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TEST BOOKLET

CSAT APTITUDE TEST– (4285) – 2024

Time Allowed: Two Hours

Maximum Marks: 200

INSTRUCTIONS

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS BOOKLET **DOES NOT** HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.

2. ENCODE CLEARLY THE TEST BOOKLET SERIES **A, B, C** OR **D** AS THE CASE MAY BE IN THE APPROPRIATE PLACE IN THE ANSWER SHEET.

3. You have to enter your Roll Number on the Test Booklet in the Box provided alongside. **DO NOT** write *anything else* on the Test Booklet.

4. This Test Booklet contains **80** items (Questions). Each item is printed in **English.** Each item comprises four responses (answers). You will select the response which you want to mark on the Answer Sheet. In case you feel that there is more than one correct response, mark the response which you consider most appropriate. In any case, choose *ONLY ONE* response for each item.

5. You have to mark all your responses *ONLY* on the separate Answer Sheet provided. See direction in the answers sheet.

6. All items carry equal marks. Attempt all items. Your total marks will depend only on the number of **correct responses** marked by you in the answer sheet. For **every incorrect** response **one-third** of the allotted **Marks** will be deducted.

7. Before you proceed to mark in the Answer sheet the response to various items in the Test booklet, you have to fill in some particulars in the answer sheets as per the instruction sent to you with your Admission Certificate.

8. After you have completed filling in all responses on the answer sheet and the examination has concluded, you should hand over to Invigilator only the answer sheet. You are permitted to take away with you the Test Booklet.

9. Sheets for rough work are appended in the Test Booklet at the end.

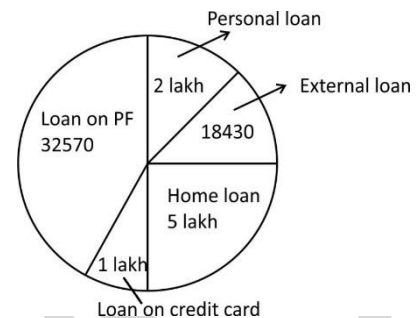## DO NOT OPEN THIS BOOKLET UNTIL YOU ARE ASKED TO DO SO

1

1. Which of the following sets is/are infinite?

(i) {x: x ∈ R and 0<x<1}

(ii) D = {x: x is divisor of 50}

(iii) C = The set of prime numbers less than 10.

(iv) Set of all lines in a given plane.

Select the correct answer using the codes given below.

(a) (i) and (ii)

(b) (ii) and (iii)

(c) (ii) and (iv)

(d) (i) and (iv)

2. Sameer gave 2/5th of his money to Alok. Alok gave 2/5th of what he got from Sameer to Yogesh. If Yogesh got Rs. 2100 less than the total money that Sameer had at the start, then how much money did Alok get from Sameer?

(a) Rs. 1000

(b) Rs. 1250

(c) Rs. 1460

(d) Rs. 1700

3. A number is made up of 2 digits, out of which the first digit is 2. If the sum of that number and the number obtained by reversing its digits is 99, then what is the second digit of that number?

(a) 6

(b) 7

(c) 8

(d) 9

4. Study the following pie-chart carefully and answer the question that follows.

Pie-chart given below shows the various loans taken by Ranjan from different sources to construct his house.

Note: The relative sizes of the various sections shown in the above pie chart may not be in the same proportion as their value.

What is the central angle made by the loan on credit card?

(a) 60º

(b) 90º

(c) 70º

(d) None of these

Directions for the following 3 (three) items:

*Read the following **two** passages and answer the items that follow each passage. Your answers to these items should be based on the passages only.*

Passage – 1

The balance of pursuing market opportunities while maintaining accountability and ethical integrity has proved a defining challenge for business enterprises since the arrival of the joint-stock company in the early years of industrialism. The accountability and responsibility of business enterprises are constantly subject to question. The manifest failures of corporate governance and business ethics in the global financial crisis have increased the urgency of the search for a better ethical framework and governance for business. A substantial increase in the range, significance, and impact of corporate social and environmental initiatives in recent years suggests the growing materiality of a more ethically informed approach.

5. Based on the above passage, the following *assumptions* have been made:

1. The present processes of corporate governance and business ethics are now outdated.

2. Before industrialism, maintaining accountability and ethical integrity was not a challenge.

Which of the above assumptions is/are valid?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

6. According to the author,

(a) Poor accountability mechanism in corporate governance erodes the trust of the people.

(b) With time, corporate governance and business ethics have grown to be more ethical.

(c) Without ethics, corporate governance is devoid of accountability and responsibility.

(d) Financial crisis is the real test of any approach to corporate governance or business ethics.

Passage – 2

Since the Census enumeration can only begin a few months after administrative boundaries are frozen and as general elections are scheduled early next year, the possibility of a Census in 2023 is ruled out. Also, the Census enumeration will be preceded by house-listing enumeration where the exercise for National Population Register (NPR) is to be held. Earlier, the deadline for jurisdictional changes was June 30, 2023, and before that, December 31, 2022. In May, Union Home Minister Amit Shah said the government is planning to bring a bill in Parliament to link data related to birth and death with electoral rolls and the overall development process. Shah had said the census is a process that may form the basis of the development agenda. Digital, complete, and accurate census figures will have multi-dimensional benefits, he said, adding planning based on the census data ensures development reaches the poorest of the poor. If the birth and death certificate data are preserved in a special way, development works can be planned properly. A bill to link the death and birth register with electoral rolls will be introduced in Parliament.

