RRB NTPC CBT-I Official Paper (Held On: 7 April 2021 Shift 1) (Previous Year Paper)

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

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Q1. Which cell organelle utilizes light energy during photosynthesis?

(a) Golgi body
(b) Mitochondria
(c) Ribosome
(d) Chloroplasts

Q2. A, B and C can complete a job in 15 days, 20 days and 30 days, respectively. If they earn Rs. 270 together, then the share of B is:

(a) Rs. 90
(b) Rs. 93
(c) Rs. 96
(d) Rs. 99

Q3. Who shot dead Rand, the commissioner of Police, Poona due to failure to-check plagues towards the end of 19^(th) century in India?

(a) Bharat Singh
(b) Damodar Chapekar
(c) Vasudev B. Phadke
(d) Veer Savarkar

Q4. The Vice-President of India is elected by the:

(a) members of both houses of parliament
(b) members of the houses of parliament and state legislative assemblies
(c) members of the Rajya Sabha
(d) members of the Lok Sabha

Q5. The sum of two positive numbers is 27, while the difference of their squares is 81. What is the value of the greater of the two numbers?

(a) 15
(b) 14
(c) 16
(d) 12

Q6. A locomotive engine without any wagon can go to a speed of 50 km per hour and its speed diminishes by a quantity which varies as the square root of the number of wagon attached. If with 25 wagons its speed is 35 km per hour, then what is the greatest number of wagon that can be attached, if the speed is NOT to fall below 11 km per hour?

(a) 196
(b) 225
(c) 169
(d) 144

Q7. If a point (1, 2) is translated 2 units through the positive direction of x-axis and then the tangents drawn from that point to the circle $x^2 + y^2 = 9$, find the angle between the tangents.

(a) 2tan ^(- 1)(3/2)
(b) 2tan ^(- 1)(1/3)
(c) tan ^(- 1)(5/3)
(d) 2tan ^(- 1)(2/3)

Q8. The chord of contact of tangents drawn from a point on the circle $x^2 + y^2 = a^2$ to the circle x2 + y2 = b^2 touches the circle x2 + y2 = c^2 such that b^m = a^nc^p, where m, n, p ε N. Find the value of m + n + p + 10.

(a) 14
(b) 10
(c) 8
(d) 12

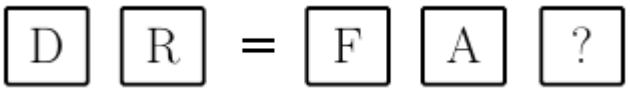
Q9. Find the value of √54 × √6.

(a) 45
(b) 18
(c) 25
(d) 65

Q10. In a certain code language, MONOLATERALS is written as NMOAOLRTESAL. How will ABRACADABRAS be written in that code?

(a) RBAACABADSAR
(b) RABAACBDASRA
(c) RABACABDASRA
(d) SARBADACARBA

Q11. Select the letter that can replace the question mark (?).



(a) P
(b) O
(c) L
(d) N

Q12. SAGA-220 was developed by Indian Space Research Organization. What is SAGA-220?

(a) Super Computer
(b) Pacemaker
(c) Satellite
(d) Missile

Q13. What is Karl Landsteiner known for?

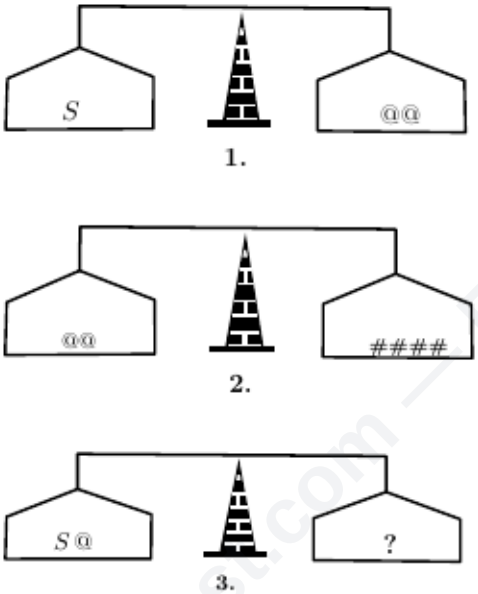
(a) Studied the nervous system
(b) Isolated the DNA
(c) Identified the Zika Virus
(d) Discovery of blood group classification

Q14. If A's salary is 50% more than that of B, then by what percentage is B's salary less than that of A?

(a) 131/3%
(b) 231/3%
(c) 301/3%
(d) 331/3%

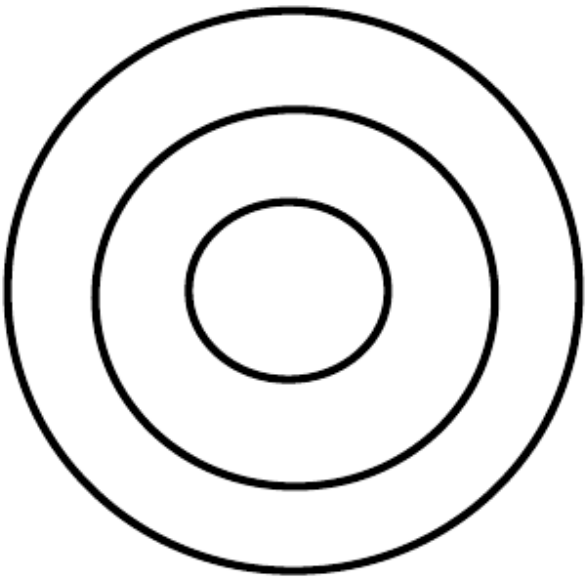
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Q15. Study the given pattern carefully and select the option that can replace the question mark (?) in it.



(a) # # # #
(b) # # # # #
(c) # # # # # #
(d) # # #

Q16. Select the option that is best represented by the following Venn diagram.



(a) Doctors, Nurses, Hospital
(b) Wheat, Crop, Cereal
(c) Criminal, Thief, Police
(d) Year, Month, Weather

Q17. If $\pi/2 < \theta < 3\pi/2$, then $\sqrt{(1 - \sin\theta)/(1 + \sin\theta)}$ is:

(a) $\tan\theta + \sec\theta$
(b) $\tan\theta - \sec\theta$
(c) $\cos\theta - \sec\theta$
(d) $\sin\theta - \sec\theta$

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Q18. SpaceX has created a new record by launching _____ satellites into space in a single launch in Jan 2021.

(a) 153
(b) 143
(c) 110
(d) 125

Q19. A train travelling at a speed of 96 km/h crosses a post in 12 seconds and a platform in 30 seconds. What is the length of the platform?

(a) 480 m
(b) 450 m
(c) 640 m
(d) 540 m

Q20. Find the value of √(248+√(51 + √169)).

(a) 25
(b) 16
(c) 9
(d) 36

Q21. Which subject is dealt with in 'Sushruta Samhita'?

(a) Religion and mythology
(b) Mathematics
(c) Medicine and surgery
(d) Astrology

Q22. Which of the following is the major worldwide centre for Ship breaking in India?

(a) Chennai
(b) Alang
(c) Vishakhapatnam
(d) Kochi

Q23. If (√5 - 1)/(√5 + 1) - (√5 + 1)/(√5 - 1) = a + b√5, then the value of (a + b) (a - b) ÷ (a^2 + b^2) is:

(a) -1
(b) 3
(c) -2
(d) 0

Q24. Find the value of N in the following equation 1/3 + 2/9 = (N + 1)/(N + 5).

(a) 0
(b) 4
(c) 1
(d) 3

Q25. Vivekanand Rock memorial is situated at _____.

(a) Tirupathi
(b) Kanyakumari
(c) Rameshawaram
(d) Kozhikode

Q26. Select the option that is related to 'Malayalam' in the same way as 'Odisha' is related to 'Odia'.

(a) Karnataka
(b) Kerala
(c) Andhra Pradesh
(d) Tamil Nadu

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Q27. Read the given statements and conclusions carefully. Assuming that the information given in the statements to be 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:

Teachers make friends with only tall people.

Tandon is very tall.

Conclusions:

I. Tandon is friends with a teacher.

II. Tandon is not friends with a teacher.

(a) Only conclusion I follows.
(b) Only conclusion II follows.
(c) Both conclusions I and II follow.
(d) Either conclusion I and II follows.

Q28. Which of the following is used as a fuel in nuclear reactors?

(a) Cobalt
(b) Copper
(c) Uranium
(d) Iodine

Q29. Consider the given statement and decide which of the given assumptions is/are implicit in the statement.

Statement:

'Please keep the doors of the emergency ward closed while leaving the ward, to keep the room germ-free' – A sign board near the emergency ward of a hospital.

Assumptions:

I. Leaving the doors of the emergency ward open will cause germs to enter.

II. People are likely to pay attention to this notice.

(a) Both assumptions I and II are implicit.
(b) Either assumption I and II is implicit.
(c) Only assumption II is implicit.
(d) Only assumption I is implicit.

Q30. Which of the following is an example of a spreadsheet?

(a) Microsoft Excel
(b) Microsoft Outlook
(c) Microsoft Word
(d) Microsoft Power Point

Q31. Nai Roshni Scheme is a Government welfare scheme launched to empower _____ women.

(a) Scheduled tribes
(b) Minority
(c) Backward caste
(d) Scheduled caste

Q32. Find the length of the tangent from any point on the circle $x^2 + y^2 + 2011x + 2012y + 2013 = 0$ to the circle $x2 + y^2 + 2011x + 2012y + 2014 = 0$.

(a) 1
(b) No common tangent can be drawn.
(c) 0
(d) 5

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Q33. The LCM of 144, 180 and 384 is:

(a) 1760
(b) 5560
(c) 5760
(d) 3760

Q34. Which of the following Articles of Indian Constitution describes the details for new state formation, alternation, of boundaries etc.?

(a) Article 2
(b) Article 3
(c) Article 1
(d) Article 10

Q35. Who is the author of Ashtadhyayi, an ancient Sanskrit book?

(a) Ashtavakra
(b) Panini
(c) Patanjali
(d) Charaka

Q36. If tan A + tan B = p and cot A + cot B = q, then cot (A + B) is:

(a) pq/(p + q)
(b) (q-p)/pq
(c) pq/(p - q)
(d) (p-q)/pq

Q37. Who was the Governor General at the time of sepoy mutiny?

(a) Lord Dalhousie
(b) Lord Cornwallis
(c) Lord Hastings
(d) Lord Canning

Q38. The LCM of 248 and 868 is 1736. The HCF of the same two numbers is:

(a) 124
(b) 248
(c) 1736
(d) 868

Q39. X told Y, 'I am neither your son, nor your father, I am not your wife's brother, but I am related to him. I am the grandson of the father of your wife. 'How is X related to y?

(a) Father's Sister's Husband
(b) Brother's Son
(c) Wife's Brother's Son
(d) Sister's Son

Q40. A circle has a radius of 3 units and its centre lies on the line y = x - 1. Find the equation of the circle if it passes through point (7, 3).

(a) $x^2 + y^2 - 8x - 6y - 16 = 0$
(b) x2 + y2 - 8x - 6y + 16 = 0
(c) x2 + y2 + 8x + 6y + 16 = 0
(d) x2 + y2 + 8x - 6y + 16 = 0

Q41. If 2/5 + 2/10 = (N + 1)/(N + 5), then find the value of N.

(a) 5/9
(b) 9
(c) 4

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(d) 5

Q42. United Nations General Assembly passed a resolution in the year _____ for establishing the UNIDO.

(a) 1966
(b) 1970
(c) 1975
(d) 1985

Q43. Which among the following countries is not the member of ASEAN?

(a) Indonesia
(b) Thailand
(c) India
(d) Singapore

Q44. Which gas can be fixed in the atmosphere by lightning?

(a) Oxygen
(b) Carbon dioxide
(c) Nitrogen
(d) Argon

Q45. INS _____, third Scorpene class submarine was commissioned into the Indian Navy on 10^(th) March, 2021.

(a) Karanj
(b) Kalvari
(c) Vela
(d) Khanderi

Q46. Which kingdom was called "a cherry" by Governor General Lord Dalhousie?

(a) Kingdom of Awadh
(b) Kingdom of Gwalior
(c) Kingdom of Jhansi
(d) Kingdom of Vijaynagara

Q47. Which of the following is an example of scattering of light?

(a) Blue colour of the sky
(b) Twinkling of stars
(c) Splitting of white light through a glass prism
(d) Rainbow

Q48. Samarth scheme is implemented by the Union ministry of _____

(a) Defence
(b) Power
(c) Textile
(d) Labour

Q49. Who led the march to raid the Dharasana salt works after Gandhiji was arrested?

(a) Jawahar Lal Nehru
(b) Sardar Vallabhbhai Patel
(c) Madan Mohan Malviya
(d) Abbas Tyabji

Q50. Four letter-pairs have been given, out of which three are alike in some manner and one is different. Select the odd one.

(a) CN
(b) LW
(c) BL

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(d) NY

Q51. Line, Daisy Wheel, Laser and Drum are types of:

(a) Scanners
(b) Photocopiers
(c) Plotters
(d) Printers

Q52. In a mixture of milk and water of 120 litres, the ratio of milk to water is 2 : 1. If the ratio of milk to water needs to be 1 : 2, then the amount of water that needs to be added to the mixture is:

(a) 110 litres
(b) 120 litres
(c) 140 litres
(d) 130 litres

Q53. Study the given pattern carefully and select the number that can replace the question mark (?) in it.

4	**5**	**4**
?	1	5
32	12	18

(a) 12
(b) 14
(c) 8
(d) 10

Q54. During First war of Independence, 1857, Kanpur region rose to oppose the British rule where Nana Saheb's Palace at _____ served as its headquarters.

(a) Pokhraya
(b) Bibighar
(c) Bithoor
(d) Fatehgarh

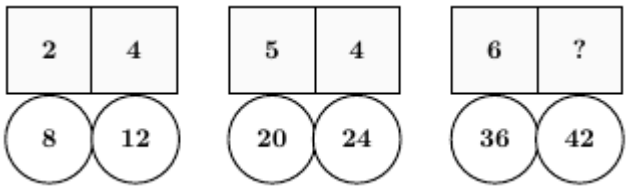
Q55. 'Loktak' lake is situated in which state?

(a) Odisha
(b) Meghalaya
(c) Manipur
(d) Rajasthan

Q56. Unix, MS DOS, Linux are examples of:

(a) Brands of printers
(b) Operating Systems
(c) Printers
(d) Computers

Q57. Study the given pattern carefully and select the number that can replace the question mark (?) in it.



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

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Q58. A path, 5 m, wide runs around and outside a rectangular plot of land of length 10 m and breadth 8 m. The area of path is:

(a) 160 m²
(b) 380 m2
(c) 260 m2
(d) 280 m2

Q59. Where is the headquarters of Nuclear Power Corporation of India Limited (NPCIL)?

