# RRB NTPC CBT-I Official Paper (Held On: 31 July 2021 Shift 1) (Previous Year Paper)

RRB NTPC • 2021 • 100 questions • 90 minutes • Answer key and solutions

**Take this paper as a timed mock test**

Practise under exam conditions, then review your answers after you submit.

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Scan the QR code or click the link to open it.

**Q1.** Which of the following diseases is NOT caused by water pollution?

**(a)** Plague
**(b)** Cholera
**(c)** Typhoid
**(d)** Diarrhoea

**Q2.** In which of the following years did Goa get its independence from Portugal?

**(a)** 1961
**(b)** 1960
**(c)** 1962
**(d)** 1963

**Q3.** The speed of three buses are in the ratio of 5 : 4 : 6. The ratio between the time taken by them to travel the same distance will be:

**(a)** 10 : 12 : 15
**(b)** 5 : 4 : 6
**(c)** 6 : 4 : 5
**(d)** 12 : 15 : 10

**Q4.** Consider the given statements and decide which of the given assumptions is/are implicit in the statement.

Statement:

The state government has decided to appoint 500 civil defence warriors in the next financial year.

Assumptions:

1. There are enough duties with the state government to be disbursed to 500 civil defence warriors.
2. The state government realises the importance of civil defence warriors.

**(a)** Both assumptions 1 and 2 implicit.
**(b)** Only assumptions 2 is implicit.
**(c)** Only assumptions 1 is implicit.
**(d)** Neither assumption 1 nor 2 implicit.

**Q5.** In which of the following years did the Quit India Movement start?

**(a)** 1943
**(b)** 1940
**(c)** 1941
**(d)** 1942

**Q6.** Which of the following plans was started by the central government in 2015 to take care of the UNESCO World Heritage Sites and to make these sites economically viable?

**(a)** UDAY
**(b)** Smart City
**(c)** Hridaya
**(d)** AMRUT

**Q7.** 6% of (25% of Rs. 900) is:

**(a)** Rs. 13.50
**(b)** Rs. 9
**(c)** Rs. 27
**(d)** Rs. 12.50

**Q8.** Who among the following was the speaker of the Lok Sabha before Om Birla?

**(a)** Meira Kumar
**(b)** Sumitra Mahajan
**(c)** Somnath Chatterjee
**(d)** Manohar Joshi

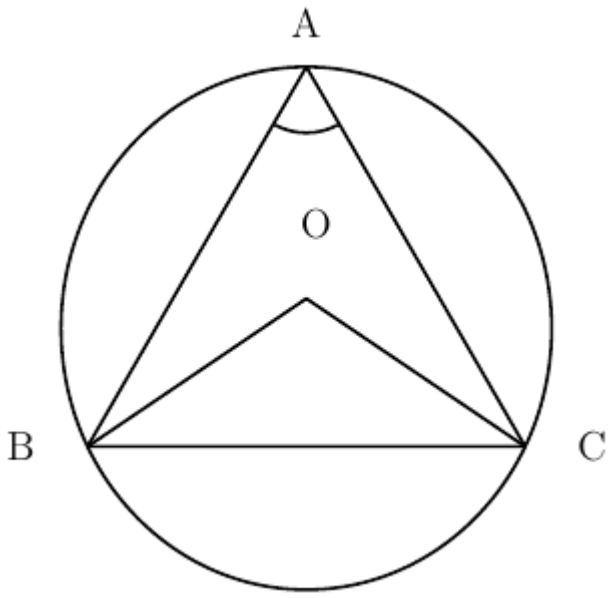
**Q9.** If @ + $ - # = 3 and # + @ - $ = 5, then the value of 2@ + $ - # = ?

**(a)** 8
**(b)** 7
**(c)** 5
**(d)** 6

**Q10.** In a certain code language, GREAT is written as JVJGA. How will ACUTE be written as in that language?

**(a)** DGZZL
**(b)** BGZZO
**(c)** DGZZM
**(d)** DGXZL

**Q11.** In the given figure, the measure of angle BAC + angle OBC is equal to:




**(a)** 90°
**(b)** 45°
**(c)** 60°
**(d)** Cannot be determined

**Q12.** The value of (tan 1° tan 2° tan 3° .....tan 89°)/(tan 45°) is equal to:

**(a)** 0
**(b)** Not defined
**(c)** 1
**(d)** 90

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**Q13.** In which of the following countries is Gold Coast located? The Commonwealth Games 2018 were held in this city.

**(a)** England
**(b)** South Africa
**(c)** Canada
**(d)** Australia

**Q14.** If tan 3θ = cot(60° - θ) and 3θ is an acute angle, then find the value of tan2θ.

**(a)** (√3)/3
**(b)** √3
**(c)** 2
**(d)** 1

**Q15.** What is the name of the intergovernmental military alliance between 30 European and North American countries?

**(a)** The International Military Collaboration
**(b)** The World Militia Organization
**(c)** The International Military Fund
**(d)** The North Atlantic Treaty Organization

**Q16.** ABCD is a square and Q is a point in its interior such that Δ QAB is equilateral. The measure of angle QCB is:

**(a)** 45°
**(b)** 30°
**(c)** 60°
**(d)** 75°

**Q17.** If nC4 = 70, then find n.

**(a)** 5
**(b)** 8
**(c)** 4
**(d)** 6

**Q18.** The democratically elected government of which of the following countries was overturned by a military coup in February 2021?

**(a)** Indonesia
**(b)** Malaysia
**(c)** Afghanistan
**(d)** Myanmar

**Q19.** Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

1. All drums are flutes.
2. No flute is a mike.
3. Some mikes are bands.

Conclusions:

I. Some bands are flutes.
II. No band is a drum.
III. All drums are mikes.

**(a)** Only conclusions I and II follow.
**(b)** Only conclusions II and III follow.
**(c)** Only conclusion I follows.
**(d)** None of the conclusions follow.

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**Q20.** What is the least number that when divided by 18 and 24 leaves a reminder of 11 and 17, respectively?

**(a)** 79
**(b)** 72
**(c)** 24
**(d)** 65

**Q21.** A, B, C, D and E have different heights. Only 2 people are shorter than D. E is taller than B, but shorter than A. A is not the tallest. How many people are taller than C?

**(a)** None, as C is the tallest.
**(b)** 4, as C is the shortest.
**(c)** 1
**(d)** 2

**Q22.** The EEG (electroencephalogram) test is conducted for diagnosing ailments of which of the following organs?

**(a)** Stomach
**(b)** Lungs
**(c)** Brain
**(d)** Heart

**Q23.** Find the value of -5{-5 - (-5 - 2) - 5}.

**(a)** -18
**(b)** 15
**(c)** 18
**(d)** -15

**Q24.** The LCM of two numbers is 1024, and one of them is a prime number. Find their GCD.

**(a)** 2
**(b)** 3
**(c)** 7
**(d)** 5

**Q25.** The ratio between two numbers is 3 : 5 and their sum is 80. Find the greater of the two numbers.

**(a)** 45
**(b)** 50
**(c)** 55
**(d)** 60

**Q26.** In a cuboid, the sum of the squares of its three dimensions is equal to half of its total surface area. If the volume of the cuboid is 729 $cm^3$, then find its lateral surface area (in $cm^2$).

**(a)** 576
**(b)** 648
**(c)** 324
**(d)** 900

**Q27.** Who among the following was the Mughal emperor when soldiers of the Bengal army mutinied in Meerut on 10 May 1857?

**(a)** Bahadur Shah Zafar
**(b)** Saadat Ali Khan
**(c)** Siraj ud-Daulah
**(d)** Burhanul Mulk

**Q28.** Shyam gets back the amount he had invested in buying 100 books by selling 65 of them. What is his profit percentage?

**(a)** 5311/13%
**(b)** 65%

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**(c)** 35%
**(d)** 499/13%

**Q29.** In a certain code language, 'KNSB' is written as '41', and 'CPFG' is written as '27'. How will 'FIJK' be written as in that language?
**(a)** 35
**(b)** 33
**(c)** 37
**(d)** 31

**Q30.** Ram and Shyam can finish a work in 30 days, Shyam and Bharti can finish it in 40 days and Bharti and Ram can finish it in 60 days. How long will they three together take to finish the work?
**(a)** 251/3 days
**(b)** 262/3 days
**(c)** 122/3 days
**(d)** 151/3 days

**Q31.** Select the number from among the given options that can replace the question mark (?) in the following series.
2, 7, 23, ?, 220, 665
**(a)** 80
**(b)** 51
**(c)** 47
**(d)** 72

**Q32.** Trachea is a part of which of the following human systems?
**(a)** Excretory system
**(b)** Circulatory system
**(c)** Endocrine system
**(d)** Respiratory system

**Q33.** Which of the following countries is NOT a part of the European Union?
**(a)** Argentina
**(b)** Germany
**(c)** Greece
**(d)** Hungary

**Q34.** Which of the following rivers makes an estuary?
**(a)** Kaveri
**(b)** Krishna
**(c)** Ganga
**(d)** Narmada

**Q35.** Select the number from among the given options that can replace the question mark (?) in the following series.
7, 20, 46, 85, 137, ?, 280, 371
**(a)** 189
**(b)** 197
**(c)** 202
**(d)** 212

**Q36.** Aman and Barun are brothers. Eva is the daughter of Diva. Diva is the sister of Fiza's husband, Barun.
How is Eva related to Aman?
**(a)** Brother's daughter
**(b)** Brother's wife's sister
**(c)** Daughter
**(d)** Sister's daughter

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**Q37.** M is Y's daughter and X is N's mother. P is A's father and B is N's son. M does not have any sister. P is married to M, and X married to Y. How is B related to P?

**(a)** Brother's son
**(b)** Wife's brother
**(c)** Father's brother
**(d)** Wife's brother's son

**Q38.** Which of the following is the world's largest glacier?

**(a)** Perito Moreno glacier
**(b)** Siachen glacier
**(c)** Lambert-Fisher glacier
**(d)** Greenland ice sheet

**Q39.** Which of the following is the full form of ICANN?

**(a)** The International Corporation for Assigned Names and Numbers
**(b)** The Internet Consortium for Assigned Names and Numbers
**(c)** The Internet Corporation for Assigned Names and Numbers
**(d)** The Internal Corporation for Assigned Names and Numbers

**Q40.** The HCF of all natural numbers from 200 to 478 is:

**(a)** 1
**(b)** 3
**(c)** 2
**(d)** 478

**Q41.** Which of the following is NOT a version of the Android mobile operating system?

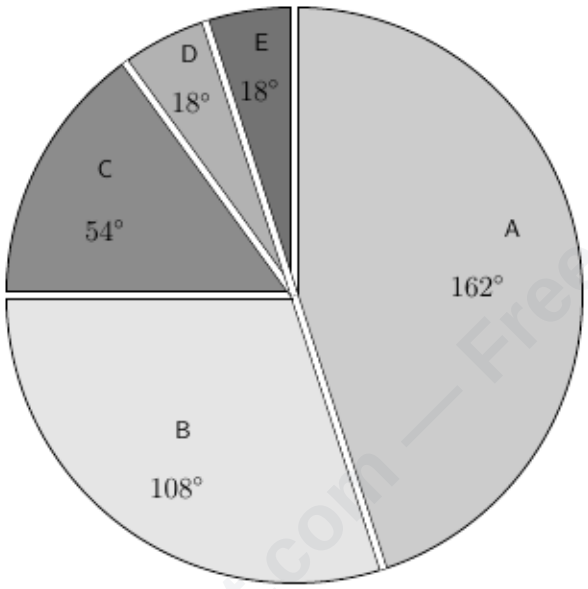
**(a)** Lollipop
**(b)** Candy bean
**(c)** Pie
**(d)** Marshmallow

**Q42.** The average of 7, 14, 21, 28, ... 77 is:

**(a)** 11
**(b)** 66
**(c)** 7
**(d)** 42

**Q43.** Study the given pie chart and answer the question that follows.

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The pie chart shows the employment details of the population of a country. The total population of the country is 5000. A indicates those employed in the public sector, B indicates those employed in the private sector, C indicates those employed in the corporate sector, D indicates those who are self-employed and E indicates those who are unemployed.

What percentage of the employed people are employed in the private sector?

**(a)** 31.58%
**(b)** 31%
**(c)** 29%
**(d)** 33.3%

**Q44.** In which of the following cities is the Mahakaleshwar temple situated?

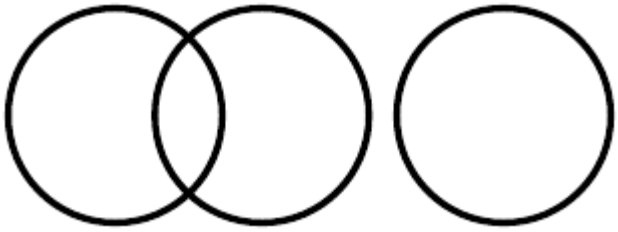
**(a)** Bhopal
**(b)** Bhubaneswar
**(c)** Ujjain
**(d)** Varanasi

**Q45.** Identify the option in which the given events are in the correct chronological order.

I. Non-cooperation Movement
II. The Salt (Dandi) March
III. The Quit India Movement
IV. Mahatma Gandhi's return from South Africa

**(a)** IV, I, II, III
**(b)** II, I, III, IV
**(c)** IV, II, III, I
**(d)** I, II, III, IV

**Q46.** Which of the following options is best depicted by the given Venn diagram?



**(a)** Rulers, Men, Engineers
**(b)** Females, Wives, Doctors
**(c)** Father, Infants, Males

**(d)** Mothers, Actress, Boys

**Q47.** Prime Minister Narendra Modi took part in which of the following activities during his visit to Bangladesh in March 2021?

**(a)** Language Movement Day
**(b)** Bangladesh's 50^(th) Independence Day celebrations
**(c)** Death anniversary of Sheikh Mujibur Rahman
**(d)** Martyred Intellectuals Day

**Q48.** The Siachen Glacier area lies in which of the following regions?

**(a)** Aksai Chin
**(b)** Shivalik Hills
**(c)** Karakoram range
**(d)** Jammu region

**Q49.** Which of the following is a multi-user operating system?

**(a)** Windows 7
**(b)** iOS
**(c)** MS-DOS
**(d)** Unix

**Q50.** What is the atomicity of phosphorus?

**(a)** Poly-atomic
**(b)** Diatomic
**(c)** Tetra-atomic
**(d)** Monoatomic

**Q51.** Which of the following glands produces the insulin hormone?

**(a)** Pancreas
**(b)** Thymus
**(c)** Adrenal
**(d)** Parathyroid

**Q52.** Which of the following is the full form of SIDBI?

**(a)** Small Industries Development Bank of India
**(b)** Small Industries and Domestic Bank of India
**(c)** Small Inter Development Bank of India
**(d)** Small Indian Development Bank for Industry

**Q53.** Chandrayaan – I, India's first mission to moon, was launched successfully in:

**(a)** October 2010
**(b)** October 2008
**(c)** November 2009
**(d)** November 2011

**Q54.** If x : y = y : z = 2 : 3, then find x : y : z.

**(a)** 2 : 3 : 4
**(b)** 4 : 5 : 8
**(c)** 4 : 6 : 7
**(d)** 4 : 6 : 9

**Q55.** Who among the following was the first non-British President of the MCC (Marylebone Cricket Club)?

**(a)** Sachin Tendulkar
**(b)** Kumar Sangakkara
**(c)** Ricky Ponting

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**(d)** Stephen Fleming

**Q56.** The construction of the new Parliament building began under which of the following projects?

**(a)** Central Vista Project
**(b)** Atal Development Project
**(c)** Swaraj Vista Project
**(d)** Raisina Hill Project

**Q57.** A certain number of women went to a hotel. Each women spent as many rupees as one-fourth of the number of women. If the total bill paid was Rs. 20,449, then how many women visited the hotel?

