainder of 1000 or -1.

\therefore The given number is expressed in the above form.

$$\text{Rem} \left(\frac{10^3}{1001} \right) = -1 \quad \text{Rem} \left(\frac{10^6}{1001} \right) = 1$$

 \therefore

$$\text{Rem} \left(\frac{12 \times 10^{15} + 345 \times 10^{12} + 678 \times 10^9 + 987 \times 10^6 + 654 \times 10^3 + 321}{1001} \right)$$

$$\begin{aligned}&= 12(-1) + 345(1) + 678(-1) + 987(1) + 654(-1) + 321 \\ &= -12 + 345 - 678 + 987 - 654 + 321 \\ &= 333 + 309 - 333 = 309.\end{aligned}$$

Alternative Solution:

$$1001 = 7 \times 11 \times 13$$

Checking for divisibility by 11 is easier than checking for divisibility by 7 and 13.

Sum of digits in odd places

$$= 1 + 3 + 5 + 7 + 9 + 7 + 5 + 3 + 1 = 41$$

Sum of digits in even places

$$= 2 + 4 + 6 + 8 + 8 + 6 + 4 + 2 = 40$$

\therefore Difference in sums = $41 - 40 = 1$

\therefore N divided by 11 leaves a remainder 1.

\Rightarrow N - 1 is exactly divisible by 11.

Let N = $1001q + r$

If N - 1 is divisible by 11, then r - 1 should also be divisible by 11.

$$\Rightarrow r = 11k + 1$$

Of the given choices, only $309 = 11 \times 28 + 1$.

Choice (2)

11. Let the two numbers be ha and hb where h is their HCF and ha and hb their LCM. Let us consider a $<$ b.

It is given that $ha + hb + hab = 143$

$$h(a + b + ab) = 143$$

143 can be expressed as the product of two numbers in 2 ways i.e., 1×143 and 11×13

Case I: 1×143

H = 1 and a + b + ab = 143. [h = 143 and a + b + ab = 1 is not possible]

$$A + B + AB = 143$$

Adding 1 to both sides, we get

$$AB + A + B + 1 = 144$$

$$(A+1)(B+1) = 144$$

144 can be expressed as the product of two numbers in the following ways.

	a	b	ha	hb	hab
1×144	0	143 [Not possible]			
2×72	1	71	1	71	71
3×48	2	47	2	47	84
4×36	3	35	3	35	105
6×24	5	23	5	23	115
8×18	7	17	7	17	119
9×16	8	15	8	15	120
12×12	11	11 [Not possible, as a, b are coprime to each other]			

Case II: 11×13

If h = 11, a + b + ab = 13

$$\therefore ab + a + b + 1 = 14$$

$$\Rightarrow (a+1)(b+1) = 14$$

	a	b	ha	hb	hab
1×14	0	13 [Not possible]			
2×7	1	6	11	66	66

If h = 13, a + b + ab = 11

$$1 + a + b + ab = 12$$

$$\text{Possible ways } (a+1)(b+1) = 12$$

Possible ways	a	b	ha	hb	hab
1×12	0	11 [Not possible]			
2×6	1	5	13	65	65
3×4	2	3	26	39	78

The following are the pairs of numbers satisfying the given condition.

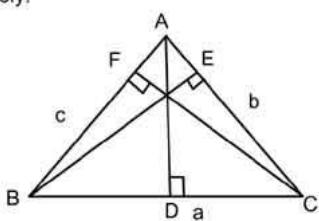
1. (1, 71) 4. (5, 23) 7. (11, 66)
2. (2, 47) 5. (7, 17) 8. (13, 65)

3. (3, 35) 6. (8, 15) 9. (26, 39)

Thus there are nine such pairs of numbers

Choice (3)

12. In the adjacent figure, AD, BE and CF are the perpendiculars drawn to the sides BC, AC and AB respectively.



Now, equating the area of the triangle ABC, we get,

$$\text{Area of } \triangle ABC = \frac{1}{2}(a)(P_a) = \frac{1}{2}(b)(P_b) = \frac{1}{2}(c)(P_c)$$

$$\therefore P_a : P_b : P_c = \frac{1}{a} : \frac{1}{b} : \frac{1}{c}$$

i.e., the ratio of the perpendiculars to the sides is equal to the ratio of the reciprocals of the sides.

$$\text{It is given that, } \frac{P_a}{P_c} = \frac{P_b - P_a}{P_c - P_b}$$

$$\Rightarrow P_a P_c - P_a P_b = P_b P_c - P_a P_c$$

$$\Rightarrow 2 P_a P_c = P_a P_b + P_b P_c$$

$$\Rightarrow \frac{2}{P_b} = \frac{1}{P_a} + \frac{1}{P_c}$$

So the perpendiculars to the sides are in harmonic progression

Therefore the sides being in the inverse ratio will be in Arithmetic progression.