7. Which of the following statements can be *inferred* from the above passage?

1. Census will be held in 2024.

2. Fruits of development may reach the most impoverished people through the census exercise.

Select the correct answer using the codes given below.

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

8. Ram and Shyam are two workers. Ram takes 8 hours more to complete a work alone, than if both worked together. Shyam alone takes 4 ½ hours more to complete the work, than if both worked together. How long will it take for them to complete the work, if they work together?
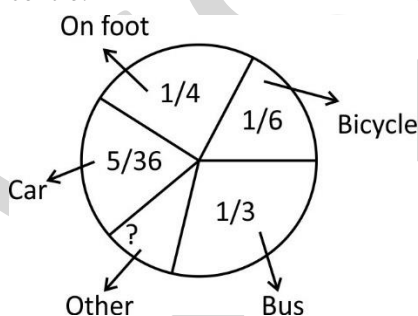
(a) 4 hours

(b) 5 hours

(c) 6 hours

(d) 7 hours

9. A container contains a mixture of chocolate and strawberry paste in the ratio of x : y, where x ε (1,2,3,4) and y ε (5,6,7,8). For how many different sets of values of x and y, the resultant mixture will have a ratio of chocolate and strawberry paste as 1 : 2?

(a) 4

(b) 16

(c) 2

(d) 8

10. Study the following pie-chart and answer the question that follows.

Following pie-chart represents different modes of transportation taken by students of a coaching centre.

If the total number of students in the coaching centre is 2160, then what is the total number of students taking other forms of transportation?

(a) 320

(b) 240

(c) 600

(d) Can't be determined

11. Consider the following information and the Statements and Question that follow:

810A4B6C is a 8-digit number, wherein A, B, C represent distinct digits.

Statement 1: The number is divisible by 5, 8 and 9.

Statement 2: Both A and B are composite numbers.

Question: Find A + B + C.

(a) 17

(b) 19

(c) 12

(d) 14

12. Ashok, Manoj and Rakesh together can complete a work in 30 minutes. Manoj and Ashok together can complete that work in 50 minutes. Rakesh alone can finish the same work in how much time?

(a) 45 minutes

(b) 150 minutes

(c) 75 minutes

(d) Data insufficient

13. Two statements S1 and S2 are given below followed by a question.

S1: N divides x and y.

S2: 2N divides x/2 and y/4.
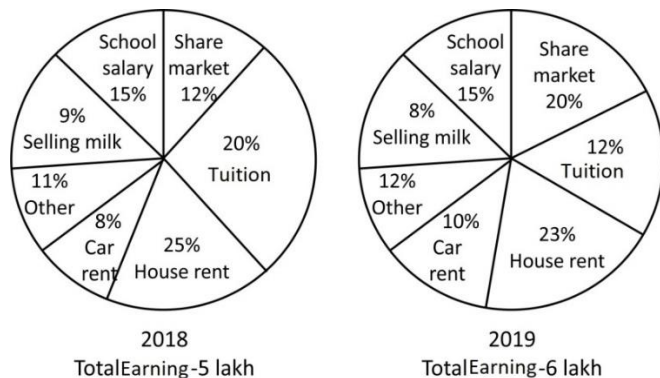
Question: Is N the HCF of the two numbers x and y?

Which one of the following is correct in respect of the above Statements and the Question?

(a) S1 alone is sufficient to answer the question.

(b) S2 alone is sufficient to answer the question.

(c) Either S1 alone or S2 alone is sufficient to answer the question.

(d) Both the statements are needed together to answer the question.

Directions for the following 2 (two) items:

Study the following pie-chart carefully and answer the questions that follow.

Pie-chart given below shows Rajesh's earnings from different sources in two consecutive years.

2018
Total Earning-5 lakh

2019
Total Earning-6 lakh

14. What is the percentage increase in the earnings from house rent in 2019 as compared to 2018?

(a) 3.04%

(b) 2%

(c) 10.4%

(d) There was a percentage decrease

15. What is the difference between Rajesh's earnings from selling milk in 2018 and 2019?

(a) Rs. 5000

(b) Rs. 2500

(c) Rs. 3500

(d) Rs. 3000

Directions for the following 3 (three) items:

*Read the following **two** passages and answer the items that follow each passage. Your answers to these items should be based on the passages only.*

Scientists on Thursday said they have found evidence to suggest that the universe is replete with low-frequency gravitational waves – ripples in the fabric of space-time that are created by huge objects moving around, colliding, and merging with each other, and predicted by Albert Einstein's General Theory of Relativity more than 100 years ago. The researchers have also contended that these waves create a cosmic background hum, which they could "hear", that permeates outer space. "It's really the first time that we have evidence of just this large-scale motion of everything in the universe," said Maura McLaughlin, co-director of NANOGrav, one of the research teams in the international collaboration that published the results in The Astrophysical Journal Letters, the Associated Press reported. Gravitational waves were first detected in 2015 using an experiment, involving Laser Interferometer Gravitational Observatory (LIGO) detectors. But those waves were of high frequency, believed to be produced by the merger of two relatively small black holes that took place about 1.3 billion years ago. All the subsequent detections after that were also of high-frequency waves. This, however, has changed now. In a bid to discover low-frequency gravitational waves, scientists used an entirely different technology compared to the one used eight years ago, as per different studies that were carried out by radio astronomers representing five different international teams including Indian Pulsar Timing Array (InPTA).