**(a)** 281
**(b)** 286
**(c)** 283
**(d)** 284

**Q58.** Which of the following political parties is NOT in alliance with Maha Vikas Aghadi (English : Maharashtra Development Front) Government?

**(a)** The Indian National Congress
**(b)** The Nationalist Congress Party
**(c)** Janata Dal (United)
**(d)** Shiv Sena

**Q59.** Who among the following won the Filmfare award for 'Best Actor in a Leading Role (Male) 2021'?

**(a)** Irrfan Khan
**(b)** Om Raut
**(c)** Amitabh Bachchan
**(d)** Saif Ali Khan

**Q60.** Find the value of (0.9 × 0.9 × 0.9)/0.9.

**(a)** 0.081
**(b)** 0.81
**(c)** 8.1
**(d)** 81

**Q61.** In which of the following cities is the Tomb of Sheikh Salim Chisti located?

**(a)** Fatehpur Sikri
**(b)** Golconda
**(c)** Junagarh
**(d)** Delhi

**Q62.** The Animal Welfare Board of India was established in the year:

**(a)** 1962
**(b)** 1968
**(c)** 1960
**(d)** 1965

**Q63.** In a Δ ABC, if angle A + angle B = 110° and angle B - angle A = 10°, then which of the following statements holds true for the triangle?

**(a)** AB is the longest side and BC is the shortest side.
**(b)** The length of AB is the same as that of BC.
**(c)** AB is the longest and AC is the shortest side.
**(d)** AC is the longest side and BC is the shortest side.

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**Q64.** If '+' means '×', '×' means '-', '-' means '+', and '÷' remains unchanged, then find the value of the following expression.

18 ÷ 6 + 12 × 2 - 5

**(a)** 39
**(b)** 45
**(c)** 32
**(d)** 35

**Q65.** Asthma is a disorder of the _____ in the human body.

**(a)** respiratory system
**(b)** locomotor system
**(c)** circulatory system
**(d)** digestive system

**Q66.** The dissolution of the Soviet Union began in which of the following years?

**(a)** 1990
**(b)** 1989
**(c)** 1991
**(d)** 1992

**Q67.** Juhu Beach in Mumbai is a part of the:

**(a)** Pacific Ocean
**(b)** Arabian Sea
**(c)** Indian Ocean
**(d)** Bay of Bengal

**Q68.** If a women covers a distance of 101/5 km in 3 hours, then find the distance covered by her in 5 hours.

**(a)** 12 km
**(b)** 13 km
**(c)** 17 km
**(d)** 15 km

**Q69.** In which of the following years was the Sino-Indian War (Indo-China War) fought?

**(a)** 1962
**(b)** 1969
**(c)** 1973
**(d)** 1964

**Q70.** In which of the following places is the Syama Prasad Mookerjee Port located?

**(a)** Kolkata
**(b)** Mumbai
**(c)** Chennai
**(d)** Kandla

**Q71.** Which of the following companies is NOT on the list of Maharatna Companies in India?

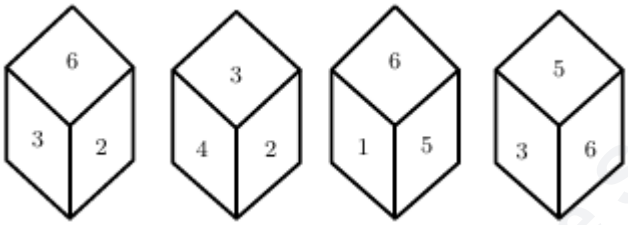
**(a)** Coal India Limited
**(b)** Bharat Heavy Electricals Limited
**(c)** Bharat Petroleum Corporation Limited
**(d)** Cement Corporation of India

**Q72.** Which of the following types of light carries a signal from a television remote to the device it controls?

**(a)** Polarised
**(b)** X-ray
**(c)** Ultraviolet
**(d)** Infrared

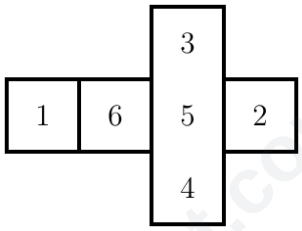
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**Q73.** Four views of the same paper cube are given.

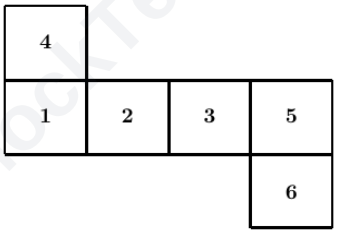



Which of the following will be the correct unfolded view when this paper cube is opened out (flattened)?

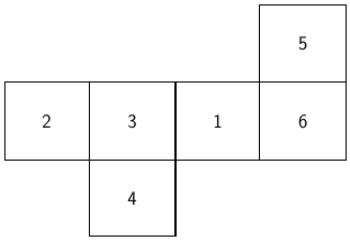
**(a)**



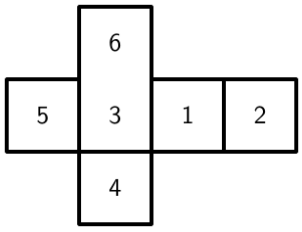

**(b)**




**(c)**




**(d)**




**Q74.** What is the smallest positive integer required to be added to 2712 to make the sum a perfect cube?

**(a)** 150
**(b)** 32
**(c)** 517
**(d)** 10

**Q75.** What number should be added to (-5)/11 to obtain 26/33 ?

**(a)** 21/33
**(b)** 41/33
**(c)** 33/33
**(d)** 11/33

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**Q76.** In a certain code language, CHAIR is written as AFAKT. How will PLATE be written as in that language?

**(a)** NJAVG
**(b)** NJAGV
**(c)** NAJGV
**(d)** JAVGW

**Q77.** L, M, N, O, P, Q and R live on 7 different floors of the same building. The lowermost floor is numbered 1, the floor above that is numbered 2 and so on till the topmost floor is numbered 7. R lives on an even numbered floor, but not on floor number4. Only 1 person lives between R and M. O lives immediately above P, and P lives immediately above Q. More than 3 persons live between Q and L.

How many people live below N?

**(a)** None, as N lives on the lowermost floor.
**(b)** 2
**(c)** 5
**(d)** 4

**Q78.** The least number of years in which a sum of money invested at 20% compound interest will become more than its double is:

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

**Q79.** Consider the average of any five consecutive odd natural numbers as p. If two more consecutive odd numbers, just next to the previous five numbers, are added, then the new average will become:

**(a)** 2p + 1
**(b)** 2/7(p+1)
**(c)** 2p - 3
**(d)** p + 2

**Q80.** Raju takes twice as long to row upstream as to row downstream in a river. If the river flows at 5 km/h, then find the speed of Raju in still water.

**(a)** 19 km/h
**(b)** 15 km/h
**(c)** 13 km/h
**(d)** 17 km/h

**Q81.** Which smallest number must be subtracted from 3467860 so that it becomes exactly divisible by 19?

**(a)** 50
**(b)** 30
**(c)** 11
**(d)** 18

**Q82.** Which of the following are electromagnetic waves?

**(a)** X-rays
**(b)** Beta rays
**(c)** Alpha rays
**(d)** Audible waves

**Q83.** In June 2019, the ancient Buddhist site _____ located in Sarnath, Uttar Pradesh was declared as a 'protected area of national importance' by Archaeological Survey of India.

**(a)** Chaukhandi Stupa
**(b)** Dharmarajika Stupa
**(c)** Sanchi Stupa
**(d)** Dhamek Stupa

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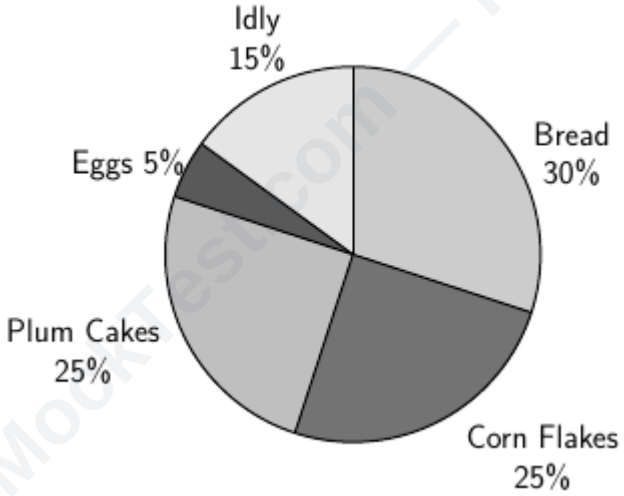
**Q84.** A toy is sold at a profit of 16%. Had it been sold for Rs. 10 more, the profit would have been 20%. Find its cost price.

**(a)** Rs. 240
**(b)** Rs. 260
**(c)** Rs. 250
**(d)** Rs. 300

**Q85.** Study the given pie diagram and answer the question that follows.

The pie diagram shows information about the number of students who like particular types of breakfast items prepared by the hostel chef.

The total number of students in the hostel is 3200.




Which of the following statements is NOT true?

**(a)** The difference between the number of students who like plum cakes and the number of students who like idly, is twice the number of students who like eggs for breakfast.
**(b)** The ratio of the number of students who like idly to the number of students who like eggs is 3 : 1.
**(c)** The difference between the number of students who like both cornflakes and plum cakes and the number of students who like both bread and eggs is greater than the number of students who like idly.
**(d)** Only 160 students like eggs for breakfast.

**Q86.** Study the given table and answer the question that follows.

The table shows the production of wheat (in quintals) in four districts in three years 2016, 2017 and 2018.

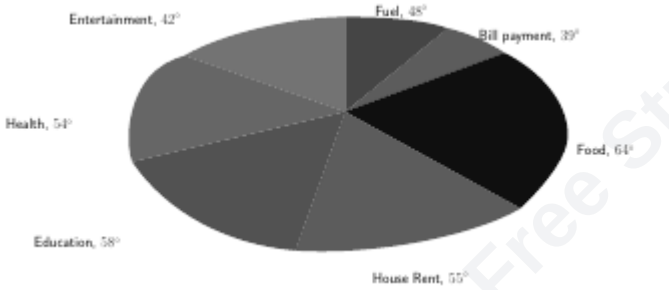
| Year | 2016 | 2017 | 2018 |
|---|---|---|---|
| District | | | |
| District-1 | 1600 | 1640 | 1620 |
| District-2 | 1710 | 1680 | 1750 |
| District-3 | 1800 | 1760 | 1640 |
| District-4 | 1650 | 1550 | 1500 |

By approximately what percentage is the wheat production in District-3 in the year 2017 more than the wheat production in District-1 for the same year?

**(a)** 5%
**(b)** 4%
**(c)** 7%
**(d)** 9%

**Q87.** Study the given circle graph and answer the question that follows.

The circle graph shows the monthly expenditure of a family.

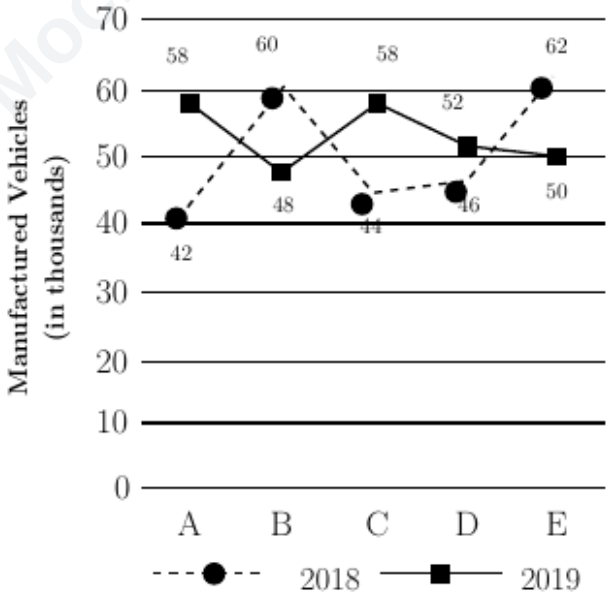



If the total amount spent on Health during the month was Rs. 6,000, then what was the approximate amount spent on the total monthly expenditure?

**(a)** Rs. 40,000
**(b)** Rs. 90,000
**(c)** Rs. 50,000
**(d)** Rs. 12,000

**Q88.** Study the given line graph and answer the question that follows.

The line graph shows the number of vehicles (in thousand numbers) manufactured by five different branches (A, B, C, D and E) of a company in the years 2018 and 2019.




The number of vehicles manufactured by which branch has increased the maximum from 2018 to 2019?

**(a)** Branch A
**(b)** Branch E
**(c)** Branch C
**(d)** Branch D

**Q89.** Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

1. All members are candidates.
2. No student is a candidate.

Conclusions:

1. No member is a student.
2. Some students are members.

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**(a)** Neither conclusion 1 nor 2 follows.
**(b)** Only conclusion 2 follows.
**(c)** Both conclusions 1 and 2 follow.
**(d)** Only conclusion 1 follows.

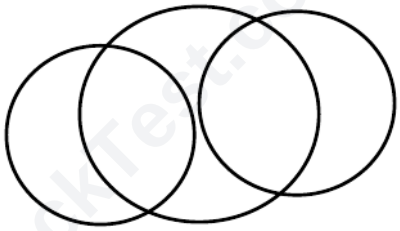
**Q90.** Select the option in which the two numbers share a different relationship from that shared by the two numbers in the rest of the options.

**(a)** 3, 25
**(b)** 5, 36
**(c)** 8, 81
**(d)** 7, 64

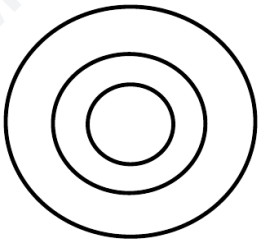
**Q91.** Select the Venn diagram that best represents the relationship between the following classes.

Sisters, Women, Wives

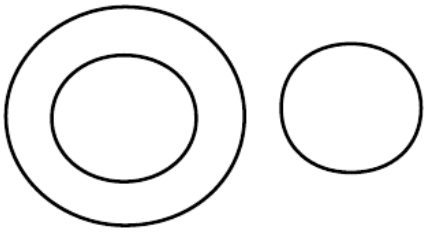
**(a)**



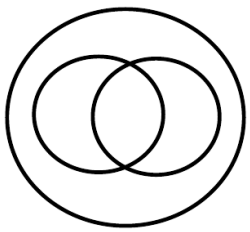
**(b)**



**(c)**



**(d)**



**Q92.** Select the option that is related to the third number in the same way as the second number is related to the first number.

18 : 45 :: 34 : ?

**(a)** 65
**(b)** 85
**(c)** 75
**(d)** 95

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**Q93.** Four letter-clusters have been given, out of which three are alike in some manner and one is different. Select the letter-cluster that is different.

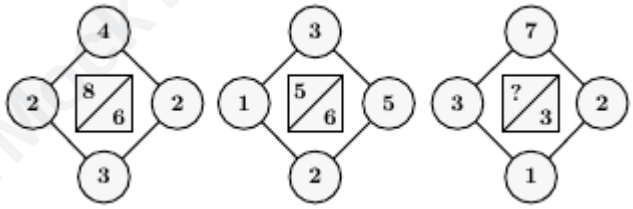
**(a)** WUQ
**(b)** MKF
**(c)** QOK
**(d)** RPL

**Q94.** A, B, C, D, E, F and H are sitting in a straight line. Some of them are facing north, while some are facing south. Only 2 people are sitting to the left of C. C is facing south. Only 2 people are sitting between C and A. D is sitting to the immediate right of A. None of the immediate neighbours of A are facing the same direction as A. H is neither an immediate neighbour of C nor A. F is third to the right of H. More than 3 people are sitting between H and B. Both the immediate neighbours of C are facing the direction opposite to that of C.