$\therefore 2b = a + c$ will be the required relation. Choice (3)

13. Let x be the average of the four consecutive odd numbers.
 \therefore Sum of the four numbers = $4x$. Given this is a perfect cube. If $4x$ has to be a perfect cube, then x must be of the form $2k^3$.

\Rightarrow The numbers must be of the form $2k^3 - 3, 2k^3 - 1, 2k^3 + 1, 2k^3 + 3$

$K = 3, \Rightarrow$ The numbers are 51, 53, 55, 57

$K = 4, \Rightarrow$ The numbers are 125, 127, 129, 131

$K = 5 \Rightarrow$ the numbers are 247, 249, 251, 253

$K = 6 \Rightarrow$ the numbers are 509, 511, 513, 515

\Rightarrow only 253 is possible.

Alternative Solution:

Assume the four odd nos. as $2n - 3, 2n - 1, 2n + 1, 2n + 3$.
 $\text{Sum} = 8n$.

If $8n$ is a perfect cube, then n is a perfect cube.

$n = 27, \text{ the numbers are } 51, 53, 55, 57$

$n = 64, \text{ the numbers are } 125, 127, 129, 131$

$n = 125, \text{ the numbers are } 247, 249, 251, 253$

Of the given choices, only 253 satisfies. Choice (1)

14. $\frac{2b - a}{a - 2c} < 0 \quad a^2 - 4bc > 0 \quad (\because ac > 0)$

\Rightarrow roots are real

The nature of the roots depends on the nature of coefficients a, b, c . When a, b, c are all rational, both the roots must be of a similar nature, i.e., both rational or both irrational.

Since there is no mention about the rationality of co-efficients a, b, c , if one root is rational the other root can be irrational

For example: solve for roots of $\sqrt{3}x^2 - (7 + \sqrt{3})x + 7 = 0$

Choice (4)

15. $20 = 2^2 \times 5$ since $2^2 < 5$, highest power of 20 in $n!$ is determined by highest power of 5.

$$\text{In } 100!, \text{ the highest power of } 5 \text{ is } \left[\frac{100}{5} \right] + \left[\frac{20}{5} \right] = 24$$

$$\text{In } 115! \text{ the highest power of } 5 \text{ is } \left[\frac{115}{5} \right] + \left[\frac{23}{5} \right] = 27$$

\therefore Highest power of 5 in $120!$ Will be $27 + 1 = 28$

Highest power of 5 in $125!$ Will be $28 + 3 = 31$

Because $125 = 5^3$

\therefore 3 additional 5s are included.

$\therefore 30$ is not possible

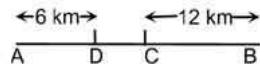
Choice (3)

16. At 10 a.m., Sita is at D, 18 km away from Gita since ratio of speeds of Sita and Gita is $1 : 2$, Sita covers a further $\frac{1}{3}$ rd of

18 km, i.e., 6 km when they meet for the first time.

\therefore Sita and Gita meet for the 1st time at C, the midpoint of AB. Between their 1st and 2nd meetings, Sita and Gita cover a total of twice the distance between A and B, i.e., 48 km.

$$\text{Distance covered by Sita out of } 48 \text{ km} = \frac{1}{3} \times 48 = 16 \text{ km}$$



16 km from C would mean 12 km to B and 4 km back from B towards A.

\therefore Sita would be 4 km from B.

Choice (4)

17. When a cube of side n is cut along the diagonals of a face of the cube, perpendicular to the face, number of unit cubes cut is

$$= 2n^2 - n \text{ when } n \text{ is odd}$$

$$= 2n^2 \text{ when } n \text{ is even}$$

From (A) number of unit cubes cut = $2K^2 + 3k + 1$

$$= 2(k+1)^2 - (k+1)$$

\therefore the side of the cube is an odd integer

From (B) the number of unit cubes cut is $72k^2 = 2(6k)^2$

\therefore Side of the cube is an even integer.

The question can be answered from either statement.

Choice (3)

18. Initial ratio of milk to total volume, $\frac{M}{T} = \frac{3}{5}$

The ratio of milk to total volume when the volume of liquid in the beaker is increased by 60% = $\frac{3}{5(1.6)} = \frac{3}{8}$

Next 38.4 litres of solution was replaced with water resulting in ratio of milk to water as 3 : 7.

$$\therefore \text{Ratio of milk to total volume in the breaker} = \frac{3}{10}$$

When 38.4 litres of solution was removed, volume of milk removed = $\frac{3}{8} \times 38.4 = 14.4$ litres.