16. Which of the following statements can be *inferred* from the above passage?

1. More evidences supporting Einstein's General Theory of Relativity have been found now.

2. Laser Interferometer Gravitational Observatory (LIGO) detectors were earlier probably more useful in detecting high-frequency gravitational waves.

Select the correct answer using the codes given below.

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

17. Consider the following statements.

1. Gravitational waves are produced by the collision of massive objects in space.

2. The first gravitational waves detected were about a billion years old.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

Passage – 2

Unsafe drinking water, sanitation and hygiene (WASH) were responsible for 395,000 deaths among children under five years of age, according to a new report by the World Health Organization (WHO). This includes 273,000 deaths from diarrhoea and 112,000 deaths from acute respiratory infections. These diseases are the two leading infectious causes of death in children under five years of age in the world. The report, Burden of disease attributable to unsafe drinking water, sanitation and hygiene: 2019 update, showed that half of the world's population still does not have adequate access to drinking water, sanitation and hygiene, which caused the death of at least 1.4 million people and 74 million disability-adjusted life years (DALY) in 2019. Globally, 771 million people lack access to safe water and 1.7 billion people don't have a toilet. The WHO report is based on the estimates of the burden of diseases attributable to unsafe WASH — namely diarrhoea, acute respiratory infections, undernutrition, and soil-transmitted helminthiases (STH). Soil-transmitted helminthiases are transmitted by eggs in human faeces, which in turn contaminate soil in areas where sanitation is poor. STHs affect an estimated 1.5 billion people or 24 percent of the world's population. The WASH-attributable burden of disease from STHs was estimated for 132 low- and lower-middle-income countries (LMICs) only, as this is where these infections are most prevalent.

18. Which of the following *best reflects the most crucial message* conveyed by the author of the passage?

(a) Lack of safe drinking water and sanitation is a major problem in many countries.

(b) Globally, illnesses brought on by contaminated water are on the rise.

(c) Children under 5 are most susceptible to diseases caused by contaminated water.

(d) Africa is the most susceptible continent to waterborne diseases.

19. Consider the following statements.

Statement – 1: $\{x: x \in Z \text{ and } x^2 = 2\} = \emptyset$

Statement – 2: $\{x: x \in N, 4 < x < 5\} = \emptyset$

Which of the above statements is/are correct?

(a) Only 1

(b) Only 2

(c) Both 1 and 2

(d) Neither 1 nor 2

20. Consider the following Statements and the Question that follows:

Statement 1: $4ab > 0$

Statement 2: $b < (a + c)$

Question: Is $(a - b + c) > (a + b - c)$?

Which one of the following is correct in respect of the above Question and Statements?

(a) Statement-1 alone is sufficient to answer the Question.

(b) Statement-2 alone is sufficient to answer the Question.

(c) Both Statement-1 and Statement-2 together are sufficient to answer the Question.

(d) Both Statement-1 and Statement-2 together are not sufficient to answer the Question.

21. Let x = average of the first five prime numbers of the number system, and y = average of the first five composite numbers of the number system, then the difference between x and y is:

(a) 1.8

(b) 2.8

(c) 0.8

(d) None of these

22. A worker can pave 16 meters of road in 16 hours, while another worker can pave the same length of road in 12 hours. If these two work together along with a third worker, they can pave the road in 4 hours. The third worker alone can pave the road in how much time?

(a) 18.7 hours

(b) 9.6 hours

(c) 5.2 hours

(d) None of these

Directions for the following item:

Read the following passage and answer the item that follows. Your answer to this item should be based on the passage only.

Passage

Expanding financial access for women is proven to have a positive impact not only on the women themselves but, consequently, on household incomes. The momentum created by policy responses to the pandemic and the consequent shift to digital services offers the opportunity to address the gender gap in financial inclusion in India. The barriers that women face are gendered: restrictive social norms, mobility constraints, lack of identification, limited financial literacy, insufficient assets for collateral, and low levels of digital literacy. These challenges must therefore be addressed through a women-centric policy approach to financial inclusion that prioritises equal access for women to the full range of financial services available to men. This will allow them the same opportunities as men to participate fully in economic activity.

23. Which of the following statements best reflects what the passage *implies*?

(a) Along with the financial inclusion of women, there is a dire need of changing the perception of their financial independence.

(b) Financial inclusion is essential for economic growth and sustainable development of the country.

(c) The financial independence of women plays a significant role in achieving gender equality between men and women.

(d) Digital services should be made to make women financially literate.

24. 60 men, working 9 hours a day can complete a work in 27 days. How many hours a day must 30 men work to complete the same work in 162 days?

(a) 3 hours

(b) 2 hours

(c) 4 hours

(d) None of these

25. 9 boys and 12 girls perform a task in 15 days. The same task is performed by 39 boys and 72 girls in 3 days. Then what will be the time taken by 20 boys and 5 girls in performing the same task ?

(a) 12 days

(b) 8 days

(c) 9 days

(d) 10 days

26. Shubham does half of the work done by Raj in one fourth of the time taken by Raj. If both working together can complete the work in 18 days, then in how many days can Raj alone complete the work?

(a) 52 days

(b) 48 days

(c) 36 days

(d) None of these

27. $M = 7^{2N} - 1$, where N is a natural number. M is divisible by 6 for

(a) Any odd value of N

(b) Any even value of N

(c) Any value of N

(d) No value of N

28. Find the smallest possible number which when divided by 6, 13 and 17 leaves a remainder of 3 in each case.

(a) 1316

(b) 1326

(c) 1329

(d) 1323

29. Amar can do a piece of work in 20 days. Sanjay is 25% more efficient than Amar. Find the number of days it takes Sanjay to do the same piece of work.