Who is sitting to the immediate left of E?

**(a)** D
**(b)** F
**(c)** H
**(d)** C

**Q95.** Study the given pattern carefully and select the number from among the given options that can replace the question mark (?) in it.




**(a)** 5
**(b)** 14
**(c)** 7
**(d)** 11

**Q96.** Select the option that is related to the third term in the same way as the second term is related to the first term.

BOWL : DMYJ :: PLATE : ?

**(a)** RJCRG
**(b)** NNYVC
**(c)** JRCGV
**(d)** RNCVG

**Q97.** Select the letter-cluster from among the given options that can replace the question mark (?) in the following series.

ADGJ, CFIL, ?, GJMP

**(a)** EGIK
**(b)** EHKN
**(c)** DFHJ
**(d)** DFIL

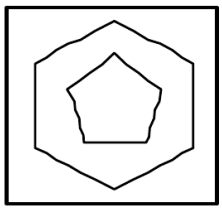
**Q98.** Select the alphanumeric-cluster from among the given options that can replace the question mark (?) in the following series.

3d16, 6e14, 9f12, 12g10, 15h8, ?

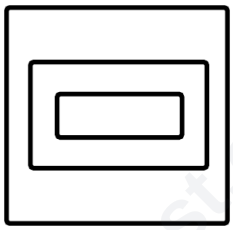
**(a)** 18i4
**(b)** 18i6
**(c)** 27i6
**(d)** 21i6

**Q99.** Four figures have been given, out of which three are alike in some manner and one is different. Select the figure that is different.

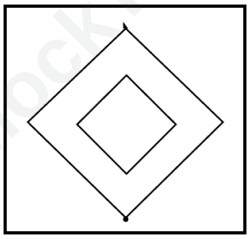
**(a)**



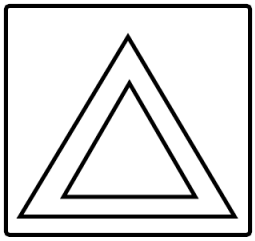
**(b)**



**(c)**



**(d)**



**Q100.** What should be added to (1/2 + 1/3 + 1/5) to get 3?

**(a)** 59/10
**(b)** 54/30
**(c)** 59/30
**(d)** 3/10

## ANSWER KEY

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | a | 2 | a | 3 | d | 4 | a | 5 | d | 6 | c | 7 | a | 8 | b | 9 | b | 10 | a |
| 11 | a | 12 | c | 13 | d | 14 | a | 15 | d | 16 | d | 17 | b | 18 | d | 19 | d | 20 | d |
| 21 | a | 22 | c | 23 | b | 24 | a | 25 | b | 26 | c | 27 | a | 28 | a | 29 | d | 30 | b |
| 31 | d | 32 | d | 33 | a | 34 | d | 35 | c | 36 | d | 37 | d | 38 | c | 39 | c | 40 | a |
| 41 | b | 42 | d | 43 | a | 44 | c | 45 | a | 46 | d | 47 | b | 48 | c | 49 | d | 50 | c |
| 51 | a | 52 | a | 53 | b | 54 | d | 55 | b | 56 | a | 57 | b | 58 | c | 59 | a | 60 | b |
| 61 | a | 62 | a | 63 | a | 64 | a | 65 | a | 66 | c | 67 | b | 68 | c | 69 | a | 70 | a |
| 71 | d | 72 | d | 73 | b | 74 | b | 75 | b | 76 | a | 77 | d | 78 | d | 79 | d | 80 | b |

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| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 81 | d | 82 | a | 83 | a | 84 | c | 85 | c | 86 | c | 87 | a | 88 | a | 89 | d | 90 | a |
| 91 | d | 92 | b | 93 | b | 94 | d | 95 | b | 96 | a | 97 | b | 98 | b | 99 | a | 100 | c |

## SOLUTIONS

**Q1. Answer: (a) Plague**

The correct answer is Plague.

Key Points

• Plague

• Plague is a serious bacterial infection caused by Yersinia pestis, a zoonotic bacterium typically found in small mammals and their fleas.

• It is transmitted to humans through the bite of infected fleas, direct contact with infected animals, or inhalation of respiratory droplets from infected individuals.

• Common symptoms include fever, chills, headache, muscle pain, weakness, and swollen lymph nodes (buboes).

• Preventive measures include avoiding contact with rodents and fleas, using insect repellent, and practicing good hygiene.

Additional Information

• Cholera

• Cholera is an acute diarrheal illness caused by infection of the intestine with Vibrio cholerae bacteria.

• It is primarily transmitted through contaminated water or food, often due to poor sanitation.

• Cholera can cause severe watery diarrhea, vomiting, and leg cramps, leading to rapid dehydration and electrolyte imbalance.

• Preventive measures include drinking and using safe water, practicing good hygiene, and getting vaccinated against cholera.

• Typhoid

• Typhoid fever is a systemic infection caused by Salmonella Typhi bacteria.

• It is typically transmitted through contaminated food or water, often due to poor sanitation or hygiene practices.

• Common symptoms include prolonged high fever, headache, fatigue, muscle aches, abdominal pain, and constipation or diarrhea.

• Preventive measures include getting vaccinated against typhoid, drinking and using safe water, practicing good hygiene, and ensuring food safety.

• Diarrhea

• Diarrhea is a condition characterized by loose, watery stools that occur more frequently than usual.

• It can be caused by various factors, including bacterial or viral infections, parasites, food intolerances, and certain medications.

• In addition to frequent loose stools, diarrhea may be accompanied by abdominal cramps, bloating, nausea, and vomiting.

• Preventive measures include practicing good hygiene, drinking safe water, properly handling and preparing food, and avoiding contact with infected individuals.

**Q2. Answer: (a) 1961**

The correct answer is 1961.

Key Points

• Goa on India's western coast was freed from Portuguese rule on 19 December 1961, more than four centuries after it was colonized.

• The fight for freedom began in the 1940s as India inched closer to independence from British rule.

• Interesting Facts about Goa:

• A forested land:

• Goa not only consists of long, sandy beaches around 20% of the land falls within the beautiful Western Ghats of India.

• A vast mountain range and a treasure trove of biodiversity.

• Goa celebrates two independence days:

• India became an independent country, free from British rule, in 1947.

• Goa celebrates this as well as their state independence from the Portuguese in 1961.

• Over 400 species of birds:

• There are six conservation areas where visitors can explore wildlife, which contain rare birds including the long-billed vulture, darter, great pied hornbill, and many more.

• Beautiful waterfalls:

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• Goa boasts one of India's largest waterfalls, the Dudhsagar Falls, which is 1017 feet high and can be found on the far-east side of the state.

• Ancient rocks:

• Some of the oldest rocks in India can be found in Goa between Molem and Anmod classified as the Trondhjemite Gneiss; these rocks are over 3,600 million years old!

**Q3. Answer: (d) 12 : 15 : 10**

Given:

The speed of three buses are in the ratio of 5 : 4 : 6.

Formula Used:

Time prop. to 1/Speed

Calculation:

Let the speeds of the buses be 5x, 4x, and 6x respectively.

Since time is inversely proportional to speed, the ratio of time taken will be the inverse of the speed ratio.

Time ratio = 1/(5x) : 1/(4x) : 1/(6x)

Time ratio = 1/5 : 1/4 : 1/6

To simplify, find the common denominator:

Time ratio = (1 × 12)/(5 × 12) : (1 × 15)/(4 × 15) : (1 × 10)/(6 × 10)

Time ratio = 12/60 : 15/60 : 10/60

Time ratio = 12 : 15 : 10

The ratio between the time taken by the buses to travel the same distance is 12 : 15 : 10.

**Q4. Answer: (a) Both assumptions 1 and 2 implicit.**

Given Statement: The state government has decided to appoint 500 civil defence warriors in the next financial year.

Now,

Assumptions:

1. There are enough duties with the state government to be disbursed to 500 civil defence warriors - Implicit (The decision to appoint 500 civil defence warriors suggests that the state government has sufficient duties and responsibilities to assign to them.)

2. The state government realises the importance of civil defence warriors - Implicit (The decision to appoint a significant number of civil defence warriors indicates that the state government understands their importance.)

Here, Both assumptions 1 and 2 are implicit.

Hence, the correct answer is "Option 1".

**Q5. Answer: (d) 1942**

The correct answer is 1942.

Key Points

Quit India movement:

• The famous Quit India Movement is also known as the 'August Movement'.

• The All-India Congress Committee proclaimed a mass protest demanding what Gandhi called "an orderly British withdrawal" from India.

• It was for the determined, which appears in his call to Do or Die, issued on 8 August at the Gowalia Tank Maidan in Mumbai in 1942.

• Most of the prominent Congress leaders were imprisoned in the initial days of the Quit India Movement.

• and peacefully.

| Name | Quit India Movement |
|---|---|
| Start date | 8 August 1942 |
| By whom | Mahatma Gandhi |
| Another name of the movement | August Movement |
| Where was it launched | Bombay session of the All-India Congress Committee |
| Slogan attached to the movement | Do or Die |

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**Q6. Answer: (c) Hridaya**

The correct answer is Hridaya.

Key Points

• The National Heritage City Development and Augmentation Yojana (HRIDAY), a central sector scheme of the Government of India, was launched on 21st January 2015 to bring together urban planning, economic growth and heritage conservation in an inclusive manner & to preserve the heritage character of the City.

• Under the Scheme, twelve cities namely, Ajmer, Amritsar, Amaravati, Badami, Dwarka, Gaya, Kanchipuram, Mathura, Puri, Varanasi Velankanni, Warangal have been identified for development.

• The mission period of the HRIDAY scheme ended on 31st March 2019.

• Ministry of Power, GoI launched Ujwal DISCOM Assurance Yojana (UDAY) which was approved by Union Cabinet on 5th November 2015. It envisages the Financial & Operational Turn around of Power Distribution Utilities (DISCOMs) of the country.

• The Government of India has launched the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) to provide basic civic amenities like water supply, sewerage, urban transport, parks to improve the quality of life for all especially the poor and the disadvantaged.

• The focus of the Mission is on infrastructure creation that has a direct link to the provision of better services to the citizens.

**Q7. Answer: (a) Rs. 13.50**

Given:

25% of Rs. 900

6% of the above result

Formula Used:

Percentage = (Percentage Value / 100) × Total Value

Calculation:

25% of Rs. 900

=> (25 / 100) × 900

=> 0.25 × 900

=> 225

6% of 225

=> (6 / 100) × 225

=> 0.06 × 225

=> 13.50

The correct answer is option 1.

**Q8. Answer: (b) Sumitra Mahajan**

The correct answer is Sumitra Mahajan.

Key Points

• In the Lok Sabha, the speaker and the deputy speaker are elected from among its members by a simple majority of members present and voting in the house.

• There are no specific qualifications are prescribed for elected as the speaker of the house.

• Whenever the office of the Speaker falls vacant, the Lok Sabha elects another member to fill the vacancy.

• The date of the election of the Speaker is fixed by the President.

Additional Information

• About Speaker of the Lok Sabha

• The Lok Sabha, which is the highest legislative body in the country, chooses its Speaker who presides over the day-to-day functioning of the House.

• Electing the Speaker of the House is one of the first acts of the newly constituted House.

• The office of the Speaker is a Constitutional Office.

• The Speaker is guided by the constitutional provisions and the Rules of Procedure and Conduct of Business in Lok Sabha.

• The Speaker is placed very high in the Warrant of Precedence in the country i.e. at rank 6.

• Adequate Powers are vested in the office of the Speaker to help her/him in the smooth conduct of parliamentary proceedings.

• The constitution provides that the Speaker's salary and allowances are not to be voted by the Parliament and are to be charged on the Consolidated Fund of India.

• In the Lok Sabha chamber, the Speaker's chair is distinctively placed to enable a commanding view of the entire House.

• The Speaker is assisted by the Secretary-General of the Lok Sabha and senior officers of the Secretariat on parliamentary

activities, practice and procedure.

• In the absence of the Speaker, the Deputy Speaker discharges the functions. A member from the Panel of Chairmen presides over the House in the absence of both the Speaker and the Deputy Speaker.

**Q9. Answer: (b) 7**

The logic followed here is:

@ means 4, $ means 5, # means 6

@ + $ - # = 3 → 4 + 5 - 6 = 3

• @ - $ = 5 → 6 + 4 - 5 = 5

Then the value of 2@ + $ - # = ? → 2 × 4 + 5 - 6 = 8 + 5 - 6 = 13 - 6 = 7

Hence, the correct answer is "7".

**Q10. Answer: (a) DGZZL**

The logic followed here is:

GREAT is written as JVJGA

Similarly, ACUTE will be written as:

Hence, the correct answer is "DGZZL".

**Q11. Answer: (a) 90°**

Concept used:

The angle subtended by an arc at the center is twice the angle subtended at the circumference.

angle BOC = 2 × angle BAC

Calculation:

In triangle OBC

Let angle OBC = X

Thus, angle OCB = X (Because OB = OC = r)

The sum of all the angles of the triangle is 180°.

angle BOC + angle OBC + angle OCB = 180

=> angle BOC + X + X = 180

=> angle BOC = 180 - 2X

Now,

angle BOC = 2 × angle BAC

So, 2 × angle BAC = 180 - 2X

=> angle BAC = 90 - X

angle BAC + angle OBC = 90 - X + X = 90°

Therefore The correct answer is 90°.

**Q12. Answer: (c) 1**

Given:

We need to evaluate:

(tan 1° tan 2° tan 3° .....tan 89°)/(tan 45°)

Solution:

Step 1: Simplify the denominator

We know that:

tan 45° = 1

Thus, the given expression reduces to:

tan 1° tan 2° tan 3° … tan 89°

Step 2: Pair the terms

The property of tangent states:

tan (90° - x) = cot x

Therefore, terms like tan 89° pair with tan 1°, tan 88° pairs with tan 2°, and so on. This gives:

tan 1° tan 89° = 1, tan 2° tan 88° = 1, tan 3° tan 87° = 1, …

Step 3: Evaluate the product

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The total product is:
1 × 1 × 1 × … × tan 45°
Since tan 45° = 1, the final product remains 1
The value of the given expression is 1.

**Q13. Answer: (d) Australia**

The correct answer is Australia.
• The Commonwealth Games 2018 was held at Gold Coast, Australia.
• Motto: Share the Dream.
• Mascot: Borobi – a blue koala.
• Australia won the highest number of medals with a total of 198.
• It was followed by England and India with a total of 136 and 66 medals respectively.
• India won 26 gold, 20 silver, and 20 bronze medals.
• The first Commonwealth Games were held at Hamilton, Canada in 1930.
• The athletes from Commonwealth Nations participated in these games.
• For the first time, India participated in the Commonwealth Games of 1934 in London.

**Q14. Answer: (a) (√3)/3**

Given:
tan 3θ = cot(60° - θ), where 3θ is an acute angle.
We need to find the value of tan 2θ.
Solution:
Step 1: Use the complementary angle property
cot(60° - θ) = tan(30° + θ).
Thus, the equation becomes:
tan 3θ = tan(30° + θ).
Step 2: Solve for 3θ
For tan A = tan B, we have:
A = B + n × 180°, where n is an integer.
Since 3θ is acute, we ignore n × 180°, so:
3θ = 30° + θ.
Simplify:
3θ - θ = 30°.
2θ = 30°.
Step 3: Calculate tan 2θ
Substitute θ = 15° into tan 2θ:
tan 2θ = tan 30° = 1/√3 = (√3)/3
The value of tan 2θ is (√3)/3.