\therefore If the volume of milk before replacement was $3x$ and total volume was $8x$, then $\frac{3x - 14.4}{8x} = \frac{3}{10} \Rightarrow x = 24$

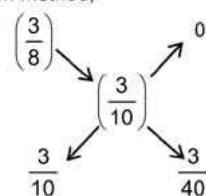
\therefore Before addition of 60% of water, total volume = $5x = 5 \times 24 = 120$ litres

Alternative Solution:

After adding 60% volume of water, the fraction of milk is $\frac{3}{8}$.

After replacing with water, fraction of milk is $\frac{3}{10}$.

Using allegation method,



∴ Ratio in which the solution and water are mixed is

$$\frac{3}{10} : \frac{3}{40} \text{ or } 4 : 1.$$

Since 38.4 litres are replaced by water, volume of solution before replacement = $5 \times 38.4 = 192$ litres.

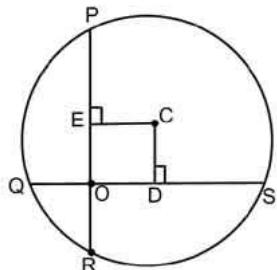
$$\therefore \text{Initial volume} = \frac{5}{8} \times 192 = 120 \text{ litres.} \quad \text{Choice (3)}$$

19. $-x-x-x-x-x-x-x-$

In an eight digit number, there are nine gaps. The digit crossed out could be from any of these nine gaps. The digit crossed out can be any of the ten digits 0 – 9 except in the 1st gap. Where zero is not allowed.

∴ Total nine-digit numbers that exist satisfying the given condition is $9 \times 10 - 1 = 89$ Choice (2)

20.



From secant theorem

$$OQ \cdot OS = OP \cdot OR$$

From the figure,

$$OD = CE \Rightarrow OD^2 = CE^2$$

$$\begin{aligned} OD^2 &= (QD - QO)^2 = \left(\frac{QS}{2} - QO\right)^2 \\ &= \left(\frac{OQ + OS}{2} - QO\right)^2 \\ CE^2 &= CP^2 - PE^2 = r^2 - \left(\frac{PR}{2}\right)^2 = r^2 - \left(\frac{OP + OR}{2}\right)^2 \\ &\Rightarrow \left(\frac{OQ + OS}{2} - QO\right)^2 = r^2 - \left(\frac{OP + OR}{2}\right)^2 \\ &\Rightarrow (OS - OQ)^2 = 4r^2 - (OP + OR)^2 \\ &\Rightarrow OS^2 + OQ^2 - 2(OS)(OQ) \\ &= 4r^2 - (OP^2 + OR^2 + 2(OP)(OR)) \\ &\Rightarrow OP^2 + OQ^2 + OR^2 + OS^2 = 4r^2 \\ &\Rightarrow QR^2 + PS^2 = 4r^2 = 25600 \end{aligned}$$

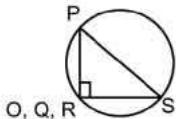
Alternative Solution:

The intersection point could be considered to be either the center of the circle or on the periphery of the circle (as limiting cases)

If it is centre of circle then it is obvious that

$$QR^2 + PS^2 = 4r^2$$

If it is on periphery, let Q, O & R coincide



OPS is right angled triangle \Rightarrow PS is diameter.

$$QR^2 + PS^2 = 4r^2 \quad \text{Choice (2)}$$

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

SECTION – II

Solutions for questions 21 to 23:

21. The opening sentence is (c) since, it introduces the topic of 'free speech'. Statement (e) is a continuation as it elaborates on the harm principle contained in (c). The principle referred to in (a) has reference to the idea contained in (e) hence it follows.

The action that can be taken depends on certain conditions, which is mentioned in option (d). Hence (d) follows.

Finally the conclusion that such a nexus is not there in Ms. Roy's statement is found in (b) – the application of the principle to a current event.