(a) 14 days

(b) 16 days

(c) 12 days

(d) 18 days

30. Neha observed that drops of water fall from four different taps at intervals of 45 seconds, 60 seconds, 75 seconds and 90 seconds respectively. If they fell simultaneously at 11:00 am, find the next time when they would fall simultaneously again.
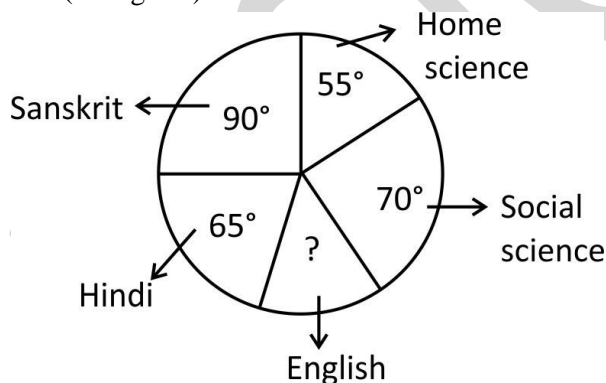(a) 11:30 am
(b) 11:15 am
(c) 11:45 am
(d) 12:15 am

31. Ananya and Rudra can together complete a work in 30 days. But they both work together only for 20 days, after which Rudra stopped working. If Ananya alone can complete the remaining work in the next 20 days, then in how many days could Ananya have completed the whole work alone?
(a) 50 days
(b) 65 days
(c) 60 days
(d) 55 days

32. Study the following pie-chart and answer the question that follows.
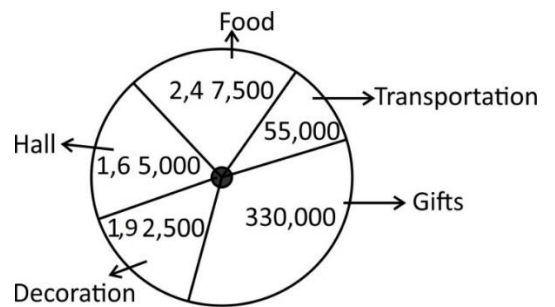Following pie-chart represents the relative marks obtained by Ravina in different subjects (in degrees).

If she scored a total of 540 marks out of 720 marks, then the marks obtained by her in English is what percent of the total marks scored by her?
(a) 18%
(b) 16.67%
(c) 30%
(d) None of these

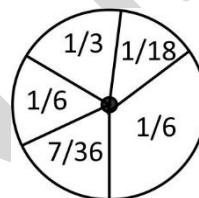**33.** Study the following pie-chart and answer the question that follows.
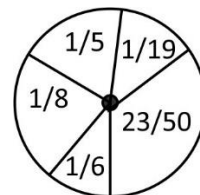Following pie-chart represents the expenses incurred in a marriage ceremony.

Expense of a marriage ceremony
Total = 9,90,000

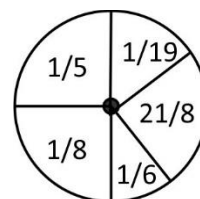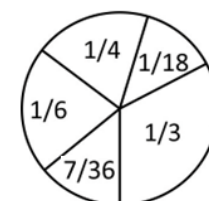Which of the following pie charts is similar to the one given above?

(a)

(b)

(c)

(d)

Directions for the following 3 (three) items:

*Read the following **two** passages and answer the items that follow each passage. Your answers to these items should be based on the passages only.*

Passage – 1

The commodification of reality and the manufacture of demand have had serious implications for the construction of human beings in the present day, where, to quote philosopher Herbert Marcuse, "people recognise themselves in their commodities". The capitalist system, dependent on a logic of never-ending growth from its earliest inception, confronted the plenty it created in its home states, especially the US, as a threat to its very existence. It would not do if people were content because they felt they had enough. However, over the course of the 20th Century, capitalism preserved its momentum by moulding the ordinary person into a consumer with an unquenchable thirst for its "wonderful stuff".

34. Which one of the following statements ***best reflects the underlying message*** of the passage?

   (a) The unquenchable thirst of humans for the "wonderful stuff" is a hindrance to their happiness.

   (b) Due to the problem of plenty, consumerism should not be a model for the growth of any country.

   (c) The disadvantages of consumerism outweigh its benefits, especially in the case of the US.

   (d) Capitalist model of growth is centred on the philosophy of consumerism by transforming ordinary people into perpetual consumers.

Passage – 2

Agricultural methods often vary widely around the world, depending on climate, terrain, traditions, and available technology. Low-technology farming involves permanent crops: food grown on land that is not replanted after each harvest. Citrus trees and coffee plants are examples of permanent crops. Higher-technology farming involves crop rotation, which requires knowledge of farmable land. Scholars and engineers use crop rotation and irrigation to plant crops according to the season, type of soil, and amount of water needed. In coastal West Africa, farmers, usually women, plant corn soon after the first rains of the growing season. They often use an ancient method of clearing called slash-and-burn. First, the farmer cuts all the brush in her plot. When this vegetation dries, she sets fire to it. The heat from the fire makes the soil easy to turn, and the burned vegetation fertilizes it. The farmer then sows kernels of corn saved from the previous year's harvest.

35. Which of the following is/are the ***most rational and logical inference/inferences*** that can be made from the passage?

   1. The people of Coastal West Africa are not aware of the modern-day agricultural technologies.

   2. Cultivation of permanent crops is more beneficial for farmers as compared to rotational crops.

Select the correct answer from the code given below.