**Q15. Answer: (d) The North Atlantic Treaty Organization**

The correct answer is The North Atlantic Treaty Organization.
Key Points
• The North Atlantic Treaty Organization (NATO) is an intergovernmental military alliance:
• NATO's purpose is to guarantee the security and freedom of its members through political and military means.
• All decisions in NATO are made by consensus, meaning all member countries must agree unanimously.
• NATO has two arms: a civilian, administrative arm and a military arm.
• The headquarters are in Brussels, Belgium.
• NATO has 32 member states, including 30 European and 2 North American.
• NATO was established in 1949 after World War II.
• The North Atlantic Treaty, also known as the Treaty of Washington, was signed on April 4, 1949.
• NATO members are committed to the principles of democracy, individual liberty, human rights, and the rule of law.

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**Q16. Answer: (d) 75°**

Given:

ABCD is a square, and Q is a point inside it such that ΔQAB is an equilateral triangle.

Solution:

ABCD is a square, so all interior angles are 90°.

In ΔQAB, all angles are 60° since it is equilateral.

At vertex B:

angle QAB = angle QBA = 60° (angle in the equilateral triangle).

The remaining angle, angle QBC = 90° − 60° = 30° (as angle B = 90°).

AB = BC = AQ = BQ [Given]

angle QBC + angle QCB + angle BQC = 180°

Since, BC = BQ

30° + 2 × angle QCB = 180° [as angle QCB = angle BQC, opposite side of equal angle]

angle QCB = (180° - 30°)/2

angle QCB = 75°

The measure of angle QCB is 75°.

**Q17. Answer: (b) 8**

Given:

nC4 = 70

Formula Used:

nC4 = n! / [(n-4)! × 4!]

Calculation:

n! / [(n - 4)! × 4!] = 70

4! = 24

=> n! / [(n - 4)! × 24] = 70

=> n! / (n - 4)! = 70 × 24

=> n! / (n - 4)! = 1680

=> n × (n - 1) × (n - 2) × (n - 3) = 1680

Let's check n = 8

=> 8 × 7 × 6 × 5 = 1680

Therefore, n = 8

The correct answer is option 2.

**Q18. Answer: (d) Myanmar**

The correct answer is Myanmar.

Key Points

• The Head of the Military government of Myanmar Senior General Min Aung Hlaing will embark on his first foreign visit after the coup to Indonesia to participate in the ASEAN leaders meeting on 24 April 2021.

• The summit meeting is being held to discuss the crisis caused by the military take over of the govt on 1 February 2021.

• Thailand and the Philippines will send their Foreign Ministers for the meeting.

**Q19. Answer: (d) None of the conclusions follow.**

Statements:

1. All drums are flutes.

2. No flute is a mike.

3. Some mikes are bands.

The least possible Venn diagram is as follows:

Conclusions:

I. Some bands are flutes. - False (because there is no direct relation between bands and flutes. So, it can be possible but not definite)

II. No band is a drum. - False (because there is no direct relation between band and drum. So, it can be possible but not definite)

III. All drums are mikes. - False (because there is no direct relation between drums and mikes. So, it can be possible but not

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definite)

Hence, the correct answer is "None of the conclusions follow".

**Q20. Answer: (d) 65**

Given:

Number divided by 18 leaves a remainder of 11.

Number divided by 24 leaves a remainder of 17.

Formula Used:

Let the number be x. When x is divided by 18, it leaves a remainder of 11.

Therefore, x = 18k + 11 for some integer k.

When x is divided by 24, it leaves a remainder of 17.

Therefore, x = 24m + 17 for some integer m.

We need to find the least x that satisfies both conditions.

Calculation:

Set the two expressions for x equal to each other:

18k + 11 = 24m + 17

18k - 24m = 6

Divide by 6:

3k - 4m = 1

We need to find integer solutions for k and m such that x is minimized. Trying different values, we find:

For k = 3,

3(3) - 4m = 1

9 - 4m = 1

4m = 8

m = 2

Substitute k = 3 into x = 18k + 11 :

x = 18(3) + 11

x = 54 + 11

x = 65

The least number that satisfies the given conditions is 65.

**Q21. Answer: (a) None, as C is the tallest.**

According to the given information:

1) A, B, C, D and E have different heights.

2) Only 2 people are shorter than D.

D > _ > _

3) E is taller than B but shorter than A.

A > E > B

4) A is not the tallest.

C > A > D > E > B

So, None of people are taller than C.

Hence, the correct answer is "None, as C is the tallest".

**Q22. Answer: (c) Brain**

The correct answer is Brain.

Key Points

• An electroencephalogram (EEG) is a test used to find problems related to the electrical activity of the brain.

• An EEG tracks and records brain wave patterns.

• EEG can differentiate between a true acute encephalopathy and epileptic states or psychiatric conditions.

Additional Information

| INSTRUMENT | USE |
|---|---|

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| | |
|---|---|
| Endoscope | To look inside the gastrointestinal tract, used mainly in surgery or by surgical consultants. |
| Sphygmomanometer | To measure the human's blood pressure. |
| Stethoscope | To hear sounds from movements within the body like heartbeats, intestinal movement, breath sounds, etc. |
| Tuning fork | To test for deafness and to categorize it. |
| Electrocardiogram (ECG) | To check the human heart's rhythm and detect the electrical signals produced by the heart each time it beats. |
| Magnetic resonance imaging (MRI) | A large magnet and radio waves to look at organs and structures inside your body. |
| Computerized tomography (CT) scan | Uses computers and rotating X-ray machines to create cross-sectional images of the body including the soft tissues, blood vessels, and bones in various parts of the body. |
| AST (Aspartate transaminase) and ALT (Alanine transaminase) | Abnormality of the liver test. |

**Q23. Answer: (b) 15**

Given:

Expression to solve: -5{-5 - (-5 - 2) - 5}

Formula Used:

Order of operations (PEMDAS/BODMAS):

1. Parentheses/Brackets
2. Exponents/Orders (such as squares and square roots)
3. Multiplication and Division (left to right)
4. Addition and Subtraction (left to right)

Calculation:

Simplify inside the parentheses first:

=> -5{-5 - (-5 - 2) - 5}

=> -5{-5 - (-7) - 5}

=> -5{-5 + 7 - 5}

=> -5{2 - 5}

=> -5{-3}

Finally, multiply:

=> -5 × -3

=> 15

The correct answer is 15.

**Q24. Answer: (a) 2**

Given:

LCM of two numbers = 1024

One of the numbers is a prime number

Formula Used:

LCM × GCD = Product of the two numbers

Calculation:

Let the prime number be p and the other number be n.

LCM(p, n) = 1024

Since one number is prime, assume p is the prime number. The product of p and n must be a multiple of 1024.

Therefore, 1024 × GCD(p, n) = p × n

For simplicity, let's assume GCD(p, n) = 1, since p is a prime number, and it will have no common factors with n other than 1.

So, 1024 × 1 = p × n

Since 1024 is a power of 2, the only prime factor that can fit this equation is 2.

So, p = 2

=> GCD of the two numbers = 2

The correct answer is option 1:

**Q25. Answer: (b) 50**

Given:

The ratio between two numbers is 3 : 5.

Their sum is 80.

Formula Used:

Sum of the parts of the ratio = Total sum

Greater number = (Greater part of the ratio / Sum of the parts) × Total sum

Calculation:

Let the two numbers be 3x and 5x.

Sum of the numbers: 3x + 5x = 80

=> 8x = 80

=> x = 80 / 8

=> x = 10

The greater number = 5x = 5 × 10

=> The greater number = 50

The correct answer is option 2.

**Q26. Answer: (c) 324**

Given:

In a cuboid, the sum of the squares of its three dimensions is equal to half of its total surface area.

Volume of the cuboid = 729 $cm^3$

Formula Used:

Lateral Surface Area (LSA) of a cuboid = 2h (l + b)

Volume of a cuboid = l × b × h

Surface Area of a cuboid = 2(lb + bh + hl)

Calculation:

Let the dimensions of the cuboid be l, b, and h.

Given: l × b × h = 729

Let l = b = h = a

$a^3 = 729$

a = 9

The dimensions of the cuboid are 9 cm each.

Total Surface Area = 2(lb + bh + hl)

Total Surface Area = 2(9 × 9 + 9 × 9 + 9 × 9)

Total Surface Area = 2(81 + 81 + 81)

Total Surface Area = 2 × 243

Total Surface Area = 486 $cm^2$

Sum of the squares of its three dimensions = $9^2 + 9^2 + 9^2$

Sum of the squares of its three dimensions = 81 + 81 + 81

Sum of the squares of its three dimensions = 243

Half of the Total Surface Area = 486 / 2

Half of the Total Surface Area = 243

Lateral Surface Area (LSA) = 2h (l + b)

LSA = 2 × 9 (9 + 9)

LSA = 2 × 9 × 18

LSA = 324 $cm^2$

The lateral surface area of the cuboid is 324 $cm^2$.

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**Q27. Answer: (a) Bahadur Shah Zafar**

The correct answer is Bahadur Shah Zafar.

Key Points

• Bahadur Shah II, better known as Bahadur Shah Zafar, was crowned the emperor of Delhi on 28 September 1837.

• The Sepoy Mutiny broke out in 1857 and the sepoys rallied around the emperor.

• Although he was practically powerless, the rebels rallied around him and he was made the figurehead of the rebellion.

• Major William Hodson arrested him on 20 September 1857.

• He was tried at the Red Fort.

• The trial concluded on 9 March 1858 and he was sentenced to be deported on account of his involvement in the Sepoy Mutiny of 1857.

• He was deported to Burma where he died in 1862.

Additional Information

• Saadat Ali Khan

• Saadat Khan was appointed subadar of Awadh in 1722 and founded a state which was one of the most important to emerge out of the break-up of the Mughal Empire.

• Awadh was a prosperous region, controlling the rich alluvial Ganga plain and the main trade route between North India and Bengal.

• Burhan-ul-Mulk also held the combined offices of subadari, diwani, and faujdari.

• In other words, he was responsible for managing the political, financial, and military affairs of the province of Awadh

• Siraj ud-Daulah

• Siraj ud-Daulah succeeded Alivardi Khan as the Nawab of Bengal in 1756.

• Siraj-ud-Daulah attacked Fort William and imprisoned the British men and women in a small cell which later became known as the Black Hole of Calcutta.

• Alivardi Khan was succeeded by his grandson Siraj-ud-Daula.

• In 1756 AD, Siraj-ud-Daula seized the English factory at Kasim bazar and marched to Calcutta and occupied Fort William.

**Q28. Answer: (a) 5311/13%**

Given:

Shyam gets back the amount he had invested in buying 100 books by selling 65 of them.

Formula Used:

Profit Percentage = ((Selling Price - Cost Price)/(Cost Price)) × 100 %

Calculation:

Let the Cost Price (CP) of each book be 1 unit.

Total Cost Price (CP) of 100 books = 100 units

Selling Price (SP) of 65 books = 100 units

SP per book = 100 / 65

SP per book = 100/65

Profit per book = 100/65 - 1

Profit per book = (100 - 65)/65

Profit per book = 35/65

Profit per book = 7/13

Profit Percentage = (7/13 × 100) %

Profit Percentage = 700/13 %

Profit Percentage = 5311/13 %

The profit percentage is 5311/13 %.

**Q29. Answer: (d) 31**

The logic followed here is: Sum of place value of letters - 5 = Number code.

'KNSB' is written as '41',

'CPFG' is written as '27'

Similarly, 'FIJK' will be written as:

Hence, the correct answer is "31".

**Q30. Answer: (b) 262/3 days**

Given:

Ram and Shyam can finish the work in 30 days.

Shyam and Bharti can finish the work in 40 days.

Bharti and Ram can finish the work in 60 days.

Calculation:

Step 1: Calculate the work done by each pair in one day

Work done by Ram and Shyam in one day = 1/30.

Work done by Shyam and Bharti in one day = 1/40.

Work done by Bharti and Ram in one day = 1/60.

Step 2: Add the work done by all three pairs

Adding the work done by all three pairs in one day:

(1/30) + (1/40) + (1/60).

Step 3: Account for overlapping contributions

In the above sum, the contribution of each individual (Ram, Shyam, Bharti) is counted twice. So, the total work done by all three in one day is:

[(1/30) + (1/40) + (1/60)] / 2.

Step 4: Calculate the value

Find the LCM of 30, 40, and 60, which is 120. Rewrite the fractions:

(1/30) = 4/120, (1/40) = 3/120, (1/60) = 2/120.

Total work done by all three pairs in one day:

(4/120) + (3/120) + (2/120) = 9/120.

Work done by all three together in one day:

(9/120) / 2 = 9/240 = 3/80.

Step 5: Calculate the total time

Time taken by all three together = 1 / (3/80) = 80/3 = 262/3 days.

All three together will take 262/3 days to finish the work.

**Q31. Answer: (d) 72**

The logic followed here is:

Hence, the correct answer is "72".

**Q32. Answer: (d) Respiratory system**

The correct answer is Respiratory system.

Key Points

• Respiratory System

• The respiratory system is responsible for the exchange of gases between the body and the external environment.

• It takes in oxygen and expels carbon dioxide.

• The main components include the lungs, trachea, bronchi, and bronchioles.

• The diaphragm plays a crucial role in breathing.

• During inhalation, air is drawn into the lungs through the nose or mouth, passing through the trachea, bronchi, and bronchioles.

• Oxygen is then exchanged for carbon dioxide in the alveoli (tiny air sacs) of the lungs. During exhalation, carbon dioxide is expelled from the body.

Additional Information

• Excretory System

• The excretory system is responsible for removing waste products from the body, maintaining fluid and electrolyte balance, and regulating blood pressure.

• The main components include the kidneys, ureters, bladder, and urethra. The skin and lungs also play a role in excretion.

• The kidneys filter blood, removing waste products such as urea and creatinine. These waste products are then excreted as urine through the ureters, bladder, and urethra.

• Circulatory System

• The circulatory system is responsible for transporting blood, oxygen, nutrients, hormones, and other substances throughout the body.1

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• The main components include the heart, blood vessels (arteries, veins, and capillaries), and blood.

• The heart pumps blood through the arteries to the body's tissues, where oxygen and nutrients are delivered and waste products are picked up. The blood then returns to the heart through the veins and is pumped to the lungs for oxygenation.

• Endocrine System

• The endocrine system is responsible for regulating various bodily functions through the production and release of hormones.

• The main components include the hypothalamus, pituitary gland, thyroid gland, adrenal glands, pancreas, ovaries, and testes.

• Hormones are released into the bloodstream and travel to target organs, where they bind to specific receptors and trigger a response. Hormones regulate various functions, including growth, metabolism, reproduction, and mood.

**Q33. Answer: (a) Argentina**

The correct answer is Argentina.

Key Points

• European Union:

• The European Union (EU) is a unique economic and political union between 27 European countries.

• The EU's predecessor was established in the aftermath of World War II.

• The first phase was to promote economic cooperation, with the premise that countries that trade with one another become more economically interdependent, making them less inclined to engage in violence

• The European Economic Community (EEC) was established in 1958 with the goal of enhancing economic cooperation among six countries: Belgium, Germany, France, Italy, Luxembourg, and the Netherlands.

**Q34. Answer: (d) Narmada**

The correct answer is Narmada.