(a) Delhi
(b) Kanpur
(c) Guwahati
(d) Mumbai

Q60. Pradhan Mantri Suraksha Bima Yojana will cover accidental death risk of Rs. _____ for a premium of just Rs. 12 per year.

(a) 2 Lakh
(b) 4 Lakh
(c) 3 Lakh
(d) 1 Lakh

Q61. Which of the following tourist circuit is not included in the Swadesh Darshan scheme launched by ministry of Tourism and Culture, Government of India?

(a) Sufi Circuit
(b) Eco Circuit
(c) Coastal Circuit
(d) Mountain Circuit

Q62. Kiran can complete a task in 15 days. He works for 5 days and then leaves. If Venkat completes the remaining task in 30 days, then in how many days can Venkat alone complete the same task?

(a) 40
(b) 45
(c) 50
(d) 48

Q63. The non-terminating repeating decimal among the following fractions is:

(a) 13/4
(b) 100/11
(c) 7/5
(d) 3/40

Q64. Find the fourth proportional to 3, 5 and 15.

(a) 25
(b) 15
(c) 20
(d) 35

Q65. P and Q started a business with equal capital. P withdrew from the business at the end of 4 months. If, at the end of the year, the business made a profit of Rs. 6,400, then the share of P is:

(a) Rs. 1,750
(b) Rs. 3,200
(c) Rs. 1,600
(d) Rs. 1,800

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Q66. Who will be conferred with the 2021 Film Archive award by the FIAF?

(a) Amitabh Bachchan
(b) Rajanikant
(c) Kamal Hasan
(d) Christopher Nolan

Q67. Which of the following Viceroy of India did take initiative to create elected local government bodies?

(a) Lord Rippon
(b) Lord Reading
(c) Lord Irwin
(d) Lord Wavell

Q68. If x is 20% more than y, then y is _____ less than x.

(a) 161/3%
(b) 162/3%
(c) 832/3%
(d) 831/3%

Q69. Identify the water-soluble vitamin from the following.

(a) Vitamin A
(b) Vitamin B1
(c) Vitamin E
(d) Vitamin D

Q70. The number that should be subtracted from 510 and 270 to get 24 as the GCD IS:

(a) 24
(b) 42
(c) 6
(d) 16

Q71. Identify the Indian batsman who scored three consecutive test centuries in his first three International Cricket test matches.

(a) Mohammad Azharuddin
(b) Virat Kohli
(c) Rahul Dravid
(d) Sachin Tendulkar

Q72. After independence, during the second Five Year Plan (1956-61), which steel plant was set up with the collaboration of Germany?

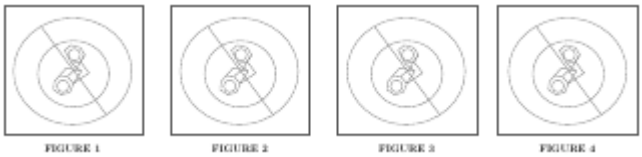
(a) Durgapur Steel Plant
(b) Rourkela Steel Plant
(c) Bokaro Steel Plant
(d) Bhilai Steel Plant

Q73. What is the name of the Island where Nelson Mandela was imprisoned for 18 years of his total 27 years prison tenure?

(a) Cyprus
(b) Nuuk
(c) Robben Island
(d) Greenland

Q74. Four figures (1 to 4) have been given, out of which three are alike and one is different. Select the odd one.

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(a) Figure 2
(b) Figure 1
(c) Figure 4
(d) Figure 3

Q75. A, B and C start a business jointly. Twice of the capital of A is equal to thrice the capital of B. The capital of B is four times the capital of C. Find the share of B if the annual profit is Rs. 2,97,000.

(a) Rs. 18,000
(b) Rs. 1,08,800
(c) Rs. 10,800
(d) Rs. 1,08,000

Q76. Find the smallest number, which when divided by 35, 40 and 60 leaves a remainder 7 in each case.

(a) 800
(b) 893
(c) 814
(d) 847

Q77. Where is the UNESCO world heritage site, Kandariya Mahadev temple located?

(a) Mandsour
(b) Bhubaneswar
(c) Khajuraho
(d) Mahabalipuram

Q78. Three of the option given share a certain relationship while the fourth is different. Select the option that is different from the rest.

(a) 125
(b) 81
(c) 27
(d) 343

Q79. Headquarters of United Nations University is situated in _____.

(a) USA
(b) Germany
(c) France
(d) Japan

Q80. Study the given series carefully and select the option that will come next (in place of the question marks).

C/29 25/F I/21 17/L O/13 (?)/(?)

(a) 9/S
(b) R/9
(c) 9/R
(d) S/8

Q81. Which of the following activity is not responsible for greenhouse effect?

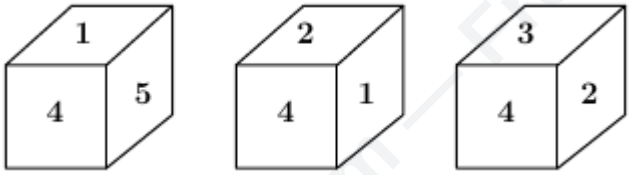
(a) Use of wood as fuel
(b) Emission from thermal power plant
(c) Use of petrol vehicles for transport
(d) Use of solar car for transport

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Q82. A truck covers a distance of 92.5 km in 2.5 h. If the truck is travelling at the same speed throughout the journey, then what is the distance covered by it in 1 h?

(a) 47 km
(b) 57 km
(c) 37 km
(d) 67 km

Q83. Three different positions of the same dice are shown. Select number that will be on the face opposite to the one having 4



(a) 3
(b) 1
(c) 6
(d) 5

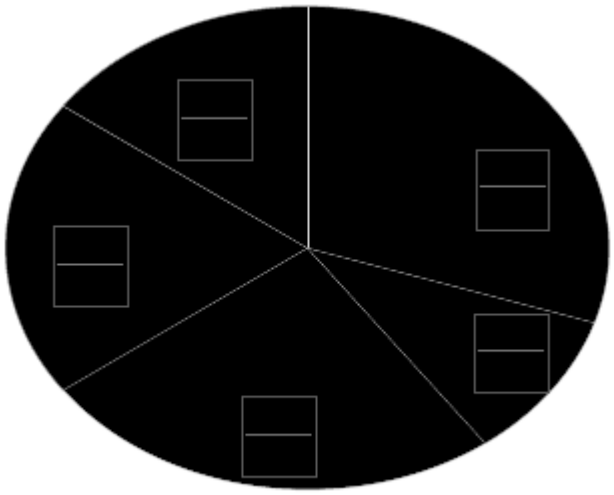
Q84. According to recommendations of which committee was NSE (National Stock Exchange) established in India?

(a) Sri Krishna Committee
(b) Pherwani Committee
(c) Rajesh Krishnan Committee
(d) Venkatachaliah Committee

Q85. A sum of Rs. 400 would become Rs. 441 after 2 years at r% p.a. compound interest. Find the value of r.

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

Q86. The given pie chart shows the percentage distribution of the sales of wheelbarrows from five different shops – 1, 2, 3, 4 and 5. Study the pie chart and answer the following question.

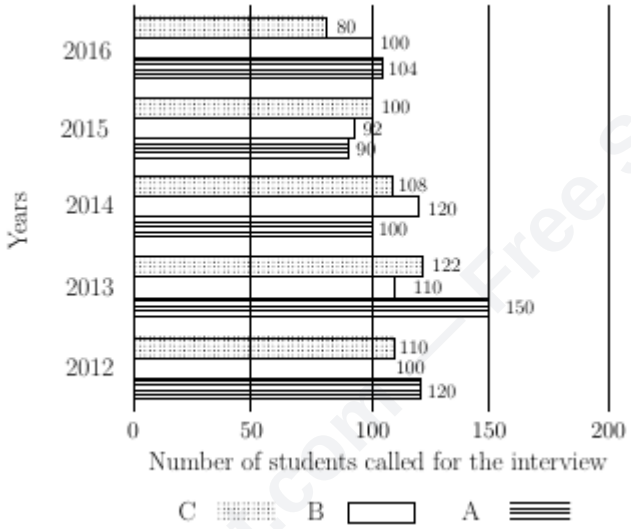


What is the central angle of the sector corresponding to the sales of goods from shop 3?

(a) 72°
(b) 90°
(c) 80°
(d) 50°

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Q87. The given bar graph shows the numbers of students called for the interview for an MBA course in a certain university from three different cities – A, B and C – from 2021 to 2016.



What is the ratio of the average number of students called for the interview from city B from 2014 to 2016 to the average number of students called for interview from city C in the same period?

(a) 14 : 15
(b) 11 : 12
(c) 13 : 15
(d) 13 : 12

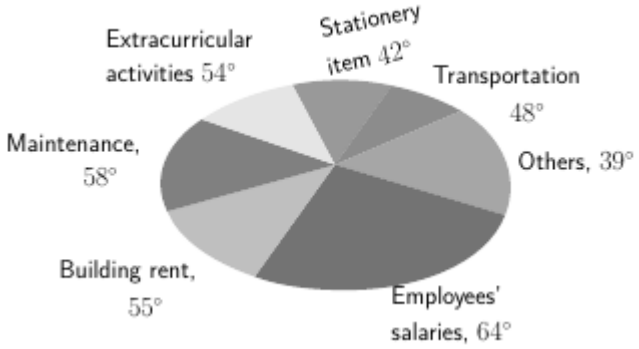
Q88. The given table shows the number of candidates who appeared for an interview for the post of Manager in a bank from five different states of India. Study the table carefully and answer the question that follows.

States	Bihar	UP	MP	Punjab	Kerala
Years					
2012	410	300	250	280	440
2013	500	400	280	320	400
2014	450	450	240	260	350
2015	320	500	400	400	380
2016	500	430	540	350	420

Based on the data provided, which of the following statements is TRUE?

(a) The average number of candidates who appeared for the interview from UP over the given period is greater than 400.
(b) The highest number of candidates who appeared for the interview during the given period was from UP.
(c) The average number of candidates who appeared for the interview from Punjab is less than 300.
(d) The lowest number of candidates who appeared for the interview during the given period was from MP.

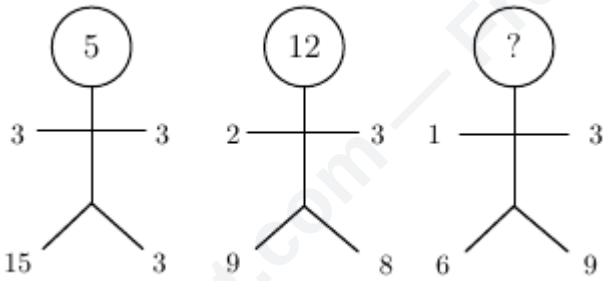
Q89. The following pie chart shows the annual expenditure of a certain international school under different heads.



If the total annual expenditure of the school during the year was Rs. 10 crore, then what was the approximate amount spent on maintenance and employee's salaries?

(a) Rs. 3 crore
(b) Rs. 2.5 crore
(c) Rs. 2.45 crore
(d) Rs. 3.38 crore

Q90. Study the given pattern carefully and select the number from among the given options that can replace the question mark (?) in it.



(a) 11
(b) 10
(c) 18
(d) 14

Q91. Select the term that can replace the question mark (?) in the following series.
U9Y, R14V, O24S, L44P, ?, F164J

(a) J84L
(b) I64M
(c) I84M
(d) I84N

Q92. Select the term that can replace the question mark (?) in the following series.
XQ, UN, RK, OH, LE, ?

(a) IB
(b) GA
(c) JC
(d) HA

Q93. How will you write 1.08 hours in hours, minutes and seconds?

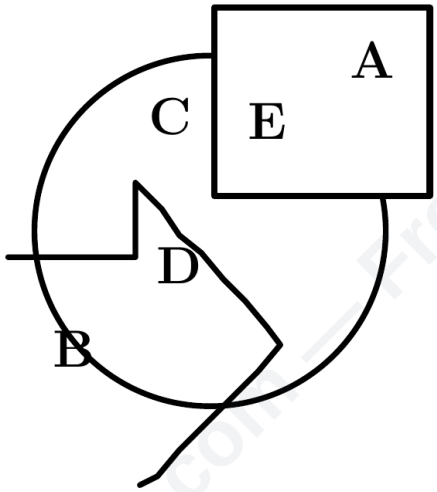
(a) 1 hour, 8 minutes
(b) 1 hour, 10 minutes, 8 seconds
(c) 1 hour, 52 minutes
(d) 1 hour, 4 minutes, 48 seconds

Q94. If FLOCK is coded as 141 in a particular coding language, then how will CREW be coded using the same language?

(a) 148
(b) 182
(c) 147
(d) 550

Q95. In the given diagram, circle represents 'tall people', square represents 'girls' and arrow represents 'boys'.

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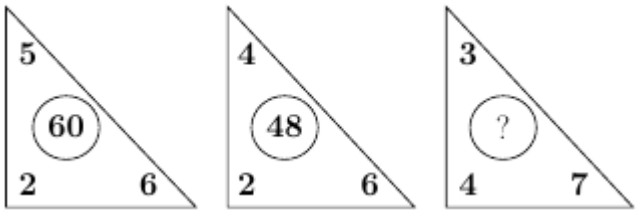
Which of the following letters represent people who are tall but not girls?

(a) C, D and B
(b) D and E
(c) C and E
(d) C and D

Q96. In a certain code, LATER is written as MCWIW. Which word will be written as GKHVHK in that code?

(a) MADAME
(b) KINDLE
(c) CREATE
(d) FIERCE

Q97. Select the given pattern carefully and select the number from among the given options that can replace the question mark (?) in it.



(a) 36
(b) 108
(c) 86
(d) 84

Q98. Select the option that is related to 'Cook' in the same way as 'Poem' is related to 'Poet'.

(a) Vegetables
(b) Eggs
(c) Meat
(d) Food

Q99. Select the term that can replace the question mark (?) in the following series.

H5S, J6Q, L10O, N19M, P35K, ?

(a) R60I
(b) S60I
(c) R60K
(d) R45I

Q100. Consider the given statement and decide which of the given assumptions is/are implicit in the statement.

Statement:

Though I don't like watching Indian films, I really enjoyed 'PK'.

Assumptions:

I. 'PK' is an Indian film.

II. 'PK' is not an Indian film.

(a) Either assumption I or II is implicit.
(b) Only assumption II is implicit.
(c) Only assumption I is implicit.
(d) Neither assumption I nor II is implicit.