   (a) 1 only
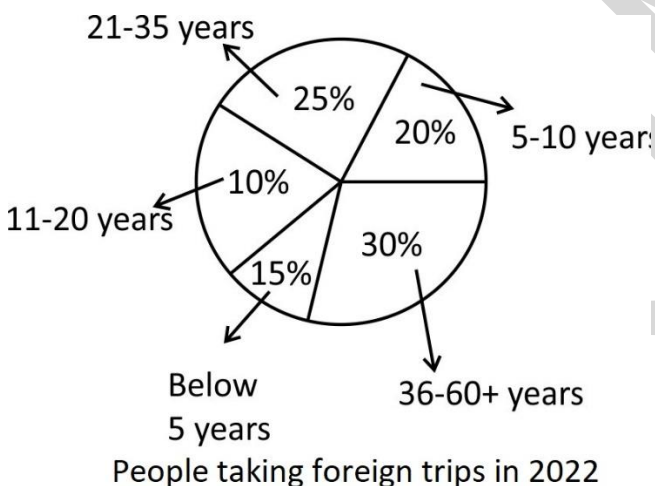
   (b) 2 only

   (c) Both 1 and 2

   (d) Neither 1 nor 2

36. With reference to the passage, which one of the following statements is correct?

(a) Agriculture is the main occupation of women in Coastal West Africa.

(b) Farming is not highly remunerative for farmers and hence it requires the intervention of technology

(c) Slash-and-burn is the best agricultural method as per the geography of Coastal West Africa.

(d) It may not be possible for everyone to practice high-technology farming.

37. A can do four times the work that B can do in the same amount of time. If both together can complete a work in 28 days, then in how much time can A alone complete that work?

(a) 35 days

(b) 45 days

(c) 55 days

(d) 14 days

38. Shubham has some dresses with him. If he distributes them equally among 20 or 30 or 50 children, he would be left with 16 dresses in each case. Instead, if he distributes them equally among 14 children, he would be left with no dress. Find the minimum possible number of dresses he has.

(a) 316

(b) 512

(c) 616

(d) None of these

39. In a high school trip, 60 students are of science stream, 36 students are of commerce stream and 24 students are of arts stream. Find the minimum number of buses required if in each bus the same numbers of students are to be seated, and in each bus a group of only one stream has to be seated.

(a) 16

(b) 10

(c) 12

(d) 15

40. A town has a population of 8000 people. Out of these, 4200 people support party A, while 2500 people support party B. If there are 1600 people who support both A and B, then how many are there who support neither A nor B?

(a) 5100

(b) 2900

(c) 1870

(d) 2700

41. In a sports club, 50 persons play cricket, 20 persons play football and 10 play both cricket and football. How many play at least one of these two games?

(a) 45

(b) 55

(c) 60

(d) 65

42. The HCF of two numbers is 12, and their sum is 588. Among all such pairs of numbers, the maximum possible value of the product of these two numbers is:

(a) 51840

(b) 83520

(c) 86400

(d) 87840

43. A man's age was a perfect cube when his son was born. A couple of years later, he had a daughter. What is the possible sum of the ages of man, his son and his daughter when the man's age becomes a perfect cube again?

(a) 136 years

(b) 132 years

(c) 110 years

(d) 130 years

Directions for the following 2 (two) items:

Study the following pie-chart carefully and answer the questions that follow.

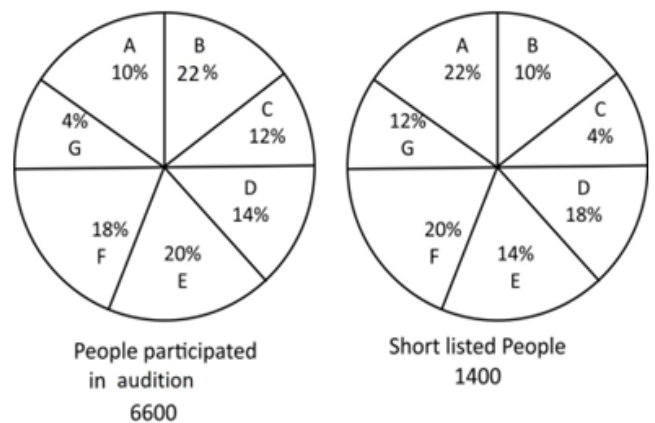Pie-chart given below shows the percentage of people of different age groups, who are taking a foreign trip in 2022.

People taking foreign trips in 2022

44. If the number of people who were taking a foreign trip in 2022 in age group of 21-35 were 24000, then what was the number of people in age group of 36-60+ that were taking a foreign trip?

(a) 27600

(b) 28800

(c) 29200

(d) 32400

45. What is the ratio of the foreign travelers in the age group of 5-10 years and that in the age group of 11-20 years?

(a) 3:1

(b) 2:1

(c) 1:3

(d) 2:5

46. A and B working on alternate days finish a job in 20 days. C working alone finishes the job in 30 days. In how many days will the work be completed if A works on the first day, B works on the second day, C works on the third day and so on?

(a) 21 days

(b) 22.5 days

(c) 22 days

(d) Either on 22nd day or on 23rd day.

Directions for the following 2 (two) items:

Study the following graph carefully and answer the questions that follow.

Pie-chart given below shows the percentage of people that gave audition in a reality show, and the percentage of people shortlisted (from different cities).

People participated in audition 6600

Short listed People 1400

47. The total number of people short-listed from cities E and F is what percent of the total number of people that participated from cities B and E?

