MANAGEMENT APTITUDE TEST (MAT)

Held on : May 2017

Time : 2.5 hrs **(BASED ON MEMORY)** *Maximum Marks : 200*

SECTION-A : English Language

DIRECTIONS (Qs. 1 -4): *In the following questions, out of the four alternatives, choose the one which best expresses the meaning of the given word.*

1. Debacle
   (a) Decline (b) Downfall
   (c) Discomfiture (d) Degeneration
2. Ostracise
   (a) Banish (b) Belittle
   (c) Beguile (d) Besiege
3. Prophylactic
   (a) Antagonistic (b) Toxic
   (c) Preventive (d) Purgative
4. Coddle
   (a) Huddle (b) Satisfy
   (c) Protect (d) Cheat

DIRECTIONS (Qs. 5 - 8) : *In each of the question given below a/an idiom/phrase is given in bold which is then followed by five options which then try to decipher its meaning as used in the sentence. Choose the option which gives the meaning of the phrase most appropriately in context of the given sentence.*

5. He found her dream house and has now landed an amazing job. He really does have **the best of both worlds**.
   (a) to have lots of money to make the things done
   (b) you can enjoy two different opportunities at the same time
   (c) to play tricks in order to achieve targets
   (d) to bribe someone
6. She might not be the most attractive but you can't **judge a book by its cover**. I'm sure she is a sweetheart.
   (a) to prove someone innocent
   (b) to make someone a cheater
   (c) to not judge someone or something based solely on appearance
   (d) to select a book by seeing its contents
7. John is just never on time to work, it's really irritating. O wow, **speak of the devil here she come**.
   (a) the person you're talking about actually turns out to be angry
   (b) the person you're talking about actually turns out to be happy
   (c) the person you're just talking about actually turns up at that moment
   (d) the person you're talking about actually turns out to be celebrating
8. We missed our flight to Paris because the connecting flight was late and to **add insult to injury** they made us pay for a new ticket as if it was our fault!
   (a) to be compensated
   (b) to make a situation worse
   (c) to be reprimanded
   (d) to be praised
   (e) to be ruined

DIRECTIONS (Qs. 9 - 10): *Find the combination of sentences which don't have errors.*

9. The Hindutva expressions in this (a)/ region have reached out (b)/ to this imaginary while the other political formations (c)/ in the region have had little to say on it. (d)
   (a) abc (b) bcd
   (c) acd (d) No Error
10. The Bahujan Samaj Party did little to (a)/ disabuse the charge that the Prime Minister (b)/ made in his election rallies (c)/ that it serves the good to one against (d)/ its claims to represent the many. (e)
    (a) abcd (b) abce
    (c) acde (d) No Error

DIRECTIONS (Qs. 11 - 15): *Read the following passage and answer the questions that follow:*

If man began with speech and civilisation with agriculture, industry began with fire. Man did not invent it; probably nature produced a marvel for him by the friction of leaves or twigs, a stroke of lightning or a chance union of chemicals; man merely had a saving wit to imitate Nature and to improve upon her. He put fire to a thousand uses. First, perhaps he made it serve as a torch to conquer his fearsome enemy, darkness; then he used it for warmth and moved about freely from his native tropics to less enervating zones, slowly making the planet human. Then, he applied, it to metals, softening them, tempering them and combining them into forms stronger and more supple than those in which they had come to his hand. It was fire that created the old and honorable art of cooking, extending the diet of man to a thousand foods that could not be eaten before. So beneficent and strange was it that fire always remained a miracle to primitive man, fit to be worshipped as God. He offered it countless ceremonies of devotion and made it a centre or focus of his life. He carried it carefully with him as he moved from place to place in his wanderings and would not willingly let it die. The Romans even punished with death the careless virgins of the Temple of Vesta who allowed the sacred fire to be extinguished.

11. Why is fire called a wonder?
    (a) Civilisation has given man this fascinating things.
    (b) Industry could utilise it very effectively.
    (c) Man did not invent it nor could understand it.
    (d) It has played the role of shaping the destiny of human beings.
12. What is the meaning of "saving wit to imitate Nature"?
    (a) blindly following the dictates of nature
    (b) abject surrender to the forces of nature
    (c) rational and objective analysis of nature's laws
    (d) intelligent use of God's gift
13. What was the duty of the virgins in the Temple of Vesta?
    (a) to light the fire everyday exactly at a designated time
    (b) to light several other fires from the fire of the Temple of Vesta
    (c) to see to it that the sacred fire in the temple did not go out
    (d) to carry the fire from place to place wherever the Roman's went
14. Which of the following statements is **NOT TRUE** in the context of the passage?
    (a) Industry began with fire.
    (b) Fire taught man the art of cooking.
    (c) Fire always remained a miracle to primitive man.
    (d) Man invented fire.
15. What was the result of the application of fire to metals?
    (a) The metals became soft and tempered.
    (b) They became weak and more supple.
    (c) They disintegrated into separate elements.
    (d) None of these

DIRECTIONS (Qs. 16 - 20): *Read the following passage carefully and answer the following questions given below it. Certain words/ phrases have been printed in bold to help you locate them while answering some of the questions:*

Our current approach to solving global warming will not work. It is flawed economically, because carbon taxes will cost a fortune and do little, and it is flawed politically because negotiations to reduce carbon-dioxide emissions will become even more fraught and divisive. And even if you disagree on both counts, the current approach is also flawed technologically.

Many countries are now setting ambitious carbon cutting goals ahead of global negotiations. Let us imagine that the world ultimately agrees on an ambitious target. Say, we decide to reduce carbon-dioxide emissions by three-quarters by the year 2100 while maintaining reasonable growth. Herein lies that the technological problem to meet this goal, non-carbon based sources of energy would have to be astounding 2.5 times greater in 2100 than that was in the year 2000.

These figures were calculated by economists of a foreign university. Their research shows that confronting global warming effectively requires nothing short of a technological revolution. We are not taking this challenge seriously. If we continue on our current path, technological development will be nowhere near significant enough to make non-carbon based energy sources competitive with fossil fuels on price and effectiveness.

Sadly, during the international negotiations, the focus is on how much carbon to cut, rather than on how to do so. Little or no consideration will be given to whether the means of cutting emissions are sufficient to achieve the goals.

Politicians wilt base their decisions on global warming models that simply assume that technological breakthroughs will happen by themselves. This faith is sadly and dangerously misplaced.

Economists examine the state of non-carbon based energy today-nuclear, wind, solar and geothermal and find that, taken together, alternative energy sources would get us less than halfway toward a path of stable carbon emissions by 2050, and only a tiny fraction of the way toward stabilization by 2100. We need many times more non-carbon based energy than is currently produced. Yet the needed technology will not be ready in terms of scalability of stability. In many cases, there is still a need for the most basic research and development. We are not even close to getting this revolution started. Current technology is so inefficient that to take just one example, if we were serious about wind power, we would have to blanket most countries with wind turbines to generate enough energy for everybody, and we would still have the massive problem of storage: We don't know what to do when the wind does not blow.

Policy makers should abandon fraught carbon reduction negotiations and instead make agreements to invest in research and development to get this technology to the level where it needs to be.

16. Which of the following is suggested in the passage by which global warming can be reduced?
    (a) To make the approach towards global warming completely free from political intervention.
    (b) By making non-carbon based energy methods as efficient and cost effective as the fossil fuels.
    (c) To force every country to confine to stricter terms of carbon emissions.
    (d) To avoid international negotiations on carbon cuts until the technological research comes out with a scalable and stable solution.
17. Which of the following is not true in the context of the given passage?
    (A) Non-carbon fuels are too expensive so they should not be used.
    (B) Political ignorance is one of the main reasons behind the inappropriate approach to combat global warming.
    (C) The generation of energy from non-carbon sources has to be increased for significant reduction in global warming.
    (a) Only (A) (b) Only (C)
    (c) Only (A) & (C) (d) Only (B) & (C)
18. Why, according to the author, are the international negotiations barely a solution to the problem of global warming?
    (a) Many countries fail to confine to the carbon-cut norms as set in these negotiations.
    (b) These negotiations emphasize on the amount of carbon to be cut and not on the ways in which it can be done.
    (c) Recent research on the carbon-cut methods is overlooked by the politicians.

(d) Such negotiations produce dominance of powerful countries over the others, thus hampering their industries development.

19. Which of the following is intended in the given passage?
(a) To suggest the ways in which alternate forms of energy can reduce climate change.
(b) To explain that the current technological developments are flawed and thus, fail to control the climate change.
(c) To explain that the stable carbon emissions are impossible to achieve in this century.
(d) To suggest to the policy makers to invest in research rather than futile negotiations.

20. Which challenge according to the author is not being taken seriously in the phrase "we are not taking this challenge seriously" as used in the passage?
(A) Cutting the carbon emissions to a scale of 2.5 times in the next decade.
(B) The challenge of locating new fossil fuel reserves since the existing ones are depleting at a fast rate.
(C) To carry out technological innovations for developing non-carbon based energy resources.
(a) Only (C) (b) Both (A) & (C)
(c) Only (B) (d) Both (A) & (C)

DIRECTIONS (Qs. 21 - 25): *Read the following passage carefully and answer the questions given below it. Certain words/phrases have been printed in bold to help you locate them while answering some of the questions.*

India is rushing headlong towards economic success and modernisation, counting on high-tech industries such as information technology and biotechnology to propel the nation to prosperity. India's recent announcement that it would no longer produce unlicensed inexpensive generic pharmaceuticals bowed to the realities of the World Trade Organisation while at the same time challenging the domestic drug industry to compete with the multinational firms. Unfortunately, its weak higher education sector constitutes the **Achilles' heel** of this strategy. Its systematic disinvestment in higher education in recent years has yielded neither world-class research nor very many highly trained scholars, scientists or managers to sustain high-tech development.

India's main competitors-especially China, but also Singapore, Taiwan, and South Korea-are investing in large and differentiated higher education systems. They are providing access to a large number of students at the bottom of the academic system while at the same time building some research-based universities that are able to compete with the world's best institutions. The recent London Times Higher Education Supplement ranking of the world's top 200 universities included three in China, three in Hong Kong. three in South Korea, one in Taiwan, and one in India. These countries are positioning themselves for leadership in the knowledge-based economies of the coming era.

There was a time when countries could achieve economic success with cheap labour and low-tech manufacturing. Low wages still help, but contemporary large-scale development requires a sophisticated and at least partly knowledge-based economy. India has chosen that path, but will find a major stumbling block in its university system.

India has significant advantages in the 21st century knowledge race. It has a large higher education sector – the third largest in the world in terms of number of students, after China and the United States. It uses English as a primary language of higher education and research. It has a long academic tradition. Academic freedom is respected. There are a small number of high-quality institutions, departments, and centres that can form the basis of quality sector in higher education. The fact that the States, rather than the Central Government, exercise major responsibility for higher education creates a rather cumbersome structure, but the system allows for a variety of policies and approaches.

Yet the weaknesses far outweigh the strengths. India educates approximately 10 per cent of its young people in higher education compared to more than half in the major industrialised countries and 15 per cent in China. Almost all of the world's academic systems resemble a pyramid, with a small, high-quality tier at the top and a massive sector at the bottom. India has a tiny top tier. None of its universities occupies a solid position at the top. A few of the best universities have some excellent departments and centres, and there are a small number of outstanding undergraduate colleges. The University Grants Commission's recent major support to five universities to build on their recognised strength is a step towards recognising a differentiated academic system and fostering excellence. These universities, combined, enrol well under one per cent of the student population.

21. What does the phrase **'Achilles' heel'** mean as used in the passage?
(a) Weakness (b) Quickness
(c) Low quality (d) Nimbleness

22. Which of the following is/are India's strength/s in terms of higher education?
(1) Its system of higher education allows variations.
(2) Medium of instruction for most higher learning is English.
(3) It has the paraphernalia, albeit small in number, to build a high-quality higher educational sector.
(a) Only (2) (b) Only (1) and (2)
(c) Only (3) (d) Only (2) and (3)

23. What are the Asian countries, other than India, doing to head towards a knowledge-based economy?
(1) Building competitive research-based universities
(2) Investing in diverse higher education systems
(3) Providing access to higher education to select few students
(a) Only (1) (b) Only (1) and (2)
(c) Only (2) and (3) (d) Only (2)

24. What did India agree to do at the behest of the World Trade Organisation?
(a) It would stop manufacturing all types of pharmaceuticals.
(b) It would ask its domestic pharmaceutical companies to compete with the international ones.
(c) It would buy licensed drugs only from the USA.
(d) It would not manufacture cheap common medicines without a licence.

25. Which of the following is/are India's weakness/es when it comes to higher education?

(1) Indian universities do not have the requisite teaching faculty to cater to the needs of the higher education sector.

(2) Only five Indian universities occupy the top position very strongly in the academic pyramid when it comes to higher education.

(3) India has the least percentage of young population taking to higher education as compared to the rest of the comparable countries.

(a) Only (1) and (2) (b) Only (2)

(c) Only (3) (d) Only (1) and (3)

DIRECTIONS (Qs. 26 - 30): *Read the following passage carefully and answer the questions given below it. Certain words/phrases are printed in bold to help you to locate them while answering some of the questions.*

In many countries, a combustible mixture of authoritarianism, unemployment and youth has given rise to disaffection with strongmen rulers which has in turn spill over into uprising. Young people in these countries are far better educated than their parents were. In 1890 the average Egyptian had 4.4 years of schooling; by 2010 the figure had risen to 7.1 years. Could it be that education, by making people less willing to put up with restrictions on freedom and more willing to question authority, promotes democratization. Ideas about the links between education, Income and democracy are at the heart of what social scientists have long studied. Since then plenty of economists and political scientists have looked for statistical evidence of a causal link between education and democratization. Many have pointed to the strong correlation that exists between levels of education and measures like the pluralism of party politics and the existence of civil liberties. The patterns are similar when income and democracy are considered. There are outliers, of course – until recently, many Arab countries managed to combine energy-based wealth and decent education with undemocratic political systems. But some deduce from the overall picture that as China and other authoritarian states get more educated and richer, their people will agitate for greater political freedom, culminating in a shift to a more democratic form of government.

This apparently reasonable intuition is shakier than it seems. Critics of the hypothesis point out that correlation is hardly causation. The general trend over the past half century may have been towards rising living standards, a wider spread of basic education and more democracy, but it is entirely possible that this is being by another variable. Even if the correlation were not spurious, it would be difficult to know which way causation ran. Does more education lead to greater democracy? Or are more democratic countries better at educating their citizens? A recent NBER paper compared a group of Kenyan girls in 69 primary school whose students were randomly selected to receive a scholarship with similar students in schools which received no such financial aid. Previous studies has shown that the scholarship programme led to higher test scores and increased the likelihood that girls enrolled in secondary school. Overall, it significantly increased the amount of education obtained. For the new study the authors tried to see how the extra schooling had affected the political and social attitudes of the women in question. Findings suggested that education may make people more interested in improving their own lives but they may not necessarily see democracy as the way to do it. Even in established democracies, more education does not always mean either more active political participation or greater faith in democracy. Poorer and less educated people often vote in larger numbers than their more educated compatriots, who often express disdain for the **messiness of democracy**, yearning for the kind of government that would deal strongly with the corrupt and build highways, railway lines and bridges at a dizzying pace of authoritarian China.

26. Which of the following most aptly describes the **central theme** of the passage?

(a) Democratic nations are richer and have a better track record of educating their citizens.

(b) Education does not necessarily lead to greater enthusiasm for a democratic form of government

(c) Educated societies with autocratic form of government enjoy a better quality of life than democracies.

(d) Citizens can fulfill their personal aspirations only under a democratic form of government.

27. What conclusion can be drawn from the statistics cited about Egypt's education system?

(a) Job prospects have been on the rise in Egypt in recent times.

(b) Authoritarian leaders have played a vital role in reforming Egypt's education system.

(c) Egypt has one of the youngest and best educated demographies in the world.

(d) There has been a rise in education levels in Egypt in recent times.

28. In the context of the passage which of the following characterize (s) democracies?

(1) Active participation of majority of educated citizens in electoral process.

(2) Fast paced economic growth and accountability of those in power.

(3) Better standards of living and access to higher education.

(a) All (1), (2) and (3) (b) Only (2) and (3)

(c) Only (3) (d) Only (1) and (2)

29. What according to the author has led to uprisings in authoritarian countries?

(a) Lack of access to education.