Key Points

• The Amarkantak Ranges are located in Madhya Pradesh and are the source of the Narmada river. Hence, option 4 is the correct answer.

• The Narmada River rises from the Amarkantak Ranges, which are located in Madhya Pradesh.

• The Amarkantak Ranges are a part of the Satpura mountain range, which is spread across central India.

• The Narmada River flows through the states of Madhya Pradesh, Maharashtra, and Gujarat before emptying into the Arabian Sea.

• The Narmada River is the fifth largest river in India and is considered sacred by Hindus.

• Western Ghats is a mountain range that runs parallel to the west coast of India and is home to several important rivers. However, the Narmada River does not rise from the Western Ghats.

• The Gawilgarh Hills are a range of hills located in the state of Maharashtra. However, the Narmada river does not rise from the Gawilgarh Hills.

• The Satpura Ranges are a mountain range that spans several states in central India. The Narmada river rises from the Amarkantak Ranges, which are a part of the Satpura Ranges.

Additional Information

• Kaveri

• The Kaveri river rises from The Brahmagiri hills.

• The Kaveri River rises on the Brahmagiri Hill of the Western Ghats in southwestern Karnataka state, flows through the states of Karnataka and Tamil Nadu in a southeasterly direction for 765 km, and descends the Eastern Ghats in a series of great falls.

• The Kaveri river is joined by two tributaries the Hemavati and Lakshmantirtha.

• Brahmagiri hills is a mountain range in the Western Ghats of Maharashtra.

• Trimbakeshwar Shiva Temple is located near the Brahmagiri hills.

• Krishna

• The Krishna river originates in the Western Ghats near Mahabaleshwar in the state of Maharashtra.

• Krishna river flows through Maharashtra, Karnataka, Telangana, and Andhra Pradesh.

• Krishna Basin extends nearly 8% of the total geographical area of the country.

• The river has a number of tributaries which include Tungabhadra as the principal tributary and others ae Mallaprabha, Koyna, Bhima, Ghataprabha, Yerla, Warna, Dindi, Musi, and Dudhganga.

• Nagarjuna Sagar Dam on the Krishna river is the world’s tallest masonry dam (124 meters).

• Ganga

• The River Ganga originates from the Gangotri glacier in Uttarakhand.

• Alaknanda River joins Bhagirathi at Devprayag and from there the river is called Ganga.

• Yamuna(Largest right bank tributary of Ganga), Damodar (Sorrow of Bengal), Ghagra, Gomti, Gandak, Ramganga, Kosi (Sorrow of Bihar), Son, Mahananda are major tributaries of River Ganga.
• It flows through the states of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, and West Bengal.
• It is a transboundary river, flows through India and Bangladesh.
• The total length of the river is 2525 km

**Q35. Answer: (c) 202**

The logic followed here is:
Hence, the correct answer is "202".

**Q36. Answer: (d) Sister's daughter**

Family Chart:
Given: Aman and Barun are brothers.
Diva is the sister of Fiza's husband, Barun.
Eva is the daughter of Diva.
So, Eva is the "Sister's daughter" of Aman.
Hence, the correct answer is "Sister's daughter".

**Q37. Answer: (d) Wife's brother's son**

Family Chart:
Given:
M is Y's daughter and X is N's mother. P is married to M, and X married to Y.
P is A's father and B is N's son. M does not have any sister.
So, B is the "Wife's brother's son" of P.
Hence, the correct answer is "Wife's brother's son".

**Q38. Answer: (c) Lambert-Fisher glacier**

The correct answer is Lambert-Fisher glacier.
Key Points
• Lambert-Fisher Glacier
• Location: Antarctica
• Size: The largest glacier in the world, covering an area of approximately 80,000 square kilometers.
• Significance: It plays a crucial role in the global climate system, contributing significantly to sea-level rise.
• Impact of Climate Change: The glacier is experiencing significant thinning and retreat due to rising global temperatures.
Additional Information
• Perito Moreno Glacier
• Location: Argentina
• Size: A large glacier in the Los Glaciares National Park, covering an area of approximately 250 square kilometers.
• Significance: It is known for its spectacular ice formations and calving events, where large chunks of ice break off and fall into the water.
• Tourism: A popular tourist destination, attracting visitors from around the world.
• Siachen Glacier
• Location: India and Pakistan
• Size: The second-largest glacier in the Himalayas, covering an area of approximately 70 square kilometers.
• Significance: It has been the site of a long-standing territorial dispute between India and Pakistan, resulting in a high-altitude conflict.
• Impact of Conflict: The conflict has had a significant environmental impact on the glacier and surrounding region.
• Greenland Ice Sheet
• Location: Greenland
• Size: The second-largest ice sheet in the world, covering approximately 80% of Greenland.
• Significance: It contains enough ice to raise global sea levels by several meters if it were to melt completely.
• Impact of Climate Change: The Greenland Ice Sheet is experiencing significant melting due to rising global temperatures, contributing to sea-level rise.

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**Q39. Answer: (c) The Internet Corporation for Assigned Names and Numbers**

The correct answer is The Internet Corporation for Assigned Names and Numbers.

Key Points

• ICANN

• ICANN is established in 1998

• It is a nonprofit public benefit corporation that coordinates and supports unique identifiers across the world, ensuring that computers can locate one another efficiently. With participants from all over the world.

• ICANN plays a crucial role in maintaining the stability and security of the internet.

Additional Information

• Samiran Gupta has returned to the Internet Corporation for Assigned Names and Numbers (ICANN) as the Vice President for Government and Intergovernmental Organization (IGO) engagement for the APAC region and Stakeholder Engagement in South Asia.

• In this role, Gupta will be responsible for overseeing ICANN's engagement with NGOs and multilateral forums in the region, including the International Telecommunication Union (ITU) and regional governments on initiatives such as the United Nations Global Digital Compact and the World Summit on the Information Society (WSIS)+20 process.

• The decision to create a dedicated Government Engagement team for the APAC region was driven by the significant increase in internet usage in the area.

**Q40. Answer: (a) 1**

Given:

Natural numbers from 200 to 478.

Formula Used:

HCF (Highest Common Factor) of a range of consecutive integers is 1.

Calculation:

Consider the range of numbers from 200 to 478.

The HCF of any set of consecutive integers is always 1.

This is because consecutive integers will not have any common factor other than 1.

So, the HCF of all natural numbers from 200 to 478 is 1.

The HCF of all natural numbers from 200 to 478 is 1.

**Q41. Answer: (b) Candy bean**

The correct answer is Candy bean

Key Points

• Candy bean

• This is NOT a version of the Android mobile operating system.

• It sounds similar to "Jelly Bean" (Android 4.1–4.3), but no version named "Candy Bean" exists.

• An operating system (OS) is a software program that manages a computer's hardware and software, and allows users to interact with their computer.

• The OS acts as an intermediary between the user and the computer's hardware, allowing users to run programs, store files, connect to networks, and more.

Additional Information

• Marshmallow:

• Android The sixth major edition of the Android operating system and the 13th version of Android is Marshmallow (codenamed Android M during development).

• It was publicly released on October 5, 2015, and was first released as a beta build on May 28, 2015, with the Nexus devices being the first to receive the update.

• Marshmallow mainly focuses on enhancing its predecessor's overall user experience, Lollipop.

• Lollipop:

• Lollipop is the dessert-themed Android codename for the 5.0 update of the open-source Android mobile operating system.

• Lollipop debuted in November 2014 as the successor to the KitKat Android release.

**Q42. Answer: (d) 42**

Given:

The series: 7, 14, 21, 28, ..., 77

Formula Used:

Average of an arithmetic series = (First term + Last term) / 2

Calculation:

First term (a) = 7

Last term (l) = 77

Number of terms (n):

Common difference (d) = 14 - 7 = 7

nth term of an arithmetic series: a + (n - 1)d = l

7 + (n - 1) × 7 = 77

=> (n - 1) × 7 = 70

=> n - 1 = 10

=> n = 11

Average = (First term + Last term) / 2

Average = (7 + 77) / 2

=> Average = 84 / 2

=> Average = 42

The average of the series is 42. The correct answer is option 4.

**Q43. Answer: (a) 31.58%**

Given:

Total population of the country = 5000.

Sector distribution:

A (Public sector employment) = 162°

B (Private sector employment) = 108°

C (Corporate sector employment) = 54°

D (Self-employment) = 18°

E (Unemployed) = 18°

Calculation:

Step 1: Calculate the total employed population

Employment includes sectors A, B, C, and D:

Total employed angle = A + B + C + D = 162° + 108° + 54° + 18° = 342°.

Proportion of employed population = (342° / 360°) × 5000 = (19/20) × 5000 = 4750.

Step 2: Calculate the private sector population

Proportion of private sector population = (108° / 360°) × 5000 = (3/10) × 5000 = 1500.

Step 3: Find the percentage

Percentage of employed people in the private sector = (Private sector population / Total employed population) × 100.

Percentage = (1500 / 4750) × 100 ≈ 31.58%.

The percentage of employed people in the private sector is approximately 31.58%.

**Q44. Answer: (c) Ujjain**

The correct answer is Ujjain.

Key Points

• The temple is situated on the side of the river Kshipra.

• The temple is dedicated to Lord Shiva and is one of the twelve Jyotirlingams.

• The idol of Lord Shiva is known to be 'Dakshina Mukhi', which means that it is facing the south.

• It is one of the shrines of the Vaippu Sthalams sung by Tamil Saivite Nayanar Appar.

• The shrine is revered as one of the 18 Maha Shakti Peetham.

• The temple complex was destroyed by Sultan Shams-ud-din Iltutmish during his raid of Ujjain in 1234.

• Its present structure was constructed in 1734 by the Maratha general Ranoji Shinde.

• Further developments were carried out by other members of his dynasty, including Mahadji Shinde and Daulat Rao Shinde's wife Baiza Bai.

Additional Information

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• Ujjain city is located in the Ujjain district.

• The Tropic of Cancer passes through Ujjain.

• Ujjain has been selected by Prime Minister Narendra Modi to be developed as a smart city under the Smart Cities Mission.

**Q45. Answer: (a) IV, I, II, III**

The correct answer is IV, I, II, III

Key Points

• IV. Mahatma Gandhi's return from South Africa

• After spending 21 years in South Africa, where he developed and experimented with his philosophy of Satyagraha (non-violent resistance), Gandhi returned to India.

• Upon his return, he toured the country to understand the social, political, and economic conditions and became a prominent leader of the Indian National Congress by 1919.

• I. Non-cooperation Movement

• The Non-cooperation Movement (1920–1922) was a nonviolent protest led by Mahatma Gandhi against British rule in India.

• It was Sparked by the Jallianwala Bagh Massacre (1919) and the British failure to meet demands regarding the Khilafat Movement, this was Gandhi’s first nationwide movement against British rule.

• The movement ended in 1922 after the violent Chauri Chaura incident, where a mob burned a police station, killing 22 policemen.

• Gandhi withdrew the movement, emphasizing his commitment to non-violence.

• II. The Salt (Dandi) March

• As part of the Civil Disobedience Movement, Gandhi marched 240 miles from Sabarmati Ashram to Dandi, Gujarat, to make salt in defiance of the Salt Law, which imposed a tax on salt.

• The march symbolised the beginning of a broader civil disobedience campaign, encouraging people to break unjust laws peacefully.

• It gained international attention and highlighted British exploitation in India.

• III. The Quit India Movement

• During World War II, Gandhi called for "Do or Die" in his famous speech at the Bombay session of the Indian National Congress.

• This was a mass uprising demanding immediate independence from British rule. Strikes, protests, and sabotage were widespread, although the movement was violently suppressed by the British.

• Hence IV (1915) → I (1920–22) → II (1930) → III (1942) is correct

**Q46. Answer: (d) Mothers, Actress, Boys**

Lets check option one by one:

Option 1) Rulers, Men, Engineers

Option 2) Females, Wives, Doctors

Option 3) Father, Infants, Males

Option 4) Mothers, Actress, Boys

Some mothers can be actress and vice-versa. Boys are different from them.

Hence, the correct answer is "Mothers, Actress, Boys"

**Q47. Answer: (b) Bangladesh's 50^(th) Independence Day celebrations**

The correct answer is Bangladesh's 50th Independence Day celebrations

Key Points

• During his visit to Bangladesh in March 2021, Prime Minister Narendra Modi took part in Bangladesh's 50th Independence Day celebrations.

• Additionally, he also participated in events commemorating the birth centenary of Sheikh Mujibur Rahman, the founding father of Bangladesh.

• This visit is in connection with the commemoration of three events:

• 50 years of Bangladesh’s war of liberation.

• Birth centenary of Sheikh Mujibur Rahman.

• 50 years of the establishment of diplomatic ties between India and Bangladesh.

• Hence 10 years of the signing of the India-Bangladesh Land Boundary Agreement (LBA) is an incorrect statement.

Additional Information

• India and Bangladesh also signed several MoUs following the talks.

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• Delegation level talks were also held before the signing of agreements.
• The two leaders virtually inaugurated some development projects today.
• PM Modi also visited Bangabandhu Mausoleum Complex in Tungipara.
• Bangladesh:
• Capital - Dhaka.
• Currency - Bangladeshi Taka.
• President - Abdul Hamid.
• Prime Minister - Sheikh Hasina.

**Q48. Answer: (c) Karakoram range**

The correct answer is the Karakoram range

Key Points

• Karakoram Range and Pir Panjal Range lies to the North-west and south of the Himalayan Range.
• A major part of the Karakoram Range lies under the disputed category of Indian and Pakistan and both countries have declared a claim over it.
• Karakoram Range, with a length of 500km, holds many largest peaks of Earth.
• K2, the second-highest peak of the world, at 8,611m lies in the Karakoram Range.
• Hindu-Kush, an extension of the Karakoram Range runs in Afghanistan.
• Karakoram has the most glaciers excluding Polar Regions.
• The Siachen Glacier and The Biafo Glacier, which are the world's 2nd and 3rd largest glaciers, are located in this range.

Additional Information

• Shivalik Hills
• The Shivalik Hills, is a mountain range of the outer Himalayas that stretches over about 2,400 km from the Indus River eastwards close to the Brahmaputra River, spanning the northern parts of the Indian subcontinent.
• Geologically, the Shivalik Hills belong to the Tertiary deposits of the outer Himalayas.
• They are chiefly composed of sandstone and conglomerate rock formations, which are the solidified detritus of the Himalayas to their north; they are poorly consolidated.
• The remnant magnetization of siltstones and sandstones indicates that they were deposited 16–5.2 million years ago.
• In Nepal, the Karnali River exposes the oldest part of the Shivalik Hills.
• Aksai Chin
• Aksai Chin is a region administered by China partly in Hotan County, Hotan Prefecture, Xinjiang and partly in Rutog County, Ngari Prefecture, Tibet and constituting the easternmost portion of the larger Kashmir region that has been the subject of a dispute between India and China since 1959.

**Q49. Answer: (d) Unix**

The correct answer is Unix

Key Points

• Unix is a multi-user operating system
• Unix is a multi-user, multi-tasking operating system that allows multiple users to use the computer's resources simultaneously.
• It was originally designed as a time-sharing system for multiple users.
• Unix is portable, meaning it can be adapted to run on different hardware platforms.
• It's well-suited for use on servers and other high-performance systems.
• Unix was developed in the 1960s at the Bell Labs research center.
• It was initially intended for use inside the Bell System, but AT&T licensed it to outside parties in the late 1970s.