(a) 80.95%

(b) 19.05%

(c) 17.17%

(d) Can't be determined

48. Which of the following cities is the most successful when it comes to shortlisting to participation ratio?

(a) C

(b) G

(c) A

(d) B

Directions for the following 2 (two) items:

*Read the following **two** passages and answer the items that follow each passage. Your answers to these items should be based on the passages only.*

Passage – 1

India has the smallest police-per-capita ratio of any major country in the world. Fully one-third of judicial postings lie vacant. The ability of state and local governments to impartially deliver basic welfare services is extremely limited. If these infirmities exist, so will criminal politicians. Because building up the state is a long, slow task ... there are some short-term measures reformers can take, such as cleaning up how politics are funded. But to fully resolve the challenges of this unique nexus, one must address both the supply of criminal politicians as well as the demand for them.

49. Based on the above passage, the following *assumptions* have been made:

1. India's politics is marred by criminal politicians.

2. To fill the vacancies of police and judiciary, the state can increase its source of income through taxes.

Which of the above assumptions is/are valid?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

Passage – 2

When we are discussing governance in particular institutions, the quality of governance within the institutions is often compared to a standard of good governance. Good governance in modern democracy means the democratization of governance. In participatory democracy, people elected their leader to govern them. But governance is not the monopoly of elected leaders. When governance becomes the privilege of a select few or when the people who are governed are kept out of the affairs of governance, it degenerates into misgovernance and becomes a travesty of democracy.

50. Which one of the following statements *best reflects the most rational and logical inference* of the passage?

(a) We cannot imagine governance without citizens' participation.

(b) Citizens should be proactive in participating in the governance of the local bodies.

(c) For good governance, elected leaders should involve people by increasing their participation.

(d) It is not necessary that democratization of governance would lead to good governance.

51. Arijit and Brajesh, working together, can complete a task in 10 days, whereas Brajesh and Chandan can finish the same job in 15 days working together. If Arijit works for 5 days and Brajesh works for 8 days, it takes Chandan 9 days to complete the rest of the task. How many days will Chandan take to finish the same job alone?

(a) 10 days

(b) 20 days

(c) 30 days

(d) None of the above.

52. Earning by a man on Wednesday is three-fourth of the money he earns on Monday and Tuesday combined. In the next two days his earning is half of what he earns in the previous three days combined. On Saturday he earns Rs. 205, which is Rs. 5 and Rs. 25 more than what he earns on Monday and Tuesday respectively. How much money did he earn in the whole week, if Sunday is a holiday?

(a) Rs. 1220.50

(b) Rs. 1210.50

(c) Rs. 1202.50

(d) None of these

53. In a health survey of 100 families, it was found that 50 families were suffering from diabetes, 75 families were suffering from blood pressure, and 25 families were suffering from a rare disease. Only 10 families have all the three kinds of diseases, and each family suffering from a rare disease is also suffering from blood pressure. How many families are suffering from blood pressure only?

(a) 20

(b) 25

(c) 35

(d) 45

54. $P = \{x: x \in N, x$ is a multiple of $3\}$; $Q = \{x: x \in N, x$ is a multiple of $7\}$; $R = \{x: x \in N, x$ is a multiple of $9\}$;
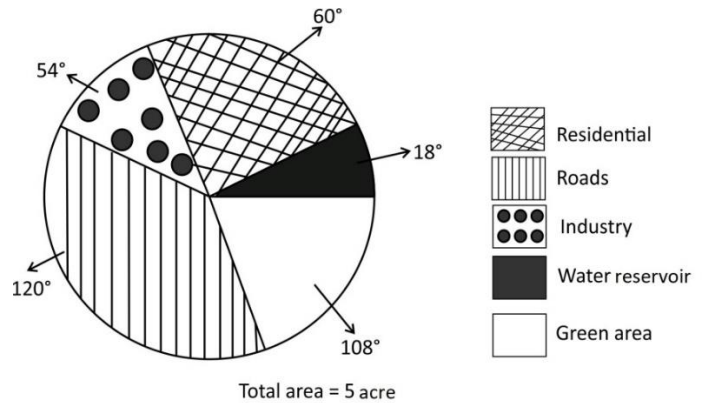
We can also represent $(P \cap Q) \cap R$ as

(a) $P \cap R$

(b) $Q \cup P$

(c) $P - R$

(d) None of these

Directions for the following 2 (two) items:

Study the following pie-chart and answer the questions that follow.

Pie-chart given below shows the planned usage area of a model urban city.

Total area = 5 acre

55. The area allotted to water reservoir, green area and industry together is what percent of the total area?

(a) Less than 40%

(b) More than 45%

(c) More than 50%

(d) Less than 30%

56. Land allotted to green area is what percent of the land allotted to residential area?

(a) 80%

(b) 120%

(c) 70%

(d) 180%

57. Find the largest three-digit number which when divided by 8 or 12 leaves a remainder of 2 in each case.

(a) 986

(b) 882

(c) 976

(d) 678

58. Shyam can do only one-fourth of the work in $3/5^{th}$ of the time taken by Ram to complete the same piece of work. If together they can complete the work in 24 days, then in how many days can Shyam alone complete the whole work?

(a) 83.6

(b) 80.6

(c) 82.6

(d) None of these

59. In a marriage party 82% guests took coffee, and 54% guests took soft drink. If each guest took either coffee or soft drink and there were 72 guests who took both, then what is the total number of guests in the party?