Hence ceadb is the correct order. Choice (4)

22. Statement (b) gives us the fairly recent information about Ensemble studios.

The other options are recollections of what Ensemble did. Hence (e) should follow. The word 'also' in (c) suggests that it should follow (e). Option (a) and (d) make a pair (.... doesn't lie in ... in a links to 'It lies in ...' in (d)). Hence becad is the correct order. Choice (2)

23. The passage is about the Phuket meeting, hence (c) is the opening sentence. Statement (a) follows as it tells us what happened there. Statement (e) follows as it gives the information who the other players were who joined in. This should be followed by (d) as it gives the gist of what happened among the participants. Statement b bring this to a close. Hence caedb Choice (1)

Solutions for questions 24 to 26:

Number of words and Explanatory notes for RC:

Number of words : 469

24. The third paragraph 'Beyond the complexity ... matters immensely' clearly spells out the answer. New competence can be acquired when the gap between the person's 'baseline behavior' (possessed competence) and new competence (desired level) is bridged. Choice (4)

25. Choices (1), (3) and (4) are narrow in focus and hence can be ruled out. Choice (2) is a comprehensive answer and can be inferred from the last paragraph where Richard Boyatzis is quoted. Choice (2)

26. The first four lines of paragraph 5 points to the answer. "It is often ... being practiced". Choices (1), (2) and (3) not mentioned in the passage. Choice (4)

Solutions for questions 27 to 29:

27. In (a), there is an error. The correction is 'to contemplate'. In (d), 'part' must be preceded by the article 'a' – 'a part' of something. In (e) 'study of ethics' must be preceded by the article 'the'. Parts (b) and (c) are correct. Choice (3)

28. In (b) it should be "... even greater strength" In c, evidence is an uncountable noun, hence, the correction must be 'to more damning evidence'. In (d), to disclose is incorrect, the correction is 'to be disclosed'. In (e) 'moments' must take an apostrophe 'moment's notice'. Only (a) is right. Choice (2)

29. In (b), 'sharply' is modifying 'reducing', hence the correction is 'sharply reducing'. In (c), 'also' is erroneous. The correction is 'so also' which means 'therefore' or 'as a result'. In (d), 'showed' is incorrect. The correction is 'shown'. Choice (1)

Solutions for questions 30 to 32:**Number of words and Explanatory notes for RC:**

Number of words : 482

30. Option (4) captures the essence of the passage. The others can be ruled out as they only cover the bits and pieces.
Choice (4)

31. The last sentence of para (6) supports option (2). "You will maximise every person's best talents."
Choice (2)

32. The passage describes the qualities that are expected by the organizations in their employees. These are leadership qualities and the passage says that these are almost certainly not taught in schools. The term 'leadership' is specified in para (4).
Choice (3)

Solutions for questions 33 to 35:

33. The word 'paragon' suggests that the first word is praise and the second refer to tales.
Choice (2)
34. In the first blank, only 'impoverished' is apt. Salubrious is pleasantly.
Choice (3)
35. In the 2nd blank, according to the context, 'iridescently', 'contentiously' and 'tenuously' are irrelevant. Blithesome, comradely and unctuous are incorrect as it talks of 'killing of innocent animals.'
Choice (1)

Solutions for questions 36 to 38:**Number of words and Explanatory notes for RC:**

Number of words : 587

36. The phrase 'Fiscal Reaper' is encountered in para 1, sentence 2. The word 'Reaper' means that which personifies death. In the given sentence we are talking about an inevitable fiscal situation, resulting from bad policies. Option (3) is most apt as an answer. Option (1) can be ruled out as it is a distortion. Option (2) can be ruled out as it is too general in scope. Option (4) can be ruled out as the losses are being attributed only to globalization which is a clear distortion.
Choice (3)

37. Option (4) is the right answer, as the author tells us the reasons which led us to the position we are in now. Option (1) can be ruled out as it is a distortion, the author blames the fiscal policies, and not globalization. Option (2) can be ruled out as the passage does not suggest any course of action which needs to be taken. Option (3) can be ruled out as the author is extremely certain that we are heading downwards.
Choice (4)

38. Option (1) 'cautioning' is apt as an answer. Please refer to para 1, sentence 2, '----- no society fueled by unsustainable debt and fiat inflation -----'. Also refer to para 1, sentence 3, '--- on nothing but questionable credit practices -----' Refer to para 1, sentence 5, '----- the fundamentals must also support that belief.' Refer to para 2, sentence 5, '..... stop the current crisis from developing, but we can ----.' Refer to last para, last sentence. All of this lend support to cautioning as the tone of the passage. Option (2) 'advisory' can be ruled out as it is mild, and does not describe the tone the author is using. Option (3) 'analytical' can be ruled out as the author is not analyzing the current scenario. He is not reasoning it out or being objective. Option (4) 'condescending' can be ruled out as it is not the undercurrent running through the passage. The author is imploring us for course correction. Choice (1)

Solutions for questions 39 and 40:

39. Statements 1 and 2 can continue the idea but cannot conclude it appropriately. Statement 4 introduces a new

idea of de-centralization. Hence it cannot conclude the paragraph aptly. Statement 3 appropriately ends the para.
Choice (3)

40. Options (1) and (3) introduce negative ideas whereas option (4) is the only one that can end the para in a positive note. Choice (2) might continue the idea but does not sum it up as aptly as (4) does.
Choice (4)

Difficulty level wise summary - Section II	
Level of Difficulty	Questions
Very Easy	-
Easy	-
Medium	22, 23, 24, 25, 26, 29, 31, 32, 33, 34, 35
Difficult	21, 27, 28, 30, 36, 37, 38, 39, 40
Very Difficult	-

SECTION – III**Solutions for questions 41 to 44:**

41. To get minimum time we need to consider the minimum distance.

Let the houses of Akash, Billu, Chunky, Dilip and Emily be denoted by A, B, C, D, E respectively. The distances (in km) between any two houses is given by the table below.