Additional Information

• MS-DOS
• MS-DOS (Microsoft Disk Operating System) was an operating system for personal computers that was primarily used until 1995
• MS-DOS was a command-line operating system that allowed users to access the computer's hardware, memory, and files.
• Users could type in commands or execute programs, and control the computer's output.
• MS-DOS was released in 1981 and was the main operating system on PCs until Windows 95 became more popular in 1995.
• iOS
• iOS is Apple's mobile operating system for smartphones and tablets, such as the iPhone and iPad.
• It was originally called iPhone OS, but was renamed to iOS in 2010 to indicate that it was being supported on more Apple

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devices.

• It Includes blend shapes, inverse kinematics, skeletal poses, and animation timelines

• Windows 7

• Windows 7 is a major release of the Windows NT operating system developed by Microsoft.

• It was released to manufacturing on July 22, 2009, and became generally available on October 22, 2009.

• It is the successor to Windows Vista, released nearly three years earlier. Windows 7's server counterpart, Windows Server 2008 R2, was released at the same time.

• It was succeeded by Windows 8 in October 2012.

**Q50. Answer: (c) Tetra-atomic**

The correct answer is Tetra-atomic

Key Points

• The atomicity of phosphorus is 4 i.e. phosphorous is tetra-atomic.

• Phosphorus is a chemical element with the symbol P.

• The formula of one molecule of phosphorous is P4.

• Its atomic number is 15.

• It is colorless and in its pure form.

• Elemental phosphorus exists in two major forms, white phosphorus, and red phosphorus.

• It is highly reactive, phosphorus is never found as a free element on Earth.

Additional Information

• Mono-atomic:

• Monoatomic or monad elements are elements that are stable as single atoms.

• Mon- or Mono- means one. For an element to stabilize itself, it must have a stable set of eight valence electrons.

• Poly-atomic:

• if an ion consists of two or more atoms, it can be called a polyatomic ion or molecular ion.

• Di-atomic:

• A molecule of a detail that has atomicity 2 or has 2 atoms in its molecule, is referred to as a diatomic.

• example:- hydrogen, oxygen, and nitrogen are diatomic.

**Q51. Answer: (a) Pancreas**

The correct answer is Pancreas.

Key Points

Pancreas:

• The pancreas is a composite gland that functions as both an endocrine and an exocrine gland.

• The endocrine pancreas contains ‘Islets of Langerhans’.

• Insulin hormone is secreted by the β- cells of the pancreas in the human body.

• The insulin hormone is responsible for controlling blood sugar levels in the human body.

• Insulin hormone is a peptide hormone that helps in the regulation of blood glucose levels.

• It primarily affects hepatocytes and adipocytes (adipose tissue cells), increasing glucose uptake and utilisation.

• As a result, glucose moves quickly from the bloodstream to liver cells and cells of adipose tissues by decreasing the blood glucose level (hypoglycaemia).

Additional Information

• Functions of insulin:

• Insulin stimulates the conversion of glucose to glycogen in target cells (glycogenesis).

• Transports and metabolizes glucose for energy.

• Decreases gluconeogenesis.

• Stimulates the storage of glucose as glycogen in the liver and muscle.

• Signals the liver to stop the release of glucose.

• Enhances dietary fat storage in adipose tissue.

• Accelerates transport of amino acids into cells.

• Also reduces the catabolism of proteins and fats.

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**Q52. Answer: (a) Small Industries Development Bank of India**

The correct answer is Small Industries Development Bank of India.

Key Points

• SIDBI stands for Small Industries Development Bank of India.

• Small Industries Development Bank of India (SIDBI) was set up on 2nd April 1990 under an Act of the Indian Parliament.

• It was formed in the year 1990.

• It is the apex regulatory body for the licensing and regulation of micro, small and medium enterprise finance companies in India.

• It comes under the jurisdiction of the Ministry of Finance.

• Its headquarters is located at Lucknow, Uttar Pradesh.

• SIDBI is regulated and supervised by the Reserve Bank of India.

Additional Information

• SIDBI is an independent financial institution aimed at aiding the growth and development of Micro, Small, and Medium Enterprises (MSMEs) which contribute significantly to the national economy in terms of production, employment, and exports.

• It aims at enhancing the wealth of shareholders through the modern technology platform.

• SIDBI retained its position in the top 30 Development Banks of the World in the ranking of The Banker, London.

• SIDBI also functions as a Nodal/Implementing Agency to various ministries of the Government of India viz., Ministry of MSME, Ministry of Textiles, Ministry of Commerce and Industry, Ministry of Food Processing and Industry, etc.

**Q53. Answer: (b) October 2008**

The correct answer is October 2008

Key Points

• Chandrayaan -1, India's first mission to the Moon was launched from Sriharikota, Andhra Pradesh.

• It was the first Indian lunar probe launched by ISRO in October 2008

• The mission included only a lunar orbiter and no lander or rover.

• Was announced by former PM shri Atal Bihari Vajpayee on 15^(th) August 2003.

Additional Information

• ISRO facts:-

• Established on 15^(th) august 1969 as INCOSPAR with the efforts of Vikram Sarabhai.

• Headquarters is at Bengaluru.

• Shri S. Somanath is the current chairman of ISRO.

• Aryabhata was the first satellite to be launched in 1975.

• Launched Mars Orbiter Mission on 5^(th) November 2013 making India the first country ever to succeed in its maiden attempt to Mars.

• On 15^(th) February 2017, ISRO made a world record by launching 104 satellites in a single rocket (PSLV-C37).

**Q54. Answer: (d) 4 : 6 : 9**

Given:

x : y = y : z = 2 : 3

Formula Used:

To find x : y : z given x : y and y : z.

Calculation:

Let x = 2k, y = 3k

Since y : z = 2 : 3, we have y = 2m and z = 3m

Equating the two values of y:

3k = 2m

=> m = 3k / 2

=> z = 3(3k / 2) = 9k / 2

Thus, x : y : z = 2k : 3k : 9k / 2

Multiplying through by 2 to clear the fraction:

=> 4k : 6k : 9k

=> 4 : 6 : 9

The correct answer is option 4.

**Q55. Answer: (b) Kumar Sangakkara**

The correct answer is Kumar Sangakkara

Key Points

• The first non-British President of the Marylebone Cricket Club (MCC) was Kumar Sangakkara.

• He was appointed for the role in 2019, marking a historic moment for the prestigious cricket institution.

• Sangakkara served as MCC President for a one-year term, from October 2019 to September 2020.

• Cricketing Achievements:

• Widely regarded as one of the greatest batsmen in cricket history.

• Scored over 28,000 international runs, including 38 Test centuries and 25 ODI centuries.

• Captained Sri Lanka to the ICC Cricket World Cup final in 2011.

• Won the ICC World Twenty20 title in 2014 with Sri Lanka.

Additional Information

• Sachin Tendulkar

• Sachin Tendulkar was born on 24 April 1973.

• He is the highest run scorer of all time in International cricket.

• Tendulkar took up cricket at the age of eleven, made his Test debut on 15 November 1989 against Pakistan in Karachi at the age of sixteen.

• He is also the first batsman to score a double century in an ODI.

• He holds the record for the most runs in both Test and ODI, and the only player to complete more than 30,000 runs in international cricket

• He has been awarded Arjuna Award, Rajiv Gandhi Khel Ratna, Padma Shri, Padma Vibhushan, and the Bharat Ratna.

• Ricky Ponting

• Ricky Thomas Ponting AO is an Australian cricket coach, commentator and former player.

• He is widely regarded as one of the greatest batsmen of all time and is the most successful captain in international cricket history, with 220 victories in 324 matches with a winning rate of 67.91%.

**Q56. Answer: (a) Central Vista Project**

The correct answer is the Central Vista Project

Key Points

• The construction of the new Parliament building in India began under the Central Vista redevelopment project

• The new Parliament building is part of the Central Vista redevelopment project

• Tata Projects Limited won the bid to construct the new Parliament building in 2020.

• The foundation stone was laid on December 10, 2020, and the building was fully finished on May 20, 2023.

• The new building will celebrate India's cultural diversity and incorporate regional arts and crafts.

• It will also be built on an area of 64,500 sq m

Additional Information

• The Parliament of India or Indian Parliament, (ISO: Bhāratīya Samsada) is the supreme legislative body of the Republic of India.

• It is a bicameral legislature composed of the Rajya Sabha (Council of States) and the Lok Sabha (House of the People).

• The president of the Republic of India, in their role as head of the legislature, has full powers to summon and prorogue either house of Parliament or to dissolve the Lok Sabha, but they can exercise these powers only upon the advice of the prime minister and the Union Council of Ministers.

• The existing Parliament building is a British-era structure whose foundation was laid in 1921 and completed in 1927.

• It was designed by Edwin Lutyens and Herbert Baker who were responsible for the planning and construction of New Delhi – but this current structure was never intended or designed to be used as a parliament.

**Q57. Answer: (b) 286**

Given:

Total bill paid = Rs. 20,449

Each woman spent = one-fourth of the number of women

Formula Used:

Total Bill = Number of women × (one-fourth of the number of women)

Calculation:

Let the number of women be x.

Each woman spent = x/4

Total Bill = Number of women × (one-fourth of the number of women)

=> 20449 = x × x/4

=> 20449 = $(x^2)/4$

=> $x^2 = 20449 \times 4$

=> $x^2 = 81796$

=> $x = \sqrt{81796}$

=> x = 286

The number of women who visited the hotel is 286.

**Q58. Answer: (c) Janata Dal (United)**

The correct answer is Janata Dal (United)

Key Points

• The Maha Vikas Aghadi (MVA), also known as the Maharashtra Development Front, was an alliance formed in 2019 to govern Maharashtra. It included three main political parties:

• The Indian National Congress (INC)

• The Nationalist Congress Party (NCP)

• Shiv Sena

• The Janata Dal (United) (JD(U)) was not part of this alliance.

• The Janata Dal (United) (JD(U)) is a regional political party based in Bihar and other parts of India.

• It primarily operates outside of Maharashtra

Additional Information

• The Indian National Congress (INC)

• A major national political party that has been part of Indian politics since its founding in 1885.

• It has had a significant influence in Maharashtra and has been part of several coalition governments.

• The Nationalist Congress Party (NCP)

• A regional party in Maharashtra founded in 1999 by Sharad Pawar after splitting from the INC.

• The NCP has a significant presence in Maharashtra and has been part of both state and national coalitions.

• Shiv Sena

• A regional party founded in 1966 by Bal Thackeray, primarily focusing on the interests of Marathi people.

• Initially allied with the Bharatiya Janata Party (BJP), it formed the MVA alliance with INC and NCP after the 2019 Maharashtra Legislative Assembly elections.

• These three parties formed a coalition government under Uddhav Thackeray (Shiv Sena) as Chief Minister, marking a significant shift in Maharashtra's political landscape, as they overcame their ideological differences to form a common government.

• The alliance was formed to prevent the BJP from taking power after the 2019 state elections.

**Q59. Answer: (a) Irrfan Khan**

The correct answer is Irfran Khan

Key Points

• Irrfan Khan won the Filmfare Award for Best Actor in a Leading Role (Male) in 2021 for his role in Angrezi Medium.

• Khan received the award posthumously, as he died from cancer in April 2021 at the age of 53.

• He was an Indian actor who worked in Indian cinema as well as British and American films.

• Khan's career spanned over 30 years and earned him numerous accolades, including a National Film Award, an Asian Film Award, and six Filmfare Awards.

• In 2011, he was awarded the Padma Shri, India's fourth highest civilian honour

Additional Information

• 66th Filmfare Awards in 2021:

• Best Actor (Critics): Amitabh Bachchan for his role in Gulabo Sitabo

• Best Actress: Taapsee Pannu for her role in Thappad

• Best Actor in a Supporting Role (Male): Saif Ali Khan for his role in Tanhaji: The Unsung Warrior

• Best Director: Om Raut for Tanhaji

• Best Debut (Female): Alaya F for her role in Jawaani Jaaneman

• Best Film (Critics): Prateek Vats for Eeb Allay Oo!

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**Q60. Answer: (b) 0.81**

Given:

Expression: (0.9 × 0.9 × 0.9)/0.9

Formula Used:

To simplify the given expression, we can cancel out common factors in the numerator and the denominator.

Calculation:

Numerator: 0.9 × 0.9 × 0.9

Denominator: 0.9

Let's simplify:

=> (0.9 × 0.9 × 0.9)/0.9

=> 0.9 × 0.9 (since 0.9 in the numerator and denominator cancels out)

=> 0.81

The value is 0.81. Therefore, the correct answer is option 2.

**Q61. Answer: (a) Fatehpur Sikri**

The correct answer is Fatehpur Sikri.

Key Points

• The famous Sufi Saint Sheikh Salim Chisti's Dargah is situated at Fatehpur Sikri in Uttar Pradesh.

• It enshrines the burial place of the Sufi saint, Salim Chisti (1478 – 1572), a descendant of Khwaja Moinuddin Chishti of Ajmer, and who lived in a cavern on the ridge at Sikri.

• The mausoleum, constructed by Akbar as a mark of his respect for the Sufi saint.

• Fatehpur Sikri is a town in the Agra District of Uttar Pradesh, India.

• The city itself was founded as the capital of the Mughal Empire in 1571 by Emperor Akbar, serving this role from 1571 to 1585, when Akbar abandoned it due to a campaign in Punjab and was later completely abandoned in 1610.

Additional Information

• Chief Minister of Uttar Pradesh - Yogi Aditya Nath

• Governor of Uttar Pradesh - Anandiben Patel

• Chief Justice of Allahabad High court - Mr. Justice Arun Bhansali

• Uttar Pradesh has a total of 75 districts.

• Lakhimpur Kheri is the largest district in Uttar Pradesh.

• Hapur is the smallest district in Uttar Pradesh (By area wise).

**Q62. Answer: (a) 1962**

The correct answer is 1962

Key Points

• The AWBI was established in 1962 under Section 4 of The Prevention of Cruelty to Animals Act (1960).

• The Animal Welfare Board of India (AWBI), headquartered at Ballabhgarh in Haryana state, is a statutory advisory body advising the Government of India's Ministry of Fisheries, Animal Husbandry and Dairying (Department of Animal Husbandry and Dairying

• The board was initially within the jurisdiction of the Government of India's Ministry of Food and Agriculture.

• In 1990, the subject of Prevention of Cruelty to Animals was transferred to the Ministry of Environment, Forests and Climate change, where it now resides.

• The Board consists of 28 members, who serve for a period of 3 years.

Additional Information

• The headquarters of the Animal Welfare Board of India (AWBI) has been shifted from Chennai to Ballabhgarh in Faridabad District of Haryana for better coordination between the environment ministry and the AWBI for carrying out the animal welfare activities.

• It was informed by Mahesh Sharma, the Union Minister of State for Environment, Forest and Climate Change, in a written reply to Rajya Sabha.

• According to Rule 3 of the Animal Welfare Board (Administrative) Rules (1962), the headquarter of the AWBI shall be at New Delhi or at such other place as the central government, may, after consultation with the Board direct.

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**Q63. Answer: (a) AB is the longest side and BC is the shortest side.**

Given:

In a Δ ABC, angle A + angle B = 110º

angle B - angle A = 10º

Formula Used:

Sum of angles in a triangle = 180º

Calculation:

Let angle A = x and angle B = y

From the given conditions:

x + y = 110º

y - x = 10º

Adding these two equations:

x + y + y - x = 110º + 10º

=> 2y = 120º

=> y = 60º

Now, substituting y in one of the original equations:

x + 60º = 110º

=> x = 50º

So, angle A = 50º and angle B = 60º

Since the sum of the angles of a triangle is 180º:

angle C = 180º - (angle A + angle B)

angle C = 180º - (50º + 60º)

angle C = 70º

The order of the angles in increasing size is angle A, angle B, angle C

Therefore, the sides opposite these angles will be in increasing length:

AB (opposite angle C) > AC (opposite angle B) > BC (opposite angle A)

The correct answer is option 1:

AB is the longest side and BC is the shortest side.