(b) Vast numbers of uneducated and unemployable youth.

(c) Frustration with the existing system of governance.

(d) Unavailability of natural energy resources like coal and oil.

30. What does the phrase "**messiness of democracy**" convey in the context of the passage?

(a) Democratic nations are chaotic on account of individual freedoms.
(b) Most democratic countries frequently have violent revolts among their citizens.
(c) The divide between the poor and educated is growing wider in democracies.
(d) High levels of pollution on account of frantic pace of infrastructure development.

DIRECTIONS (Qs. 31 -34): *The sentences given in each question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. Choose the most logical order of the sentences from amongst the given choices so as to form a coherent paragraph.*

31. P : In the past, the customised tailoring units were localised to the township or city and catered exclusively to domestic demand.
Q : Traditionally, Indians preferred custom-made clothing and the concept of ready-to-wear is a relatively recent one.
R : Consumer awareness of styling issues and the convenience afforded by ready-to-wear helped RMG industry make small inroads into the domestic market in the 1980s.
S : The customised tailoring outfits have always been a major source of clothing for domestic market.
(a) Q R S P (b) Q S P R
(c) R S Q P (d) S Q P R

32. P : Such a system will help to identify and groom executives for positions of strategists.
Q : Evaluation of performance is more often than not done for the purpose of reward or punishment for past performance.
R : They must become an integral part of the executive system' .
S : Even where the evaluation system is for one's promotion to assume higher responsibilities, it rarely includes terms that are a key for playing the role effectively, e.g., the skills of playing the role of change agent and creative problem solving.
(a) S Q P R (b) S R Q P
(c) R S Q P (d) Q S R P

33. P : Participation involves more than the formal sharing of decisions.
Q : Through anticipation individuals or organisations consider trends and make plans, shielding institutions from trauma of learning by shock.
R : Innovative learning involves both anticipation and participation.
S : It is an attitude characterised by the cooperation, dialogue and empathy.
(a) Q R S P (b) P Q R S
(c) R Q P S (d) S P Q R

34. P : Almost a century ago, when the father of the modem automobile industry, Henry Ford, sold the first Model T car, he decided that only the best would do for his customers.
Q : Today, it is committed to delivering the' finest quality with over six million vehicles a year in over 200 countries across the world.
R : And for over 90 years, this philosophy has endured in the Ford Motor company.
S : Thus a vehicle is ready for the customers only, if it passes the Ford 'Zero Defect Programme'.
(a) P Q R S (b) P R Q S
(c) R S P Q (d) P R S Q

DIRECTIONS (Qs. 35 - 38): *In each question below, two sentences or parts of sentences are given with two blank spaces (_____) (_____) between them. From among the three parts / sentences denoted by (A), (B) and (C) given below each, find out which two can fill up the blanks in proper sequence (i.e. the order in which these are given in the answer options) to make the sentence/ group of sentences meaningfully complete.*

35. Four years ago, I had a major surgery. (_____) . (_____). I was too ill.
(A) It left me disabled.
(B) My attempts to go back to work could not succeed.
(C) I had fully recovered except for some minor weakness.
(a) (B) and (A) only (b) (C) and (A) only
(c) (B) and (C) only (d) (A) and (B) only

36. Based on scientific research, scientists conclude that (_____) (_____), they will live even more than a hundred years.
(A) keep themselves active all through
(B) exercise more, ensure proper vitamin intake,
(C) human species, if regulate their diet,
(a) Only (A) and (B)
(b) Only (A) and (C)
(c) Only (C) and (A)
(d) Either (C) and (A) or (C) and (B)

37. The Central Government's plans to (_____) (_____) despite the fact that the opposition parties' united front had mobilized support of general public at the outskirts of Mumbai.
(A) defy the curfew imposed to prevent the proposed rally from protesting against the hike in petrol prices
(B) curb the rally called for by the opposition succeeded due to ruling party's announcement to
(C) cancel all the trains entering Mumbai,
(a) (A) and (B) only (b) (B) and (A) only
(c) (B) and (C) only (d) (A) and (C) only

38. The economic gloom was exacerbated yesterday by Greek Prime Minister's surprise announcement (_____)(_____), and vote might put the torturously conceived package in jeopardy.
(A) that was struck last week
(B) that he would recommend the Parliament to strike down the obnoxious deal
(C) that his country would hold a referendum on the European debt deal

(a) (C) and (A) only
(b) (B) and (A) only
(c) (A) and (C) only
(d) Either (C) and (A) or (B) and (A)

DIRECTIONS (Qs. 39 - 40): *Each of the following paragraphs is followed by its four alternative summaries. Choose the option that best captures the essence of the text.*

39. Ninety-nine years ago, John Philip Sousa predicted that recordings would lead to demise of music. The phonograph, he warned, would erode the finer instincts of the ear, end amateur playing and singing, and put professional musicians out of work. "The time is coming when no one will be ready to submit himself to the ennobling discipline of learning music," he wrote. "Everyone will have their ready made or ready pirated music in their cupboards." Something is irretrievably lost when we are no longer in the presence of bodies making music, Sousa said. "The nightingale's song is delightful because the nightingale herself gives it forth."
(a) The advent of recordings would lead to a monitory value being put on music, which will eventually damage it.
(b) Easy accessibility of music would discourage people from learning music and indulging in many beneficial activities.
(c) Piracy and its pernicious effects has been documented by Sousa in another form many decades back.
(d) Recordings lead to the demise of music like the computer led to the demise of the book. e. The advent of recordings would lead to unemployment among musicians.

40. Local communities have often come in conflict with agents trying to exploit resources, at a faster pace, for an expanding commercial-industrial economy. More often than not, such agents of resource- intensification are given preferential treatment by the state, through the grant of generous long leases over mineral or fish stocks, for example, or the provision of raw material at an enormously subsidized price. With the injustice so compounded, local communities at the receiving end of this process have no recourse except direct action, resisting both the state and outside exploiters through a variety of protest techniques. These struggles might perhaps be seen as a manifestation of a new kind of class conflict.
(a) A new kind of class conflict arises from preferential treatments given to agents of resource- intensification by the state, which the local community sees as unfair.
(b) The grant of long leases to agents of resourceintensification for an expanding commercialindustrial economy leads to direct protests from the local community, which sees it as unfair.
(c) Preferential treatment given by the state to agents of resource-intensification for an expanding commercial-industrial economy exacerbates injustice to local communities and leads to direct protests from them, resulting in a new type of class conflict.
(d) Local communities have no option but to protest against agents of resourceintensification and create a new type of class conflict when they are given raw material at subsidized prices for an expanding commercial-industrial economy.

SECTION–B : Intelligence & Critical Reasoning

DIRECTIONS (Qs. 41 - 44): *Read the information given below and answer the questions that follows:*

A company wants to select a team of four call center executives from its South Indian Centre for transfer to North India where they are going to set up a new centre. The company is managed by professional managers and is very particular about human resources and personnel relations. There are seven team members of equal ability X, Y and Z (who are Senior), and A, B, C and D (who are Junior). The company requires that there should be two Senior Executives and two Junior Executives in the team. It is also necessary that all of the executives in a particular team are friendly with each other in order to have a real team spirit and avoid any personnel relations problem in the new centre being set up in the North. Following is the situation of relations among the seven executives :
I. Y and A are not friendly
II. Z and C are not friendly
III. A and B are not friendly

41. If A is on the team, then which other executives must be on the team as well?
(a) X, Y and D
(b) X, Z and D
(c) X, Z and B
(d) X, Z and C

42. Which statement(s) must be false?
I. Y and C are never selected together
II. Z and B are never selected together
III. Z and D are never selected together
(a) I only (b) I and II only
(c) I and III only (d) I, II and III

43. Which of the following statements are true for X?
I. X must be selected as one of the Senior Executives on the team
II. X must be selected, if C is selected
III. X cannot be selected, if both A and C are rejected
(a) I only (b) II only
(c) II and III only (d) I, II and III

44. If both Y and Z are selected, which of the executives must be on the team with them?
(a) Both C and D (b) Only D
(c) Both B and A (d) Both B and D

DIRECTIONS (Qs. 45 - 49): *Read the information given below and answer the questions that follows:*

K. C. Das has five different kinds of sweets to give to children: Halwa, Burfi, Laddu, Kaala Jamun, Rasgulla. Jogindra, Kedarnath, Girish, Trilochan and Rameshwar went to see K. C. Das, who gave each one of them one type of sweet.
Kedarnath got either Burfi or Rasgulla.

Trilochan did not receive Laddu or Kaala Jamun.
Among the five children, exactly one received Laddu and one Burfi
No other child received the same treat as Kedarnath
Neither Jogindra nor Girish got Kaala Jamun
At least one child received Kaala Jamun

45. What sweet did Rameshwar receive?
    (a) Halwa (b) Burfi
    (c) Laddu (d) Kaala-Jamun
46. If Kedarnath received Rasgulla, which of the following must be true?
    (a) If Jogindra received Laddu, Girish received Halwa
    (b) If Jogindra received Burfi, Girish received Halwa
    (c) If Jogindra received Halwa, Trilochan received Burfi
    (d) If Girish received Laddu, Trilochan received Rasgulla
47. If Trilochan received halwa, which of the following is a complete and accurate list of those children who could have also received Halwa?
    (a) Jogindra and Kedarnath
    (b) Kedarnath and Girish
    (c) Rameshwar and Girish
    (d) Jogindra and Girish
48. If Kedarnath received Burfi, which of the following must be false?
    (a) If Jogindra received Laddu, Girish received Halwa
    (b) If Jogindra received halwa, Trilochan received Rasgulla.
    (c) If Jogindra received Rasgulla, Girish received Halwa
    (d) If Girish received Laddu, Trilochan received Rasgulla
49. If Girish received Burfi, what must be false?
    (a) Jogindra received Laddu.
    (b) Trilochan received Halwa.
    (c) Kedarnath received Rasgulla.
    (d) Trilochan received Rasgulla.

DIRECTIONS (Qs. 50 - 52): *On the basis of the information provided, answer the questions below.*

Eight doctors P, Q, R, S, T, U, V, and W of the same family i.e. father, mother, father's sister, mother's brother, 2 daughters and 2 sons visit a clinic every day for one hour each except on Monday which is a holiday. The timings are 9 am to 1 pm and 2 pm to 6 pm, with lunch time from 1 pm to 2 pm. Each has a different specialisation namely Cardiologist, Orthodontist, Neurologist, Paediatrician, Gynaecologist, Urologist, Radiologist and General Physician.

- No doctor visits the clinic before doctor Q and after doctor U.
- The Orthodontist visits right after lunch and is followed by R who is a female.
- The mother comes in at the same place before lunch as the younger son P after lunch.
- The General Physician is the sister of Urologist's father and is last to visit before lunch.
- The Cardiologist is the first while the elder daughter is the last to visit.
- T is the mother's brother of U and visits between the father and mother.
- Before 1 pm. V comes after the Radiologist, who is second to visit during the day
- S, the mother comes at 11 am after the father.
- The Neurologist is at the same place after lunch as the Gynaecologist before lunch and comes right after Urologist.

50. The General Physician is a_____ and comes at _____
    (a) Female, 11 am (b) Female, 12 noon
    (c) Male, 11 am (d) Male, 12 noon
51. R is a _____ by specialisation and is Cardiologist's_____
    (a) Orthodontist, Sister
    (b) Pediatrician, Daughter
    (c) Urologist, Mother
    (d) Urologist, Daughter
52. If lunch break and subsequent working hours are reduced by 15 minutes on Wednesday, then Doctor U who is _____ and Cardiologist's _____ will reach the clinic at_____
    (a) Radiologist, Sister, 3:15 pm
    (b) Urologist, Daughter, 4:15 pm
    (c) Paediatrician, Daughter, 5:45 pm
    (d) Paediatrician, Daughter. 4:15 pm
53. Leena, Nitin, Arun and Mohan crossed a lake in a canoe that could hold only two persons. The Canoe held two persons on each of three forward trips across the lake and one person on each of two return trips. Leena was unable to paddle when someone else was in the canoe with her. Nitin was unable to paddle when anyone else except Arun was in the canoe with him. Each person paddle continuously for at least one trip. Who paddled twice?
    (a) Leena (b) Nitin
    (c) Mohan (d) Arun
54. A, B, C, D, E, F and G are the members of a family consisting of 4 adults and 3 children, two of whom, F and G are girls, A and D are brothers and A is doctor. E is an engineer married to one of the brothers and has two children. B is married to D and G is their child. Who is C?
    (a) G's father (b) F's father
    (c) E's daughter (d) A's son

DIRECTIONS (Qs. 55 - 58): *Read the following carefully and answer the given questions:*

10 friends (5 boys P, Q, R, S and T and 5 girls A, E, I, O and U) are playing a game and they are sitting in a circle. The distance between every two friends is equal. Two boys and two girls are facing opposite to the centre of the circle and other 6 friends are facing towards the centre of the circle.

A is the fourth to the left of O, who is third to the right of P. R is second to the right of T, who is not near to E. There are three friends between I and R. S is second to the left of U and facing the centre of the circle. P and E are sitting opposite and facing each other. I is second to the left of Q. A is facing opposite to the centre of the circle. More than three boys or girls are not sitting together. Not more than two friends who are facing opposite to the centre of the circle are sitting together.

55. Which two girls are sitting facing opposite to the centre of the circle?
    (a) I and U (b) O and A
    (c) E and I (d) O and E

56. Which of the following boys is not sitting between two girls?
(a) P (b) Q
(c) R (d) Both P and S

57. What is the position of I vis-a-vis A?
(a) Immediate left (b) Immediate right
(c) Opposite (d) (a) and (c)

58. Which two boys are facing opposite to the centre of the circle?
(a) R and Q (b) Q and P
(c) R and T (d) Can't be determined

DIRECTIONS (Qs. 59 - 63): *The following questions are based upon the alphabetical series given below :*

T J E N U Q A K I O G R M S P B H F D L V C

59. If 'OD' is related to 'GF' and 'EB is related to 'NP' in a certain way, to which of the following is 'AL' related to, following the same pattern ?
(a) KD (b) QV
(c) KL (d) KV

60. What will come in place of question mark (?) in the following series based on the above alphabetical series?
TE JU NK ? GH
(a) IS (b) IR
(c) AG (d) AR

61. Ashok started walking towards South. After walking 50 metres he took a right turn and walked 30 metres. He then took a right turn and walked 100 metres. He again took a right turn and walked 30 metres and stopped. How far and in which direction was he from the starting point?
(a) 50 metres South
(b) 150 metres North
(c) 180 metres East
(d) 50 metres North

62. In a row of children facing North, Shweta is fifteenth from the left and Jyoti is third to the left of Shweta. Ram who is seventh to the right of Jyoti is fifth from the right end of the row. What is Shweta's position from the right end ?
(a) 12th (b) 10th
(c) 8th (d) 9th

63. Pratap correctly remembers that his mother's birthday is before twenty third April but after nine teenth April, whereas his sister correctly remembers that their mother's birthday is not on or after twenty second April. On which day in April is definitely their mother's birthday ?
(a) Twentieth
(b) Twenty-first
(c) Twentieth or twenty-first
(d) Cannot be determined

DIRECTIONS (Qs. 64 - 68): *A statment is given followed by three courses of action. A course of action is taken for improvement, follow-up etc. Read the statement carefully and pick the correct answer choice.*

64. **Statement :** Inefficient batting by frontline batsmen caused the team to mess up things in the last series.
Courses of Action :
I. The bowlers should be sent in the beginning and the frontline batsmen towards the end.
II. The frontline batsmen should be asked to concentrate on their practice.
III. A fresh crop of batsmen should replace the existing ones.
(a) Only I and II follow
(b) Only III follows
(c) Only I follows
(d) Only II follows

65. **Statement :** Although strict vigilance by the police has brought down the rate of night crimes, daylight robberies and chain-snatching etc. have only increased.
Courses of action :
I. The police should be asked to stop its vigilance programme during nights.
II. The police should be given powers to kill criminals involved in day light robberies and chain-snatching.
III. The police should be directed to reorient its strategy so that daylight crimes are not ignored.
(a) I and II follow (b) Only III follows
(c) Only I follows (d) II and III follow

66. **Statement :** The recent landmark decision in which the court has put a ban on the plying of thousands of diesel buses that have not converted to CNG, has created a great problem to commuters in city X.
Courses of action :
I. The government should make it mandatory for private vehicles to ferry passengers at a charge in city X.
II. The government should draw up a contingency plan to tackle the transport problem in the city.
III. The government should appear to the court to allow it to phase out diesel buses gradually.
(a) Only I follows
(b) Only II follows
(c) Only I and II follow
(d) None of these

67. **Statement :** The Company 'X' has rejected first lot of valves supplied by Company 'A' and has cancelled its entire huge order quoting use of inferior-quality material and poor craftsmanship.
Courses of action :
I. The Company 'A' needs to investigate functioning of its purchase, production and quality control departments.
II. The Company 'A' should inspect all the valves rejected by Company 'X'
III. The Company 'A' should inform Company 'X' that steps have been taken for improvement and renegotiate schedule of supply.
(a) Only I and II (b) Only II
(c) All I, II and III (d) II and either I or III

68. **Statement :**
The vehicular traffic has increased so much in the recent past that it takes at least two hours to travel between the city and the airport during peak hours.