	B	C	D	E
A	6	3	3	1
B	-	2	7	8
C	-	-	5	4
D	-	-	-	3

The shortest path with A as the starting point is AEDCB (which can be arrived at by observing the values in the table)

Distance of the bakery from A is 4 km.

∴ Total distance to be traveled along AEDCB

$$= 4 + (1 + 3 + 5 + 2) = 15 \text{ km}$$

Similarly, the shortest paths with B, C, D and E as the starting points are BCDEA, CBAED, DEACB and EADCB/EDACB respectively.

Total distance along the route

$$\text{BCDEA is } 7 + (2 + 3 + 3 + 1) = 16 \text{ km}$$

$$\text{CBAED is } 5 + (2 + 6 + 1 + 3) = 17 \text{ km}$$

$$\text{DEACB is } 6 + (3 + 1 + 3 + 2) = 15 \text{ km}$$

$$\text{EADCB/EDACB is } 3 + (1 + 3 + 5 + 2) = 14 \text{ km}$$

∴ Distance traveled is shortest when the 1st house at which cake delivery takes place is Emily's house.

∴ Total time taken for traveling to all houses and delivering the pizzas is

$$\frac{14 \text{ km}}{12 \text{ km/hr}} \times 60 \text{ min} + 5 \times 3 \text{ min} = 85 \text{ min}$$

$$= 1 \text{ hour } 25 \text{ min}$$

∴ The latest time at which the delivery boy can start is 11:45 – 1 hour 25 minutes = 10:20 p.m. Choice (2)

42. Since Pizzas must be delivered at both Billu's and Chunky's houses, one of these two houses should be the 1st house at which delivery takes place.

If the delivery boy first reaches Billu's house and then Chunky's house, time taken to reach Chunky's house is

$$\left(\frac{7}{12} \times 60 \right) + 3 + \left(\frac{2}{12} \times 60 \right) \times 60 = 48 \text{ min.}$$

By this time, the pizza goes cold.

But if instead the delivery boy first reaches Chunky's house, time taken to reach Billu's house is

$$\left(\frac{5}{12} \times 60 \right) + 3 + \left(\frac{2}{12} \times 60 \right) = 38 \text{ min.}$$

∴ The pizza still remains hot.

∴ In this case, the route followed is CBAED.

$$\therefore \text{Total time taken} = \left(\frac{17}{12} \times 60 \right) + (5 \times 3) = 100 \text{ minutes.}$$

Choice (2)

43. The road connecting Akash's and Emily's house is not used for commuting. The minimum distance taken by the delivery boy is obtained if the delivery boy visits the houses in the order EDACB.

$$\therefore \text{Time taken} = \left(\frac{14}{12} \times 60 \right) + (5 \times 3) = 85 \text{ min}$$

Choice (3)

44. Statement I:

Shown below is the table of distances (in km) between any two houses.

	B	C	D	E
A	6	3	3	1
B	—	—	7	8
C	—	—	5	4
D	—	—	—	3

Shortest distance to be traveled with A, B, C, D, E as the starting points are along the routes ACEDB, BAEDC, CAEDB, DACEB and EACDB. Among these, EACDB has the shortest distance of $3 + (1 + 3 + 5 + 7) = 19$ km.

The longest distance will be traveled along the route DBECA (find out the longest possible distance with other starting points and convince yourself)

$$\therefore \text{Maximum distance traveled} = 6 + (7 + 8 + 4 + 3) \\ = 28 \text{ km}$$

Since delivery time is same in both cases, difference in times taken = $\frac{28 - 19}{12} \times 60 = 45$ minutes.

∴ Statement I is true.

Statement II:

The statement is false as for minimum time taken, the route is EACDB, i.e., Billu is the last one to receive his delivery. Hence the statement II is false. Choice (1)

Solutions for questions 45 to 47:

Given that there are equal number of films in each category. From the given table we can say that only E and H can be the best films as they are the only two films which can have their final rating in the range of 76 – 100.

B is an average film as final points are 24 and G has Bad quality.