ANSWER KEY

1	d	2	a	3	b	4	a	5	a	6	c	7	a	8	a	9	b	10	b
11	b	12	a	13	d	14	d	15	b	16	b	17	b	18	b	19	a	20	b
21	c	22	b	23	a	24	b	25	b	26	b	27	d	28	c	29	a	30	a
31	b	32	b	33	c	34	b	35	b	36	b	37	d	38	a	39	c	40	b
41	d	42	a	43	c	44	c	45	a	46	a	47	a	48	c	49	d	50	c
51	d	52	b	53	a	54	c	55	c	56	b	57	d	58	d	59	d	60	a
61	d	62	b	63	b	64	a	65	c	66	a	67	a	68	b	69	b	70	c
71	a	72	b	73	c	74	a	75	d	76	d	77	c	78	b	79	d	80	c
81	d	82	c	83	c	84	b	85	b	86	b	87	d	88	a	89	d	90	c
91	c	92	a	93	d	94	c	95	d	96	d	97	d	98	d	99	a	100	c

SOLUTIONS

Q1. Answer: (d) Chloroplasts

The correct answer is Chloroplasts

Key Points

• Chloroplast is capable of storing light energy.
• It helps in utilizing the solar energy provided by the Sun in the process of Photosynthesis.
• Chloroplasts are small organelles that contain chlorophyll, a green substance that traps light energy.
• Chloroplasts are similar to mitochondria in several ways, including:
• Both generate metabolic energy, Both have their own genetic systems, and Both replicate by division.

Additional Information

• Mitochondria
• The number of mitochondria in a single cell may be up to 50 to 5000.
• The inner lumen of mitochondria contains ribosome phosphate particles and DNA molecules.
• It has the potential to synthesize its own protein and oxidation of carbohydrates and fats are taken place with the help of enzymes in mitochondria.
• This energy is stored in the form of ATP (Adenosine Triphosphate) so, these are known as the "Powerhouse of the cell".
• Golgi body
• The Golgi apparatus has multiple names such as the Golgi complex or Golgi body.
• The name is given on the name of the scientist, who discovered the organelle, i.e. Camillo Golgi.
• It is found in all eukaryotic cells, plants as well as animals.
• They are membrane-bound organelles present in the cytosol of the cell.
• The Golgi body comprises 5 to 8-cup-shaped, series of compartments known as cisternae. Cisternae is a flattened, disk-shaped, stacked pouches that make up the Golgi apparatus.
• Ribosome

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• Ribosomes are known as protein factories because they are the main site of protein synthesis.
• The molecule of RNA which is a component of the ribosome organelle is called ribosomal RNA.
• Ribosomes are composed of ribonucleic acids and proteins.
• It is made up of two subunits-
• Large subunits- join amino acids to form a polypeptide chain.
• Small subunits- reads RNA.

Q2. Answer: (a) Rs. 90

Given:
A, B and C can complete a job in 15 days, 20 days and 30 days, respectively.
Total earnings together = Rs. 270
Formula used:
Individual shares are based on their work rates:
Work Rate = 1 / Number of Days
Share = (Individual's Work Rate / Total Work Rate) x Total Earnings
Calculations:
Work rates:
A's work rate = 1/15
B's work rate = 1/20
C's work rate = 1/30
Total work rate = 1/15 + 1/20 + 1/30
=> Total work rate = 4/60 + 3/60 + 2/60
=> Total work rate = 9/60
B's share = (B's work rate / Total work rate) x Total Earnings
=> B's share = (1/20) / (9/60) x 270
=> B's share = (60/180) x 270
=> B's share = 1/3 x 270
=> B's share = 90
Therefore The correct answer is option 1.

Q3. Answer: (b) Damodar Chapekar

The correct answer is Damodar Chapekar
Key Points
• Walter Charles Rand was a British civil servant in India during the time of the British Raj.
• During his tenure as Chairman of the Special Plague Committee in Pune during the Bubonic Plague of 1897, his implementation of drastic measures to control the plague caused widespread discontent and unrest.
• Rand was assassinated by the Chapekar brothers, namely Damodar Hari Chapekar and Balkrishna Hari Chapekar.
• The decision was prompted by widespread anger against Rand's harsh methods during the plague.
Additional Information
• Bhagat Singh:
• Bhagat Singh was born on September 1907, in Lyallpur western Punjab, India (Now in Pakistan)
• In 1923, he joined National College in Lahore founded by Lala Lajpat Rai.
• Bhagat Singh was deeply affected by the Jallianwala Bagh massacre.
• In 1928, He established the Hindustan Socialist Republican Association (HSRA) along with Chandrashekhar and others.
• Bhagat Singh and Batukeshwar Dutt, on April 8th,1929, threw a bomb in the Central Legislative Assembly.
• On 23 March 1931 Bhagat Singh, Rajguru and Sukhdev were Hanged by the British Government.
• At that time his age was a little more than 23 years.
• Vasudev B. Phadke
• He was born in the Raigad district of Maharashtra and belonged to the farming community and believed in Swaraj (Self-Rule).
• He got the control of the Pune in Maharashtra after catching british soldiers off-guard during a surprise attack.
• He formed a Revolutionary group of Ramoshi people with the help of Koli, Bhil and Dangar communities in the region.
• Vinayak Damodar Savarkar (1883-1966):

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• He was a scholar, social worker & revolutionary from Maharastra.
• Founded:
• Mitra Mela, 1899. (renamed it as Abhinav Bharat Society in 1904).
• Free India Society in London, 1906.
• He got arrested for his involvement in Nashik Conspiracy Case.
• He got elected as the President of Hindu Mahasabha in 1937.
• He described the Revolt of 1857 as the 1st war of Independence in his book, "Indian War of Independence".
• The airport at Port Blair, Andaman and Nicobar was renamed Veer Savarkar International Airport in 2002.
• Books:
• The Indian war of independence, 1857.
• Hindutva: Who Is a Hindu?

Q4. Answer: (a) members of both houses of parliament

The correct answer is members of both houses of parliament

Key Points

• The Vice-President is elected by (members of both houses of parliament) Rajya Sabha and Lok Sabha and is a member of the electoral college.
• The Vice-President
• S/he occupies the second-highest office in the country.
• S/he is accorded a rank next to the President in the official warrant of precedence.
• This office is modelled on the lines of the American Vice-President.

Additional Information

• Election:
• The Vice-President, like the president, is elected not directly by the people but by the method of indirect election.
• He is elected by the members of an electoral college consisting of the members of both Houses of Parliament.
• Thus, this electoral college is different from the electoral college for the election of the President in the following two respects:
• It consists of both elected and nominated members of the Parliament (in the case of the president, only elected members).
• It does not include the members of the state legislative assemblies (in the case of the President, the elected members of the state legislative assemblies are included).
• Qualifications
• To be eligible for election as Vice-President, a person should fulfil the following qualifications:
1. He should be a citizen of India.
2. He should have completed 35 years of age. Hence, statement a is incorrect.
3. He should be qualified for election as a member of the Rajya Sabha.
4. He should not hold any office of profit under the Union government or any state government or any local authority or any other public authority.
• But, a sitting President or Vice-President of the Union, the governor of any state and a minister for the Union or any state is not deemed to hold any office of profit and hence qualified for being a candidate for Vice-President.
• Further, the nomination of a candidate for election to the office of Vice-President must be subscribed by at least 20 electors as proposers and 20 electors as seconders.
• Every candidate has to make a security deposit of Rs. 15,000 in the Reserve Bank of India.
• Conditions of Office
• The Constitution lays down the following two conditions of the Vice-President's office:
• He should not be a member of either House of Parliament or a House of the state legislature.
• If any such person is elected Vice-President, he is deemed to have vacated his seat in that House on the date on which he enters upon his office as Vice-President.
• He should not hold any other office of profit.

Q5. Answer: (a) 15

Given:

The sum of two positive numbers is 27, while the difference of their squares is 81.

Formula used:

Let the two numbers be x and y.

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$x + y = 27$

$x^2 - y^2 = 81$

$(x + y)(x - y) = 81$

Calculation:

$x + y = 27$

$\Rightarrow 27(x - y) = 81$

$\Rightarrow x - y = 81 / 27$

$\Rightarrow x - y = 3$

Now, we have the system of equations:

1) $x + y = 27$

2) $x - y = 3$

Adding these two equations:

$\Rightarrow (x + y) + (x - y) = 27 + 3$

$\Rightarrow 2x = 30$

$\Rightarrow x = 30 / 2$

$\Rightarrow x = 15$

Therefore, the greater of the two numbers is $x = 15$.

Therefore The correct answer is option 1.

Q6. Answer: (c) 169

Given:

A locomotive engine without any wagon can go to a speed of 50 km per hour and its speed diminishes by a quantity which varies as the square root of the number of wagons attached.

With 25 wagons, its speed is 35 km per hour.

Formula used:

Speed with n wagons = Initial speed - $k\sqrt{n}$

Where, k is a constant.

Calculation:

Initial speed = 50 km/hr

Speed with 25 wagons = 35 km/hr

$\Rightarrow 50 - k\sqrt{25} = 35$

$\Rightarrow 50 - 5k = 35$

$\Rightarrow 5k = 15$

$\Rightarrow k = 3$

Now, we need to find the greatest number of wagons (n) that can be attached without the speed falling below 11 km/hr.

$\Rightarrow 50 - 3\sqrt{n} = 11$

$\Rightarrow 3\sqrt{n} = 39$

$\Rightarrow \sqrt{n} = 13$

$\Rightarrow n = 13^2$

$\Rightarrow n = 169$

Therefore The correct answer is option 3.

Q7. Answer: (a) 2tan ^(- 1)(3/2)

Given:

Point (1, 2)

Circle: $x^2 + y^2 = 9$

Translation: 2 units in the positive direction of the x-axis

Formula used:

Angle between tangents from point (x1, y1) to a circle $x^2 + y^2 = r^2$ is given by:

$\theta = 2\tan ^{(-1)}(r/(\sqrt{(x1^2 + y1^2 - r^2)}))$

Calculations:

New point after translation: (1 + 2, 2) = (3, 2)

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r = 3
x1 = 3, y1 = 2
θ = 2tan ^(-1)(3/(√(3² + 2² - 3²)))
=> θ = 2tan ^(-1)(3/(√(9 + 4 - 9)))
=> θ = 2tan ^(-1)(3/√4)
=> θ = 2tan ^(-1)(3/2)
Therefore The correct answer is option 1.

Q8. Answer: (a) 14

Given:
Equation of first circle: $x^2 + y^2 = a^2$
Equation of second circle: $x^2 + y^2 = b^2$
Chord of contact touches the third circle: $x^2 + y^2 = c^2$
Condition: b^m = a^nc^p, where m, n, p in N
Formula used:
For the chord of contact from a point on the first circle to the second circle:
Distance from center to chord = c
Thus, $c = b^2 / a$
Calculations:
Step 1: Express c in terms of a and b.
$c = b^2 / a$
Step 2: Substitute c into the condition b^m = a^nc^p.
b^m = $a^n \times (b^2 / a)^p$
b^m = $a^n \times b^{(2p)} \times a^{(-p)}$
b^m = b^(2p) × a^(n - p)
Step 3: Equate the exponents of a and b.
For the equation to hold true for all a and b:
Exponent of a: n - p = 0 => n = p
Exponent of b: m = 2p
Step 4: Express m and n in terms of p.
m = 2p
n = p
Step 5: Find the value of m + n + p + 10.
m + n + p + 10 = 2p + p + p + 10 = 4p + 10
Since p is a natural number, let p = 1:
m = 2 × 1 = 2
n = 1
m + n + p + 10 = 2 + 1 + 1 + 10 = 14
Answer:
m + n + p + 10 = 14

Q9. Answer: (b) 18

Given:
√54 × √6
Formula used:
√a × √b = √(a × b)
Calculations:
√54 × √6 = √(54 × 6)
=> √324
=> 18
Answer:
The value of √54 × √6 is 18.

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Q10. Answer: (b) RABAACBDASRA

The logic followed here is:

MONOLATERALS is written as NMOAOLRTESAL

Similarly,

ABRACADABRAS is written as

Hence, "Option 2" is the correct answer.

Q11. Answer: (b) O

The logic followed here is:

4 + 18 = 6 + 1 + ?

22 - 7 = ?

15 = ?

So, 15 is the position value of the letter 'O'.

Hence, "Option 2" is the correct answer.

Q12. Answer: (a) Super Computer

The correct answer is Super Computer

Key Points

• SAGA-220 is a supercomputer developed by the Indian Space Research Organization (ISRO)

• SAGA-220 is a supercomputer that was designed and built by the Vikram Sarabhai Space Centre (VSSC).

• It was unveiled in 2011 and was at the time India's fastest supercomputer.

• Space scientists use SAGA-220 to solve complex aerospace problems, including the design of future space launch vehicles.

• SAGA-220 was built using commercially available hardware, open-source software components, and in-house developments.

• It has 400 NVIDIA Tesla C2070 GPUs and 400 Intel Quad Core Xeon CPUs.

• SAGA-220 is located at the Satish Dhawan Supercomputing Facility at VSSC in Thiruvananthapuram.

Additional Information

• PARAM Yuva II is the fastest in the prestigious PARAM series of Supercomputers built in India.

• SAHASRA T provides service in the fields of aerospace engineering, meteorology predictions, and astrological simulation.

• Seymour Cray is considered the father of the supercomputer.

• CDC 6600 is the world's first supercomputer.

Q13. Answer: (d) Discovery of blood group classification

The correct answer is the Discovery of blood group classification

Key Points

• Karl Landsteiner discovered human blood groups in the year 1900.

• The discovery laid the foundation for the modern medical practice of blood transfusion.

• Karl Landsteiner himself considered it an accidental discovery.

• On the basis of the presence of Antigen or Glycoprotein, there are four groups of blood in human:

• That contains Antigen A–Blood Group A.

• That contains Antigen B–Blood Group B.

• That contains both the Antigens A and B–Blood Group AB.

• That contains neither of the Antigens– Blood Group O.

• Blood Group O is called the Universal Donor.

• Blood Group AB is called Universal Receptor.

Additional Information

• Rh Blood Group System

• Alongside the ABO blood grouping system, the Rh blood group system is also significant.

• Approximately two-thirds of the population have a third antigen on the surface of their red blood cells, known as the Rh factor or Rh antigen.

• If the Rh factor is present, an individual is rhesus positive (Rh+ve); if the Rh factor is absent, the individual is rhesus negative (Rh-ve).

• Hence, compatibility between the donor and recipient is also critical in this case.

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Q14. Answer: (d) 331/3%

Given:

If A's salary is 50% more than that of B, then by what percentage is B's salary less than that of A?

Formula used:

Percentage decrease = Difference/Original × 100

Calculation:

Let B's salary be Rs. 100

Then, A's salary = Rs. 100 + 50% of Rs. 100 = Rs. 150

Difference = Rs. 150 - Rs. 100 = Rs. 50

Original (A's salary) = Rs. 150

Percentage decrease = 50/150 × 100

=> Percentage decrease = 1/3 × 100

=> Percentage decrease = $33^{1}/3\%$

Therefore The correct answer is option 4.