Courses of Action :

I. Non-airport bound vehicles should not be allowed to ply on the road connecting the city and the airport.

II. The load of vehicular traffic should be diverted through various link roads during peak hours.

III. The departure and arrival of flights should be regulated so as to avoid congestion during peak hours.

(a) Only I follows (b) Only I and II follow
(c) Only II follows (d) All follow

DIRECTIONS (Qs. 69 - 72): *Given below are pairs of events 'A' and 'B'. You have to read both the events 'A' and 'B' and decide their nature of relationship. You have to assume that the information given in 'A' and 'B' is true and you will not assume anything beyond the given information in deciding the answer. Mark answer:*

(a) If 'A' is the effect and 'B' is its immediate and principal cause.
(b) If 'A' is the immediate and principal cause and 'B' is its effect.
(c) If 'A' is an effect but 'B' is not its immediate and principal cause.
(d) If 'B' is an effect but 'A' is not its immediate and principal cause.

69. **Event (A)** :The revised entry fee for internationally known Taj Mahal monument has been increased by ₹ 50 and ₹ 500 for Indians and foreigners respectively.
Event (B) : There has been adequate increase in the number of foreign tourists visiting India in view of the improved infrastructure facilities.

70. **Event (A)** :Due to mechanisation the life of human beings is becoming more comfortable in urban areas.
Event (B) : Life is becoming insecure in urban area.

71. **Event (A)** :India is today gearing to become a leading producer and exporter of a range of minerals.
Event (B) : India is endowed with rich mineral resources.

72. **Event (A)** :The high-profile criminal was arrested and put behind bars.
Event (B) : The cops made more than adequate security arrangements in Jail.

DIRECTIONS (Qs. 73 - 76): *Study the following information carefully and answer the questions:*

Ten persons are sitting in 2 parallel rows containing 5 persons in each row. In 1st row A, B, C, D and E are seated and are facing south. In 2nd row, U, V, X, Y and Z are seated and are facing north. Therefore in the given seating arrangement, each member seated in a row faces another member of the other row. They like different colours Red, Orange, Blue, Brown, Black, White, Yellow, Pink, Peach, and Grey (not necessarily in same order). A doesn't like brown and D likes black. Y sits third to the left of U, who likes yellow. A faces immediate neighbour of Y, who likes orange. The one who likes peach sits at extreme end. C sits second to the right of A. The one who likes red faces the one who likes pink but A doesn't like pink. Only one person sits between B and D. V and Z are immediate neighbours. Z does not face A and B, who doesn't like grey. The one who faces U likes white. The one who faces an immediate neighbour of Y likes brown.

73. How many persons are seated between B and the one who likes white?
(a) None (b) One
(c) Two (d) Three

74. Who amongst the following faces D?
(a) U (b) The one who likes pink
(c) X (d) The one who likes grey

75. Which of the following is true regarding A?
(a) B and X are immediate neighbours of A
(b) A sits at one of the extreme ends of the line.
(c) A likes black.
(d) D sits immediaste left of A

76. Who amongst the following pair sits exactly in the middle of the rows?
(a) A, Z (b) D, Y
(c) A, V (d) U, B

DIRECTIONS (Qs. 77 - 78): *In making decisions about important questions, it is desirable to be able to distinguish between 'strong' argument and 'weak' arguments. 'Strong' arguments are those which are important and directly related to the question. 'Weak' arguments are those which are of minor importance and also may not be directly related to the question or may be related to a trivial aspect of the question. Each question below is followed by two arguments numbered I and II. You have to decide which of the arguments is a strong argument and which is a weak argument.*

Give answer
(a) If only Argument I is strong.
(b) If only Argument II is strong.
(c) If either Argument I or Argument II is strong.
(d) If neither Argument I nor Argument II is strong.

77. **Statement** Should India send its troops to a foreign country, for constructive purposes, without a UN resolution?
Arguments
I. Yes, it will bring accolades from all over the world and will strengthen the claim for candidature for permanent membership of the UN.
II. No, India is already facing many troubles.

78. **Statement** Should all the electricity state boards be privatised in India?
Arguments
I. No, this will increase the grievances of the people.
II. Yes, it will check the growing menace of power theft which has resulted in annual pilferage of a huge amount.

DIRECTIONS (Qs. 79 - 80): *In each of the questions given below there are two statements labelled Assertion (A) and Reason (R).*

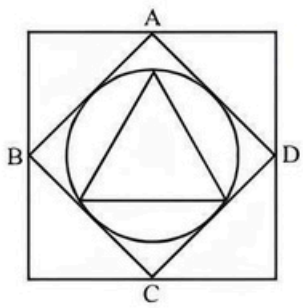
(a) If both (A) and (R) are true and (R) is the correct explanation of (A)
(b) If both (A) and (R) are true but (R) is not the correct explanation of (A)
(c) If (A) is true but (R) is false
(d) If (A) is false but (R) is true

79. **Assertion (A) :** When a person is standing in a lift which is either at rest or moving up or moving down with uniform speed, he does not find any apparent change in his weight.
Reason (R) : The reaction of the floor of the lift is equal to his weight.

80. **Assertion (A) :** Pressure cookers are fitted with ebonite handles.
Reason (R) : Ebonite is strong

SECTION-C : Mathematical Skills

81. What is the area of the inner equilateral triangle if a side of the outermost square is 'a' units? ($ABCD$ is a square.)



(a) $\frac{3\sqrt{3}a^2}{32}$ sq. units (b) $\frac{3\sqrt{3}a^2}{64}$ sq. units

(c) $\frac{5\sqrt{3}a^2}{32}$ sq. units (d) $\frac{\sqrt{3}}{16}a^2$ sq. units

82. A shopkeeper labelled the price of his articles so as to earn a profit of 30% on the cost price. He,then sold the articles by offering a discount of 10% on the labelled price. What is the actual per cent profit earned in the deal?
(a) 18% (b) 15%
(c) 20% (d) None of these

83. Sarita started a boutique investing an amount of ₹ 50,000. Six months later Neeta joined her with an amount of ₹ 80,000. At the end of one year they earned a profit of ₹ 18,000. What is Sarita's share in the profit ?
(a) ₹9000 (b) ₹8000
(c) ₹12000 (d) ₹10000

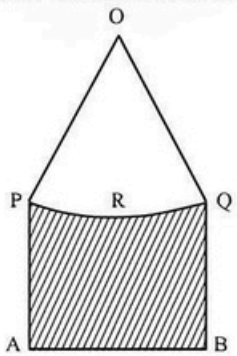
84. Three containers A, B and C are having mixtures of milk and water in the ratio 1 : 5, 3 : 5 and 5 : 7, respectively. If the capacities of the containers are in the ratio 5 : 4 : 5, then find the ratio of the milk to the water if the mixtures of all the three containers are mixed together.
(a) 51 : 115 (b) 52 : 115
(c) 53 : 115 (d) 54 : 115

85. Rani bought more apples than oranges. She sells apples at ₹ 23 a piece and makes 15% profit. She sells orange at ₹ 10 a piece and makes 25% profit. If she gets ₹ 653 after selling all the apples and oranges, find her profit percentage.
(a) 16.8% (b) 17.4%
(c) 17.9% (d) 18.5%

86. A water tank has M inlet pipes and N outlet pipes. An inlet pipe can fill the tank in 8 hours while an outlet pipe can empty the full tank in 12 hours. If all pipes are left open simultaneously, it takes 6 hours to fill the empty tank. What is the relationship between M and N?
(a) M : N = 1 : 1 (b) M : N = 2 : 1
(c) M : N = 2 : 3 (d) None of these

87. P.....Q
R.....S
T.....U
V.....W
Using 5 dots in each of the lines PQ, RS, TU and VW as the vertices, how many triangles can be drawn such that the base is on any one of the above lines?
(a) 120 (b) 150
(c) 200 (d) 600

88. In the given figure, PA=QB and PRQ is the arc of the circle, centre of which is O such that angle POQ = 90°. If $AB = 25\sqrt{2}$ cm and the perpendicular distance of AB from centre O is 30 cm. Find the area of the shaded region?



(a) $625\sqrt{2}$ sq. cm

(b) $625\left(\frac{1}{2}+\frac{\pi}{4}\right)$ sq. cm

(c) $750\sqrt{2}-625\left(\frac{1}{2}+\frac{\pi}{4}\right)$ sq.cm

(d) None

89. Ram, Ravi and Ratan can alone finish an assignment in 9 days, 12 days and 15 days respectively. They decide to complete a work by working in turns. Ram works alone on Monday. Ravi does the work alone on Tuesday, followed by Ratan working alone on Wednesday & so on. What proportion of the complete work is done by Ravi?
(a) 2/9 (b) 12/47
(c) 1/3 (d) 4/9

90. Let S_1 be a square of side 4 cm. Circle C_1 circumscribes the the square S_1 such that all its corners are on C_1. Another square S_2 circumscribes the circle C_1. Circle C_2 circumscribes the square S_2 and square S_3 circumscribes circle C_2, & so on. If A_N is the area between the square S_N and the circle C_N, where N is the natural number, then the ratio of sum of all A_N to A_1 is

(a) 1 (b) $\frac{\pi}{2}-1$

(c) Can't be determined (d) None of the above

91. At the foot of the mountain, the angle of elevation of the Summit at the top of the mountain is 45°. After ascending 100 metres at a slope of 30° up the mountain towards the Summit, the angle of elevation of the summit is 60°. Find the height of the Summit.

(a) $50(\sqrt{3}+1)$ metres (b) $50(\sqrt{5}+1)$ metres

(c) $50(\sqrt{3}+2)$ metres (d) $50\sqrt{3}$ metres

92. Land Cruiser Prado, the latest SUV from Toyota Motors, consumes diesel at the rate of $\frac{1}{400}\left\{\frac{1000}{x}+x\right\}$ litres per Km, when travelling at the speed of x km/hr. The diesel costs Rs. 65 per litre and the driver is paid Rs. 50 per hour. Find the steady speed that will minimize the total cost of a 1000 km trip.

(a) 33 km/hr (b) 36 km/hr

(c) 39 km/hr (d) 52 km/hr

93. The square root of $1+x^2+\sqrt{1+x^2+x^4}$

(a) $\frac{1}{\sqrt{2}}[\sqrt{1+x+x^2}+\sqrt{1-x+x^2}]$

(b) $\frac{1}{\sqrt{2}}[\sqrt{1+x+x^2}-\sqrt{1-x+x^2}]$

(c) $\frac{1}{\sqrt{2}}\sqrt{(1+x^2+x^4+x^8)}$

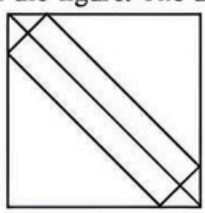
(d) None of the above

94. Swarn a SME enterprise borrowed a sum of money from a nationalized bank at 10% simple interest per annum and the same amount at 8% simple interest per annum from a microfinace firm for the same period. If cleared the first loan 6 months before the scheduled date of repayment and repaid the second loan just at the end of the scheduled period. If in each case it had to pay ₹ 62100 as amount then how much money and for what time period did it borrow?

(a) ₹ 55750, 2 years (b) ₹ 52500, 2 years

(c) ₹ 51750, 2.5 years (d) ₹ 55750, 2.5 years

95. A rectangular plank $\sqrt{10}$ metre wide, is placed symmetrically along the diagonal of a square of side 10 metres as shown in the figure. The area of the plank is:



(a) $10(\sqrt{20}+1)$ sq.mt. (b) $10(\sqrt{5}-1)$ sq.mt.

(c) $10(\sqrt{20}-1)$ sq.mt (d) None

96. Somesh, Tarun and Nikhil can complete a work separately in 45, 60 and 75 days. They started the work together but Nikhil left after 5 days of start and of Somesh left 2 days before the completion of the work. In how many days will the work be completed?

(a) $25\frac{1}{7}$ (b) $50\frac{1}{7}$

(c) $35\frac{5}{7}$ (d) $40\frac{5}{7}$

97. In a certain sequence the term x_n is given by formula

$$x_n = 5x_{n-1} - \frac{3}{4}x_{n-2} \text{ for } n \geq 2.$$

What is the value of x_3, if $x_0 = 4$ and $x_1 = 2$?

(a) 67/2 (b) 37/2

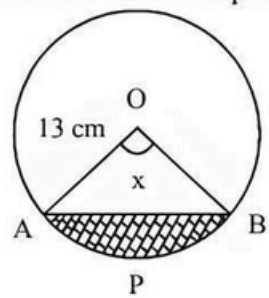
(c) 123/4 (d) None

98. If $10^{67} - 87$ is written as an integer in base 10 notation, what is the sum of digits in that integer?

(a) 683 (b) 489

(c) 583 (d) 589

99. A chord AB of length 24 cm is drawn in a circle of radius 13 cm. Find the area of the shaded portion APB.



(a) $13\pi x$ cm^2 (b) $\frac{13\pi x}{180}$ cm^2

(c) $\frac{169\pi x}{360} - 60$ cm^2 (d) $\frac{169\pi x}{180} - 60$ cm^2

100. The Drizzle Pvt. Ltd, a squash company has 2 cans of juice. The first contains 25% water and the rest is fruit pulp. The second contains 50% water and rest is fruit pulp. How much juice should be mixed. from each of the containers so as to get 12 litres of juice such that the ratio of water to fruit pulp is 3 : 5?

(a) 6 litres, 6 litres

(b) 8 litres, 4 litres

(c) 5 litres, 7 litres

(d) 9 litres, 3 litres

101. An overhead tank, which supplies water to a settlement, is filled by three bore wells. First two bore wells operating together fill the tank in the same time as taken by third bore well to fill it. The second bore well fills the tank 10 hours faster than the first one and 8 hours slower than the third one. The time required by the third bore well to fill the tank alone is:

(a) 9 hours (b) 12 hours

(c) 15 hours (d) 20 hours

102. Two farmers were cultivating wheat on their respective agricultural land in a village. Farmer A had an average production of 20 bushels from a hectare. Farmer B, who had 15 hectares of more land dedicated to wheat cultivation, had an output of 30 bushels of wheat from a hectare. If farmer B harvested 530 bushels of wheat more than farmer A, how many bushels of wheat did farmer A cultivate?