(a) 210

(b) 240

(c) 200

(d) 400

60. A six digit number is of the form XYXYXY (such that $1 \leq X \leq 9$ & $1 \leq Y \leq 9$). Which of the following will always divide such type of six digit number?

(a) 101

(b) 10101

(c) 1010

(d) 1011

61. What is the unit digit of $6^{25} + 9^{16} + 5^{40}$?

(a) 4

(b) 3

(c) 2

(d) 1

Directions for the following 3 (three) items:

*Read the following **two** passages and answer the items that follow each passage. Your answers to these items should be based on the passages only.*

Passage – 1

The internal security environment in India is highly complex and challenging. Yet it is to the credit of India and the Indian people that none of the security challenges has overwhelmed the country. Despite these challenges, India has become stronger and today is looking towards becoming a middle-income country and a major player in global affairs. The instability created by the partition would have destabilized India, which is highly diverse and varied. Many of our problems can be traced to the partition. Yet, India has retained its unity and emerged as a strong country. While there is no room for complacency, the country is confident that despite the complexity, these challenges can be handled through a combination of sound policies and institutional capacity.

62. Based on the above passage, the following *assumptions* have been made:

1. The growth and the per capita income of a country can increase despite the instability in the country.

2. The government of India has been able to successfully curb secessionist tendencies causing internal security issues.

Which of the above assumptions is/are valid?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

63. With reference to the passage, which one of the following statements is correct?

    (a) Sound policies are more than enough to handle the complex internal security challenges.

    (b) The root cause of all the internal security challenges lies in the partition of the country.

    (c) Internal security challenges have not deterred India from moving along a growth trajectory.

    (d) The handling of internal security challenges requires effort not only in the domestic arena but also in the external environment.

Passage – 2

In recent years, there has been a surge of studies revealing that the trillions of microbes living in and on our bodies play a vital role in maintaining good health. These have largely used next-generation sequencing approaches to provide a snapshot of the type and abundance of species in these microbial communities, drawing relationships between healthy and disease states. The results have uncovered associations between disruptions to the human gut microbiota and many different diseases – including inflammatory bowel disease, cancer, and neurodevelopmental disorders. But other experimental approaches are needed to understand the underlying mechanisms for how interactions between the gut microbiota and the host affect human health and disease.

64. Which one of the following statements *best reflects the crux* of the passage?

    (a) The major cause of cancer, neurodevelopmental disorders and inflammatory bowel disease could be considered the gut microbiota.

    (b) Despite extensive research, the mechanisms of interactions between the gut microbiota and the host is not clear.

    (c) Human gut microbiota gets disturbed due to the different diseases caused in humans.

    (d) By restoring the gut microbiota, the diseases like cancer, and neurodevelopmental disorders could be treated.

65. Raju can paint $2/5^{th}$ of a wall in 6 days. Sandhya can paint $1/3^{rd}$ of the same wall in 10 days. In how many days can both together paint the wall?

    (a) 8 days

    (b) 10 days

    (c) 12 days

    (d) 15 days

66. There are four temples in a town, each having one bell. If these four bells ring at an interval of 9, 15, 18 and 25 seconds respectively, then calculate how many times will they ring together in 4 hours?

    (a) 32 times

    (b) 16 times

    (c) 18 times

    (d) 36 times

67. Consider the following sets:

P = {x: x is a letter of the word 'BLOW}'

Q = {x: x is a letter of the word 'FLOW'}

R = {x: x is a letter of the word 'SLOW'}

Which of the following is false?

(a) P ⊂ Q

(b) R ⊆ Q

(c) Q = R

(d) None of these

68. In a school examination 40% failed in science and 60% failed in maths, but 30% passed in both the examinatons. If 12000 failed in both the exams, then how many students appeared in the school exam?

(a) 40000

(b) 64000

(c) 48000

(d) 56000

69. If M = {m, n}, N = {4, 6, 8, 10} and O = {6, 8, 10, 11, 12}, then find M × (N ∩ O).

(a) M ∪ O

(b) ∅

(c) {(6, m), (8, m), (6, n), (8, n)}

(d) {(m, 6), (m, 8), (m, 10), (n, 6), (n, 8), (n, 10)}

70. There are 80 soldiers enrolled in the security of a VIP. 20 percent of these soldiers own a bullet proof jacket, while 50 percent of the remaining own a helmet only. How many soldiers neither own a bulletproof jacket nor a helmet?

(a) 22

(b) 32

(c) 42

(d) 52

Directions for the following 4 (three) items:

*Read the following **four** passages and answer the items that follow each passage. Your answers to these items should be based on the passages only.*

Passage – 1

An extremely unusual marine heatwave is occurring in the North Atlantic Ocean, especially around the United Kingdom (UK) and Ireland. It has lasted for more than two months and may continue through the rest of the year as well. The occurrence is part of a worldwide pattern driven by global warming and the development of El Nino conditions in the equatorial Pacific Ocean. A marine heat wave is an extended period of warmer-than-normal sea surface temperatures (SST). Such warming has never been observed in the region before and could lead to long-lasting impacts on marine flora and fauna, on livelihoods and local weather patterns, and even heatwaves on the land. "The current marine heatwave is classified as an Extreme Category IV / V Marine Heatwave — extremely unusual for this time of year," said Craig Donlon, head of the Earth Surfaces and Interior Section at European Space Agency (ESA), in a statement. On June 18, temperatures in the North Sea were more than five degrees Celsius above normal, while they were 8°C above normal in the Baltic Sea, according to the ESA satellite data.