Q15. Answer: (b) # # # # #

The logic followed here is:

→ 1($) = 2(@)

And,

→ 2(@) = 4(#) --------- (1)

→ 1(@) = 2(#) --------- (2)

Therefore, from (1) and (2):

→ 1($) + 1(@)

→ 4(#) + 2(#) = 6(#)

Hence, "Option 2" is the correct answer.

Q16. Answer: (b) Wheat, Crop, Cereal

The set of words that best represented by the given Venn diagram is shown below:

Option 1) Doctors, Nurses, Hospital - Doctors and nurses are associated with hospital. Doctors and nurses are of different categories. => Option - 1 eliminated

Option 2) Wheat, Crop, Cereal - Wheat is a type of crop and crop is a type of cereal i.e.

Option 3) Criminal, Thief, Police - Police is of different category from criminal or thief => Option - 3 eliminated

Option 4) Year, Month, Weather - Month is a subset of year but year is of a different category from weather => Option - 4 eliminated

Hence, "Option 2" is the correct answer.

Q17. Answer: (b) tan θ - sec θ

Given:

$\pi/2 < \theta < 3\pi/2$

Expression: $\sqrt{((1 - \sin\theta)/(1 + \sin\theta))}$

Formula used:

$\sqrt{((1 - \sin\theta)/(1 + \sin\theta))} = (1 - \sin\theta)/|\cos\theta|$

Calculations:

Since $\pi/2 < \theta < 3\pi/2$, $\cos\theta < 0$

=> $|\cos\theta| = -\cos\theta$

=> $\sqrt{((1 - \sin\theta)/(1 + \sin\theta))} = (1 - \sin\theta)/(-\cos\theta)$

=> $\sqrt{((1 - \sin\theta)/(1 + \sin\theta))} = (\sin\theta - 1)/\cos\theta$

Answer:

The value of $\sqrt{((1 - \sin\theta)/(1 + \sin\theta))}$ is $\tan\theta - \sec\theta$.

$x = (-b \pm \sqrt{(b^2-4ac)})/2a$

Q18. Answer: (b) 143

The correct answer is 143

Key Points

• A veteran rocket from billionaire entrepreneur Elon Musk's SpaceX aerospace company launched 143 spacecraft into space on 25th January 2021, a new record for the most spaceships deployed on a single mission, according to the company.

• The Falcon 9 rocket lifted off at 10 a.m. EST from the Space Launch Complex 40 at Cape Canaveral Space Force Station in Florida.

• It flew south along the eastern coast of Florida on its way to space, the company said.

• SpaceX's record broke the previous record of 104 satellites launched in a single launch by the Indian space agency ISRO in February 2017

Additional Information

• SpaceX has developed three launch vehicles: Falcon 1, Falcon 9, and Falcon Heavy.

• Falcon 1 was the first launch vehicle, but was retired in 2009.

• Falcon 9 is a medium-lift rocket, while Falcon Heavy is a heavy-lift rocket

• SpaceX has previously launched to orbit more than 800 satellites of the several thousand needed to offer broadband internet globally, a $10 billion investment it estimates could generate $30 billion annually to help fund Musk's interplanetary rocket program, called Starship.

Q19. Answer: (a) 480 m

Given:

Speed of train = 96 km/h = 96 × (1000/3600) m/s = 26.67 m/s

Time to cross the post = 12 seconds

Time to cross the platform = 30 seconds

Formula used:

Length of train (L_(train)) = Speed × Time to cross post

Length of train + Length of platform (L_(platform)) = Speed × Time to cross platform

Calculation:

Length of train (L_(train)) = 26.67 × 12

=> L_(train) = 320.04 m

Length of train + Length of platform = 26.67 × 30

=> 320.04 + Length of platform = 800.1

=> Length of platform = 800.1 - 320.04

=> Length of platform = 480 m

Therefore The correct answer is option 1.

Q20. Answer: (b) 16

Calculations:

We have,

√(248+√(51 + √169))

=> √(248+√(51 + 13))

=> √(248+√64)

=> √(248+8)

=> √256 = 16

Therefore The correct answer is option (2).

Q21. Answer: (c) Medicine and surgery

The correct answer is Medicine and surgery

Key Points

• Sushruta is known for his work on medicine during the Gupta period.

• About Sushruta:

• Sushruta was the first Indian surgeon.

• The Sushruta Samhita is a Sanskrit text on surgery.

• The work is attributed to Sushruta, a historical physician of 6th century BCE, although the text as preserved dates to the 3rd or 4th century CE.

• It is one of the three foundational texts of Ayurveda (Indian traditional medicine).

• The Sushruta Samhita, in its extant form, is divided into 186 chapters and contains descriptions of 1,120 illnesses, 700 medicinal plants, 64 preparations from mineral sources and 57 preparations based on animal sources.

Additional Information

• About the Gupta Era (320-550 AD):

• The Gupta age in ancient India has been called the 'Golden Age of India' because of the many accomplishments in the field of arts, science, and literature that Indians made under the Guptas.

• The affluence under the Guptas initiated a period of distinguished accomplishments in arts and sciences.

• The Gupta Empire lasted from 320 AD to 550 AD.

• Sanskrit literature thrived under the Guptas. Kalidasa, the great poet, and playwright were in the court of Chandragupta Vikramaditya.

• He composed great epics such as Abhijnanashaakuntalam, Kumarasambhavam, Malavikagnimitram, Ritusamharam, Meghadootam, Vikramorvashiyam, and Raghuvamsham.

Q22. Answer: (b) Alang

The correct answer is Alang.

Key Points

• Alang in Gujarat is the world's biggest ship-breaking yard with hundreds of ships getting scrapped each year.

• It is a town in the Bhavnagar district of Gujarat.

• Bhavnagar covers a total area of 9980.9 sq km. One of the major coastal districts of Gujarat, the place shares its borders with Ahmedabad, Surendranagar, Gulf of Cambay, Amreli, and Rajkot.

• The Diamond-cutting industry is one of the major sources of revenue earning of Bhavnagar. Apart from agricultural activities, the place also exports cotton and ship machinery.

Additional Information

• The Centre has notified the directorate general of shipping as the National Authority for Recycling of Ships.

• DG Shipping is designated as apex authority under the Recycling of Ships Act, 2019 for the ship recycling industry of the country.

• The office of the national authority will be set up in Gandhinagar, Gujarat.

Q23. Answer: (a) -1

Given:

If $(\sqrt{5} - 1)/(\sqrt{5} + 1) - (\sqrt{5} + 1)/(\sqrt{5} - 1) = a + b\sqrt{5}$, then the value of $(a + b)(a - b) \div (a^2 + b^2)$ is:

Formula used:

$(\sqrt{5} - 1)/(\sqrt{5} + 1) - (\sqrt{5} + 1)/(\sqrt{5} - 1) = a + b\sqrt{5}$

Calculation:

$(\sqrt{5} - 1)/(\sqrt{5} + 1) = ((\sqrt{5} - 1)^2)/(\sqrt{5} + 1)(\sqrt{5} - 1) = (5 - 2\sqrt{5} + 1)/4 = (6 - 2\sqrt{5})/4 = (3 - \sqrt{5})/2$

$(\sqrt{5} + 1)/(\sqrt{5} - 1) = ((\sqrt{5} + 1)^2)/(\sqrt{5} + 1)(\sqrt{5} - 1) = (5 + 2\sqrt{5} + 1)/4 = (6 + 2\sqrt{5})/4 = (3 + \sqrt{5})/2$

$\Rightarrow (3 - \sqrt{5})/2 - (3 + \sqrt{5})/2 = (3 - \sqrt{5}) - (3 + \sqrt{5})/2 = (3 - \sqrt{5} - 3 - \sqrt{5})/2 = (-2\sqrt{5})/2 = -\sqrt{5}$

$\Rightarrow a = 0$ and $b = -1$

$(a + b)(a - b) \div (a^2 + b^2)$

$(0 + (-1))(0 - (-1)) \div (0^2 + (-1)^2) = (-1)(1) \div (1) = -1$

Therefore The correct answer is option 1.

Q24. Answer: (b) 4

Given:

$1/3 + 2/9 = (N + 1)/(N + 5)$

Formula used:

Combine fractions on the left side and then solve for N.

Calculation:

$1/3 + 2/9 = (N + 1)/(N + 5)$

$3/9 + 2/9 = (N + 1)/(N + 5)$

$5/9 = (N + 1)/(N + 5)$

Cross-multiply:

$\Rightarrow 5(N + 5) = 9(N + 1)$

=> 5N + 25 = 9N + 9

Simplify:

=> 25 - 9 = 9N - 5N

=> 16 = 4N

=> N = 4

Therefore The correct answer is option (2).

Q25. Answer: (b) Kanyakumari

The correct answer is Kanyakumari

Key Points

• Vivekananda Rock Memorial is the most popular monument situated in the southernmost tip of Kanyakumari district in the state of Tamil Nadu in India and 500 meters away from the mainland.

• It was built in 1970 in honour of the great Indian monk and reformer Swami Vivekananda and took six years to complete the construction.

• The rocks are surrounded by the Laccadive Sea or Lakshadweep Sea.

• A meditation hall known as Dhyana Mandapam is also attached to the memorial for visitors to meditate.

• It is believed that after meditating for three days and three nights at the rock, Swami Vivekananda attained enlightenment and transformed himself from a simple monk to an enlightened being.

• Thiruvalluvar Statue is 133 feet near Vivekanandha Rock, denotes 133 chapters of (Tirukkural) tall stone sculpture of the popular Tamil Poet- Saint Thiruvalluvar, who authored the Thirukkural Couplets.

Additional Information

• Kanyakumari is also known as " Cape Comorin" and famous for its unique ocean sunrise, sunset and moonrise.

• Kanyakumari is located North of the Equator

• Kanyakumari is the southernmost point of peninsular India.

• The Tropic of Cancer passes through the middle of India

• Tamil Nadu lies in the southernmost part of the Indian Peninsula.

• Tamil Nadu is the first state to ban lotteries.

Q26. Answer: (b) Kerala

The logic is given here:

Oriya is spoken mainly in Odisha state.

Similarly,

Malayalam is spoken mainly in Kerala state.

Hence, the correct answer is "Kerala".

Q27. Answer: (d) Either conclusion I and II follows.

The least possible Venn diagram for the given statements is as shown below :

Conclusions:

I. Tandon is friends with a teacher → Does not follow (As teachers make friends with only tall people and Tandon is very tall. As all friends of teachers must be tall, but it does not guarantee that every tall person is friends with a teacher, therefore it is possible but not definite.)

II. Tandon is not friends with a teacher → Does not follow (As teachers make friends with only tall people and Tandon is very tall. As no direct relation is given between Tondon and teacher, therefore it is false.)

Therefore Here, Either conclusion I and II follows.

Hence, the correct answer is "Option 4"

Additional InformationConditions of either-or case:

1. The elements should be same in both statements.

2. Individually both the conclusions should be false.

3. One conclusion should be positive and one conclusion should be negative (Complementary pair).

The two complementary pairs are:

1) All + Some not

2) No + Some

Q28. Answer: (c) Uranium

The correct answer is Uranium

Key Points

• Nuclear reactors operate on the principle of nuclear fission.

• Different materials can be used as a fuel in nuclear reactor, but most commonly used is Uranium.

• Uranium is abundant, and can be found in many places around the world, including in the oceans.

• Other fuels, such as plutonium and thorium, can also be used.

• Nuclear reactor consists of mainly three components: Fuel elements, Moderator and Control rods.

• U-235 is a naturally occuring isotope of Uranium and is used as a fuel in nuclear reactors.

• It is the only fissile isotope capable of sustaining a fission chain reaction.

Additional Information

• Cobalt

• It is an essential component of vitamin B12, which is involved in the formation of amino acids and neurotransmitters.

• Cobalt is also important for dairy cows, where it supports the immune system, calf viability, and hoof strength.

• Copper

• It works with iron to form red blood cells,

• It is also important for maintaining the health of bones, nerves, and blood vessels.

• Copper is important for cattle, where it supports fetal development, immune function, and bone development.

• Iodine

• It is frequently added to concentrate rations for cattle, such as using seaweed preparations.

• Iodine is a mineral that is essential for the proper functioning of the thyroid gland.

• It is used in the production of thyroid hormones, which are important for growth, energy use, and bone and brain development.

Q29. Answer: (a) Both assumptions I and II are implicit.

Given statement: 'Please keep the doors of the emergency ward closed while leaving the ward, to keep the room germ-free' – A sign board near the emergency ward of a hospital.

Assumptions:

I. Leaving the doors of the emergency ward open will cause germs to enter => Implicit

This is implicit because the purpose of the notice is to emphasize keeping the room germ-free by keeping the doors closed. It assumes that open doors increase the risk of germs entering.

II. People are likely to pay attention to this notice => Implicit

This is implicit because the signboard's existence relies on the belief that people will read it and follow the instructions. Otherwise, the signboard would be pointless.

Thus, Both assumptions I and II are implicit.

Hence, "Option 1" is the correct answer.

Q30. Answer: (a) Microsoft Excel

The correct answer is Microsoft Excel.

Key Points

• Excel is Microsoft’s spreadsheet program that can be used to organize, format, and calculate data.

• You can create formulas to aggregate large amounts of data, graph and chart data, create macros, and develop pivot tables.

• It can be used to organize, format, and calculate data.

• Originally a neck-and-neck competitor with Lotus 1-2-3, Excel is now the spreadsheet.

Additional Information

Other major software from the MS Office Package:-

• Microsoft Word

• Word is Microsoft’s word processing app.

• It includes an array of features for document creation and editing, including Spell-check, a rich text editor, and page features such as justification, paragraphs, and indentation.

• You also benefit from the what-you-see-is-what-you-get (WYSIWYG) display – as the screen displays everything in the same way as the document will look when printed.

• Microsoft PowerPoint

• Microsoft PowerPoint helps you create professional presentations.

• PowerPoint was first launched in 1990, using slides to display text, graphics, and multimedia.

• Since then, it's added a variety of features to streamline and enhance presentations, such as transition effects, timers, and software integrations.

• Microsoft Outlook

• Mainly used as an email application, Outlook is considered a personal information manager, coordinating your calendars, task managers, contacts, notes, journals, and browsing sessions.

• Outlook can be used as a stand-alone app, or it can be networked to connect multiple users to shared mailboxes and calendars under a single organization, for example.

Q31. Answer: (b) Minority

The correct answer is Minority.

Key Points

• The NAI ROSHNI scheme is a leadership development program for minority women in India.

• It was launched by the Ministry of Minority Affairs in 2012.

• The scheme aims to empower and instil confidence among minority women by providing them with knowledge, tools, and techniques for interacting with government systems, banks, and other institutions.