(a) 50 (b) 80

(c) 160 (d) 200

103. A playschool contains 4 boys and y girls. On every Wednesday during winter, five students, of which at least three are boys, go to Zoological Garden, a different group being sent every week. At the Zoological Garden, each boy in the group is given a ball. If the total number of balls distributed is 368, then the value of y is
(a) 5 (b) 6
(c) 7 (d) 8

104. Which of the following statements regarding arrangement of the word 'RIYADH' is / are true:
(i) Two vowels can be arranged together in 120 ways
(ii) Vowels do not occur together in 240 ways
Which of the above statements are true?
(a) Statement (i) only
(b) Statement (ii) only
(c) Both statements (i) and (ii)
(d) None of the above

105. In a local shop, as part of promotional measures, the shop owner sells three different varieties of soap, one at a loss of 13 percent, another at a profit of 23 percent and the third one at a loss of 26 percent. Assuming that the shop owner sells all three varieties of soap at the same price, the approximate percentage by which average cost price is lower or higher than the selling price is
(a) 10.5 higher (b) 12.5 lower
(c) 14.5 lower (d) 8.5 higher

106. A boat is being rowed away in still water, from a 210 metres high cliff at the speed of 3 km/hr. What is the approximate time taken for the angle of depression of the cliff at the boat to change from 60 deg. to 45 deg?
(a) 5 min (b) 4 min
(c) 1 min (d) 2 min

107. X and Y are the two alloys which were made by mixing Zinc and Copper in the ratio 6:9 and 7 :11 respectively. If 40 grams of alloy X and 60 grams of alloy Y are melted and mixed to form another alloy Z, what is the ratio of Zinc and Copper in the new alloy Z?
(a) 6:9 (b) 59:91
(c) 5:9 (d) 59:90

108. Mrs. Sonia buys ₹ 249.00 worth of candies for the children of a school. For each girl she gets a strawberry flavoured candy priced at ₹ 3.30 per candy; each boy receives a chocolate flavoured candy priced at ₹ 2.90 per candy. How many candies of each type did she buy?
(a) 21, 57 (b) 57, 21
(c) 37, 51 (d) 27, 51

109. Two trains P and Q are scheduled to reach New Delhi railway station at 10.00 AM. The probability that train P and train Q will be late is 7/9 and 11/27 respectively. The probability that train Q will be late, given that train P is late, is 8/9. Then the probability that neither train will be late on a particular day is
(a) 40/81 (b) 41/81
(c) 77/81 (d) 77/243

110. Two alloys of aluminium have different percentages of aluminium in them. The first one weighs 8 kg and the second one weighs 16 kg. One piece each of equal weight was cut off from both the alloys and first piece was alloyed with the second alloy and the second piece alloyed with the first one. As a result, the percentage of aluminium became the same in the resulting two new alloys. What was the weight of each cut-off piece?
(a) 3.33 kg (b) 4.67 kg
(c) 5.33 kg (d) None of these

111. Mukesh, Suresh and Dinesh travel from Delhi to Mathura to attend Janmasthmi Utsav. They have a bike which can carry only two riders at a time as per traffic rules. Bike can be driven only by Mukesh. Mathura is 300 km from Delhi. All of them can walk at 15 km/hr. All of them start their journey from Delhi simultaneously and are required to reach Mathura at the same time. If the speed of bike is 60 km/hr then what is the shortest possible time in which all three can reach Mathura at the same time.
(a) $8\frac{2}{7}$ hrs. (b) $9\frac{2}{7}$ hrs.
(c) 10 hrs. (d) None of these

112. In 2006, Raveendra was allotted 650 shares of Sun Systems Ltd in the initial public offer, at the face value of Rs. 10 per share. In 2007, Sun Systems declared a bonus at the rate of 3:13. In 2008, the company again declared the bonus at the rate of 2:4. In 2009 the company declared a dividend of 12.5%. How much dividend does Raveendra get in 2009 as the percentage of his initial investment?
(a) 24.5% (b) 23.9%
(c) 24.1% (d) 23%

113. Sukriti and Saloni are athletes. Sukriti covers a distance of 1 km in 5 minutes and 50 seconds, while Saloni covers the same distance in 6 minutes and 4 seconds. If both of them start together and run at uniform speed, by what distance will Sukriti win a 5 km mini marathon :
(a) 150 m (b) 192 m
(c) 175 m (d) 225 m

114. If $\text{Tan}\,x+\text{Tan}\left(x+\frac{\pi}{3}\right)+\text{Tan}\left(x+\frac{2\pi}{3}\right)=3$ then which of the following is correct?
(a) $\text{Tan}\,x=1$ (b) $\text{Tan}\,2x=1$.
(c) $\text{Tan}\,3x=1$ (d) None of the above

115. A boat goes 30 km. upstream and 44 km. downstream in 10 hours. In 13 hours, it can go 40 km upstream and 55 km downstream. The speed of the boat in still water is:
(a) 3 km/hour (b) 4 km/hour
(c) 8 km/hour (d) None of the above

116. A shopkeeper purchases a packet of 50 pens at Rs 10 per pen. He sells a part of the packet at a profit of 30%. On the remainig part, he incurs a loss of 10%. If his overall profit on the whole packet is 10%, the number of pens he sold at profit is
(a) 25 (b) 30
(c) 20 (d) 15

117. In two alloys, the ratios of copper to zinc is 5:2 and 3:4. How many kilograms of the first alloy and the second alloy

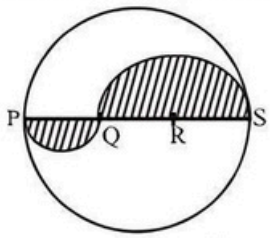
respectively should be melted together to obtain 28 kg of a new alloy with equal copper and zinc?

(a) 8 kg and 20 kg (b) 4 kg and 24 kg

(c) 3 kg and 25 kg (d) 7 kg and 21 kg

118. PQRS is a diameter of a circle whose radius is r. The lengths of PQ, QR and RS are equal. Semi-circles are drawn on PQ and QS to create the shaded figure below :

The perimeter of the shaded figure is :



(a) $\pi r + r$ (b) $\frac{4\pi r}{3} + r$

(c) $\frac{5\pi r}{3} + r$ (d) $\frac{3\pi r}{2} + r$

119. A and B enter into a partnership with ₹50,000 and ₹60,000 respectively. C joins them after x months contributing ₹70,000 and B leaves x months before the end of the year. If they share the profit in the ratio of 20 : 18: 21, then find the value of x.

(a) 6 (b) 3

(c) 9 (d) 8

120. The weight of an empty bottle is 20% of the weight of bottle when filled with some liquid. Some of the liquid has been removed. Then the bottle, along with the remaining liquid, weighed half of the original weight. What fractional part of the liquid has been removed?

(a) $\frac{3}{5}$ (b) $\frac{1}{9}$

(c) $\frac{2}{5}$ (d) None these

SECTION-D : Data Analysis & Sufficiency

DIRECTIONS (Qs. 121 - 125): *The question consists of a question and two statements numbered (I) and (II) given below it. You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and give answer*

(a) if the question can be answered by using the Statements-II ALONE, but cannot be answered using the Statement-I alone;

(b) if the question can be answered by using EITHER Statement alone;

(c) if the question can be answered by using Statement-I ALONE.

(d) if the question CANNOT be answered even by using BOTH statements TOGETHER;

121. What will be the cost of painting the four walls and the roof of a room with length, width and height as 7 metres, 5 metres and 2.5 metres respectively. The room has one door and two windows.

I. Cost of painting per square metre is Rs 72.

II. Area of window is half of the area of the door.

122. The towns A, B and C lie on a straight line. C is between A and B. The distance from A to B is 100 miles. How far is it from A to C?

I. The distance from A to B is 25% more than the distance from C to B.

II. The distance from A to C is $\frac{1}{4}$ the distance from C to B.

123. A person bought 2 kg of rice from a shop. But when he entered the next shop he found that the price was less. He calculated that if he bought 6 kg from that shop his average price would be ₹ 20. Then what is the price in the first shop?

I. The price in the second shop was ₹ 18 per kg.

II. The difference in the prices was ₹ 8 per kg.

124. A worker is hired for 6 days. He is paid ₹ 5 more for each day of work than he was paid for the preceding day. How much was he paid for the first day of the work ?

(I) His total wages for 6 days were ₹ 900.

(II) He was paid less than ₹ 100 on the first day.

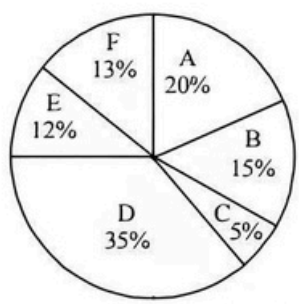
125. How much minimum marks will be require to pass an examination?

(I) Student A secured 32% marks in that examination and he failed by 1 mark. Student B secured 36% marks in the same examination and his marks was 1 more than the minimum pass marks.

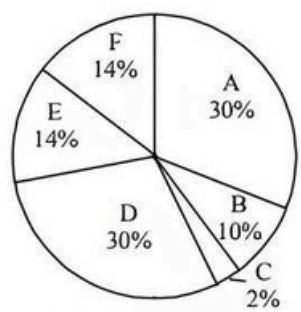
(II) Student A secured 30% of full marks in the examination and he failed by 2 marks. If he had secured 5 more marks his percentage of marks would have been 40%.

DIRECTIONS (Qs. 126 - 130): *Study the following pie-graphs to answer the given questions.*

Total students: 1200 (800 girls + 400 boys)



Percentage of students in various courses (A, B, C, D, E, F)



Percentage of girls

126. For course D, what is respective ratio of boys and girls?

(a) 3 : 4 (b) 4 : 5 (c) 3 : 5 (d) 5 : 6

127. For which pair of courses is the number of boys are the same?
(a) E & F (b) A & D (c) C & F (d) B & D

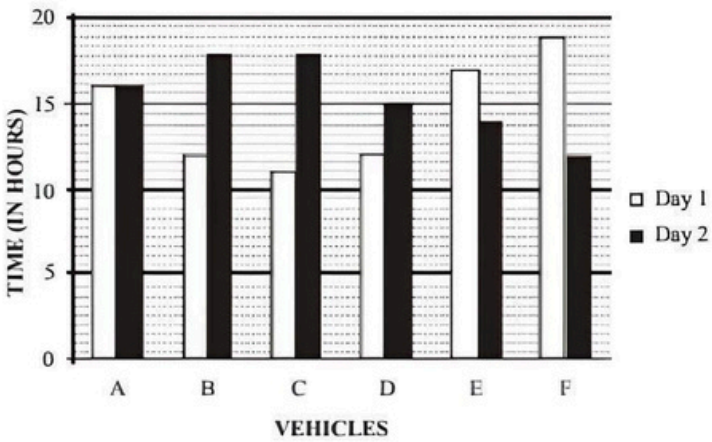
128. For course E, the number of girls is how much per cent more than the number of boys for course E?
(a) 250 (b) 350 (c) 150 (d) 80

129. For which course is the number of boys the minimum?
(a) E (b) F (c) C (d) A

130. How many girls are there in course C?
(a) 44 (b) 16 (c) 40 (d) 160

DIRECTIONS (Qs. 131 - 135): *Study the following graph and table carefully and answer the questions given below :*

TIME TAKEN TO TRAVEL (IN HOURS) BY SIX VEHICLES ON TWO DIFFERENT DAYS



DISTANCE COVERED (IN KILOMETERS) BY SIX VEHICLES ON EACH DAY

Vehicle	Day 1	Day 2
A	832	864
B	516	774
C	693	810
D	552	765
E	935	546
F	703	636

131. Which of the following vehicles travelled at the same speed on both the days ?
(a) Vehicle A (b) Vehicle C
(c) Vehicle F (d) Vehicle B

132. What was the difference between the speed of vehicle A on day 1 and the speed of vehicle C on the same day ?
(a) 7 km/hr. (b) 12 km/hr.
(c) 11 km/hr. (d) 8 km/hr.

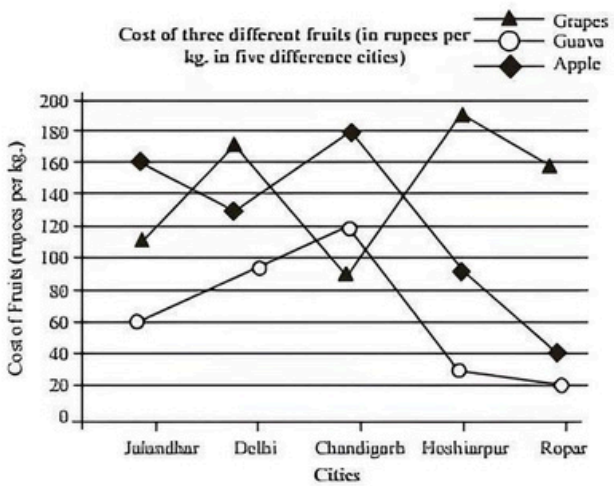
133. What was the speed of vehicle C on day 2 in terms of meters per second ?
(a) 15.3 (b) 12.8
(c) 11.5 (d) 13.8

134. The distance travelled by vehicle F on day 2 was approximately what percent of the distance travelled by it on day 1 ?
(a) 80 (b) 65
(c) 85 (d) 90

135. What is the respective ratio between the speeds of vehicle D and vehicle E on day 2 ?
(a) 15:13 (b) 17:13
(c) 13:11 (d) 17:14

DIRECTIONS (Qs. 136 - 140): *Study the following information carefully and answer the given questions.*

Cost of three different fruits (in rupees per kg. in five different cities)



136. In which city is the difference between the cost of one kg of apple and cost of one kg of guava second lowest?
(a) Jalandhar (b) Delhi
(c) Chandigarh (d) Hoshiarpur

137. Cost of one kg of guava in Jalandhar is **approximately** what percent of the cost of two kgs of grapes in Chandigarh?
(a) 66 (b) 24 (c) 28 (d) 34

138. What total amount will Ram pay to the shopkeeper for purchasing 3 kgs of apples and 2 kgs of guavas in Delhi?
(a) ₹ 530/- (b) ₹ 450/-
(c) ₹ 570/- (d) ₹ 620/-

139. Ravinder had to purchase 45 kgs of grapes from Hoshiarpur. Shopkeeper gave him discount of 4% per kg. What amount did he pay to the shopkeeper after the discount?
(a) ₹ 8,208/- (b) ₹ 8,104/-
(c) ₹ 8,340/- (d) ₹ 8,550/-

140. What is the respective ratio between the cost of one kg of apples from Ropar and the cost of one kg of grapes from Chandigarh?
(a) 3 : 2
(b) 2 : 3
(c) $2^2 : 3^2$
(d) $4^2 : 9^2$

DIRECTIONS (Qs. 141 - 145): *Study the table below to answer the questions that follow :*

PRODUCTION OF PLASTIC MATERIAL

Month	Polypropylene ('000 tonnes)		Polyethylene ('000 tonnes)		Nylon ('000 tonnes)	
	2003-2004	2004-2005	2003-2004	2004-2005	2003-2004	2004-2005
March	17.6	20.8	104	40	3150	2900
April	16.4	20.6	100	88	3050	2850
May	16.0	21.4	80	96	3000	2900
June	15.4	19.2	88	80	2520	2800
July	16.0	19.2	90	84	2600	2700
August	16.6	21.4	94	80	2650	2750
September	16.4	20.8	98	84	2500	2650
October	17.8	23.0	100	80	2200	3000
November	16.4	22.6	104	92	2000	2950
December	17.6	21.8	108	88	2250	3000
January	20.0	20.0	96	100	2750	2350
February	19.8	17.8	20	96	2600	2250
March	21.0	–	40	96	2900	–

141. In 2003-2004, the ratio of the difference between the maximum and the minimum production of polyethylene, to the difference between the maximum and minimum production of polypropylene, is nearly
(a) 15 (b) 14 (c) 16 (d) 18

142. The ratio of the maximum production of polyethylene in 2004-2005 to the minimum production of polyethylene in 2003-2004 is
(a) 5 (b) 4.8 (c) 5.4 (d) 4.2

143. The maximum number of times the production in 2003-2004 equals the production in 2004-2005 is for which product?
(a) Polyethylene (b) Polypropylene
(c) Nylon (d) None of these

144. For polyethylene, the production in 2003-2004 is greater than the production in 2004-2005 for how many months ?
(a) 5 (b) 8
(c) 10 (d) 9

145. The difference between the minimum production of polypropylene in 2004-2005 and the minimum production of polypropylene in 2003-2004 is how many times the difference in July's production of polyethylene (of the two Years)?
(a) 2 times (b) 3 times
(c) equal (d) 0.4 times

DIRECTIONS (Qs. 146 - 150): *There are two quantities named I and II given below. Based on the given information, you have to determine the relation between the two quantities. You should use the given data to answers the questions.*

146. **Quantity I:** Profit percent when an article of cost price ₹ 160 is sold for ₹ 184.
Quantity II: When a person buys an article whose marked price is ₹ 2400 for ₹ 2016, then percentage discount availed by him.
(a) Quantity - I > Quantity - II
(b) Quantity - I < Quantity - II
(c) Quantity - I ≥ Quantity - II
(d) Quantity - I ≤ Quantity - II

147. **Quantity I :** If the speed of the boat in the direction of current is 13 km/hr and the speed of the current is 4 km/hr. What is the speed of the boat against current.
Quantity II : The downstream speed and upstream speed of the boat is 13 km/hr and 3 km/hr respectively. What is the speed of the stream
(a) Quantity - I > Quantity - II
(b) Quantity - I < Quantity - II
(c) Quantity - I ≥ Quantity - II
(d) Quantity - I = Quantity - II