Since G is Bad quality film and no film has final rating less than or equal to 10, the video rating of G should be either 3 or 4.

As E obtained a higher video rating than A, video rating of A should be less than 9.

Hence C and D are categorised as Good quality films.

E obtained a higher final rating than H. Hence E obtained either 9 or 10 in Audio and H got 8 points in Audio.

B obtained a higher rating in Audio than in Video.

Hence the combination is either 8, 3 or 6, 4.

Case 1: Let us assume B got 8, 3 then from the clue only 2 films got same ratings in any parameter.

We say that F gets either 3 or 4 in Audio. Hence it must be the other Bad quality film. Therefore, A is an average quality film. A can either get 5 or 6 in Video.

The table looks as follows.

	Audio	Video	Final rating points
A	6	5/6	30/36
B	8	3	24
C	10/9	7	70/63
D	7	8	56
E	9/10	9	81/90
F	3/4	4	12/16
G	5	3/4	15/20
H	8	10	80

Case 2: B got 6, 4 ratings

We get D has got final rating points as 56 and A can get either 5 or 6 in video.

The table looks as follows.

	Audio	Video	Final rating points
A	6	5/6	30/36
B	6	4	24
C	10/9	7	70/63
D	7	8	56
E	9/10	9	81/90
F	3/4	4	12/16
G	5	3	15
H	8	10	80

45. From case (1) the rating of A in video is either 5 or 6. Hence cannot be determined. Choice (4)

46. The final rating points of D is 56. Choice (2)

47. Statement I: we cannot determine as F can either get 12 or 16 final points.

Statement I is not definitely true.

Statement II: Film A gets either 5 or 6 in video. Hence it gets minimum 30 points.

Therefore, statement II is true. Choice (2)

Solution for question 48:

48. Let Ajay, Bharat, Charan and Dinesh be denoted by A, B, C, D respectively

Given, A is not behind B and D is not in front of C
⇒ A is in 1st, 2nd, 3rd position, B is in 2nd, 3rd or 4th position
D is in 2nd, 3rd, or 4th position, C is in 1st, 2nd or 3rd position

Statement I: C stands behind at least one of the remaining three

⇒ C is in 2nd position (and D is in 3rd or 4th position)
or C is in 3rd position (and D is in 4th position)

B stands before at least one of the remaining three

⇒ B is in 1st, 2nd or 3rd position but B is always behind A
⇒ B is in 2nd or 3rd position and A is either 1st or 2nd position

The possible arrangements are ABCD or ACBD

In both cases, D is the last person

∴ Dinesh is the tallest

∴ Statement I is alone sufficient to answer the question

Statement II:

B does not stand in front of C

⇒ B is in 3rd or 4th position and C is in 1st or 2nd position

A does not stand behind D

⇒ A is in 1st or 2nd position and D is in 3rd or 4th position

∴ Possible arrangements are ACBD, ACDB, CABD, CADB

∴ The last person can be either Bharat or Dinesh

Statement II alone cannot be used to answer the question

Choice (4)

Solutions for questions 49 to 52:

49. Let the total price increase in emerging countries be 100 k.

⇒ Price increase in each crop can be calculated.

Also, contribution of supply shock to price increase in each crop is given in the 2nd bar chart.

	Corn	Rice	Wheat	Rapeseed oil	Soyabeen oil	Palm oil
Price increase	30 k	20 k	15 k	10 k	10 k	15 k
% increase due to supply shock	20%	15%	25%	10%	10%	25%

∴ Total price increase due to supply shock

$$= 20\%(30 \text{ k}) + 15\%(20 \text{ k}) + 25\%(15 \text{ k}) + 10\%(10 \text{ k}) + 10\%(10 \text{ k}) + 25\%(15 \text{ k}) = 18.5 \text{ k}$$

Price increase in corn due to supply shock = 6 k
 \therefore Required percentage = $\frac{6k}{18.5k} = 32.4\%$ Choice (2)

50. The basket value in 2008-09 in emerging countries
 $= \sum P_i W_i = (20 + 25 + 28 + 15 + 30 + 32) \times 5$
 $= \text{Rs.750}$
 Given, the basket value of emerging countries in 2008-09 increased by 40% in the next year.
 \therefore Increase in basket value = 40% of 750 = Rs.300
 Contribution of 5 kg of rice to increase in basket value
 $= 20\% \text{ of Rs.300} = \text{Rs.60}$
 \therefore Contribution of 1 kg of rice = $\frac{60}{5} = \text{Rs.12.}$
 \therefore Average annual price of rice in 2009-10 in emerging countries is sum of average annual price of rice in 2008-09 and price increase per kg of rice = Rs.25 + Rs.12 = Rs.37.
 \therefore Amount paid for 8 kg rice in 2008-09 = 8×25
 $= \text{Rs.200}$
 Amount paid for 10 kg rice in 2009-10 = 10×37
 $= \text{Rs.370}$
 \therefore Difference in amounts paid = Rs.370 - Rs.200
 $= \text{Rs.170.}$ Choice (3)