• The scheme is a six-day non-residential/five-day residential training program.

• The training modules cover areas related to programmes for women such as Health and Hygiene, Legal Rights of Women, Financial Literacy, Digital Literacy, Swachch Bharat, Life Skills, and Advocacy for Social and Behavioural changes.

• The scheme has been implemented in all states and union territories of India.

Additional Information Other Government Schemes

Scheme	Objective
Ayushman Bharat Pradhan Mantri Jan Aarogya Yojana	To provide health insurance coverage to economically vulnerable individuals
Information on Child Development	It covers information of Anganwadi centers, guidelines for ICDS implementation, the mother and child protection card associated with ICDS and the Ministry of Human Resource Management (MHRM). The universalization efforts of ICDS, as well as instructions directed towards Anganwadi workers and helpers.
Nutrition programme for adolescent girls	The objective of the Nutrition Programme for Adolescent Girls is to address the specific nutritional needs and challenges faced by adolescent girls in order to improve their overall health and well-being.
Pradhan Mantri Suraksha Bima Yojana (PMSBY)	To provide accidental death and disability cover to the poor and vulnerable sections of society

Q32. Answer: (b) No common tangent can be drawn.

Given:

Find the length of the tangent from any point on the circle $x^2 + y^2 + 2011x + 2012y + 2013 = 0$ to the circle $x^2 + y^2 + 2011x + 2012y + 2014 = 0$.

Formula used:

Length of the tangent from a point on one circle to another circle can be found using the formula:

For circles $S1 = x^2 + y^2 + 2g1x + 2f1y + c1 = 0$ and $S2 = x^2 + y^2 + 2g2x + 2f2y + c2 = 0$, the length of the tangent from the first circle to the second is given by:

$\sqrt{(c1 - c2)}$

Calculations:

Here, the two circles are given as:

Circle 1: $x^2 + y^2 + 2011x + 2012y + 2013 = 0$

Circle 2: $x^2 + y^2 + 2011x + 2012y + 2014 = 0$

We see that:

$c1 = 2013$

$c2 = 2014$

Using the formula for the length of the tangent:

$\sqrt{(c1 - c2)}$

=> √(2013 - 2014)

=> √(-1)

This result is not a real number, indicating that no tangent can be drawn from any point on the first circle to the second circle.

Therefore The correct answer is option (2).

Q33. Answer: (c) 5760

Given:

The LCM of 144, 180, and 384 is:

Formula used:

LCM is found by taking the highest power of each prime factor appearing in the factorization of each number.

Calculations:

Prime factorization:

144 = 2^4 × 3²

180 = 2² × 3² × 5

384 = 2^7 × 3

LCM = 2^7 × 3² × 5

=> LCM = 128 × 9 × 5

=> LCM = 1152 × 5

=> LCM = 5760

Therefore The correct answer is option (3).

Q34. Answer: (b) Article 3

The correct answer is Article 3

Key Points

• This Article empowers the Indian parliament to form a new state by separation of territory from any state, or by uniting two or more states or parts of states.

• Parliament can increase or decrease the area of any state, alter the boundaries of any state, or alter the name of any state.

• No bill can be introduced in either House of Parliament without the recommendation of the President.

• The bill must also be referred to the concerned state legislature for its opinion within a specified period.

Additional Information

Articles	What does it say
Article 1	• Name and territory of the union. - Describes India that is Bharat is a "union of states" rather than a "federation of states". This provision deals with two things one, the name of the country, and two, types of polity.
Article 2	• Admission or establishment of the new state. - Empowers the parliament to admit into the union of India or establish new states on such terms and conditions as it thinks fit.
Article 10	• This article states that a person who is considered a citizen of India will continue to be a citizen, unless Parliament passes a law to terminate or acquire citizenship.

Q35. Answer: (b) Panini

The correct answer is Panini.

Key Points

• Ashtadhyayi was written by Indian grammarian Panini during the 6th to 5th century BCE.

• Ashtadhyayi sets the work standard for the Sanskrit language.

• It sums up in 4,000 sutras that had evolved in the Vedic religion.

• Panini divided his work into eight chapters, each of which is further divided into quarter chapters.

• Beyond defining the morphology and syntax of Sanskrit language, Ashtadhyayi distinguishes between usage in the spoken language and usage that is proper to the language of the sacred texts.

Additional Information

• An ancient Sanskrit philologist, grammarian, and a respected scholar in ancient India were Pānini, variously dated between the

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4th century BCE and the 6th to 5th century BCE.

• Pānini has been considered the "first descriptive linguist" and also labelled as "the father of linguistics" since the discovery and publication of his work by European scholars in the nineteenth century.

Q36. Answer: (b) (q-p)/pq

Shortcut Trick

Given p = tan A + tan B and q = cot A + cot B.

Note that q = (1/tan A) + (1/tan B) = (tan A + tan B) / (tan A × tan B).

This gives tan A × tan B = p / q.

Applying the formula cot(A + B) = (1 − tan A × tan B) / (tan A + tan B).

Result = (1 − p/q) / p = (q − p) / (q × p).

Therefore The correct answer is (q − p) / pq.

Alternate Method

Given: tan A + tan B = p, cot A + cot B = q

Formula Used: cot(A + B) = (cot A × cot B − 1) / (cot A + cot B)

=> p = tan A + tan B

=> p = (1 / cot A) + (1 / cot B)

=> p = (cot B + cot A) / (cot A × cot B)

=> Substituting (cot A + cot B) = q in the above expression:

=> p = q / (cot A × cot B)

=> cot A × cot B = q / p

=> cot(A + B) = (cot A × cot B − 1) / (cot A + cot B)

=> cot(A + B) = (q/p − 1) / q

=> cot(A + B) = ((q − p) / p) / q

=> cot(A + B) = (q − p) / pq

Therefore The correct answer is (q − p) / pq.

Additional Information

Compound Angle Formulas for Tangent

tan(A + B) = (tan A + tan B) / (1 − tan A × tan B) and tan(A − B) = (tan A − tan B) / (1 + tan A × tan B).

Compound Angle Formulas for Cotangent

cot(A + B) = (cot A × cot B − 1) / (cot B + cot A) and cot(A − B) = (cot A × cot B + 1) / (cot B − cot A).

Reciprocal Identity

tan θ = 1 / cot θ and cot θ = 1 / tan θ. Also, tan θ × cot θ = 1.

Sum to Product Relation

tan A + tan B = sin(A + B) / (cos A × cos B) and cot A + cot B = sin(A + B) / (sin A × sin B).

Q37. Answer: (d) Lord Canning

The correct answer is Lord Canning.

Key Points

• During the 'Sepoy Mutiny,' Lord Canning was the Governor-General of India.

• Lord Canning served as India's first Viceroy and last Governor-General.

• Canning officially revoked the doctrine of lapse.

• The remarriage of Hindu widows was first legalised by Canning.

• He introduced income tax in India

Additional Information

• Lord Dalhousie

• He served as Governor-General of India from 1848 to 1856.

• During his presidency, India saw the introduction of passenger trains, the electric telegraph, and uniform postage.

• In India, Dalhousie established the Public Works Department.

• He is popularly known as the 'maker of modern India'.

• Lord Hastings

• Lord Hastings, who was the Governor-General of India from 1813 to 1823, introduced a new policy of 'paramountcy'.

• By this policy, the Company claimed that its authority was paramount or supreme, hence its power was greater than that of Indian states.
• The chief instrument through which Lord Dalhousie implemented his policy of annexation was the ‘Doctrine of Lapse’.
• Lord Cornwallis
• He served as Governor-General of India from 1786 to 1793.
• In 1781, he is best known for surrendering at the Siege of Yorktown.
• He is the father of the Indian civil service.

Important Points
• Sepoy Mutiny is well known as India's first attempt to gain freedom from the British.
• The sepoy mutiny started at Meerut on 10th May 1857.
• Mangal Pandey was the revolt's first martyr.
• The revolt was dubbed 'Devil's Wind' by the English.
• The revolt was suppressed in 1858.

Q38. Answer: (a) 124

Given:
The LCM of 248 and 868 is 1736.
Formula used:
LCM(a, b) × HCF(a, b) = a × b
Calculation:
248 × 868 = 1736 × HCF(248, 868)
=> 248 × 868 = 1736 × HCF
=> HCF = (248 × 868) / 1736
=> HCF = 124
Therefore The correct answer is option 1.

Q39. Answer: (c) Wife's Brother's Son

Given: X told Y, 'I am neither your son, nor your father, I am not your wife's brother, but I am related to him. I am the grandson of the father of your wife.
So, here the only possibility of the 'X' to be the grandson of Y's wife's father is to be son of Y's wife's father's child, and X cannot be son of Y therefore X will be son of the sibling of Y's wife.
Thus, out of all the options, the possibility of 'X being Y's wife's sibling's son' is 'Wife's Brother's Son'.
Therefore, X is Y's wife's brother's son or nephew.
Hence, the correct answer is "Option 3".

Q40. Answer: (b) x2 + y2 - 8x - 6y + 16 = 0

Given:
A circle has a radius of 3 units and its centre lies on the line y = x - 1. It passes through point (7, 3).
Formula used:
The general equation of the circle is $(x - h)^2 + (y - k)^2 = r^2$ where (h, k) is the center and r is the radius.
Calculation:
Let the center of the circle be (h, k). Given, k = h - 1
Since the circle passes through point (7, 3):
$(7 - h)^2 + (3 - k)^2 = 3^2$
=> $(7 - h)^2 + (3 - (h - 1))^2 = 9$
=> $(7 - h)^2 + (4 - h)^2 = 9$
=> $(49 - 14h + h^2) + (16 - 8h + h^2) = 9$
=> $2h^2 - 22h + 65 = 9$
=> $2h^2 - 22h + 56 = 0$
Solving this quadratic equation using the quadratic formula $h = [-b \pm \sqrt{(b^2 - 4ac)}] / 2a$:
a = 2, b = -22, c = 56
=> $h = [22 \pm \sqrt{((-22)^2 - 4 \times 2 \times 56)}] / (2 \times 2)$
=> $h = [22 \pm \sqrt{(484 - 448)}] / 4$

=> h = [22 ± √36] / 4

=> h = [22 ± 6] / 4

=> h = 7 or h = 4

If h = 7, then k = 6

If h = 4, then k = 3

Checking both values:

For h = 7, k = 6, the circle's equation is:

$(x - 7)^2 + (y - 6)^2 = 9$

Expanding:

$x^2 - 14x + 49 + y^2 - 12y + 36 = 9$

=> $x^2 + y^2 - 14x - 12y + 76 = 9$

=> $x^2 + y^2 - 14x - 12y + 67 = 0$

For h = 4, k = 3, the circle's equation is:

$(x - 4)^2 + (y - 3)^2 = 9$

Expanding:

$x^2 - 8x + 16 + y^2 - 6y + 9 = 9$

=> $x^2 + y^2 - 8x - 6y + 16 = 0$

Therefore The correct answer is option (2).

Q41. Answer: (d) 5

Given:

(2/5) + (2/10) = (N + 1)/(N + 5)

Formula used:

Add the fractions on the left side and solve for N.

Calculations:

2/5 + 2/10 = 4/10 + 2/10 = 6/10 = 3/5

=> 3/5 = (N + 1)/(N + 5)

=> 3(N + 5) = 5(N + 1)

=> 3N + 15 = 5N + 5

=> 3N - 5N + 15 - 5 = 0

=> -2N + 10 = 0

=> -2N = -10

=> N = 5

Answer:

N = 5

Q42. Answer: (a) 1966

The correct answer is 1966

Key Points

• The United Nations Industrial Development Organization UNIDO is a United Nations specialized organisation

• It promotes industrial development to reduce poverty, promote inclusive globalization, and ensure environmental sustainability.

• On November 17, 1966, the United Nations Industrial Growth Organization (UNIDO) was created as an autonomous body.

• UNIDO has 170 member nations as of 2019, and the Lima Declaration endorsed the UNIDO mission in 2013.

Additional Information

• United Nations:

• The UNO was formed on 24 October 1945.

• At present, 193 countries are members of the UN.

• South Sudan is the latest and the 193rd member to join the UN in 2011

• The UN Charter came into force on October 24, 1945, when the Governments of China, France, the UK, the Soviet Union, and the USA, and a majority of other counties had ratified it.

• The headquarters of the UN is situated in New York (USA).

• International Atomic Energy Authority has its headquarters in Vienna, Austria.

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• United Nations Educational, Scientific and Cultural Organization has its headquarters in Paris, France.

Q43. Answer: (c) India

The correct answer is India.

Key Points

• India is not a member of ASEAN.

• ASEAN

• It is The Association of Southeast Asian Nations.

• It was established on 8 August 1967 in Bangkok, Thailand.

• The founding members, namely Indonesia, Malaysia, Philippines, Singapore, and Thailand signed the Bangkok Declaration.

Additional Information

• 8th August is observed as ASEAN Day.

• The Motto of ASEAN is "One Vision, One Identity, One Comunity".

• Its purpose is to promote peace and stability in the region by incorporating respect for justice and the rule of law in the relationship between nations and adherence to the United Nations principles.

• The body is headquartered in Jakarta, Indonesia.

Q44. Answer: (c) Nitrogen

The correct answer is Nitrogen

Key Points

• Nitrogen is a gas that can be fixed in the atmosphere by lightning

• Lightning's high energy breaks the bonds of nitrogen molecules in the atmosphere, allowing the free nitrogen atoms to combine with oxygen to form nitrogen oxides.

• These nitrogen oxides dissolve in moisture to form nitrates, which are carried to the Earth's surface by precipitation.

• Nitrogen is the most abundant gas in the atmosphere, making up 78% of the total composition of air

Additional Information

• Gaseous composition of the atmosphere:

• The air in the atmosphere is a mixture of many gases like nitrogen, oxygen, carbon dioxide, and water vapours.

• The atmosphere is composed mainly of nitrogen and oxygen

• Nitrogen and oxygen are two gases that make up the bulk of the atmosphere.

• Carbon dioxide, helium, ozone, argon, and hydrogen are found in lesser quantities.

• Oxygen holding the second position by volume constitutes 21% of the atmosphere.

Q45. Answer: (a) Karanj

The correct answer is Karanj

Key Points

• The Indian Navy commissioned Scorpene-class submarine INS Karanj on March 10, 2021.

• This is the third submarine of its class.

• It was under trials for more than 100 days before being commissioned.

• INS Karanj has a length of over 65 metres and was constructed by public sector shipbuilder Mazagon Dock Ltd. (MDL) in collaboration with French company Direction des Constructions Navales (DCNS).

Additional Information

• Kalvari-class submarines

• These diesel-electric attack submarines are designed for a variety of naval combat, including anti-submarine and anti-warship operations, intelligence gathering, and surveillance.