148. **Quantity I:** Present age of A and B are in the ratio of 4 : 5 respectively. Five years hence the ratio of their ages becomes 5 : 6 respectively. What is A's present age?
Quantity II: If the average age of A, B and C are 24 years, and the average of B and C is 20, then the age of A:
(a) Quantity - I > Quantity - II
(b) Quantity - I < Quantity - II
(c) Quantity - I ≥ Quantity - II
(d) Quantity - I ≤ Quantity - II

149. If X is earning 40% more than Z and Y is earning 35% more than Z
Quantity I: If Z earning ₹ 17500, then X is earning
Quantity II : If Z earning ₹ 20000, then Y is earning
(a) Quantity - I > Quantity - II
(b) Quantity - I < Quantity - II
(c) Quantity - I ≥ Quantity - II
(d) Quantity - I ≤ Quantity - II

150. **Quantity I:** The speed of the stream is 3 km/hr. A boat goes 30 km upstream and comes back again to the starting point in 175 min. Then the speed of the boat in still water (in km/hr):
Quantity II: A man in a car travels a certain distance in 20 min. He observes that he crossed 8 bus stops. If distance between two bus stops are 1000m, then the speed at which the car is travelling (in km/hr)
(a) Quantity - I > Quantity - II
(b) Quantity - I < Quantity - II
(c) Quantity - I ≥ Quantity - II
(d) Quantity - I = Quantity - II

DIRECTIONS (Qs. 151 - 155): *The following information is about the production of cars by 3 different companies from Monday to Friday in a specific week. Read the information carefully and answer the following question:*

The total production by 3 companies on Monday was 540 out of which 100/3% cars were produced by Tata. The number of cars produced by Renault on Monday is less than the cars produced by Tata on Monday by the same extent as the number of cars produced by Maruti on Monday is more than the cars produced by Tata on Monday. The difference between cars produced by Renault and Maruti on Monday is 40.150 cars are produced by Tata on Tuesday, which is 100 less than the cars produced by the same company on Wednesday. A total of 910 cars were produced by Tata from Monday to Friday. The ratio between cars produced by Tata on Thursday to cars produced by the same company on

Friday is 5 : 6. 220 cars were produced by Renault on Tuesday, which is 80 less than the cars produced by Maruti on Wednesday. A total of 570 cars were produced on Tuesday, which is 76% of the total cars produced on Wednesday. The number of cars produced by Maruti on Thursday is 200/3% more than cars produced by Tata on the same day. Total 580 cars were produced on Thursday. The number of cars produced by Maruti on Friday is same as that on Monday. 140 cars were produced by Renault on Friday.

151. Find the ratio between total cars produced on Monday to that on Wednesday.
(a) 18 : 29 (b) 18 : 25
(c) 18 : 31 (d) 3 : 5

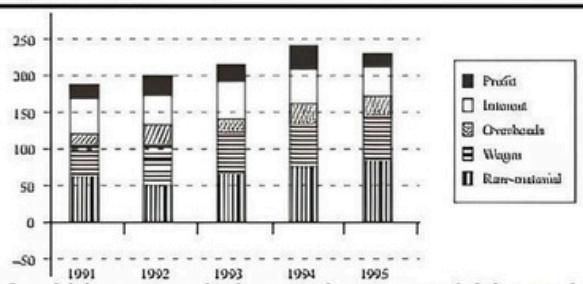
152. Find the total number of cars produced by Renault from Monday to Friday.
(a) 900 (b) 980 (c) 950 (d) 960

153. Find the average number of cars produced per day by Maruti from Monday to Friday.
(a) 250 (b) 220 (c) 270 (d) 230

154. On which pair of days out of the following, the number of cars produced by Tata is the same?
(a) Tuesday and Wednesday
(b) Wednesday and Thursday
(c) Tuesday and Thursday
(d) Monday and Wednesday

155. On which day the total number of cars produced was the maximum?
(a) Monday (b) Tuesday
(c) Wednesday (d) Thursday

DIRECTIONS (Qs. 156 - 160): *These questions are based on the graph given below.*



156. In which year was the increase in raw material the maximum?
(a) 1992 (b) 1993 (c) 1994 (d) 1995

157. In which two successive years was the change in profit the maximum?
(a) 1991-92 (b) 1992-93 (c) 1993-94 (d) 1994-95

158. In which year were the overheads, as a percentage of the raw material, the maximum?
(a) 1995 (b) 1994 (c) 1992 (d) 1993

159. Over the period, the profits formed what percent of the costs?
(a) 3% (b) 5% (c) 8% (d) 11%

160. If the interest component is not included in the total cost calculation, which year would show the maximum profit per unit cost?
(a) 1991 (b) 1992 (c) 1993 (d) 1995

SECTION-E : Indian & Global Environment

161. Who among the following was first black Formula One World Champion in history?
(a) Felipe Massa (b) Jensson Button
(c) Lewis Hamilton (d) Fernando Alo

162. Which network marketing company sells with the slogan - Better Ideas- Better Life
(a) Amway (b) SkyBiz
(c) HLL (d) Nirma

163. Forester is the name of a car manufactured by
(a) Ford (b) BMW
(c) Chevrolet (d) Mitsubishi

164. Which company has the tagline of "100 % Performance everytime."?
(a) CITIGROUP
(b) Servo
(c) CIPLA
(d) NYSE (New York Stock Exchange)

165. Which country has started 'Operation Insaniyat' to provided assistance to Bangladesh to help Rohingya refugees into that country from Myanmar?
(a) China (b) Thailand
(c) India (d) Afghanistan

166. Name the IT giant who has launched the latest UPI-based payments app in the country by the name of 'Tez'?
(a) IBM (b) Yahoo
(c) Google (d) Infosys

167. The International Day of Democracy was observed across the world on 15 September. What was the theme of the day?
(a) People Power Revolution
(b) Democracy and Conflict prevention
(c) Engaging youth on democracy
(d) Space for Civil Society

168. Daiken Industries Limited' is originally from
(a) Malaysia (b) Korea
(c) China (d) Japan

169. 'Linea' is a car model of
(a) Fiat (b) Skoda
(c) Maruti Suzuki (d) Tata Motors

170. With which game will you associates 'COPA America'- an international tournament involving 12 countries and previously known as South American Championship?
(a) Football (b) Snooker
(c) Tennis (d) Hockey

171. As per International Energy Agency (IEA) report released in June 2011, greenhouse gas emissions are
(a) marginally decreased
(b) considerably decreased
(c) going up
(d) not decreasing

172. Chhattisgarh state was created in
(a) 1995 (b) 1998
(c) 2002 (d) 2000

173. Which of the following is not a Fundamental Right?
(a) Right against exploitation
(b) Equality before law
(c) Right to freedom of religion
(d) Equal pay for equal work

174. In which country International Atomic Energy Agency (IAEA) decided to open the Low Enriched Uranium Bank?
(a) Pakistan (b) China
(c) Japan (d) Kazakhstan

175. Name the country in which the 1st regional center of the New Development Bank has been set up by India and other BRICS nations?
(a) Russia (b) Brazil
(c) India (d) South Africa

176. What is the name of the first PoS product being launched by Canara HSBC Oriental Bank of Commerce Life Insurance Company (CHOICE)?
(a) PoS - Easy Bima Plan
(b) PoS - Easy Money Plan
(c) PoS - Easy Insurance Plan
(d) PoS - Easy Paisa Scheme

177. Which Indian city has been declared as a World Heritage City at the 41st session of UNESCO's world heritage committee?
(a) Delhi (b) Indore
(c) Ahmedabad (d) Bhopal

178. Which city has been selected by the UN as the data hub for the Middle East North Africa and South Asia (MENASA) region?
(a) Saudi Arabia (b) Bahrain
(c) Iraq (d) Dubai

179. Which country has been chosen by International Boxing Association (AIBA) to host their first Men's World Championship in 2021?
(a) Japan (b) Sri Lanka
(c) Malaysia (d) India

180. Name the online major with which Nestle India has tied up for the launch of its new Nutrilicious range of Maggi Noodles.?
(a) Flipkart (b) Amazon India
(c) Snapdeal (d) Grofers

181. 'Because You're Worth It' is the tagline of which company?
(a) L'Oreal (b) Lakme
(c) Revlon (d) Maybelline

182. Who among the following will be conferred Padma Shri Award for the year 2017?
(a) Cricketer Virat Kohli
(b) Wrestler Sakshi Malik
(c) Singer Kailash Kher
(d) All of the above

183. Appy Fizz, the carbonated apple juice is product by:
(a) Britannia Industries (b) Cadbury
(c) Parle Agro (d) Nestle

184. Which city has topped the 2017 Savills Tech Cities Index?
(a) Berlin (b) Austin
(c) Sydney (d) London

185. Who has won the Spanish Grand Prix in May 2017?
(a) Michael Schumacher
(b) Lewis Hamilton
(c) Sebastian Vettel
(d) Antonio Giovinazzi

186. What state has topped the 2017 Public Affairs Index (PAI) in governance?
(a) West Bengal (b) New Delhi
(c) Uttar Pradesh (d) Kerala

187. In which 2 sections of Public Premises (Eviction of Unauthorised Occupants) Act, 1971, union Cabinet has approved the amendment?
(a) Section 1 and Section 3
(b) Section 2 and Section 3
(c) Section 5 and Section 2
(d) Section 2 and Section 7

188. Which team won Asia cup hockey 2017?
(a) Malaysia (b) Japan
(c) India (d) South Korea

189. The longest mountain range in the world is.....?
(a) Great Dividing Range
(b) The Alps
(c) The Andes
(d) Transantarctic Mountains

190. In which of the following festivals are boat races a special feature?
(a) Onam (b) Pongal
(c) Thrissur Pooram (d) Hampi

191. Which India born physicist invented the 'Optical Fibre'?
(a) C.V. Raman (b) Homi J. Bhabha
(c) Narinder Singh Kapany
(d) Satyendra Nath Bose

192. What is the name of first indigenously developed Super Computer of India ?
(a) Tejas (b) Anupam
(c) Aryabhatt (d) Param 8000

193. Which among the following bank is the first bank to launch the Mudra Card based on the RuPay platform?
(a) SBI (b) Corporation Bank
(c) Vijaya Bank (d) PNB

194. What is the effort of IBA?
(a) Assist and provide common services to members.
(b) Promote sound and progressive banking principles and practices.
(c) Co-ordinate and co-operate on procedural, legal, technical, administration, professional matters.
(d) All of the above

195. An Asset Reconstruction Company(ARC) in India is associated with-
(a) UCPDC (b) DICGC
(c) NPA (d) Home Loan

196. Global Hunger Index (GHI) is released by__
(a) IFPRI (b) WEF
(c) UNDP (d) All of the above

197. The rate of inflation increases when the purchasing power of money .....
(a) decreases (b) increases
(c) stable (d) decrease just half

198. National Banana Festival is observed in __
(a) Uttar Pradesh (b) Andhra Pradesh
(c) Tamil Nadu (d) Kerala

199. Which among the following is the difference in value between a country's imports and exports?
(a) Balance of Trade (b) Balance of Payment
(c) Balance of Power (d) Credit Balance

200. Which of the following are factors of production?
(a) Land (b) Labour
(c) Capital (d) All of them

48. (c) If Jogindra receives Rasgulla that Girish must get Laddu as Trilochan can not get Laddu.

49. (d) If Girish received Burfi then Kedarnath must receive Rasgulla, which no one else can receive. So Trilochan can not get Rasgulla.

Sol. (50 - 52):

Time slot	Person	Relation	Profession
9–10	Q (male)	Father	Cardiologist
10–11	T (male)	Mother's Brother	Radiologist
11 – 12	S (female)	Mother	Gynecologist
12 – 1	V (female)	Father's sister	General Physician
1 – 2	**LUNCH**		
2 – 3	W (male)	Elder son	Orthodontist
3 – 4	R (female)	Younger daughter	Urologist
4 – 5	P (male)	Younger son	Neurologist
5 – 6	U (female)	Elder daughter	Pediatrician

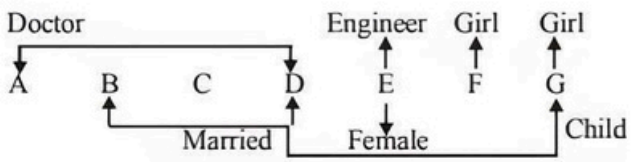
50. (b) The general physician is a female and comes at 12 noon.

51. (d) R is a urologist by specialisation and is cardiologist's daughter.

52. (d) If lunch break and subsequent working are reduced by 15 min. then the new timings in order will be 1 – 1:45 (lunch), 1:45 – 2:30, 2:30 – 3:15, 3:15 – 4 & 4 – 4:45.
Since U is the last doctor and she is Pediatrician, daughter of Cardiologist will reach the clinic at 4pm.

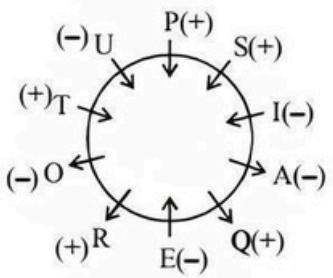
53. (c) Leena paddled only once on the return trip, when she was alone. Nitin paddled once with Arun and Arun paddled once when he was with somebody else than Nitin.
Only Mohan is left now.

54. (d)



G's father can either be B or D, so (a) is eliminated.
A, B, & D adults, so C is a child, hence (b) is eliminated.
C is not a girl, so, (c) is eliminated.

Sol. (55 - 58):



Here (+) is for male and (–) is for female.

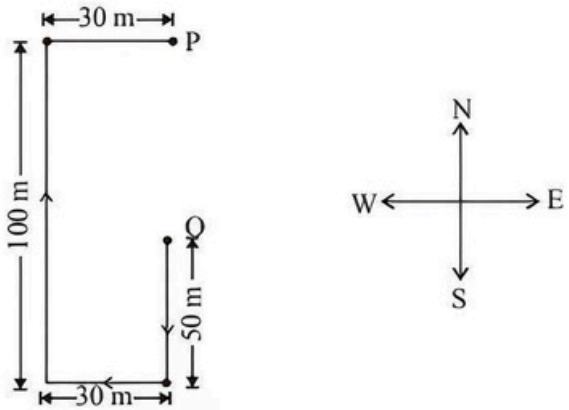
55. (b) 56. (d) 57. (a) 58. (a)

59. (a) $O \xrightarrow{+1} G$ $E \xrightarrow{+1} N$
$D \xrightarrow{-1} F$ $B \xrightarrow{-1} P$

Similarly.
$A \xrightarrow{+1} K$ $L \xrightarrow{-1} D$

60. (d) $T \xrightarrow{+1} J \xrightarrow{+2} N \xrightarrow{+3} [A] \xrightarrow{+4} G$
$E \xrightarrow{+2} U \xrightarrow{+3} K \xrightarrow{+4} [R] \xrightarrow{+5} H$

61. (d)



OP = 100 m – 50 m = 50 m
Besides, P is north of O.

62. (d) → 15th → 19th
→ [J] | | [S] | | | [R]
5th ←
Total number of children in the row = 19 + 5 – 1 = 23
Shweta's position from right end
= 23 – 15 + 1 = 9th

63. (c) According to Pratap his mother's birthday may be on 20th, 21st or 22nd April.
According to Pratap's sister their mother's birthday may be from 1st April to 21st April.
Common Dates ⇒ 20th and 21st.

64. (d) I is a bizarre solution : do we expect the lower-order batsmen to tackle the new ball in the opening overs?
II is a desirable course of action because practice is supposed to improve one's performance. III again is being over-optimistic. We can't expect the entire lot of inexperienced batsmen to perform better than all the established ones.

65. (b) I does not follow because stopping vigilance would be foolish thing to do. A better solution could be to reduce vigilance during nights a little and reinforce daylight vigilance as III suggests. Killing criminals is equivalent to giving punishment and this is an area for the judiciary, not for the police. So II does not follow.

66. (d) I does not follow because of the word 'mandatory'. II and III are advisable because they will reduce problem.

67. (c) As in the statement it is mentioned 'rejection due to inferior-quality material and poor craftsmanship', it is well known that purchase department is responsible for purchasing the inferior quality material. Again production department is responsible for improper inspection. Hence investigation is compulsory for all the department. Hence I follows. II follows because claim of company 'X' may be wrong. III follows because

relationship with a previous client should always be kept up.