51. Δ denotes change in price (Rs./kg) of a commodity.
 Basket value in 2008-09 is
 $5(20 + 25 + 28 + 15 + 30 + 32) = \text{Rs.750}$ for emerging countries,
 $5(30 + 38 + 34 + 24 + 34 + 40) = \text{Rs.1000}$ for developing countries,
 and $5(35 + 42 + 35 + 29 + 38 + 46) = \text{Rs.1125}$ for developed countries,
 Increase in basket value from 2008-09 to 2009-10 in emerging countries = 40% of Rs.750 = Rs.300,
 in developing countries = 24% of Rs.1000 = Rs.240,
 and in developed countries = 32% of Rs.1125
 $= \text{Rs.360.}$
 Let $\Delta c, \Delta r, \Delta w$ represent the contribution (in Rs./kg) of corn, rice and wheat respectively to the increase in basket value. For example, in emerging countries, contribution of 5 kg corn to increase in basket value = 30% of Rs.300
 $= \text{Rs.90}$
 \therefore Contribution of 1 kg corn, $\Delta c = \frac{1}{5} \times 90 = \text{Rs.18.}$

Similarly, the other values (in Rs./kg) can be found out and tabulated as under.

	Δc	Δr	Δw
Emerging Countries	18	12	9
Developing Countries	7.2	16.8	14.4
Developed Countries	3.6	21.6	18

Cost of a sample from India comprising 2 kg each of corn, rice and wheat = $2[(30 + 7.2) + (38 + 16.8) + (34 + 14.4)]$
 $= \text{Rs.280.8}$
 Cost of importing from India = 40% of 280.8
 $= \text{Rs.112.32}$
 \therefore Total cost of ordering from India = $280.8 + 112.32$
 $= \text{Rs.393.12}$
 Cost of sample from France
 $= 2[(35 + 3.6) + (42 + 21.6) + (35 + 18)] = \text{Rs.310.4}$
 Cost of importing from France = 50% of 310.4
 $= \text{Rs.155.2}$
 \therefore Total cost of ordering from France = $310.4 + 155.2$
 $= \text{Rs.465.6}$
 \therefore Difference in cost = $465.6 - 393.12 = \text{Rs.72.48}$ Choice (4)

52. The increase in basket value in emerging countries from 2008-09 to 2009-10 is Rs.60 (per kg of each commodity)
 Contribution of Palm oil to the price increase
 $= 15\% \text{ of } 60 = \text{Rs.9/kg}$

\therefore Price of Palm oil in 2009-10 is $P_2 = \text{Rs.32} + \text{Rs.9}$
 $= \text{Rs.41/kg}$
 Contribution of import duties to price increase in Palm oil
 $= 35\% \text{ of } 9 = \text{Rs.3.15/kg}$
 If import duties are lifted on Palm oil, then the price falls by Rs.3.15/kg
 \therefore Percentage decrease in price = $\frac{3.15}{41} = 7.68\%$ Choice (4)

Solutions for questions 53 and 54:

53. The percentage increase for the companies during the given period.
 $A = \frac{10}{45} \times 100 = 22.22\%$
 $B = \frac{-15}{60} \times 100 = -25\%$
 $C = \frac{30}{35} \times 100 = 85.7\%$
 $D = \frac{25}{40} \times 100 = 62.5\%$

The maximum percentage increase is shown by C during the given period. Choice (3)

54. The percentage change in units sold by B from 2002-2003
 $= \frac{10}{60} \times 100 = 16.66\%$
 From 2003-04 = $\frac{5}{50} \times 100 = 10\%$
 From 2004-05 = $\frac{20}{55} \times 100 = 36.36\%$
 From 2005-06 = $\frac{30}{75} \times 100 = 40\%$

Hence the maximum percentage change by B is observed in 2006. Choice (4)

Solution for question 55:

55. Given the lawyer is 5 places away to the left of the Pilot and the Lawyer is not at any extreme end. Then the following arrangements are possible

Case 1
 $\underline{\quad L \quad} \underline{\quad P \quad}$

Case 2
 $\underline{\quad L \quad} \underline{\quad P \quad} \underline{\quad }$

The 2nd case is not possible because Typist, Teacher and Driver are together and it also given that the Doctor and the Engineer are also adjacent
 T is the teacher and D is the doctor.