• They are around 220 feet long and 40 feet high, and can reach speeds of up to 20 knots when submerged and 11 knots when surfaced.

• Submarine names

• In the Indian Navy, ships are named in a specific way, often with names that have similar meanings, prefixes, or first letters.

• The names may also come from a particular type of word, such as rivers, animals, mythological concepts, weapons, cities, or people.

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Q46. Answer: (a) Kingdom of Awadh

The correct answer is the Kingdom of Awadh.

Key Points

• The Kingdom of Awadh was called "a cherry" by Governor-General Lord Dalhousie.

• To be precise, in 1851, Governor-General Lord Dalhousie described the kingdom of Oudh as "a cherry that will one day fall in our mouths".

• Five years later, in 1856, the state was formally annexed to the British Empire.

• A subsidiary alliance had already been imposed on Oudh in 1801.

• The Nawab had to disband its military power and according to the alliance, the British had to allow their troops to be stationed within the state.

• The Nawabs became increasingly dependent on the British for maintaining law and order within the state.

• The British felt that the soil of Awadh was good for the production of indigo and cotton.

• The acquisition of Awadh in 1856 was expected to complete the process of territorial merger.

Additional Information

• Lord Dalhousie:

• James Andrew Brown-Ramsay also known as Lord Dalhousie.

• He served as governor-general of India from 1848-1856.

• James Outram was made the British Resident of Awadh in place of Sleeman.

• He said that the administration of Awadh is very corrupt and the condition of the people is very contemplative.

• Outram's report was the basis for the annexation of Awadh.

• Lord Dalhousie annexed the Nawab of Awadh, Wajid Ali Shah on February 13, 1856, accusing him of misrule.

• Apart from Awadh, under the principle of Doctrine of Lapse, the merged territories- Satara (1848), Jaitpur and Sambalpur (1849), Udaipur (1852), Jhansi (1853), Nagpur (1854), and Karauli (1855).

• The first attempt towards railway construction in India was made by Lord Dalhousie in 1853 AD.

• It was laid between Bombay to Thane at the time of Dalhousie.

• The last expansion of British Indian territory took place during Dalhousie.

• During his tenure, for the first time, a separate public Works Department was created.

Q47. Answer: (a) Blue colour of the sky

The correct answer is the Blue colour of the sky

Key Points

• The blue colour of the sky is an example of scattering of light

• Scattering of light occurs when light interacts with particles in the atmosphere and is redirected in different directions.

• In the case of the blue sky, the particles in the atmosphere scatter shorter wavelengths of light (blue) more than longer wavelengths (red).

• This is known as Rayleigh scattering.

Additional Information

• Scattering of Light:

• Scattering of light can be defined as the process in which light gets dispersed all around the surroundings due to small tiny particles.

• This process is responsible for naturally occurring phenomena like halos, the Tyndall effect, and the blue as well as the red colour of the sky.

Q48. Answer: (c) Textile

The correct answer is Textile

Key Points

• Samarth, or ‘Scheme for Capacity Building in Textile Sector’ is aimed at skilling the youth for employment in the textile sector.

• It was an initiative of the Ministry of Textile.

• The aim is to deliver amenable skills to the youth to promote industrial efforts in organized textile.

• The focus would also be on traditional sectors of handicrafts, handlooms, sericulture and jute.

Additional Information

• Under the Samarth initiative of the Ministry, following benefits will be available to aspiring and existing women entrepreneurs:

• 20% of MSME Business Delegations sent to domestic & international exhibitions under the schemes for Marketing Assistance

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implemented by Ministry will be dedicated to women owned MSMEs.

• 20% Discount on annual processing fee on NSIC's Commercial Schemes

• Special Drive for registration of women-owned MSMEs under Udyam Registration

Q49. Answer: (d) Abbas Tyabji

The correct answer is Abbas Tyabji.

Key Points

• Dandi March or Salt Satyagraha was a major nonviolent protest action in India led by Mahatma Gandhi in March–April 1930.

• Starting from Sabarmati Ashram on 12th March 1930 till Dandi, a coastal village in Gujarat, to break the salt law by producing salt from seawater.

• Sarojini Naidu joined him on the way. Every day more and more people joined him and on 5th April 1930, they reached Dandi.

• Around 60,000 people including Gandhiji himself were arrested by the government.

• Gandhi and other leaders had made arrangements for the continuation of the agitation if they were arrested.

• A chain of leaders had been chosen, so that as each leader was arrested another would be ready to take his place.

• On April 6, the atmosphere at Dandi was both tense and solemn.

• Gandhiji then nominated Shri Abbas Tyabji, and after him, Smt. Sarojni Naidu, to lead the satyagraha if he was arrested.

• Gandhiji's successor, Mr. Abbas Tyabji, ex-Justice of Baroda, was arrested on May 12, 1930.

• Mrs. Sarojini Naidu succeeded Abbas Tyabji.

Additional Information

• Jawaharlal Nehru-

• Jawaharlal Nehru was an Indian independence activist and, subsequently, the first Prime Minister of India, as well as a central figure in Indian politics both before and after independence.

• He became the prominent leader of the left-wing factions of the Indian National Congress during the 1920s, and eventually of the entire Congress, with the tacit approval of his mentor, Mahatma Gandhi.

• As Congress President in 1929, Nehru called for complete independence from the British Raj and hosted the tricolour flag on the banks of river Ravi in Lahore.

• Sardar Vallabh Bhai Patel-

• Sardar Patel, also known as the iron man of India.

• He served as the First Deputy Prime Minister of India.

• As a senior leader of the Indian National Congress who played a leading role in the country's struggle for independence and guided its integration into a united, independent nation.

• He was elected as Congress President in the 1931 Karachi Session.

• Madan Mohan Malaviya

• Madan Mohan Malaviya was the freedom fighter credited with popularizing the slogan Satyameva Jayate (the truth alone shall triumph).

• Madan Mohan Malaviya was an Indian scholar, education reformer and politician, notable for his role in the Indian independence movement, four times of the Indian National Congress.

• President and founder of the All India Hindu Mahasabha.

• He was respectfully addressed as Pandit and was also addressed as Mahamana.

Q50. Answer: (c) BL

The logic followed here is:

Option 1) CN

Option 2) LW

Option 3) BL

Option 4) NY

Thus, out of all the options, 'BL' is the odd one out.

Hence, "Option 3" is the correct answer.

Q51. Answer: (d) Printers

The correct answer is Printers

Key Points

• Line, Daisy Wheel, Laser, and Drum are all types of printers, and they fall into the categories of impact and non-impact printers:

• Impact printers

• These printers use a hammer to strike an inked ribbon against the paper.
• Examples of impact printers include:
• Line printers
• Daisy wheel printers
• Drum printers
• Dot-matrix printers
• Non-impact printers
• These printers do not use a striking device to produce characters.
• Examples of non-impact printers include:
• Laser printers
• Inkjet printers
• Thermal printers
• Non-impact printers are generally easier to maintain than impact printers.
Additional Information
• Plotter
• The plotter is basically a type of Printer.
• It is an output device of the computer.
• It uses a pen to create a print on paper or media.
• The output is created on vector graphics.
• It means that the dots are printed which are joined by lines and curves to produce text and images.
• Plotters are present in many designs used for printing large format prints.
• It includes architecture like layouts, building plans, ship designs, CAD (computer-aided design), big canvas prints, and any other engineering drawing.
• Scanner
• A scanner is an input device, which works more like a photocopy machine.
• It is a device that captures images from photographic prints, posters, magazine pages.
• The scanner captures images from the source which are then converted into digital form that can be stored on the disk.
• These images can be edited before they are printed.

Q52. Answer: (b) 120 litres

Given:
In a mixture of milk and water of 120 litres, the ratio of milk to water is 2 : 1.
Formula used:
Let the amount of milk be M and the amount of water be W.
Then, M/W = 2/1 and M + W = 120 litres.
To find the new amount of water (W_(new)) to make the ratio 1 : 2,
New ratio: M/(W + W_(add)) = 1/2
Calculation:
M/W = 2/1
=> M = 2W
M + W = 120
=> 2W + W = 120
=> 3W = 120
=> W = 40 litres
So, M = 2 × 40 = 80 litres
Now, to change the ratio to 1 : 2,
80/(40 + W_(add)) = 1/2
=> 80 = 1/2 × (40 + W_(add))
=> 160 = 40 + W_(add)
=> W_(add) = 160 - 40
=> W_(add) = 120 litres
Therefore The correct answer is option 2.

Q53. Answer: (a) 12

The logic followed here is:

(5 + 1) × 2 = 12

6 × 2 = 12

12 = 12 (LHS = RHS)

And,

(4 + 5) × 2 = 18

9 × 2 = 18

18 = 18 (LHS = RHS)

Similarly,

(4 + ?) × 2 = 32

4 + ? = 32 ÷ 2

4 + ? = 16

? = 16 - 4

? = 12

Hence, "Option 1" is the correct answer.

Q54. Answer: (c) Bithoor

The correct answer is Bithoor

Key Points

• During the First War of Independence in 1857, Kanpur region rose to oppose British rule, and Nana Saheb's palace at Bithoor served as its headquarters.

• Nana Sahib, born as Dhondu Pant, was an Indian Peshwa (prime minister) of the Maratha empire.

• He was adopted by Baji Rao II, who was the last Peshwa of the Maratha Empire.

• Nana Sahib played a significant role in the Indian Rebellion of 1857 (also known as the First War of Independence or the Sepoy Mutiny).

• He led the revolt in the region of Kanpur (Cawnpore) and despite initial successes, was defeated by British forces later on.

• After the Indian rebellion, he disappeared, and his ultimate fate was never known, leading to various theories and speculations.

Additional Information

About 1857 Revolt:

• The Indian Mutiny of 1857-59 was a widespread but unsuccessful rebellion against the rule of the British East India Company in India which functioned as a sovereign power on behalf of the British crown.

• The reason for the Revolt of 1857 is the immediate factor was the introduction of the 'Enfield' rifle.

• The cartridge had to be bitten off before loading it into the gun.

• Indian sepoys believed that the cartridge was greased with either pig fat or made from cow fat.

• 1857 revolt started firstly on 29th March 1857 from Barrackpur (West Bengal) by Mangal Pandey.

Q55. Answer: (c) Manipur

The Correct Answer is "Manipur".

Key Points

• Loktak lake is fed by the Manipur River in northeast India’s Manipur state, situated between Myanmar and Bangladesh.

• At nearly 111 square miles, Loktak is the region’s largest lake, but what makes it unique is its collection of floating Phumdis.

• The Phumdis and surrounding lake were declared a national park in 1977.

• It remains the only national park in the world that floats.

• The Keibul Lamjao National Park is situated on the floating island in the middle of the lake.

• This makes it the only natural park in the whole world which is situated on a natural floating island on a lake.

• The larger, circular Phumdis are actually filled with fish, and serve as a major food source and livelihood for the local community.

Additional Information

• Other states Lakes

State	Lake Name	Description
Odisha	Chilika Lake	Asia's largest brackish water lagoon; known for its biodiversity and bird sanctuary.

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Anshupa Lake	Freshwater lake near Cuttack	
Kanjia Lake	Located near Bhubaneswar; supports a rich aquatic ecosystem.	
Meghalaya	Umiam Lake (Barapani)	Man-made reservoir
Ward's Lake	Located in Shillong; famous for its landscaped gardens and boating.	
Umkhrah Lake	Seasonal water body located near Shillong.	
Rajasthan	Sambhar Lake	India's largest inland saltwater lake; famous for salt production.
Pushkar Lake	Sacred lake surrounded by temples; significant for Hindu pilgrimages.	
Nakki Lake	Located in Mount Abu	

Q56. Answer: (b) Operating Systems

The Correct answer is Operating System.

Key Points

• An Operating System (OS) is software that acts as an interface between computer hardware components and the user.

• Every computer system needs at least one operating system to run other programs

• Every computer system must have at least one operating system to run other programs.

• MS-DOS, Windows XP,Linux and Unix are examples of Operating System software.

Additional Information

• The Utility Software is system software that helps to maintain the proper and smooth functioning of a Computer System.

• A language processor is a special type of software program that has the potential to translate the program codes into machine codes.

• An application program is a computer program designed to carry out a specific task other than one relating to the operation of the computer itself, typically to be used by end-users.

• Word processors, media players, and accounting software are examples of application Software.

Q57. Answer: (d) 6

The logic followed here is:

2 × 4 = 8

(2 + 1) × 4 = 12 → 3 × 4 = 12

And,

5 × 4 = 20

(5 + 1) × 4 = 12 → 6 × 4 = 24

Similarly,

6 × ? = 36 → ? = 6

(6 + 1) × ? = 42 → 7 × ? = 42 → ? = 6

Hence, "Option 4" is the correct answer.

Q58. Answer: (d) 280 m2

Given:

Length of rectangular plot (L) = 10 m

Breadth of rectangular plot (B) = 8 m

Width of path (W) = 5 m

Formula used:

Area of path = Area of outer rectangle - Area of inner rectangle

Calculations:

Area of inner rectangle = L × B

=> Area of inner rectangle = 10 × 8 = 80 m²

Length of outer rectangle = L + 2W

=> Length of outer rectangle = 10 + 2 × 5 = 20 m

Breadth of outer rectangle = B + 2W

=> Breadth of outer rectangle = 8 + 2 × 5 = 18 m

Area of outer rectangle = 20 × 18

=> Area of outer rectangle = 360 m²

Area of path = Area of outer rectangle - Area of inner rectangle

=> Area of path = 360 - 80 = 280 m²

Therefore The correct answer is option 4.

Q59. Answer: (d) Mumbai

The correct answer is Mumbai

Key Points

• The headquarters of Nuclear Power Corporation of India Limited (NPCIL) is located in Mumbai, Maharashtra, India.

• The Nuclear Power Corporation of India Limited (NPCIL) is a government-owned corporation responsible for the generation of nuclear power for electricity in India

• It is established in September 1987

• NPCIL is responsible for designing, constructing, operating, and maintaining nuclear power plants in India.

• It aims to meet the country's electricity needs through clean and efficient nuclear energy.

Additional Information

• Nuclear Power

• Involves the use of nuclear reactions to generate heat, which is then used in steam turbines to produce electricity.

• Provides a significant portion of the world's electricity.

• Considered a low-carbon power generation method as it produces minimal greenhouse gases.

Q60. Answer: (a) 2 Lakh

The correct answer is 2 Lakh

Key Points

• The amount of insurance cover available for accidental death under the Pradhan Mantri Suraksha Bima Yojana (PMSBY) is Rs. 2 lakh.

• PMSBY is a social security scheme announced by the Government of India in the 2015 Budget.

• It is an accident insurance scheme, which offers a one-year accidental death and disability cover, which can be renewed.

• The cover is for a one-year period, starting June 1 to May 31 of the subsequent year.