68. (c) The best option in this case is to divert the load of vehicular traffic through various link roads during peak hours.

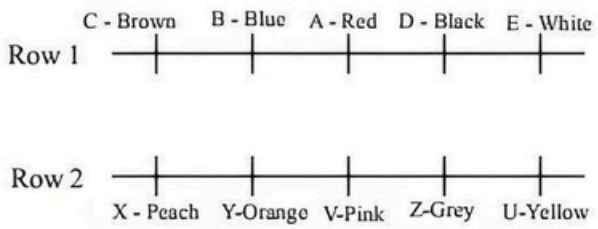
69. (c) There may be several causes for the increment in entry fee in the Taj Mahal. Event (B) may be one of the causes. It is also possible that the hike in maintenance cost is the other cause of this increment.

70. (d) Insecurity is a long-run impact of this habit of too much comfort. Comfort leads to a distaning from follow beings. And this loneliness later results in insecurity.

71. (c) Event (A) is the effect but event (B) is not its immediate and principal cause because to get the above outcome proper use of rich mineral resources is equally important.

72. (b) The security arrangements were made to check the high-profile criminal from escaping.

Sol. (73 - 76):



73. (c) 74. (d) 75. (d) 76. (c)

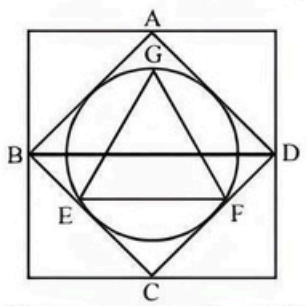
77. (d) Neither Argument I nor Argument II is strong because it is not a proper way to claim permanent membership of the UN.

78. (a) Argument I is not strong because it does not feel that why the grievances of people will increase. Argument II is strong because it will reduce the power theft which has resulted a huge amount.

79. (a) Due to the movement of lift a person standing in it does not find any apparent change in his weight because the reaction of the floor of the lift is equal to that person's weight. So, both (A) and (R) are true and (R) in the correct explanation of (A).

80. (c) Pressure cookers are fitted with ebonite handles because ebonite is a bad conductors of heat, so it does not heats up with pressure cooker so hands are burn while handling it. So, (A) is true while (R) is false.

81. (d)



We have, $BD \parallel EF$ and $BD = 2EF$

Now, $EF = \frac{1}{2} \times a \quad (\because BD = a)$

Area of the equilateral triangle GEF

$$= \frac{\sqrt{3}}{4}\left(\frac{1}{2}a\right)^2 = \frac{\sqrt{3}}{4} \times \frac{1}{4}a^2 = \frac{\sqrt{3}}{16}a^2 \text{ sq. units}$$

Hence, options (d) is the correct.

82. (d) Let the cost price of the articles be ₹100
Marked Price = ₹130
After giving a discount of 10% the selling price of the articles = $0.9 \times 130 = 117$

So, actual profit per cent = $\frac{(117-100)}{100} \times 100 = 17\%$

83. (d) Ratio of equivalent capitals of Sarita and Neeta for 1 month = $50000 \times 12 : 80000 \times 6 = 5 : 4$

$\therefore$ Sarita's share = ₹ $\left(\frac{5}{9} \times 18000\right)$ = ₹ 10000

84. (c) Ratio of milk in the containers are,

$$5 \times \frac{1}{6} : 4 \times \frac{3}{8} : 5 \times \frac{5}{12} = \frac{5}{6} : \frac{3}{2} : \frac{25}{12}$$

and the ratio of water in the containers are,

$$5 \times \frac{5}{6} : 4 \times \frac{5}{8} : 5 \times \frac{7}{12} = \frac{25}{6} : \frac{5}{2} : \frac{35}{12}$$

Ratio of mixture of milk and water in the containers

$$= \left(\frac{1}{6} \times 5 + \frac{3}{8} \times 4 + \frac{5}{12} \times 5\right) : \left(\frac{5}{6} \times 5 + \frac{5}{8} \times 4 + \frac{7}{12} \times 5\right)$$

$$= 106 : 230 = 53 : 115$$

85. (b) Let No. of Apples and Oranges Rani bought are A and O respectively.
Now, $23A + 10O = 653$ ....(1)
Since 653 has last digit 3 which can come by 23 only after multiplying it 1, 11, 21, 31 and so on by keeping in mind Apples > Oranges
$23A + 10O = 653$
Soln of (A, O)
(1, 63); (11, 40); (21, 17)
So only 21, 17 can be possible.
$\therefore$ No. of Apples = 21 ....(2)
No. of Oranges = 17 ....(3)
Now, S.P of 1 Apple = 23 Rs.

C.P of 1 Apple = $\frac{23}{1.15}$ = 20 Rs.

S.P of 1 Orange = 10 Rs.

C.P of 1 Orange = $\frac{10}{1.25}$ = 8 Rs.

Total C.P = $20 \times 21 + 17 + 8 = 556$ Rs.

Hence profit % = $\frac{653-556}{556} \times 100 = 17.4\%$

86. (d) M intel pipes can fill the $\left(\frac{M}{8}\right)^{th}$ Part of the tank in 1 hour

Similarly N outlet pipes can empty $\left(\frac{N}{12}\right)^{th}$ part of the tank in 1 hour

$\therefore \quad \frac{N}{8}-\frac{N}{12}=\frac{1}{6}$

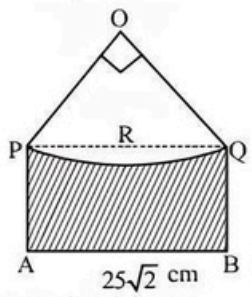
$6M-4N=8$

$M=\frac{4+2N}{3}$ ....(1)

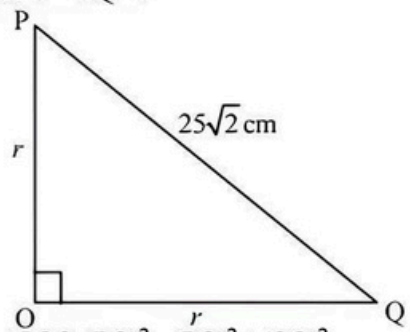
So there will be infinite number of solutions (N = 1, 4, 7, --) but none of the ratios given in the option are correct.
forere – When M = 2, N = 1 or M = 4, N = 4
eq (1) can be solved.
But when M = 4, N = 2 or M = 2, N = 4.
Solution of eq (1) doesn't satify.

87. (d) Each triangle have base its along the line PQ, RS, TU or VW.
Number of triangles having base along the line PQ.
$= {}^5C_2 \times ({}^5C_1 + {}^5C_1 + {}^5C_1) = 10 \times 15 = 150$
Similarly, number of triangles having base along the line RS, TU and VW = 150 + 150 + 150 = 450.
Hence, total number of triangles = 150 + 450 = 600.

88. (c)



Let PO = OQ = r



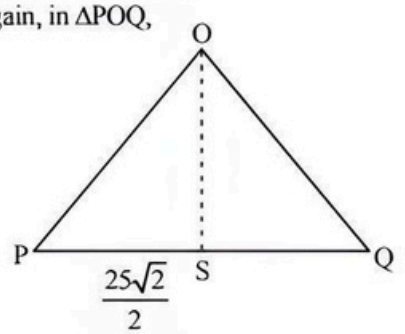
In ΔPOQ, $(PQ)^2 = (PO)^2 + (QO)^2$

$(25\sqrt{2})^2 = r^2 + r^2$

$625 \times 2 = 2r^2$

$r^2 = 625 \Rightarrow r = 25$ cm

Again, in ΔPOQ,



Let point 'S' divide PQ into two parts,

then, $PS = SQ = \frac{25\sqrt{2}}{2}$ cm $= \frac{25}{\sqrt{2}}$ cm.

Now, ΔPOS,

$(PO)^2 = (OS)^2 + (PS)^2$

$(25)^2 = (OS)^2 + \left(\frac{25}{\sqrt{2}}\right)^2$

$OS = \sqrt{(25)^2 - \frac{(25)^2}{2}}$

$OS = \frac{25}{\sqrt{2}}$ cm.

$\therefore PA = \left(30 - \frac{25}{\sqrt{2}}\right)$ cm

Area of shaded portion.

$= \frac{1}{2} \times 25 \times 25 + 25\sqrt{2} \times \left(30 - \frac{25}{\sqrt{2}}\right) - \frac{\pi}{4}(25)^2$

$= \frac{625}{2} + 750\sqrt{2} - 625 - \frac{625}{4}\pi$

$= 750\sqrt{2} - \frac{625}{2} - \frac{625}{4}\pi$

$= 750\sqrt{2} - 625\left(\frac{1}{2} + \frac{\pi}{4}\right)$ sq. cm.

89. (c) Work done by Ram in 1 day $= \frac{1}{9}$

Work done by Ravi in 1 day $= \frac{1}{12}$

Work done by Ratan in 1 day $= \frac{1}{15}$

Work done by Ram, Ravi and Ratan in 3 days, when then work in turn $= \frac{1}{9} + \frac{1}{12} + \frac{1}{15}$

$= \frac{20+15+12}{180} = \frac{47}{180}$ work

Work done 9 days, when they work in same turn

$= 3 \times \frac{47}{180} = \frac{141}{180}$.

Remaining work $= 1 - \frac{141}{180} = \frac{39}{180}$.

Work done by Ram and Ravi in two days,

When they work in turn $= \frac{1}{9} + \frac{1}{12} = \frac{7}{36}$

Remaining work when after 11 days

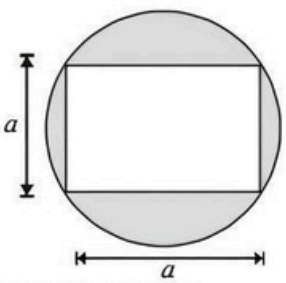
Work in same turn $= \frac{39}{180} - \frac{7}{36} = \frac{4}{180}$

That $\frac{4}{180}$ work is done by Ratan in 12^{th} day.

In this way, Ravi has worked 4 days.
So, portion of work done by Ravi in 4 days

$= 4 \times \frac{1}{12} = \frac{1}{3}$

90. (d) For A_1, let side of the square is a unit. Then, radius of the circumcircle $= \frac{a}{\sqrt{2}}$



Area between S_1 and C_1 :

$A_1 = C_1 - S_1$

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

Similarly, $A_2 = C_2 - S_2$

$= \left\{\pi a^2 - \left(a\sqrt{2}\right)^2\right\}$

$A_3 = C_3 - S_3$

$= \left\{\pi.2a^2 - (2a)^2\right\}$

$A_N = \left\{\pi.2^{N-2}.a^2 - 2^{N-1}.a^2\right\}$

Now, $\sum_{N=1}^{N} A_N = \left\{\pi a^2.\sum_{N=1}^{N} 2^{N-2} - a^2 \sum_{N=1}^{N} 2^{N-1}\right\}$

$= \pi a^2\left[\frac{1}{2} + \left(2^{N-1} - 1\right)\right] - a^2[2^N - 1]$

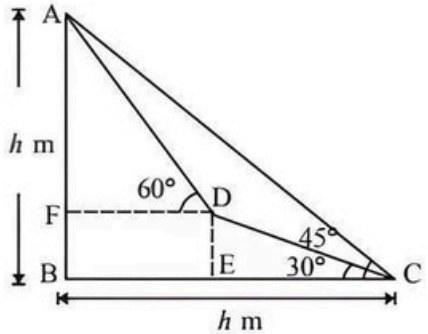
$= \pi a^2.2^{N-1} - \frac{\pi a^2}{2} - 2^N.a^2 + a^2$

For $a = 4$, $\frac{\Sigma A_N}{A_1} = \frac{\left[\pi.2^{N-1} - \frac{\pi}{2} - \{2^N - 1\}\right]16}{\left[\frac{\pi}{2} - 1\right]16}$

$= \frac{(2^N - 1)\left(\frac{\pi}{2} - 1\right).16}{\left(\frac{\pi}{2} - 1\right).16}$

$= \boxed{2^N - 1}$

91. (a)



Let height of the summit of the mountain is h meter.
And point 'C' is a point at the foot of the mountain.
According to the question, $\angle ACB = 45°$

In ΔABC, $\tan 45° = \frac{AB}{BC} \Rightarrow BC = AB = h$ m

Again, in ΔCDE, $\angle ECD = 30°$ and $CD = 100$ m (given)

$\therefore DE = CD.\sin 30° = 100 \times \frac{1}{2} = 50$ m.

$CE = CD.\cos 30° = 100 \times \frac{\sqrt{3}}{2} = 50\sqrt{3}$ m.

In ΔAFD, $\angle ADF = 60°$, $FB = DE = 50$ m,
$AF = AB - FB = (h - 50)$ m

$FD = BE = BC - CE = (h - 50\sqrt{3})$ m

Now, $\tan 60° = \frac{AF}{FD}$

$\sqrt{3} = \frac{(h - 50)}{(h - 50\sqrt{3})}$

$(\sqrt{3} - 1)h = 150 - 50$

$h = \frac{100}{(\sqrt{3} - 1)} = 50(\sqrt{3} + 1)$ m

92. (b) Total time taken to cover 1000 km $= \frac{1000}{x}$ hr.

Amount paid to driver $= \frac{1000}{x} \times 50 = \frac{50000}{x}$

Fuel consumed by SUV to cover 1000 km

$= 1000 \times \frac{1}{400}\left[\frac{1000}{x} + x\right]$

$= \frac{10}{4}\left[\frac{1000}{x} + x\right]$ litres.

Fuel expensses $= \frac{65 \times 10}{4}\left(\frac{1000}{x} + x\right)$.

$= 162.5\left(\frac{1000}{x} + x\right)$

Total amount

$z = \frac{50000}{x} + 162.5\left(\frac{1000}{x} + x\right)$

For minimum cost, $\frac{dz}{dx}=0$

$$\frac{dz}{dx}=-\frac{50000}{x^2}+162.5\left(\frac{-1000}{x^2}+1\right)$$

$$\therefore 0=-\frac{50000}{x^2}+162.5\left(\frac{-1000}{x^2}+1\right)$$

$$\frac{50000+162500}{x^2}=162.5$$

$$\frac{212500}{x^2}=162.5$$

$$x=\sqrt{\frac{212500}{162.5}}\approx 36 \text{ km/hr}$$

93. (a) Let $y=1+x^2+\sqrt{1+x^2+x^4}$

$$y=\frac{1}{2}\left[2+2x^2+2\sqrt{1+x^2+x^4}\right]$$

$$=\frac{1}{2}\left[\left(1+x+x^2\right)+\left(1-x+x^2\right)+2\sqrt{\left(1+x^2\right)^2-x^2}\right]$$

$$y=\frac{1}{2}\left[\begin{array}{c}\left(\sqrt{\left(1+x+x^2\right)}\right)^2+\left(\sqrt{1-x+x^2}\right)^2\\ +\sqrt{\left(1+x++x^2\right)\left(1-x+x^2\right)}\end{array}\right]$$

$$=\frac{1}{2}\left[\sqrt{1+x+x^2}+\sqrt{1-x+x^2}\right]^2$$

$$\therefore \sqrt{y}=\frac{1}{\sqrt{2}}\left[\sqrt{1+x+x^2}+\sqrt{1-x+x^2}\right].$$

94. (c) $$P+\frac{P\times 10\times\left(t-\frac{1}{2}\right)}{100}=P+\frac{P\times 8\times t}{100}$$

Choose option (c), Time $=2.5-\frac{1}{2}$ year $=2$ years

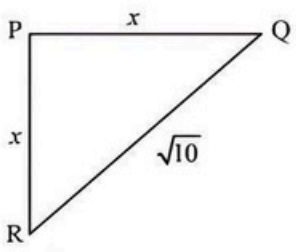
Rate $=10\%\times 2=20\%=\frac{1}{5}$

Amount after 2 years $=62100$

$5\rightarrow 6=62100$

$$P=5=51750\Rightarrow 5=?=\frac{62100\times 5}{6}=51750$$

95. (c) In ΔPQR,



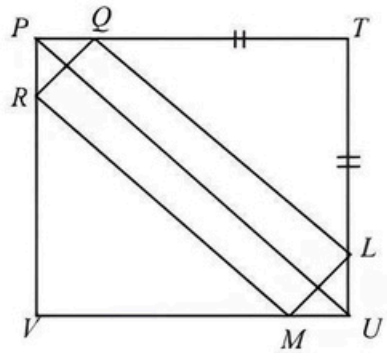
$PQ=PR=x$ (say)

Then, from $PR^2+PQ^2=RQ^2$

$x^2+x^2=(\sqrt{10})^2$

$2x^2=10$

$x=\sqrt{5}$



$PT=10$

$QT=10-\sqrt{5}$

ΔQTL isosceles traingle $QL=\sqrt{2}(10-\sqrt{5})$

Area of $RQLM=\sqrt{10}\times\sqrt{2}(10-\sqrt{5})$

$=10(\sqrt{20}-1)$ sq. meter.