71. Which of the following statements *best reflects the crux* of the passage?

(a) El Nino and La Nina impact the global weather system.

(b) Unusual marine heatwave in North Atlantic Ocean might continue throughout the year.

(c) North Europe is the most affected region due to marine heat waves.

(d) Increasing marine traffic is causing the marine heat wave in Europe.

Passage – 2

While referring to business activities, Mahatma Gandhi once mentioned that all businesses have a social responsibility which has nothing to do with their ordinary economic activity. For instance, if there is a natural calamity in an area adjoining a business organisation, society would expect the business to participate in the relief work. Such a social responsibility arises out of ethical considerations and not out of profit-making considerations. Therefore, the responsibility towards society is a moral obligation arising out of business ethics, which in turn is steeped in the philosophy of business.

72. Which of the following statements best reflects what the passage *implies*?

(a) Businesses which are focused on profit-making are not considered to be ethical.

(b) Philosophy of business should include social responsibility.

(c) Not only businesses but every person in society should be socially responsible.

(d) Without profit making no business could be socially responsible.

Passage – 3

Connecting the dots moving forward, does start with looking backwards. And up, down, and everywhere. But it especially involves looking inward. By examining your past (and present) behaviours, beliefs, values, and actions, you will start to see a pattern – aka dots connecting. Based on this intelligence that you have gathered about the things you hold most dear – both personally and professionally – you can start to chart your dots for future action. Your vision for the future is therefore built on being able to see the connected dots of your past. From here you can either continue to follow the pattern of previous dots or start a dot course correct.

73. Which one of the following statements *best reflects the crux* of the passage?

(a) Drawing lessons from past mistakes and applying them in our future to move forward is the aim of connecting the dots.

(b) Dots are nothing but life incidents and your reactions to them.

(c) Connecting the dots help a person become more emotionally intelligent.

(d) To move forward in life, we should always challenge our beliefs, values, and actions.

Passage – 4

A good leader with a stress-free mind can easily spot any signs of trouble in his team, and quickly and effectively solve these issues as they arise. Since the techniques used in managing stress are also very beneficial to creating emotional management, when used now, the mind of the leader can immediately become clear to handle any challenges in the workplace. This may also help them to objectively handle any bullying and/or unethical practices that may be occurring in the team with firmer yet fairer hands, without reacting too harshly or personally with the concerned team members.

74. Which one of the following statements *best reflects the crux* of the passage?

(a) For productivity and efficient management, a good leader should manage his stress on priority.

(b) Understanding of emotions of self and others is crucial for becoming a good leader in the corporate world.

(c) Team management is an intrinsic ability of a good leader.

(d) A good leader does not face any stress in managing team members or his own productivity.

75. In a class, there are 18 boys who are over 160 cm tall. If these boys constitute three-fourth of the total number of boys, which is two-thirds of the total number of students in the class, what is the number of girls in the class?

(a) 10

(b) 12

(c) 14

(d) 18

76. All the page numbers in a book are added, beginning from page 1. However, a page number was added twice by mistake. If the sum obtained was 850, which page number must have been added twice?

(a) 25

(b) 30

(c) 35

(d) 40

77. Laxman and Suresh can complete a piece of work in 6 days and 12 days respectively, while working alone. If they work together and complete it, then what part of the work is done by Laxman?

(a) 1/4

(b) 2/3

(c) 1/3

(d) 1/2

78. Tina takes a test called CSAT which comprises of 80 questions. In CSAT, three marks are awarded for each correct response, one mark is deducted for each incorrect response and there are no marks for unattempted questions. If she scores more than 150 marks in CSAT, then what is the maximum possible number of incorrect responses that she could have marked?

(a) 18

(b) 20

(c) 22

(d) 24

Directions for the following 2 (two) items:
*Read the following **two** passages and answer the items that follow each passage. Your answers to these items should be based on the passages only.*

Passage – 1

Today, biomimicry is used in everything from medical technology to city planning and architecture. By studying nature, scientists have come up with new ways to fight harmful bacteria and to construct buildings that can heat and cool themselves. Researchers are studying how plants store energy, to help design better solar panels. Biomimicry principles are used to produce more energy-efficient trains and cars and to help manufacturing plants create products that use less energy and produce little or no waste.

79. Which one of the following statements **best reflects what is implied** by the passage?

(a) The multi-dimensional uses of biomimicry are associated with the high cost of development.

(b) The potential of biomimicry promises future living based on the principles of sustainable development.

(c) Energy generation using biomimicry would soon phase out fossil fuels.

(d) Despite its promising future, biomimicry still remains unaffordable.

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Passage – 2

Whether we like it or not, technology has an increasing role in our lives. And while many aspects of modern technology are amazing, access to a 24/7 society can take its toll. For some people, being constantly connected can cause psychological issues such as expectation of instant gratification, distraction, narcissism, sleep issues, stress, even anxiety and depression. Hands up if you find yourself worrying over not getting a prompt reply to your latest WhatsApp or text message. Or are you constantly checking Facebook, Instagram, or Snapchat to see what your friends are up to and how many likes your last post received? If you have raised your hand, you are not alone. These are issues experienced by an increasing number of people.

80. Which one of the following statements *best reflects the underlying message* of the passage?

   (a) There needs to be a balance in work-life responsibilities and we can achieve this by limiting the use of social media.

   (b) Use of technology gives pleasure, but it also takes a toll on mental health.

   (c) Access to social media should be allowed only for a few hours for ensuring better mental health.

   (d) Technology in the form of social media is a bad servant but a good master.