• Under this scheme, the risk coverage available is Rs 2 lakh for accidental death & permanent total disability, and Rs 1 lakh for permanent partial disability.

• Eligibility: All individual bank account holders in the 18-70 year age group are eligible to join PMSBY.

• The premium payable is Rs 20 per annum per member.

Additional Information

• Other Jan Suraksha Initiatives by GoI

• For a very long time, a significant number of Indians have been without any sort of health, accident, or life insurance.

• According to the 66th Round of the National Sample Survey Office (NSSO) Survey from 2011–12, 88% of the 47.29 crores of workers in the unorganized sector are anticipated to be without a formal pension plan.

• Encouraged by the success of Pradhan Mantri Jan Dhan Yojana, the Indian government proposed using bank accounts as the foundation for the schemes to work toward establishing a universal social security system for all Indians, with a focus on the poor, the underprivileged, and those employed in the unorganized sector.

• The government of India came up with three Jan Suraksha Initiatives (social security)- Pradhan Mantri Suraksha Bima Yojna, Atal Pension Yojana (APY), and Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) were suggested in the Budget 2015–16 to address this issue.

• These three programs are based on Jan Dhan Yojana’s mission to safeguard residents through times of illness, mishap, or aging.

• On May 9, 2015, the prime minister introduced these three social security programs in an effort to give the poor and disadvantaged access to pension and insurance coverage.

Q61. Answer: (d) Mountain Circuit

The correct answer is Mountain Circuit.

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Key Points

• The Swadesh Darshan Scheme is an initiative by the Ministry of Tourism, Government of India, aimed at integrated development of theme-based tourist circuits.

• The scheme aims to promote, develop, and harness the potential of tourism in India by creating tourist circuits on specific themes.

• Some of the key circuits under the Swadesh Darshan Scheme include the Sufi Circuit, Eco Circuit, and Coastal Circuit.

• The Mountain Circuit is not included in the Swadesh Darshan Scheme, making it the correct answer.

Additional Information

• Swadesh Darshan Scheme:

• Launched by the Ministry of Tourism, Government of India, to develop theme-based tourist circuits across the country.

• The scheme aims to promote cultural and heritage value, enhance the tourist experience, and create jobs in the tourism sector.

• Some of the popular circuits include the Buddhist Circuit, Ramayana Circuit, and North-East India Circuit.

• The scheme is funded by the Ministry of Tourism and implemented in collaboration with state governments and private stakeholders.

• Sufi Circuit:

• Aims to promote the spiritual heritage of Sufism in India.

• Includes important Sufi pilgrimage sites like Ajmer, Delhi, and Fatehpur Sikri.

• Focuses on the development of infrastructure and facilities at these sites to attract tourists.

• Eco Circuit:

• Focuses on promoting eco-tourism in India.

• Includes destinations with rich natural and ecological resources such as wildlife sanctuaries, national parks, and forest reserves.

• Aims to create awareness about sustainable tourism practices and conservation of natural habitats.

• Coastal Circuit:

• Aims to promote coastal tourism in India.

• Includes popular beach destinations like Goa, Kerala, and Odisha.

• Focuses on the development of beach tourism infrastructure, water sports facilities, and promotion of coastal culture and heritage.

Q62. Answer: (b) 45

Given:

Kiran can complete a task in 15 days.

He works for 5 days and then leaves.

Venkat completes the remaining task in 30 days.

Formula used:

Work done = Time × Rate of work

Calculation:

Rate of work of Kiran = 1/15 per day

Work done by Kiran in 5 days = 5 × 1/15 = 1/3

Remaining work = 1 - 1/3 = 2/3

Rate of work of Venkat = x (let x be the rate of work of Venkat)

Venkat completes 2/3 of the work in 30 days.

=> 30 × x = 2/3

=> x = 2/3 × 1/30 = 1/45

Therefore, Venkat alone can complete the entire task in 45 days.

Therefore The correct answer is option 2.

Q63. Answer: (b) 100/11

Concept used:

A fraction produces a terminating decimal only if the denominator (in its simplest form) has prime factors of only 2 and/or 5. If the denominator contains any prime factor other than 2 or 5, it produces a non-terminating repeating decimal.

Calculation:

13/4 : Denominator = 4 = (2^2) → Only prime factor is 2.

It is a terminating decimal.

100/11 : Denominator = 11 → Prime factor is 11.
It is a non-terminating repeating decimal.
7/5 : Denominator = 5 → Only prime factor is 5.
It is a terminating decimal.
3/40 : Denominator = 40 = ($2^3 \times 5$) → Only prime factors are 2 and 5.
It is a terminating decimal.
The non-terminating repeating decimal is 100/11.

Q64. Answer: (a) 25

Given:
Numbers: 3, 5, 15
Formula used:
If a, b, c are given, then the fourth proportional d is given by:
a : b = c : d
Calculations:
3 : 5 = 15 : d
=> d = (5 × 15) ÷ 3
=> d = 75 ÷ 3
=> d = 25
Answer:
The fourth proportional is 25.

Q65. Answer: (c) Rs. 1,600

Given:
P and Q started a business with equal capital.
P withdrew from the business at the end of 4 months.
Total profit at the end of the year = Rs. 6,400
Formula used:
Profit sharing ratio = Capital × Time
Calculations:
Let the initial capital for both P and Q be C.
Time for P = 4 months
Time for Q = 12 months
P's share of profit ratio = C × 4
Q's share of profit ratio = C × 12
Total ratio = C × 4 + C × 12 = 4C + 12C = 16C
P's share of profit = (P's ratio / Total ratio) × Total profit
P's share of profit = (4C / 16C) × 6400
=> P's share of profit = 1/4 × 6400
=> P's share of profit = 1600
Therefore The correct answer is option 3.

Q66. Answer: (a) Amitabh Bachchan

The correct answer is Amitabh Bachchan.
Key Points
• Bollywood actor Amitabh Bachchan was honoured with the International Federation of Film Archives (FIAF) Award 2021.
• The virtual ceremony was held on March 19. Bachchan shared a heartwarming message after he received the award.
• In the lengthy message, the 'Chehre' actor also, as they conferred the award.
• Amitabh is the first Indian to receive the award for his contribution to the preservation of and access to the world`s film heritage for the benefit of present and future generations.
Additional Information
• FIAF Award
• The FIAF Award is a prestigious recognition granted by the International Federation of Film Archives (FIAF).

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• It honors individuals and institutions for their outstanding dedication and contribution to the preservation and restoration of global film heritage.

• The award was instituted in 2001 by FIAF, an international organization representing film archives and institutions worldwide.

• Prominent filmmakers, actors, and other contributors to cinema have received this award, including Martin Scorsese, Christopher Nolan, and Amitabh Bachchan.

Q67. Answer: (a) Lord Rippon

The correct answer is Lord Rippon.

Key Points

• Lord Rippon was the viceroy and Governor-General of India between 1880 and 1884.

• Lord Ripon was the Viceroy of India who took initiative to create elected local government bodies called the local boards.

• He is popularly called the 'father of local self-government in India'.

• He passed the local self-government act in 1882.

• The 'Ilbert bill controversy' was during the period of Lord Rippon.

• Lord Rippon raised the age limit of civil service from 19 to 21.

• Hunter commission(education) was appointed by Lord Rippon in 1882.

• "Judge me by my acts and not by my words" was the famous quote said by Lord Rippon.

Additional Information

• Lord Reading

• He served as viceroy of India from 1921 to 1926.

• He abolished the Devadasi system in India.

• Hilton Young commission was appointed by Lord Reading.

• The Chauri Chaura incident was during the tenure of Lord Reading.

• Lord Irwin

• He served as viceroy of India from 1926 to 1931.

• He is the first occupant of Rashtrapathi Bhavan.

• He is popularly known as the "Christian viceroy".

• He was the viceroy during the arrival of the Simon Commission.

• Lord Wavell

• He served as viceroy of India from 1943 to 1947.

• The Royal naval mutiny was during the tenure of Lord Wavell.

• The Simla conference was held under the leadership of Lord Wavell.

• The Constituent Assembly was formed during the period of Lord Wavell.

Q68. Answer: (b) 162/3%

Given:

x is 20% more than y.

Formula used:

If x is p% more than y, then y is q% less than x.

Calculations:

Step 1: Express x in terms of y.

x = y + 20% of y

=> x = 1.2y

Step 2: Express y in terms of x.

y = x / 1.2

=> y = 5x/6

Step 3: Calculate the percentage less.

y = (5/6)x

=> y = x - (1/6)x

=> Percentage less = (1/6) × 100% = 16 2/3%

Answer:

y is 162/3 % less than x.

Q69. Answer: (b) Vitamin B1

The correct answer is Vitamin B1

Key Points

• Water-soluble vitamins are a class of essential nutrients that dissolve in water and perform vital roles in the body.

• Unlike fat-soluble vitamins, they are not stored in large amounts and need to be replenished regularly through diet

• Water-Soluble Vitamins:

• They include the B-complex vitamins (e.g., B1, B2, B6, B12) and Vitamin C.

Additional Information

• Water Soluble:

• Vitamin B1 (Thiamine): it is mainly released from food and the main action is to maintain the proper functioning of the nervous system.

• Vitamin B2 (Riboflavin): helps to maintain good vision and healthy skin, also plays an important role in amino acid conversion tryptophan into niacin.

• Vitamin B3 (Niacin) helps in Digestion, Absorption, and Metabolism.

• Vitamin B5 (pantothenic acid) helps in metabolism and the formation of hormones.

• Vitamin B6 (pyridoxine) helps in protein metabolism, RBC, and Insulin production.

• Vitamin B7 (biotin) helps to release energy from carbohydrates, metabolism of fats, proteins, and carbohydrates from food.

• Vitamin B9(folate or folic acid) helps in protein metabolism helps in RBC production and lowers the risk of developing Neural Tube Defect.

• Vitamin B12(cobalamin) helps in the production of normal red blood cells and also maintains the nervous system.

• Vitamin C (ascorbic acid) plays a key role in iron absorption and collagen synthesis. It also helps in wound healing and bone formation also to regulates the whole immune system.

• Fat-Soluble Vitamins

• Fat-soluble vitamins are those vitamins that are dissolved in fats.

• They are mainly absorbed by fat globules and then to the digestive tract and after absorption from there, they are circulated in the main bloodstream.

• As these are stored in the body tissues, especially in the adipose tissues, their excessive intake may lead to toxic and adverse effects.

• Vitamin A: Plays a major role in bone formation and vision. It also helps to boost immune and cellular function.

• Vitamin D plays a major role in the absorption and metabolism of phosphorous and calcium in the bone.

• Vitamin E is an antioxidant.

• Vitamin K plays a major role in blood clotting.

Q70. Answer: (c) 6

Given:

The number that should be subtracted from 510 and 270 to get 24 as the GCD is:

Options: 1) 24, 2) 42, 3) 6, 4) 16

Formula used:

GCD(a - x, b - x) = 24

Where, a = 510, b = 270, and x is the number to be subtracted

Calculation:

Let x be the number to be subtracted.

=> GCD(510 - x, 270 - x) = 24

Since GCD of 24 should divide the difference of 510 and 270, we calculate:

=> 510 - 270 = 240

=> The number x must be such that 240 is divisible by 24.

=> 240 / 24 = 10

=> Therefore, x = 6 satisfies the condition.

Therefore The correct answer is option (3).

Q71. Answer: (a) Mohammad Azharuddin

The correct answer is Mohammad Azharuddin.

Key Points

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• Mohammad Azharuddin is a former Indian cricketer and captain of the Indian national team.
• He is known for his wristy strokes and was considered one of the finest batsmen in the world during his playing days.
• Azharuddin made his debut in Test cricket on 31st December 1984 against England at Eden Gardens, Kolkata.
• He scored centuries in each of his first three Test matches, making him the only Indian cricketer to achieve this feat.

Additional Information

• Test Cricket
• Test cricket is the longest form of the sport of cricket and is considered its highest standard.
• It is played between international teams over five days, with each team having two innings.
• Test cricket is named so because it tests the endurance, skill, and strategic acumen of the players.
• It began in 1877 when Australia played England at the Melbourne Cricket Ground (MCG).
• Century in Cricket
• A century is a score of 100 or more runs by a batsman in a single innings.
• Scoring a century is considered a significant achievement and is often celebrated by players and fans alike.
• It demonstrates a batsman's skill, concentration, and ability to play a long innings.
• In Test cricket, scoring centuries in consecutive matches is a rare and commendable feat.
• Eden Gardens, Kolkata
• Located in Kolkata, West Bengal, Eden Gardens is one of the oldest and most iconic cricket stadiums in India.
• It was established in 1864 and has a seating capacity of around 66,000 spectators.
• Eden Gardens has hosted numerous historic cricket matches, including Test matches, One-Day Internationals (ODIs), and Indian Premier League (IPL) games.
• It is known for its passionate and knowledgeable crowd, often referred to as the "Mecca of Indian cricket".

Q72. Answer: (b) Rourkela Steel Plant

The correct answer is Rourkela Steel Plant.

Key Points

• Rourkela Steel Plant is located in Rourkela, Odisha.
• It is India's first integrated steel plant.
• It was built in the 1960s with the collaboration of West Germany.
• Rourkela Steel Plant is managed by the Steel Authority of India.
• It was established during the second Five Year Plan (1956-61).
• Rourkela Steel Plant was Asia's first steel plant to use the LD (Linz-Donawitz) steel-making process.
• It is also the first steel plant in SAIL and the only one presently where 100% of slabs are produced through the cost-effective and quality-centric continuous casting route.
• It is SAIL's only steel plant capable of producing silicon steels for the power sector as well as high-quality pipes for the oil and gas industry.

Additional Information

• Durgapur Steel Plant
• It is one of the Steel Authority of India Limited's integrated steel plants.
• Is located in Durgapur, West Bengal.
• It was established with the assistance of the United Kingdom.
• The Bhilai Steel Plant
• It is located in Bhilai IN Chhattisgarh.
• It is India's first and main producer of steel rails.
• Bokaro Steel Plant (BSL)
• It is located in Bokaro, Jharkhand.
• It is India's fourth integrated public-sector steel factory, developed with Soviet Unions' assistance.
• It was incorporated as a limited company in 1965

Q73. Answer: (c) Robben Island

The correct answer is Robben Island

Key Points

• Robben Island, the world heritage site is associated with Nelson Mandela.
• Robben Island is an island in Table Bay, near Cape Town, South Africa.