96. (a) Somesh $\longrightarrow$ 45 Days
Tarun $\longrightarrow$ 60 Days
Nikhil $\longrightarrow$ 75 Days
20, 15, 12 $\rightarrow 60\times 15$

Let work finished in 'x' days.

$\Rightarrow (x-2)20+5\times 12+15\times x=60\times 15$

$\Rightarrow 35x=840+40$

$\Rightarrow x=\frac{176}{7}=25\frac{1}{7}$

97. (a) $$x_2=5x_1-\frac{3}{4}x_0=10-\frac{3}{4}\times 4=7$$

$$x_3=5x_2-\frac{3}{4}x_1=35-\frac{3}{2}=\frac{67}{2}$$

98. (d) $10^2=100-87=13$

$10^3-87=1000-87=913$

$10^4-87=10000-87=9913$

$\vdots$

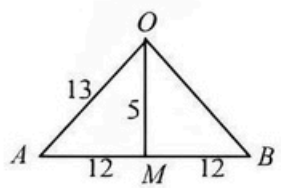
$\vdots$

$10^{67}-87=999.....913$

Digits $=67$

Sum of digits $=65\times 9+1+3=589$.

99. (c)



Area $= \frac{1}{2} AB \times OM$ Area $= \frac{1}{2} \times 24 \times 5 = 60$

Area of sector $OAPB = \frac{\pi(13)^2 \times x}{360}$

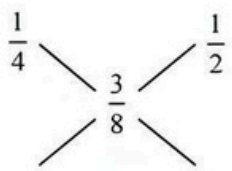
Shaded portion $= \frac{169x\pi}{360} - 60$ cm^2.

100. (a) Water : Pulp

1 : 3

1 : 1

3 : 8



1 : 1 of 12 litres

$= 6\,l$: $6\,l$

101. (b) $A \rightarrow x+18$ hrs.

$B \rightarrow x+8$ hrs.

$C \rightarrow x$ hrs.

From question,

$$\frac{1}{x+18} + \frac{1}{x+8} = \frac{1}{x}$$

$$\Rightarrow \frac{(x+8+x+18)}{(x+18)(x+8)} = \frac{1}{x}$$

$$\Rightarrow x(2x+26) = (x+18)(x+8)$$

$$\Rightarrow 2x^2 + 26x = x^2 + 26x + 144$$

$$\Rightarrow x^2 = 144 \Rightarrow x = 12$$

102. (c) Let farmer A has 'x' hectare land

$\therefore$ Total production of

A $= 20x$

Farmer B has $x + 15$ hectare land

$\therefore$ Total production of

B $= (x+15) \times 30$

Given that $(x+15) \times 30 - 20x = 530$

$\Rightarrow 30x + 450 - 20x = 530 \Rightarrow 10x = 80 \Rightarrow x = 8.$

$\therefore$ Total production of farmer A $= 20x = 20 \times 8 = 160$ bushels.

103. (d) 5 students out of 4 boys and y girls can be chosen in 2 ways.

There are two conditions:

(i) 3 Boys & 2 Girls $= {}^4C_3 \times {}^yC_2$

(ii) 4 Boys & 1 Girl $= {}^4C_4 \times {}^yC_1$

Since only boys are given a ball, thus

Total balls given to 3 boys each in 1st case + Total balls given to 4 boys each in 2nd case = 368

$\Rightarrow 3 \times {}^4C_3 \times {}^yC_2 + 4 \times {}^4C_4 \times {}^yC_1 = 368$

$$\Rightarrow 3 \times 4 \times \frac{y(y-1)}{2} + 4 \times 1 \times y = 368$$

$\Rightarrow 6y(y-1) + 4y = 368 \Rightarrow 6y^2 - 6y + 4y = 368$

$\Rightarrow 3y^2 - y = 184 \Rightarrow 3y^2 - y - 184 = 0$

on solving this. then, $y = 8$.

104. (d) There are two vowels I and A in RIYADH

(i) No. of ways in which 2 vowels can be arranged together in RIYADH $= 5! \times 2! = 240$

Hence statement (i) is not true.

(ii) Total no. of arrangements $= 6! = 720$.

$\therefore$ No. of ways in which vowels do not occur together $= 720 - 240 = 480$

Hence statement (ii) is also not true.

105. (a) Let SP of each article be ₹100.

Thus, C.P. of article sold at 13% loss

$$= \frac{100}{87} \times 100 = 115$$

C.P. of article sold at 23% profit

$$= \frac{100}{123} \times 100 = 81.3$$

C.P. of article sold at 26% loss

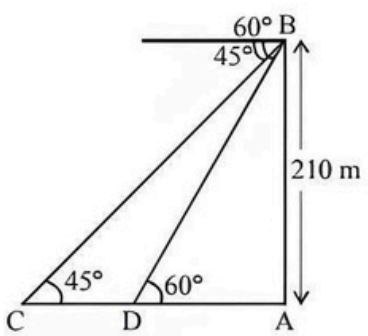
$$= \frac{100}{74} \times 100 = 135.1$$

Hence total CP of article $= 331.4$

% by which CP is higher than SP

$$= \frac{331.4 - 300}{300} \times 100 = 10.5\% \text{ higher.}$$

106. (d)



Now, in ΔABD

$$\tan 60° = \frac{AB}{AD}$$

$$\Rightarrow \sqrt{3} = \frac{210}{AD}$$

$$\therefore AD = \frac{210}{\sqrt{3}} m$$

In ΔABC

$$\tan 45° = \frac{AB}{AC}$$

$$\Rightarrow 1 = \frac{210}{AC}$$

$\therefore$ $AC = 210$ m

Distance travelled between point D to C

$$= 210 - \frac{210}{\sqrt{3}} = 210\left(\frac{\sqrt{3}-1}{\sqrt{3}}\right)\times\frac{\sqrt{3}}{\sqrt{3}}$$

$$= \frac{210(3-\sqrt{3})}{3} = 70(3-\sqrt{3}) \text{ m}$$

Speed of boat = 3 km/h

$$= 3\times\frac{1000}{60} = 50 \text{ m/min}$$

Time taken to boat change from 60 days to 45 days

$$= \frac{70-(3-\sqrt{3})}{50} = 1.77 \text{ min} \approx 2 \text{ min}$$

107. (b) Here X and Y are two alloys which is made of zinc and copper.

$$X \longrightarrow \underset{6}{\text{Zinc}} : \underset{9}{\text{Copper}}$$

Quantity of zinc in 40 g of alloy X

$$= \frac{6}{15}\times 40 = 16 \text{ g}$$

Quantity of copper in 40 g of alloy X

$$= 40 \text{ g} - 16\text{g} = 24 \text{ g}$$

Now, in alloy Y

$$Y \longrightarrow \underset{7}{\text{Zinc}} : \underset{11}{\text{Copper}}$$

Quantity of zinc in 60 g of alloy Y

$$= \frac{7}{18}\times 60 = \frac{70}{3}\text{g}$$

Quantity of copper in 60 g of alloy Y

$$= \left(60 - \frac{70}{3}\right)\text{g} = \frac{110}{3}\text{g}$$

Now, in alloy Z

$$\text{Quantity of zinc} = 16\text{g of X} + \frac{70}{3} \text{ of Y}$$

$$= \frac{48+70}{3} = \frac{118}{3}\text{g}$$

Quantity of copper in alloy Z

$$= 24\text{ g} + \frac{110}{3}\text{g}$$

$$= \frac{3\times 24\text{g} + 110\text{g}}{3} = \frac{182}{3}\text{g}$$

$$\text{Required ratio} = \frac{\text{Quantity of zinc}}{\text{Quantity of copper}}$$

$$= \frac{118}{3}\times\frac{3}{182} = \frac{59}{91} = 59:91$$

108. (b) Let the number of strawberry and chocolate flavoured candies be a and b respectively.

$\therefore$ $3.3a + 2.9b = 249$ ...(i)

Since, there is only one equation with two unknowns, substitute the given options into the equations.

$a = 57$ and $b = 21$ satisfy the equation (i).

109. (b) Let E be the event that train P is late and F be the event that train Q is late.

$$\therefore\ P(E) = \frac{7}{9} \text{ and } P(F) = \frac{11}{27}$$

$$\text{Now, } P(F/E) = \frac{P(E\cap F)}{P(E)}$$

$$\therefore\ P(E\cap F) = P(F/E)\times P(E)$$

$$\therefore\ P(E\cap F) = \frac{8}{9}\times\frac{7}{9} = \frac{56}{81}$$

$$\text{Now } P(E\cup F) = P(E) + P(F) - P(E\cap F)$$

$$\Rightarrow\ P(E\cup F) = \frac{7}{9} + \frac{11}{27} - \frac{56}{81} = \frac{40}{81}$$

Probability that neither train will be late

$$= 1 - P(E\cup F) = 1 - \frac{40}{81} = \frac{41}{81}$$

110. (c) Let weight of the cut-off piece = X kg

Let percentage of aluminium in 8 kg and 16 kg alloy be a and b respectively.

$$\therefore\ \frac{(8-X)a + Xb}{8\times 100} = \frac{(16-X)b + Xa}{16\times 100}$$

$\Rightarrow 16a - 2Xa + 2Xb = 16b - Xb + Xa$

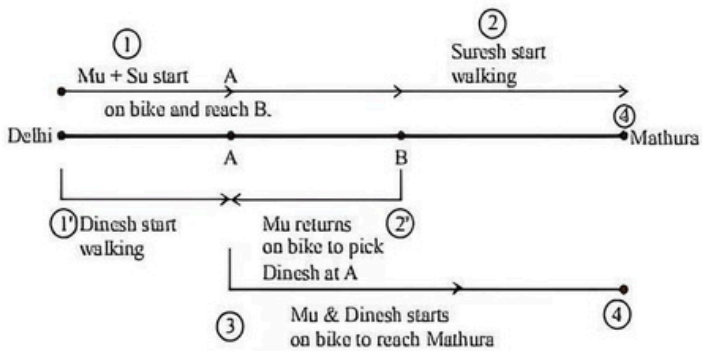
On comparing the coefficient of a and b on both sides, we get

$16 - 2X = X$ and $2X = 16 - X$

$$\therefore\ X = \frac{16}{3} = 5.33$$

Hence weight of each cut-off piece = 5.33 kg

111. (b)



1 and 1′ start simultaneously.

2 and 2′ start simultaneously

= Distance between Delhi and B + Distance A and B

Distance between Delhi and Mathura = 4 (Dist between Delhi and A)

Let Delhi be point D and Mathura be point M

$AB + BA = 3DA$

$AB = 1.5\,DA.$

Let $DA = 2$

$AB = 3$

$BM = 2$

$$DA = \frac{600}{7}, \quad AB = \frac{900}{7}, BM = \frac{60}{7}$$

$$\therefore \text{ Time taken} = \frac{600}{7(15)} + \frac{900+600}{7(60)} = \frac{40}{7} + \frac{25}{7} = 9\frac{2}{7} \text{ hrs.}$$

112. (d) Let Raveendra had Rs. x in 2006,

So, his share by end of 2008 =

$$x \times \frac{13+3}{13} \times \frac{4+2}{4} = \frac{24}{13}x$$

Now the dividend declared in 2009 was 12.5%

So, actual dividend that Raveendra gets

$$= \frac{\frac{24}{13}x}{x} \times 12.5\% = 23.07\%$$

113. (b) Time taken by Sukriti to travel 5 km

= 5 × (5 mins and 50 sec)

= 29 mins and 10 sec.

Distance covered by Saloni in 29 min and 10 sec

$$= \frac{1 \text{ km}}{6\text{min and } 4 \text{ Sec}} \times 29 \text{ min and } 10 \text{ sec}$$

$$= \frac{1 \text{ km}}{364} \times 1750 = 4.808 \text{ km}$$

So, Sukriti defeats Saloni by 192 m in a 5 km race.

114. (c) Let $x + \frac{\pi}{3} = \theta$

$$\therefore \quad \tan(\theta - \frac{\pi}{3}) + \tan\theta + \tan(\theta + \frac{\pi}{3}) = 3$$

$$\Rightarrow \quad \frac{\tan\theta - \sqrt{3}}{1 + \sqrt{3}\tan\theta} + \tan\theta + \frac{\tan\theta + \sqrt{3}}{1 - \sqrt{3}\tan\theta} = 3$$

$$\tan\theta - \sqrt{3}\tan^2\theta - \sqrt{3} + 3\tan\theta + \tan\theta$$

$$\Rightarrow \quad \frac{-3\tan^3\theta + \tan\theta + \sqrt{3} + \sqrt{3}\tan^2\theta + 3\tan\theta}{1 - 3\tan^2\theta} = 3$$

$$\Rightarrow \quad \frac{3\tan\theta - 9\tan^3\theta}{1 - 3\tan^2\theta} = 3$$

$$\Rightarrow \quad 3\left[\frac{\tan\theta - 3\tan^3\theta}{1 - 3\tan^2\theta}\right] = 3$$

$$\Rightarrow \quad \tan 3\theta = 1, \Rightarrow \tan 3\left(x + \frac{\pi}{3}\right) = 1, \Rightarrow \tan(\pi + 3x) = 1$$

$$\Rightarrow \quad \tan 3x = 1$$

115. (c) Let the speed of the boat in still water be x km/hr and the speed of the stream be y km/hr.

$$\therefore \quad \frac{30}{x-y} + \frac{44}{x+y} = 10 \qquad \text{.....(i)}$$

$$\text{and} \quad \frac{40}{x-y} + \frac{55}{x+y} = 13 \qquad \text{....(ii)}$$

Multiply equation (i) by 4 and (ii) by 3, we get

$$\frac{120}{x-y} + \frac{176}{x+y} = 40 \qquad \text{....(iii)}$$

$$\frac{120}{x-y} + \frac{165}{x+y} = 39 \qquad \text{....(iv)}$$

Subtracting equation (iv) from (iii), we get

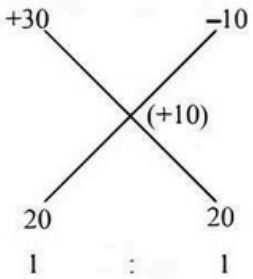
$x + y = 11, \Rightarrow y = 11 - x$

Now putting the value of y in equation (i), we get

$x = 8$

Hence speed of the boat in still water = 8 km/hr

116. (a) By Alligation method



Number of pens sold at profit = $\frac{1}{2} \times 50 = 25$

117. (d) Let x kg of first alloy is mixed with y kg of second alloy.

So, in x kg of first alloy amount of copper = $\frac{5}{7}x$ and

that of zinc = $\frac{2}{7}x$

Similarly, in y kg of second alloy amount of copper = $\frac{3}{7}y$ and that of zinc = $\frac{4}{7}y$

Mixture amount of copper is $\frac{5}{7}x + \frac{3}{7}y = \left(\frac{5x+3y}{7}\right)$

Mixture amount of zinc is $\frac{2}{7}x + \frac{4}{7}y = \left(\frac{2x+4y}{7}\right)$

According to question

$$\frac{5x+3y}{7} : \frac{2x+4y}{7} = 1:1$$

$\Rightarrow 5x + 3y = 2x + 4y$

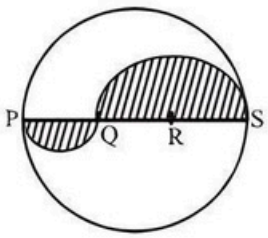
$3x = y$

$3x - y = 0$ ...(i)

$x + y = 28$ (given) ...(ii)

Solving equ. (i) & (ii)
$x = 7, y = 21$

118. (a) PS = Diameter $= 2r$



Therefore, $PQ = QR = RS = \frac{2r}{3}$

Perimeter of the shaded region

$$= \overline{PQ} + \overline{QS} = \frac{1}{2}\left(2\pi \times \frac{r}{3}\right) + \frac{1}{2}\left(2\pi \times \frac{2r}{3}\right) + r$$

$$= \frac{\pi r}{3} + \frac{2\pi r}{3} + r = \pi r + r$$

119. (b) According to the given information

$$\frac{50,000 \times 12}{60,000 \times (12 - x)} = \frac{20}{18} \Rightarrow \frac{50,000 \times 12 \times 18}{60,000 \times 20} = 12 - x$$

$\therefore x = 3$ months

120. (d) Let the weight of the filled bottle be 100 g. Then, the weight of the empty bottle is 20 g.
Let x gm liquid removed

Now, $100 - x = \frac{100}{2} \Rightarrow x = 50$

Required ratio $= \frac{50}{100} = \frac{1}{2}$

121. (d) Since the dimension of the window and door is not given, therefore, question can't be solved by using both statements together.