By taking case 1 there are 8 possibilities possible value of D

D/E	E/D	L	T	Ty	Dr	S	P	2	1, 2
D/E	E/D	L	Dr	Ty	T	S	P	2	3, 4
D/E	E/D	L	S	I	Ty	Dr	P	2	2, 3
D/E	E/D	L	S	Dr	Ty	T	P	2	4, 5

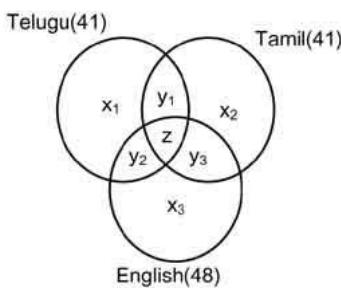
\therefore It can be seen that there are only 5 distinct possible value of D. Choice (4)

Solutions for questions 56 and 57:

56. The total number of two-wheelers and four-wheelers registered in Pune in 2000 = $28000 + 80000 = 108000$
 In 2002, the total number is = $40000 + 104000 = 144000$
 \therefore % increase = $\frac{144000 - 108000}{108000} \times 100 = 33\frac{1}{3}\%$ Choice (4)

57. No. of four-wheelers registered in Pune in 2000 = 28,000
 No. of four-wheelers registered in Nashik in 2000 = $\frac{28000}{0.80}$
 = 35,000
 In 2001, in Pune, the number of registered four-wheelers = 32,000
 In 2001, in Nashik, the number of registered four-wheelers = $\frac{32000}{0.5714} = \frac{32000}{\left(\frac{4}{7}\right)} = 56,000$
 $\therefore \% \text{ change} = \frac{56000 - 35000}{35000} \times 100 = 60\% \text{ increase}$

Choice (1)

Solutions for questions 58 to 60:

Number of families reading an english newspaper = $41 + 7 = 48$.
 Total number of families = 91

Let $\sigma_1, \sigma_2, \sigma_3$ represent number of families reading exactly one, two and three newspapers respectively.
 $\therefore \sigma_1 + \sigma_2 + \sigma_3 = 91$ ----- (1)
 Total number of instances of families reading newspapers = $41 + 41 + 48 = 130 = \sigma_1 + 2\sigma_2 + 3\sigma_3$ ---- (2)
 \therefore From (1) & (2), $\sigma_2 + 2\sigma_3 = 130 - 91 = 39$ ----- (3)
 Given 31 families read at least two newspapers ie. exactly two and exactly three newspapers.
 $\therefore 31 = \sigma_2 + \sigma_3$ ----- (4)
 From (3) & (4), $\sigma_3 = 8, \Rightarrow \sigma_2 = 23 \Rightarrow \sigma_1 = 60$

Given, a total of 36 families read exactly one of tamil & telugu newspapers and the no. of families reading only tamil newspapers is 20% less than that for telugu newspapers.
 $x_1 + 0.8x_1 = 36 \Rightarrow x_1 = 20$
 \therefore No. of families reading only telugu newspapers = $x_1 = 20$
 \therefore No. of families reading tamil newspaper = $x_2 = 16$
 $\sigma_1 = 60 = x_1 + x_2 + x_3 \Rightarrow x_3 = 24$
 $\sigma_3 = 8 = z$
 Also, $x_1 + y_1 + y_2 + z = 41$
 $x_2 + y_1 + y_3 + z = 41$
 $x_3 + y_2 + y_3 + z = 48$
 $z = 8, x_1 = 20, x_2 = 16, x_3 = 24$
 Solving the above, $y_1 = 7, y_2 = 6, y_3 = 10$

58. Number of native tamil families, is unknown (since it is not known as to who else reads and how many other families read only tamil newspaper)
 \therefore The difference cannot be determined. Choice (4)

59. Number of families reading only telugu and english newspapers = $y_2 = 6$
 Number of families reading tamil and english newspapers = $y_3 + z = 18$
 \therefore Number of families not reading both tamil and english newspapers = $91 - 18 = 73$
 \therefore Difference = $73 - 6 = 67$ Choice (4)

60. Number of families reading both english and tamil newspapers = $y_3 + z = 18$
 Of these only 8 families also read telugu newspapers
 \therefore Required proportion = $\frac{8}{18} = \frac{4}{9}$ Choice (2)

Difficulty level wise summary - Section III	
Level of Difficulty	Questions
Very Easy	-
Easy	-
Medium	45, 46, 47, 48, 49, 50, 53, 54, 55, 56, 57, 59, 60
Difficult	41, 42, 43, 44, 51, 52, 58
Very Difficult	-