**Q64. Answer: (a) 39**

Given: 18 ÷ 6 + 12 × 2 - 5 = ?

Decoding the given information:

| **Symbol** | • | • | × | ÷ |
|---|---|---|---|---|
| Means | × | • | • | ÷ |

Now replacing the sign from left to right using BODMAS Rule, we get:

=> 18 ÷ 6 × 12 − 2 + 5

= 3 × 12 − 2 + 5

=> 36 − 2 + 5

= 34 + 5 = 39

Hence, the correct answer is "Option 1".

**Q65. Answer: (a) respiratory system**

The correct answer is the Respiratory system

Key Points

• Asthma is a disorder of the respiratory system in the human body.

• It involves inflammation and narrowing of the airways, leading to difficulty in breathing, wheezing, and coughing.

• When exposed to certain triggers, such as allergens, pollutants, exercise, or respiratory infections, the airways can become even more constricted, leading to asthma attacks.

• In Asthma

• The lining of the airways becomes swollen, and mucus production increases, making it harder to breathe.

Additional Information

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• Locomotor System:

• The locomotor system is responsible for the movement of the body and its parts.

• It includes bones, muscles, and joints.

• It is Composed of the skeletal system (bones and joints) and muscular system (skeletal muscles).

• Disorders Include conditions such as arthritis, osteoporosis, and muscular dystrophy, which affect mobility,

• Circulatory System:

• The circulatory system is responsible for transporting blood, nutrients, oxygen, carbon dioxide, and hormones throughout the body.

• It Includes the heart, blood vessels (arteries, veins, capillaries), and blood.

• Conditions like hypertension, heart disease, and stroke affect the circulatory system

• Digestive System:

• The digestive system is responsible for breaking down food, absorbing nutrients, and eliminating waste.

• It Includes the mouth, esophagus, stomach, intestines, liver, and pancreas.

• Conditions like acid reflux, irritable bowel syndrome (IBS), and ulcers affect the digestive system

**Q66. Answer: (c) 1991**

The Correct Answer is 1991.

Key Points

• The dissolution of the Soviet Union was the process of internal disintegration in the Union of Soviet Socialist Republics (USSR).

• It was started with the turmoil in the various constituent republics in the late 1980s and ended on 26 December 1991, when the Supreme Soviet voted out of existence for the USSR itself.

• Declaration 142-H of the Supreme Soviet acknowledged the Soviet republics self-governing independence and officially abolished the Soviet Union.

• The conclusion of the Cold War marked the culmination of both the 1989 Revolutions and the fall of the USSR.

Additional Information

• The USSR was a loose confederation of 15 republics with Russia as the leader.

• The USSR had a total of 15 republics before its disintegration in 1991 are Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.

• On December 25, 1991, the Soviet hammer and sickle flag lowered for the last time over the Kremlin, thereafter replaced by the Russian tricolor.

• Mikhail Gorbachev resigned his post as president of the Soviet Union, leaving Boris Yeltsin as president of the newly independent Russian state.

• The office of president had been added to the political structure of the Russian Soviet Federated Socialist Republic in 1991.

• Personality clashes between Yeltsin and the parliamentary leadership led to a break between the legislative and executive branches.

**Q67. Answer: (b) Arabian Sea**

The correct answer is the Arabian Sea

Key Points

• Juhu Beach in Mumbai is part of the Arabian Sea.

• It is located in the Western part of Mumbai

• It is Approximately six kilometers long.

• Juhu Beach is one of the most popular beaches in India

• It's located in the Juhu suburb, which is home to many Bollywood celebrities and has luxury hotels and apartments.

Additional Information

• Arabian Sea

• The Arabian Sea lies to the west of India.

• It is a region of the northern Indian Ocean.

• It is bounded by Pakistan and Iran, on the west by the Gulf of Aden, Guardafui Channel, and the Arabian Peninsula, on the southeast by the Laccadive Sea, on the southeast by Somali Sea, and on the east by India.

• Bay of Bengal

• The Bay of Bengal is in the northeastern part of the Indian Ocean.

• The Bay of Bengal is bounded on the west and northwest by India, on the north by Bangladesh, and on the east by Myanmar and the Andaman and Nicobar islands of India.

• Indian Ocean
• The Indian Ocean is the youngest among the Pacific and the Atlantic oceans.
• Java Trench is a part of the Indian Ocean.
• It stretches between the southern tips of Africa and Australia.
• Pacific Ocean
• It is the largest and deepest ocean in the world.
• Most of the islands of this ocean are volcanic or of coral origin.
• Mariana Trench is the deepest trench of the world, lies in there.
• The depth of this trench is 11 km.
• It is bounded by some continents of Asia and Australia from the west and the Americas in the east.
• It starts from the Arctic ocean in the North to the Southern Ocean in the South.

**Q68. Answer: (c) 17 km**

Given:
Distance covered in 3 hours = 101/5 km
Formula Used:
Distance = Speed × Time
Speed = Distance / Time
Calculation:
Distance covered in 3 hours = 101/5 km
Speed = Distance / Time
Speed = (101/5) / 3
Speed = (51/5) / 3
Speed = 51 / 15
Speed = 3.4 km/hr
Distance covered in 5 hours = Speed × Time
=> Distance covered in 5 hours = 3.4 × 5
=> Distance covered in 5 hours = 17 km
The correct answer is option 3.

**Q69. Answer: (a) 1962**

The correct answer is 1962.
Key Points
• The Sino-Indian War (Indo-China War) foughtr took place in 1962.
• India was attacked on October 20, 1962, in what famously came to be known as the Sino-India war of 1962.
• The war continued for about a month and ended on November 21, after China declared a ceasefire.
• When China announced that it would be occupying Tibet, India sent a letter of protest proposing negotiations on the Tibet issue.
• China was more active in deploying troops on the Aksai Chin border.
• India was so concerned about its relations with China that it did not even attend a conference for the conclusion of a peace treaty with Japan because China was not invited.
• In 1954, China and India concluded the Five Principles of Peaceful Coexistence i.e. Panchsheel principles.
• Under this agreement, India acknowledged Chinese rule in Tibet.
Additional Information
• Chinese maps showed some 120,000 square kilometres of Indian territory as Chinese.
• China felt humiliated by the reception Dalai Lama obtained in India when he fled there in March 1959.
• Tensions increased between the two nations when Mao stated that the Lhasa rebellion in Tibet was caused by Indians.
• China's perception of India as a threat to its rule of Tibet became one of the most prominent reasons for the Sino-Indian War.
• On October 20, 1962, China's People's Liberation Army invaded India in Ladakh, and across the McMahon Line in the then North-East Frontier Agency.
• The Chinese also cut Indian telephone lines, preventing the defenders from making contact with their headquarters.
• India, thinking that war would not take place, did not prepare itself for the war.
• The war ended on November 21, after China declared a ceasefire.
• According to China's official military history, the war achieved China's policy objectives of securing borders in its western sector.

**Q70. Answer: (a) Kolkata**

The correct answer is Kolkata

Key Points

• Kolkata Port is the only riverine major port of India.

• It is officially known as Syama Prasad Mukherjee Port.

• It was constructed by the British East India Company.

• It is around 203 kilometres from the sea.

• Kolkata is a freshwater port with no variation in salinity.

• The port has two distinct dock systems — Kolkata Docks at Kolkata and a deep water dock at Haldia Dock Complex, Haldia.

Additional Information

| Coast | Ports | Features |
|---|---|---|
| Western Coast | Mumbai | Handles maximum traffic mostly of petroleum and dry cargo |
| Cochin | Major natural port in Wellington island | |
| Kandla | Tidal port & handles traffic of crude oil, petroleum, edible oil etc. | |
| Marmugao | It handles iron ore. Alo serves as a naval base. | |
| New Mangalore | All-weather port. | |
| Eastern Coast | Tuticorin | Offers direct weekly container service to the USA. |
| Ennore | First corporatised port in India. | |
| Vishakapatnam | It serves the Bhilai & Rourkela steel plants. | |
| Paradeep | It handles iron ore, coal & dry cargo | |
| Chennai | All-weather port, It has deep drafted berth oil jetties, iron ore terminals etc. | |

**Q71. Answer: (d) Cement Corporation of India**

The correct answer is Cement Corporation of India

Key Points

• Cement Corporation of India is not a Maharatna company in India.

• Cement Corporation of India Limited (CCI) is the only cement manufacturing Public Sector Undertaking of Government of India.

• The company was incorporated as a wholly government-owned corporation on 18 January 1965, with the objective of setting up cement units in public sector to help achieve self-sufficiency in cement production in the country.

• CCI is based in New Delhi.

Additional Information

• The Maharatna status is conferred upon select central public sector enterprises (CPSEs) in India based on their financial performance, operational efficiency, and global competitiveness.

• 1. Bharat Heavy Electricals Limited (BHEL) 1964

• 2. Bharat Petroleum Corporation Limited (BPCL) 1952

• 3. GAIL India Limited (GAIL) 1984

• 4. Coal India Limited (CIL) 1975

• 5. Hindustan Petroleum Corporation Limited (HPCL) 1974

• 6. Steel Authority of India Limited (SAIL) 1954

• 7. National Thermal Power Corporation (NTPC) 1975

• 8. Rural Electrification Corporation Limited (REC) 1969

• 9. Power Finance Corporation (PFC) 1986

• 10. Power Grid Corporation of India Limited (POWERGRID) 1989

• 11. Indian Oil Corporation Limited (IOCL) 1959

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• 12. Oil & Natural Gas Corporation Limited (ONGC) 1956

• 13. Oil India Limited (OIL) 1959

**Q72. Answer: (d) Infrared**

The correct answer is Infrared Rays.

Key Points

• The waves used in common TV remote control are Infrared Rays.

• Infrared (IR), sometimes called infrared light, is electromagnetic radiation (EMR) with wavelengths longer than those of visible light.

• It is therefore invisible to the human eye.

• IR is generally understood to encompass wavelengths from the nominal red edge of the visible spectrum around 700 nanometers (frequency 430 THz) to 1 millimetre (300 GHz) (although the longer IR wavelengths are often designated rather as terahertz radiation).

• Black-body radiation from objects near room temperature is almost all at infrared wavelengths.

• As a form of electromagnetic radiation, IR propagates energy and momentum, with properties corresponding to both those of a wave and of a particle, the photon.

Additional Information

• An X-ray, or X-radiation, is a penetrating form of high-energy electromagnetic radiation.

• X-rays have a wavelength ranging from 10 picometers to 10 nanometers, corresponding to frequencies in the range 30 petahertz to 30 exahertz and energies in the range 124 eV to 124 keV.

• Ultraviolet (UV) is a form of electromagnetic radiation with a wavelength from 10 (with a corresponding frequency around 30 PHz) to 400 nm (750 THz), shorter than that of visible light, but longer than X-rays. UV radiation is present in sunlight and constitutes about 10% of the total electromagnetic radiation output from the Sun.

• It is also produced by electric arcs and specialized lights, such as mercury-vapour lamps, tanning lamps, and black lights.

• Polarised are light waves that vibrate in a single plane, as opposed to unpolarized light waves, which vibrate in multiple planes.

• Polarization is the process of converting unpolarized light into polarized light.

**Q73. Answer: (b) [figure]**

First we have to find the opposite surfaces, we need to compare the common surface in the given dices,

So, From Dice 1 and Dice 3,

From both dices, 6 is common. So, remaining surface will be opposite to each other.

Opposites pairs:

3 → 1, 2 → 5, 6 → 4

Option 1)

→ Incorrect (because of opposite pairs)

Option 2)

→ Correct (because of opposite pairs; 3 <=> 1, 2 <=> 5, 6 <=> 4)

Option 3)

→ Incorrect (because of opposite pairs)

Option 4)

→ Incorrect (because of opposite pairs)

So, Option 2 will be the correct unfolded view when this paper cube is opened out (flattened).

Hence, the correct answer is "Option 2"

**Q74. Answer: (b) 32**

Given:

The smallest positive integer required to be added to 2712 to make the sum a perfect cube.

Formula Used:

Perfect Cube: $n^3$

Calculation:

Find the cube root of 2712:

Cube root of 2712 ≈ 13.98

The next integer is 14.

Find the cube of 14:

$14^3 = 14 \times 14 \times 14$

$14^3 = 2744$

Now, subtract 2712 from 2744:

=> 2744 - 2712 = 32

The smallest positive integer required to be added to 2712 to make the sum a perfect cube is 32.

**Q75. Answer: (b) 41/33**

Given:

We need to find the number that should be added to -5/11 to obtain 26/33.

Solution:

Step 1: Represent the equation

Let the number be x. The equation becomes:

-5/11 + x = 26/33.

Step 2: Isolate x

x = 26/33 + 5/11.

Step 3: Find the LCM of the denominators

The denominators are 33 and 11. The LCM is 33.

Rewrite the fractions with a common denominator:

5/11 = 15/33.

Now the equation becomes:

x = 26/33 + 15/33.

Step 4: Add the fractions

x = (26 + 15)/33 = 41/33.

The number to be added is 41/33.

**Q76. Answer: (a) NJAVG**

The logic followed here is:

CHAIR is written as AFAKT

Similarly, PLATE will be written as:

Hence, the correct answer is "NJAVG".

**Q77. Answer: (d) 4**

Given: L, M, N, O, P, Q and R live on 7 different floors of the same building. The lowermost floor is numbered 1, the floor above that is numbered 2 and so on till the topmost floor is numbered 7.

1) R lives on an even numbered floor, but not on floor number 4.

2) Only 1 person lives between R and M.

| Floor | Person | |
|---|---|---|
| | Case 1 | Case 2 |
| 7 | | |
| 6 | R | |
| 5 | | |
| 4 | M | M |
| 3 | | |
| 2 | | R |
| 1 | | |

3) O lives immediately above P, and P lives immediately above Q.

| Floor | Person | |
|---|---|---|
| | Case 1 | Case 2 |

| | | |
|---|---|---|
| 7 | | O |
| 6 | R | P |
| 5 | | Q |
| 4 | M | M |
| 3 | O | |
| 2 | P | R |
| 1 | Q | |

4) More than 3 persons live between Q and L.

As maximum number of person that can be positioned between Q and L in case 2 is 3, therefore is eliminated.

After positioning L only one floor is left which will be occupied by the only person left i.e. N.

| Floor | Person |
|---|---|
| | Case 1 |
| 7 | L |
| 6 | R |
| 5 | N |
| 4 | M |
| 3 | O |
| 2 | P |
| 1 | Q |

Thus, according to the final arrangement, 4 people live below N.

Hence, "Option 4" is the correct answer.

**Q78. Answer: (d) 4**

Given:

Rate of interest (r) = 20%

Final amount (A) = 2 × Principal amount (P)

Formula Used:

$A = P (1 + r/100)^n$

Calculation:

We need to find the least number of years (n) for which the amount becomes more than double.

$A = 2P$

$2P = P (1 + 20/100)^n$

$2 = (1 + 0.2)^n$

$2 = (1.2)^n$

Now, we solve for n:

Taking log on both sides:

$\log(2) = n \log(1.2)$

$n = \log(2) / \log(1.2)$

$n \approx 3.8$

Since n must be an integer and it should be the least number of years:

The least number of years is 4.