122. (b) AB = 100 miles and AC + CB = 100 miles.

$$(I) \Rightarrow AB = CB\left(1 + \frac{25}{100}\right)$$

$$\Rightarrow 100 = \frac{5}{4}CB \Rightarrow CB = 80 \text{ miles}$$

$$(II) \Rightarrow AC = \frac{1}{4}(CB)$$

Hence, question can be answered using either of the statements.

123. (b) Let the price in first shop = ₹ x per kg

$$(I) \Rightarrow \frac{18 \times 6 + x \times 2}{8} = 20 \Rightarrow x \text{ can be determined.}$$

$$(II) \Rightarrow \frac{6x + 2(x + 8)}{8} = 20 \Rightarrow x \text{ can be determined.}$$

$\therefore$ Each statement alone is sufficient for answering the question.

124. (c) Suppose he was paid ₹ x for the first day.

$$(I) \Rightarrow x + (x + 5) + (x + 10) + (x + 15) + (x + 20) + (x + 25) = 900$$

Hence x can be calculated. Therefore statement (I) alone is sufficient to answer the question.
$(II) \Rightarrow x < 100$.
$\therefore$ Statement (II) is not sufficient to answer the question.

125. (b) Let the total marks = x
$(I) \Rightarrow$ Minimum pass marks = 32% of x + 1 = 36% of x − 1.
Hence minimum marks can be calculated.
$(II) \Rightarrow$ Minimum pass marks = 30% of x + 2 and 30% of x + 5 = 40% of x
Hence minimum marks can be calculated.
Therefore each statement alone is sufficient for answer the question.

Sol. (126-130):

Courses	Total students T = x% of 1200	Number of girls G = y% of 800	Number of boys B = T − G
A	240	240	0
B	180	80	100
C	60	16	44
D	420	240	180
E	144	112	32
F	156	112	44

126. (a) Required ratio = 180 : 240 = 3 : 4

127. (c) Courses are C and F

128. (a) Required % $= \frac{112 - 32}{32} \times 100 = 250\%$

129. (d) The number of boys for course A = 0

130. (b) Number of girls in course C = 16.

Sol. (131-135):

	Day 1			Day 2		
Vehicle	Time in hr	Distance in km	Speed in km / hr	Time in hr	Distance in km	Speed in km/hr
A	16	832	52	16	864	54
B	12	516	43	18	774	43
C	11	693	63	18	810	45
D	12	552	46	15	765	51
E	16	935	58.4	14	546	39
F	19	703	37	12	636	53

131. (d) Vehicle B.

132. (c) Speed of vehicle A on day 1 = 52 km/hr
Speed of vehicle C on day 1 = 63 km/hr
Difference = 63 − 52 = 11 km / hr

133. (d) Speed of vehicle can day 2 = 45 km/hr

$$\Rightarrow\left(45\times\frac{5}{18}\right)\text{m/sec}=12.5\,\text{m/sec}$$

134. (d) Percentage

$$=\frac{\text{Distance travelled by vehicle F on day 2}}{\text{Distance travelled by vehicle F on day 1}}\times100$$

$$=\frac{636}{703}\times100\approx\frac{630}{700}\times100\approx90\%$$

135. (b) Speed of vehicle D on day 2 = 51
Speed of vehicle E on day 2 = 39

$$\text{Required ratio}=\frac{51}{39}=\frac{17}{13}\text{ or }17:13$$

136. (b) Difference between cost of 1 kg apple and cost of 1 kg guava in 5 cities.

J 160 – 60 = 100
D 130 – 90 = 40
C 180 – 120 = 60
H 90 – 30 = 60
R 40 – 20 = 20
∴ Cost is second lowest in Delhi.

137. (d) Cost of 1 kg guava in Jalandhar = ₹ 60
Cost of 2 kg grapes in chandigarh = ₹ 90 × 2 = ₹ 180

$$\text{Require }\%=\frac{60}{180}\times100=33.3\approx34\%$$

138. (c) Cost of 3 kgs apples for Ram = 3 × 130 = ₹ 390
Cost of 2 kgs guavas for Ram = 2 × 90 = ₹ 180
Total cost that Ram pay = 390 + 180 = ₹ 570

139. (a) Total cost of 45 kgs grapes from Hoshiarpur = 45 × 190 = ₹ 8550

$$\text{After discount 4\% Ravinder paid}=8550-\frac{8550\times4}{100}$$

= ₹ 8208

140. (c) Cost of 1 kg apples from Ropar :

Cost of 1kg grapes from chandigarh
40 : 90
4 : 9 or $2^2 : 3^2$

141. (c) Difference between maximum and minimum production of polypropylene = 21.0 – 15.4 = 5.6
Difference between maximum and minimum production of polyethylene = 108 – 20 = 88

$$\therefore\text{ The ratio}=\frac{88}{5.6}=15.7\approx16.$$

142. (a) Maximum productions of polyethylene in 2004-05 = 100
Minimum production of polyethylene in 2003-04 = 20

$$\therefore\text{ Ratio}=\frac{100}{20}=5.$$

143. (b) Polypropylene is the product for which we see in the given data, that the production in 2003-04 equals production in 2004-05 for the maximum number (1) of times.

144. (d) For polyethylene the production in 2003-04 is greater than 2004-05 in 9 months.

145. (d) Minimum production of Polypropylene in 2004-05 = 17.8
Minimum production of Polypropylene in 2003-04 = 15.4
Difference = 2.4
Difference in July's production of polyethylene = 90 – 84 = 6

$$\text{Ratio}=\frac{2.4}{6}=0.4\text{ times.}$$

146. (b) Quantity - I
C.P. = 160
S.P. = 184
Profit = 184 – 160 = 24

$$\text{Profit }\%=\frac{24}{160}\times100$$

∴ Profit % = 15%
Quantity - II
M.P. = 2400
S.P. = 2016
Discount = 2400 – 2016 = 384

$$\text{Discount }\%=\frac{384}{2400}\times100$$

Discount % = 16%
∴ Quantity-I < Quantity-II

147. (d) Explanation :
Quantity I = 13 – 4 – 4 = 5 kmph
Quantity II = (13 – 3)/2 = 5km/hr
Quantity I = Quantity II

148. (b) Quantity - I
Let the present ages of A and B be 4x and 5x.

$$\frac{4x+5}{5x+5}=\frac{5}{6}$$

∴ x = 5
∴ A's present age = 20 yrs
Quantity - II
Average age of A, B and C = 24 years
Total = 24 × 3 = 72 years
Average age of B and C = 20 years
Total age of B and C = 20 × 2 = 40
Age of A = 72 – 40 = 32 years
∴ Quantity-I < Quantity-II

149. (b) Quantity - I :

$$X=\left(\frac{100+40}{100}\right)\times17500=24500$$

Quantity - II :

$$Y=\left(\frac{100+35}{100}\right)\times20000=27000$$

Quantity 1 < Quantity II

150. (d) Quantity - I
Let speed of the Boat = x
Speed of the stream = 3 km/hr

$$\frac{30}{x-3}+\frac{30}{x+3}=\frac{175}{60}$$

$$\frac{60x}{x^2-9}=\frac{35}{12}$$

$7x^2-144x-63=0$

$7x^2-147x+3x-63=0$

$(x-21)(7x+3)=0$

$\therefore x=21$ km/hr

Quantity - II

Bus stops = 8

Distance between bus stops = 1 km

Total distance = $1\times7=7$ km

Let speed of car = x

Time = 20 min

$$\frac{7}{20}\times\frac{60}{1}=21\text{ km/hr}$$

Hence, Quantity - II = Qunatity - I

Sol. (151 - 155):

	Monday	Tuesday	Wednesday	Thursday	Friday
Tata	180	150	250	150	180
Renault	160	220	200	180	140
Maruti	200	200	300	250	200
	540	570	750	580	520

151. (b) Required ratio $=\frac{540}{750}=18:25$

152. (a) Total number of cars produced by Renault from monday to Friday = 900

153. (d) Required average $=\frac{1150}{5}=230$

154. (c) No. of cars produced on Tuesday and Thursday is same i.e. 150.

155. (c) Maximum number of cars produced = 750, on Wednesday.

Sol. (156-160):

The values in the graph can be represented in the table given below. Here O.H. is overheads and Int. is interest, P/C is profit/cost.

Year	Raw Material	Wages	O.H.	Int.	Profit
1991	60	45	10	50	15
1992	50	55	20	55	25
1993	65	60	15	55	20
1994	75	65	25	50	-30
1995	80	65	20	50	15
Total	330	290	90	260	45

156. (b) We can see that the increase in raw material has been maximum in 1993, viz. 15 points increase.

157. (c) The change in the profit is maximum in 1993-94. In this year, there is a 50 points drop in the profits.

158. (c)

Year	Raw Mat (RM)	O.H.	OH/RM × 100
1991	60	10	16.66%
1992	50	20	40%
1993	65	15	23.07%
1994	75	25	33.33%
1995	80	20	25%

Thus, it can be seen from the above table that the overheads as a percentage of raw material is maximum for 1992.

159. (b) The total profits over the period
$=(15+25+20-30+15)=45$
Total costs $=(330+290+90+260)=970$.
Hence, profit/costs $=45/970=4.6\%=5\%$ (Approximately)

160. (b) If the interest component is not included in the cost, the data can be represented as follows.

Year	Cost	Profits	P/C × 100
1991	115	15	13.04%
1992	125	25	20%
1993	140	20	14.28%
1994	165	-30	-
1995	165	15	9.09%

Hence, we can see from the table that maximum profit per unit cost is in 1992.

161. (c) Lewis Hamilton is a British Formula One racing driver. He had won the 2008 Formula One World Championship. He became the youngest driver to win the title, as well as the first black driver.

162. (a) 163. (c) 164. (b)

165. (c) India has started Operation Insaniyat to provided assistance to Bangladesh in response to humanitarian crisis being faced by it due to large influx of Rohingya refugees from Myanmar. Under this operation, India will provide relief material consisting of items including rice, sugar, salt, pulses, cooking oil, biscuits and mosquito nets to the affected people.

166. (c) The Tez app is developed by Google. It operates atop the Unified Payments Interface, developed by the National Payments Corporation of India.[3] It can be used where UPI payments are accepted.

167. (b) 168. (d) 169. (a)

170. (a) Copa America, known until 1975 as the South American Football Championship, is a men's international football tournament contested among national teams from CONMEBOL. It is the oldest international continental football competition. Since 1993, the tournament has generally featured 12 teams - all 10 CONMEBOL teams and two additional teams from other confederations.

171. (c)

172. (d) Chhattisgarh located in the centre-east of the country. It is the tenth-largest state in India, with an area of 135,191 km2 (52,198 sq mi). The state was formed on

1 November 2000 by partitioning 10 Chhattisgarhi and 6 Gondi speaking southeastern districts of Madhya Pradesh. The capital city is Raipur.

173. (d) The Fundamental Rights are defined as basic human freedoms that every Indian citizen has the right to enjoy for a proper and harmonious development of personality. There are six basic Fundamental Rights of Indian Citizens, which are right to equality, right to freedom of religion, cultural and educational rights, right to freedom, right to constitutional remedies and right against exploitation.

174. (d) The International Atomic Energy Agency (IAEA) has opened world's first low Enriched Uranium (LEU) Bank in Oskemen in Kazakhstan. The bank is owned and managed by IAEA. It will be the first of its kind LEU bank not to be under control of any individual country. The LEU Bank has reserve capacity to store 90 tons of LEU, the essential ingredient needed to make the fuel for light-water nuclear reactors.

175. (d) The first regional centre of the New Development Bank, set up by India and other BRICS nations, was officially opened in South African. The New Development Bank (NDB), formerly referred to as the BRICS Development Bank, is a multilateral development bank established by the BRICS states (Brazil, Russia, India, China and South Africa) with an initial authorised capital of the bank is USD 100 billion.

176. (a)

177. (c) Ahmedabad city has been declared as a World Heritage City (WHC) at the 41st session of UNESCO's world heritage committee. With this, the 606-year-old walled city of Ahmedabad, which was founded by Sultan Ahmed Shah, has become India's first World Heritage City. The city was also the center for India's non-violent freedom struggle led by Mahatma Gandhi.

178. (d) MENASA is refers to the Middle East, North Africa and South Asia region. It consists mostly of Islamic regions of MENA and South Asia, with Dubai chosen as its United Nations headquarters.

179. (d) 180. (b) 181. (a)

182. (d) Padma Awards, one of the highest civilian Awards of the country, are conferred in three categories, namely, Padma Vibhushan, Padma Bhushan and Padma Shri. The awards are announced on the occasion of Republic Day every year. President Pranab Mukherjee announced the names of recipients of year 2017 Padma awards. He approved conferment of Padma Awards on 89 persons. The list includes 7 Padma Vibhushan, 7 Padma Bhushan and 75 Padma Shri Awardees.

183. (c) 184. (b)

185. (b) The 2017 Spanish Grand Prix was a Formula One motor race held on 14 May 2017 at the Circuit de Barcelona-Catalunya in Montmelo, Spain. Lewis Hamilton has won the Spanish Grand Prix from pole position in the Formula One championship. This is Hamilton's 55th career win and second win of the season.

186. (d) 187. (c) 188. (c)

189. (c) The Andes Mountains are the longest continental mountain range in the world, forming a continuous highland along the western edge of South America. It is a collection of numerous mountain chains which join together in what are called orographic knots. The range is 7,000 km long, 200 to 700 km wide (widest between 18° south and 20° south latitude), and has an average height of about 4,000 m.

190. (a)

191. (c) Narinder Singh Kapany is an Indian-born American physicist known for his work in fibre optics. He is also known as "Father of Fiber Optics". The term fibre optics was coined by Singh Kapany in 1956.

192. (d) PARAM is a series of supercomputers designed and assembled by the Centre for Development of Advanced Computing (C-DAC) in Pune, India. PARAM 8000 was the first indigenously developed Super Computer of India. It was architectted by Vijay Bhatkar and was a fairly new and innovative microprocessor architecture designed for parallel processing at the time.

193. (b) Corporation Bank is the first bank to launch the Mudra Card based on the RuPay platform under the Pradhan Mantri MUDRA Yojana (PMMY). Micro Units Development & Refinance Agency Ltd. (MUDRA) is a new institution set up by Government of India to provide funding to the non-corporate, non-farm sector income generating activities of micro and small enterprises whose credit needs are below ₹10 Lakh.

194. (d) Indian Banks' Association (IBA), an association of Indian banks and financial institutions. It was formed in Mumbai on 26 September 1946 as a representative body of management of banking operating. It was formed for development, coordination and strengthening of Indian banking, and assist the member banks in various ways including implementation of new systems and adoption of standards among the members.

195. (c)

196. (a) The Global Hunger Index (GHI) is a tool designed to comprehensively measure and track hunger at global, regional, and national levels. The GHI is designed to raise awareness and understanding of the struggle against hunger, provide a way to compare levels of hunger between countries and regions, and call attention to those areas of the world where hunger levels are highest and where the need for additional efforts to eliminate hunger is greatest. The GHI was initially published by the International Food Policy Research Institute (IFPRI) and Welthungerhilfe.

197. (a) 198. (d)

199. (a) Balance of trade is the difference between the value of a country's imports and exports for a given period. The balance of trade is the official term for net exports that makes up the balance of payments. The balance of trade can be a "favorable" surplus (exports exceed imports) or an "unfavorable" deficit (imports exceed exports).

200. (d)