• Political Analyst Nelson Mandela was imprisoned here for 18 years.
• He was later elected as President of South Africa.
• Kgalema Motlanthe and Jacob Zuma were two other elected presidents from Robben Island.
• Robben Island was declared a World Heritage Site by UNESCO

Additional Information

• Greenland:
• Nuuk is the capital city of Greenland.
• Greenland is bordered by the Atlantic Ocean to the southeast, the Greenland Sea to the east, the Arctic Ocean to the north, and the Baffin Bay to the west.
• Greenland is the world's largest island with an area of 2,166,086 square km.
• Danish krone is the name of the currency in Greenland.
• Cyprus
• Cyprus is officially called the Republic of Cyprus.
• It is in an island country in the East of the Mediterranean Sea.
• Currency: Euro

Q74. Answer: (a) Figure 2

The logic followed here is: All the three slant lines is touch the diameter the inner circle.

Figure 1)

→ All the three slant lines is touch the diameter the inner circle.

Figure 2)

→ Only two slant lines is touch the diameter the inner circle.

Figure 3)

→All the three slant lines is touch the diameter the inner circle.

Figure 4)

→ All the three slant lines is touch the diameter the inner circle.

**Hence, 'option 2' is the correct answer.

Q75. Answer: (d) Rs. 1,08,000

Given:

A, B and C start a business jointly.

Twice the capital of A is equal to thrice the capital of B.

The capital of B is four times the capital of C.

Annual profit = Rs. 2,97,000

Formula used:

Share of profit is distributed in the ratio of their capitals.

Calculation:

Let the capital of C be Rs. x.

Then, the capital of B = 4x.

Twice the capital of A = thrice the capital of B

=> 2A = 3B

=> 2A = 3(4x)

=> 2A = 12x

=> A = 6x

Now, the ratio of their capitals:

A : B : C = 6x : 4x : x = 6 : 4 : 1

Total parts = 6 + 4 + 1 = 11

The share of B in the profit:

=> (4/11) × 2,97,000

=> 4 × 27,000

=> Rs. 1,08,000

Therefore The correct answer is option (4).

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Q76. Answer: (d) 847

Given:

Find the smallest number, which when divided by 35, 40 and 60 leaves a remainder 7 in each case.

Formula used:

We need to find the LCM of 35, 40, and 60 and then add 7 to it.

Calculations:

LCM(35, 40, 60)

Prime factorization:

35 = 5 × 7

40 = 2^3 × 5

60 = 2^2 × 3 × 5

LCM = 2^3 × 3 × 5 × 7

=> LCM = 8 × 3 × 5 × 7

=> LCM = 840

Adding the remainder:

Smallest number = LCM + 7

=> Smallest number = 840 + 7

=> Smallest number = 847

Therefore The correct answer is option 4.

Q77. Answer: (c) Khajuraho

The correct answer is Khajuraho.

Key Points

• Kandariya Mahadev temple is in Khajuraho.

• Kandariya Mahadeva temple:

• The Kandariya Mahadeva temple is dedicated to Shiva and was constructed in 999 by king Dhangadeva of the Chandela dynasty.

• An ornamented gateway led to an entrance and the main hall (maha mandapa) where dances were performed.

• The image of the chief deity was kept in the main shrine (Garbhagriha).

• This was the place for ritual worship where only the king, his immediate family, and priests gathered.

• The temples were decorated with elaborately carved sculptures.

Additional Information

• Mahabalipuram

• The city of Mahabalipuram was founded by the Pallava king Narasimhavarman I.

• It has 40 ancient monuments and Hindu temples, including one of the largest open-air rock reliefs in the world: the Descent of the Ganges or Arjuna's Penance.

• This was an Indian dynasty, which ruled a portion of southern India from 275 CE to 897 CE.

• Since the extinction of the Satavahana dynasty which the Pallavas served as feudatories, they gained prominence.

• During the reign of Mahendravarman I (571–630 CE), and Narasimhavarman I (630–668 CE) it became a major power.

• Pallavas built the Shore Temple in Mamallapuram, a UNESCO World Heritage Site.

• They developed the script for Pallava from which Grantha eventually descended.

Q78. Answer: (b) 81

The logic followed here is:

125, 27, and 343 are all cubes of whole numbers,

Whereas,

81 is a square number (9 x 9) and not a cube number.

So, 81 is different from the given options.

Hence, the correct answer is "Option 2".

Q79. Answer: (d) Japan

The correct answer is Tokyo.

Key Points

• The global United Nations University system is coordinated by UNU Headquarters (also called UNU Centre) in Tokyo, Japan.

• The UNU Headquarters Building in Tokyo houses the Office of the Rector as well as global administrative, academic services, and technical services units.

• The UNU Centre administrative services unit also has an adjunct office in Putrajaya, Malaysia.

• One vice-rectorate (the UNU Vice-Rectorate in Europe) is located in Bonn, Germany.

Additional Information

• United Nations:

• The UNO was formed on 24 October 1945.

• It was founded in San Francisco, USA.

• The headquarters were shifted to New York in 1946.

• At present, 193 countries are members of the UN.

• South Sudan is the latest and the 193rd member to join the UN in 2011.

• The UN Charter came into force on October 24, 1945, when the Governments of China, France, the UK, the Soviet Union, and the USA, and a majority of other counties had ratified it.

Q80. Answer: (c) 9/R

The logic followed here is:

Hence, "Option 3" is the correct answer.

Q81. Answer: (d) Use of solar car for transport

The correct answer is the Use of solar car for transport

Key Points

• The activity that is not responsible for the greenhouse effect is Use of solar car for transport

• Greenhouse Effect:

• It is the warming of the Earth's surface due to the trapping of heat by greenhouse gases (e.g., carbon dioxide, methane, nitrous oxide)

• It is released during activities that burn fossil fuels or emit pollutants.

• Solar cars use energy from the sun and do not emit greenhouse gases, making them environmentally friendly.

Additional Information

Greenhouse Effect:

• Solar energy is trapped by the earth atmosphere and radiate slowly so to cover our earth with a warm blanket.

• This is the natural process of the greenhouse effect on earth to maintain its temperature and makes the earth perfect for life.

• Greenhouse gases are carbon dioxide, other greenhouse gases are methane, water vapour, nitrous oxide, CFCs and ozone.

• Values of radiation absorbed by the greenhouse gases are as follow:

Gas	Value of absorption in percentage
Ozone	10.2 %
Methane	16.3 %
Carbon Dioxide	56.4 %
Nitro Oxide	5.4 %

Q82. Answer: (c) 37 km

Given:

Distance covered = 92.5 km

Time taken = 2.5 hours

Formula used:

Speed = Distance ÷ Time

Distance covered in 1 hour = Speed × 1

Calculation:

Speed of the truck:

=> Speed = 92.5 ÷ 2.5

=> Speed = 37 km/h

Distance covered in 1 hour:

=> Distance = Speed × 1

=> Distance = 37 × 1 = 37 km

Therefore The distance covered by the truck in 1 hour is 37 km.

Q83. Answer: (c) 6

The logic followed here is :-

From the given three different cubes the adjacent sides are as shown below :

As 4 is common on both the dice I and III, it is clear that 1, 5, 3, and 2 are adjacent to it, and the remaining i.e. 6 will be opposite to it.

Opposite pairs:

1 → 3

5 → 2

4 → 6

So, the opposite side of "4" will be side "6".

Hence, the correct answer is "Option 3".

Q84. Answer: (b) Pherwani Committee

The correct answer is the Pherwani Committee

Key Points

• The National Stock Exchange (NSE) was established in India based on the recommendations of the Pherwani Committee.

• The NSE was incorporated in 1992.

• The NSE was recognized as a stock exchange by SEBI in April 1993.

• The NSE began operations in 1994 with the launch of the wholesale debt market.

Additional Information

• Sri Krishna Committee

• Srikrishna Committee was set up by the center to look into the need for a separate state of Telangana from Andhra Pradesh, and which had accorded the highest priority to a non-separation of the state.

• The committee was headed by former chief justice B. N. Srikrishna.

• The committee was formed by the union government on 3rd February 2010.

• The committee submitted its report on 30th December 2010 to the ministry of Home Affairs.

• The committee consists of five members including the chairman.

• Rajesh Krishnan Committee

• Rajmannar Committee was set up by the then DMK Government of Tamil Nadu in 1969 under the Chairmanship of Dr. P.V. Rajamanar.

• It was appointed to examine all aspects of Centre-State relations and to investigate and identify the causes of unitary tendencies in Central-State relations.

• It submitted its report in 1971.

• The Central government completely ignored the recommendations of the Rajamannar Committee.

Q85. Answer: (b) 5%

Given:

Principal (P) = Rs. 400

Amount (A) = Rs. 441

Time (t) = 2 years

Formula used:

A = P(1 + ^r/100)^t

Where, r = rate

Calculations:

441 = 400(1 + ^r/100)²

=> ^(441)/400 = (1 + ^r/100)²

=> ²¹/20 = (1 + ^r/100)²

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=> 21/20 = 1 + ^(2r)/100

=> 21/20 - 1 = ^(2r)/100

=> 1/20 = ^(2r)/100

=> r = 5%

Therefore The correct answer is option 2.

Q86. Answer: (b) 90°

Given:

Percentage distribution of sales from Shop 3 = 25%.

Total angle of the pie chart = 360°.

Formula used:

Central angle = (Percentage / 100) × 360°

Calculation:

Central angle for Shop 3:

=> Central angle = (25 / 100) × 360°

=> Central angle = 0.25 × 360°

=> Central angle = 90°

Therefore The central angle corresponding to the sales of goods from Shop 3 is 90°.

Q87. Answer: (d) 13 : 12

Data from the Graph:

City B (2014 to 2016):

2014: 120

2015: 92

2016: 100

City C (2014 to 2016):

2014: 108

2015: 100

2016: 80

Formula used:

Average = Sum of observations ÷ Number of years

Ratio = Average (City B) : Average (City C)

Calculation:

Average number of students from City B:

=> Sum = 120 + 92 + 100 = 312

=> Average = 312 ÷ 3 = 104

Average number of students from City C:

=> Sum = 108 + 100 + 80 = 288

=> Average = 288 ÷ 3 = 96

Ratio of averages:

=> Ratio = Average (City B) : Average (City C)

=> Ratio = 104 : 96

Simplify the ratio:

=> Ratio = 26 : 24

=> Ratio = 13 : 12

Therefore The ratio of the average number of students from city B to city C is 13 : 12.

Q88. Answer: (a) The average number of candidates who appeared for the interview from UP over the given period is greater th...

Given:

The table of candidates who appeared for an interview:

States	2012	2013	2014	2015	2016

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Bihar	410	500	450	320	500
UP	300	400	450	500	430
MP	250	280	240	400	540
Punjab	280	320	260	400	350
Kerala	440	400	350	380	420

Formula used:

Average = (Sum of candidates) / (Number of years)

Calculation:

Option 1: The average number of candidates who appeared for the interview from UP over the given period

Sum = 300 + 400 + 450 + 500 + 430

=> Sum = 2080

Average = 2080 / 5

=> Average = 416

Option 2: The highest number of candidates who appeared for the interview during the given period

Highest = 540 (from MP in 2016)

Option 3: The average number of candidates who appeared for the interview from Punjab

Sum = 280 + 320 + 260 + 400 + 350

=> Sum = 1610

Average = 1610 / 5

=> Average = 322

Option 4: The lowest number of candidates who appeared for the interview during the given period

Lowest = 240 (from MP in 2014)

Therefore The correct answer is option 1.

Q89. Answer: (d) Rs. 3.38 crore

Given:

The total annual expenditure of the school during the year = Rs. 10 crore

Percentage of expenditure on maintenance = 15%

Percentage of expenditure on employee's salaries = 18%

Formula used:

Total expenditure on maintenance and employee's salaries = (Percentage of maintenance + Percentage of employee's salaries) × Total annual expenditure

Calculations:

Total percentage for maintenance and employee's salaries = 15% + 18%

=> Total percentage = 33%

Total amount spent on maintenance and employee's salaries = 33% of Rs. 10 crore

=> 33% × 10 crore

=> 0.33 × 10 crore

=> 3.3 crore

Therefore The correct answer is option (4).

Q90. Answer: (c) 18

The logic followed here is:

3 × 5 × 3 = 15 × 3

45 = 45 (LHS = RHS)

And,

2 × 12 × 3 = 9 × 8

72 = 72 (LHS = RHS)

Similarly,

1 × ? × 3 = 6 × 9

? = 54 ÷ 3

? = 18

Hence, "Option 3" is the correct answer.

Q91. Answer: (c) I84M

The logic followed here is:

Hence, "Option 3" is the correct answer.

Q92. Answer: (a) IB

The logic followed here is:

Hence, "Option 1" is the correct answer.

Q93. Answer: (d) 1 hour, 4 minutes, 48 seconds

Given : 1.08 hours

So, 1.08 hours can be written as:

1.08 hours => 1 hour + 0.08 hours

Now, Converting hours to minutes:

1 hour = 60 min

0.08 hrs = 60 × 0.08 => 4.8 min

Here, 4.8 min can be written as → 4 min + 0.8 min

Now, Converting minutes to seconds:

1 min = 60 sec

0.8 min = 60 × 0.8 => 48 sec

Thus, 1.08 hours can be written as 1 hour, 4 minutes, 48 seconds.

Hence, "Option 4" is the correct answer.

Q94. Answer: (c) 147

The logic followed here is:

FLOCK is coded as 141

Similarly,

CREW is coded as

Hence, "Option 3" is the correct answer.

Q95. Answer: (d) C and D

According to the given Venn diagram:

The shaded region represents the people who are tall but not girls.

So, the people who are tall but not girls → C and D

Hence, the correct answer is "Option 4".

Q96. Answer: (d) FIERCE

The logic followed here is:

LATER is written as MCWIW

Similarly,

? is written as GKHVHK

Hence, "Option 4" is the correct answer.

Q97. Answer: (d) 84

The logic followed here is:

→ (5 × 2 × 6) = 60

And,

→ (4 × 2 × 6) = 48

Similarly,

→ (3 × 4 × 7) = 84

Hence, "Option 4" is the correct answer.

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Q98. Answer: (d) Food

The logic followed here is:

Logic: Role and Creation.

Here,

Poem : Poet → Poet is someone who creates a Poem.

Similarly,

Cook : Food → Cook is someone who creates Food.

Hence, the correct answer is "Option 4".

Q99. Answer: (a) R60I

The logic followed here is:

Hence, "Option 1" is the correct answer.

Q100. Answer: (c) Only assumption I is implicit.

Given Statement: Though I don't like watching Indian films, I really enjoyed 'PK'.

Now,

Assumptions:

I. 'PK' is an Indian film - Implicit (The statement implies that 'PK' is an Indian film because it contrasts the speaker's usual dislike for Indian films with their enjoyment of 'PK'.)

II. 'PK' is not an Indian film - Not Implicit (The statement would not make sense if 'PK' was not an Indian film, as it is used to highlight an exception to the speaker's usual dislike for Indian films.)

Here, Only assumption I is implicit.

Hence, the correct answer is "Option 3".

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