**Q79. Answer: (d) p + 2**

Given:

Average of any five consecutive odd natural numbers = p

Formula Used:

New average = (Sum of old numbers + Sum of new numbers) / Total numbers
Calculation:
Let the five consecutive odd natural numbers be: a, a+2, a+4, a+6, a+8
Average of these numbers, p = (a + (a+2) + (a+4) + (a+6) + (a+8))/5
p = (5a + 20)/5
p = a + 4
Now, add two more consecutive odd numbers just next to the previous five numbers: a+10, a+12
New sum = 5a + 20 + (a + 10) + (a + 12)
New sum = 7a + 42
New average = (7a + 42)/7
New average = a + 6
Since p = a + 4
a = p - 4
New average = (p - 4) + 6
New average = p + 2
The new average will become: p + 2

**Q80. Answer: (b) 15 km/h**

Shortcut Trick
Ratio of Time taken (Upstream : Downstream) = 2 : 1
Ratio of Speeds (Upstream : Downstream) = 1 : 2 (Since Distance is constant)
Speed Ratio (Still water : Stream) = (2 + 1) : (2 − 1) = 3 : 1
Given Stream Speed = 5 km/h (1 unit = 5 km/h)
Speed of Raju in still water = 3 units = 3 × 5 = 15 km/h
Therefore The correct answer is 15 km/h.
Alternate Method
Given:
Speed of stream (y) = 5 km/h
Time taken upstream (T_u) = 2 × Time taken downstream (T_d)
Formula used: Speed = Distance / Time
River Current (y = 5 km/h)
Upstream: x − 5 (Time = 2t)
Downstream: x + 5 (Time = t)
Let the speed of Raju in still water be x km/h.
=> Downstream speed = (x + 5) km/h
=> Upstream speed = (x − 5) km/h
=> Since distance (D) is same, D = Speed × Time
=> (x + 5) × T_d = (x − 5) × T_u
=> (x + 5) × T_d = (x − 5) × (2 × T_d)
=> x + 5 = 2x − 10
=> 2x − x = 10 + 5
=> x = 15 km/h
Therefore The correct answer is 15 km/h.
Additional Information
Downstream and Upstream Speeds
Downstream Speed (D) = x + y and Upstream Speed (U) = x − y, where x is speed in still water and y is stream speed.
Calculating Speed in Still Water
Speed in still water (x) = (D + U) ÷ 2. It is the average of downstream and upstream speeds.
Calculating Speed of Stream
Speed of stream (y) = (D − U) ÷ 2. It represents half the difference between the two speeds.
Inverse Relation of Speed and Time
For a constant distance, Speed1 ÷ Speed2 = Time2 ÷ Time1.

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**Q81. Answer: (d) 18**

Given:

Number = 3467860

Formula Used:

To find the smallest number that must be subtracted to make a number divisible by a given divisor:

Smallest number to subtract = Remainder when the number is divided by the divisor

Calculation:

Divisor = 19

Remainder = 3467860 % 19

3467860 ÷ 19 = 182518

3467860 - (182518 × 19) = 3467860 - 3467842

Remainder = 18

Therefore, the smallest number to be subtracted is 18.

The correct answer is option 4.

**Q82. Answer: (a) X-rays**

The correct answer is X-rays

Key Points

• Among the options provided, X-rays are the only electromagnetic waves.

• X-rays:

• Electromagnetic waves that have high energy and short wavelengths, used in medical imaging and other applications.

• They belong to the electromagnetic spectrum, which also includes visible light, radio waves, and gamma rays.

• X-rays, also known as radiography, are a type of radiation that produces black-and-white images of the inside of the body.

• X-rays are a quick and painless procedure that are often used to examine bones and joints.

Additional Information

• Electromagnetic waves are also known as EM waves that are produced when an electric field comes in contact with the magnetic field.

• It can also be said that electromagnetic waves are the composition of oscillating electric and magnetic fields.

• The electromagnetic field is produced by an accelerating charged particle.

• Electromagnetic waves are nothing but electric and magnetic fields travelling through free space with the speed of light c.

• An accelerating charged particle is when the charged particle oscillates about an equilibrium position.

• If the frequency of oscillation of the charged particle is f, then it produces an electromagnetic wave with frequency f.

• The wavelength λ of this wave is given by λ = c/f.

• Electromagnetic waves transfer energy through space.

• Applications of Electromagnetic Waves

• Electromagnetic waves can transmit energy through vaccum.

• Electromagnetic waves play an important role in communication technology.

• Electromagnetic waves are used in RADARS.

• UV rays are used to detect forged bank-notes. Real bank-notes don’t turn fluorescent under UV light.

• Infrared radiation is used for night vision and is used in the security camera.

**Q83. Answer: (a) Chaukhandi Stupa**

The correct answer is Chaukhandi Stupa

Key Points

• Chaukhandi Stupa is located in Sarnath, Uttar Pradesh.

• It was built in the period of the 4th and 5th century A.D during the Gupta period.

• It is believed that Buddha first time met his five disciples here.

• It was built to mark the site where Lord Buddha and his first disciples met while traveling from Bodh Gaya to Sarnath.

• It is declared as a ‘protected area of national importance’ in 2019.

• It was founded by Alexander Cunningham in 1861.

• The Archaeological Survey of India declared Chaukhandi Stupa as a monument of national importance in June 2019.

Additional Information

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• Dharmarajika Stupa
• It was built in 249 BCE, later replaced in 500 CE.
• It was built by Emperor Ashoka of the Maurya Dynasty.
• It is located at Sarnath, Varanasi, Uttar Pradesh, India.
• It was built as a Buddhist Pilgrimage.
• Architectural Style is Buddhist Art and Architecture.
• Dhamek stupa marks the spot where Buddha gave the first sermon to his first five Brahmin disciples after attaining enlightenment.
• Sanchi Stupa
• Sanchi Stupa is a Buddhist complex built by Ashoka.
• It is situated in the Raisen District of Madhya Pradesh.
• It is considered the oldest stone structure in India.
• It was designed by the Mauryan emperor Ashoka within the 3rd century BCE.
• It is also the UNESCO World Heritage site.
• Sanchi Stupa motif is a feature that can be seen in the new Rs. 200 note.

**Q84. Answer: (c) Rs. 250**

Given:
Profit at 16%
Selling price if Rs. 10 more, profit would be 20%
Formula Used:
Selling Price = Cost Price + Profit
Profit = (Profit% × Cost Price) / 100
Calculation:
Let the cost price be Rs. x.
Selling price at 16% profit = x + (16% of x)
=> Selling price at 16% profit = x + (16x / 100)
=> Selling price at 16% profit = 116x / 100
If the selling price is Rs. 10 more, the profit would be 20%.
Selling price at 20% profit = x + (20% of x)
=> Selling price at 20% profit = x + (20x / 100)
=> Selling price at 20% profit = 120x / 100
According to the given condition,
120x / 100 = (116x / 100) + 10
=> 120x / 100 - 116x / 100 = 10
=> (120x - 116x) / 100 = 10
=> 4x / 100 = 10
=> 4x = 1000
=> x = 250
The cost price of the toy is Rs. 250.

**Q85. Answer: (c) The difference between the number of students who like both cornflakes and plum cakes and the number of stu...**

Given:
The total number of students in the hostel is 3200.
The pie chart shows the percentage of students who like different breakfast items:
Idly: 15%
Bread: 30%
Eggs: 5%
Plum Cakes: 25%
Corn Flakes: 25%
Solution:
Step 1: Calculate the number of students for each breakfast item

Idly: (15/100) × 3200 = 480 students

Bread: (30/100) × 3200 = 960 students

Eggs: (5/100) × 3200 = 160 students

Plum Cakes: (25/100) × 3200 = 800 students

Corn Flakes: (25/100) × 3200 = 800 students

Step 2: Analyze each statement

Statement 1: "The difference between the number of students who like plum cakes and the number of students who like idly, is twice the number of students who like eggs for breakfast."

Difference between students liking plum cakes and idly:

800 - 480 = 320.

Twice the number of students who like eggs:

2 × 160 = 320.

This statement is true.

Statement 2: "The ratio of the number of students who like idly to the number of students who like eggs is 3:1."

Number of students who like idly: 480.

Number of students who like eggs: 160.

Ratio = 480:160 = 3:1.

This statement is true.

Statement 3: "The difference between the number of students who like both cornflakes and plum cakes and the number of students who like both bread and eggs is greater than the number of students who like idly."

Number of students who like both cornflakes and plum cakes = 800 + 800 = 1600 (approximation for combined categories).

Number of students who like both bread and eggs = 960 + 160 = 1120.

Difference = 1600 - 1120 = 480, which equals the number of students who like idly (not greater).

This statement is false.

Statement 4: "Only 160 students like eggs for breakfast."

Number of students who like eggs is indeed 160.

This statement is true.

The statement that is NOT true is Statement 3.

**Q86. Answer: (c) 7%**

Given:

The production of wheat in District-3 in 2017 = 1760 quintals.

The production of wheat in District-1 in 2017 = 1640 quintals.

We need to calculate by approximately what percentage the wheat production in District-3 in 2017 is more than the wheat production in District-1 for the same year.

Solution:

Step 1: Calculate the difference in production

Difference = Production in District-3 (2017) - Production in District-1 (2017)

Difference = 1760 - 1640 = 120 quintals.

Step 2: Calculate the percentage increase

Percentage increase = (Difference / Production in District-1) × 100

Percentage increase = (120 / 1640) × 100

Percentage increase = 7.32% ≈ 7%

The wheat production in District-3 in 2017 is approximately 7% more than the wheat production in District-1 for the same year.

**Q87. Answer: (a) Rs. 40,000**

Given:

Amount spent on Health = Rs. 6,000.

Angle for Health in the pie chart = 54°.

Total angle of a circle = 360°.

We need to find the approximate amount spent on the total monthly expenditure.

Solution:

Step 1: Use the proportion of the pie chart

The proportion of the amount spent on Health is:

Proportion = (Angle for Health) / (Total angle).

Proportion = 54° / 360° = 3 / 20.

Step 2: Calculate the total monthly expenditure

Total expenditure = Amount spent on Health / Proportion.

Total expenditure = Rs. 6,000 / (3 / 20).

Total expenditure = Rs. 6,000 × (20 / 3).

Total expenditure = Rs. 40,000.

The approximate amount spent on the total monthly expenditure is Rs. 40,000.

**Q88. Answer: (a) Branch A**

Given:

The line graph shows the number of vehicles (in thousands) manufactured by five branches (A, B, C, D, E) in 2018 and 2019.

We need to find the branch where the increase in the number of vehicles manufactured from 2018 to 2019 is the maximum.

Solution:

Step 1: Extract data from the graph

Branch A: 2018 = 42, 2019 = 58, Change = 58 - 42 = +16 (increase)

Branch B: 2018 = 60, 2019 = 48, Change = 48 - 60 = -12 (decrease)

Branch C: 2018 = 44, 2019 = 58, Change = 58 - 44 = +14 (increase)

Branch D: 2018 = 46, 2019 = 52, Change = 52 - 46 = +6 (increase)

Branch E: 2018 = 62, 2019 = 50, Change = 50 - 62 = -12 (decrease)

Step 2: Identify the maximum increase

The maximum increase in the number of vehicles manufactured is for Branch A with an increase of +16.

The branch with the maximum increase in the number of vehicles manufactured from 2018 to 2019 is Branch A.

**Q89. Answer: (d) Only conclusion 1 follows.**

The least possible Venn diagram for the given statements is as shown below :

Conclusions:

1. No member is a student → Follow (As all members are candidates and no student is a candidate. As all members comes in candidates which cannot be students, therefore it is true)

2. Some students are members → Does not follow (As all members are candidates and no student is a candidate. As all members comes in candidates which cannot be students, therefore it is false)

Therefore Here, Only conclusion 1 follows.

Hence, the correct answer is "Option 4".

**Q90. Answer: (a) 3, 25**

The logic followed here is:

Option 1) 3, 25

(3 + 1)2 = 25

(4)2 = 25

36 ≠ 25 (LHS ≠ RHS)

Option 2) 5, 36

(5 + 1)2 = 36

(6)2 = 36

36 = 36 (LHS = RHS)

Option 3) 8, 81

(8 + 1)2 = 81

(9)2 = 81

81 = 81 (LHS = RHS)

Option 4) 7, 64

(7 + 1)2 = 64

(8)2 = 64

64 = 64 (LHS = RHS)

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Thus, out of all the options, '3, 25' is the correct answer.
Hence, "Option 1" is the correct answer.

**Q91. Answer: (d) [figure]**

The diagram that best represents the relationship between the given classes is shown below :
Sisters and wives are subset of women category.
Some sisters can be wives.
Hence, "Option 4" is the correct answer.

**Q92. Answer: (b) 85**

The logic followed here is:
Logic: 1st number × 2.5 = 2nd number.
Now,
For, 18 : 45
=> 18 × 2.5 = 45.
Similarly, for 34 : ?
=> 34 × 2.5 = 85.
Hence, the correct answer is "Option 2".

**Q93. Answer: (b) MKF**

The logic followed here is:
Option 1) WUQ
Option 2) MKF
Option 3) QOK
Option 4) RPL
Thus, out of all the options, 'MKF' is the odd one out.
Hence, "Option 2" is the correct answer.

**Q94. Answer: (d) C**

Given: A, B, C, D, E, F and H are sitting in a straight line. Some of them are facing north, while some are facing south.
1) C is facing south.
2) Only 2 people are sitting to the left of C.
3) Both the immediate neighbours of C are facing the direction opposite to that of C.
4) Only 2 people are sitting between C and A.
5) H is neither an immediate neighbour of C nor A.
6) F is third to the right of H.
7) More than 3 people are sitting between H and B.
8) None of the immediate neighbours of A are facing the same direction as A.
9) D is sitting to the immediate right of A.
After positioning D only one position is left which will be occupied by the only person left i.e. E.
Thus, according to the final arrangement, C is sitting to the immediate left of E.
Hence, "Option 4" is the correct answer.

**Q95. Answer: (b) 14**

The logic followed here is:
2 × 4 × 2 × 3 = 8 × 6
48 = 48 (LHS = RHS)
And,
1 × 3 × 5 × 2 = 5 × 6
30 = 30 (LHS = RHS)
Similarly,
3 × 7 × 2 × 1 = ? × 3
42 ÷ 3 = ?
14 = ?

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Hence, "Option 2" is the correct answer.

**Q96. Answer: (a) RJCRG**

The logic followed here is:

BOWL : DMYJ

Similarly,

PLATE : ?

Hence, "Option 1" is the correct answer.

**Q97. Answer: (b) EHKN**

The logic followed here is:

Hence, "Option 2" is the correct answer.

**Q98. Answer: (b) 18i6**

The logic followed here is:

Hence, "Option 2" is the correct answer.

**Q99. Answer: (a) [figure]**

The logic followed here is:

Option 1)

→ Two different polygons.

Option 2)

→ Two similar polygons.

Option 3)

→ Two similar polygons.

Option 4)

→ Two similar polygons.

**Hence, 'Option 1' is the correct answer.

**Q100. Answer: (c) 59/30**

Given:

We need to find the number to be added to (1/2 + 1/3 + 1/5) to get 3.

Solution:

Step 1: Find the sum of the fractions

LCM of the denominators 2, 3, and 5 is 30.

Convert the fractions to have a common denominator:

1/2 = 15/30

1/3 = 10/30

1/5 = 6/30

Sum = 15/30 + 10/30 + 6/30 = 31/30.

Step 2: Calculate the number to be added

Let the number to be added be x.

We have:

31/30 + x = 3

x = 3 - 31/30

x = (90/30) - (31/30)

x = 59/30.

The number to be added is 59/30.

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