RRB NTPC CBT-I Official Paper (Held On: 13 Jan 2021 Shift 2) (Previous Year Paper)

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

Take this paper as a timed mock test

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

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Q1. Which of the following languages does a computer use to process data?

(a) COBOL
(b) BASIC
(c) Windows
(d) Binary

Q2. What is the approximate percentage of female literacy in India according to 2011 Census?

(a) 65.46%
(b) 46.89%
(c) 59.23%
(d) 29.32%

Q3. __ and ___ are the two kinds of sound effects files that can be added in Microsoft PowerPoint.

(a) .wav files, .mid files
(b) .doc files, .gif files
(c) .jpg files, .pdf files
(d) .wav files, .jpg files

Q4. Find the value of the series.

$(2^2 + 4^2 + 6^2 + ... + 22^2)$.

(a) 2024
(b) 4220
(c) 1224
(d) 1042

Q5. In a college, if 15% of the boys are the same in number as one-third of the girls, then find the ratio of the number of boys to that of girls in the college.

(a) 7 : 20
(b) 9 : 20
(c) 20 : 7
(d) 20 : 9

Q6. Find the value of $(0.868 \times 0.237 + 0.868 \times 0.763)/(0.7 \times 0.936 + 0.7 \times 0.064)$.

(a) 12.4
(b) 1.24
(c) 0.124
(d) 1.42

Q7. Select the number from among the given options that can replace the question mark (?) in the following series.

2, 6, 18, 54, ?

(a) 162
(b) 94

(c) 84
(d) 104

Q8. If tanθ=12/13 then find the value of (2sinθ cosθ)/(cos²θ -sin²θ)
(a) 13/12
(b) 413/25
(c) 312/25
(d) 512/25

Q9. Select the option that is related to the third number in the same way as the second number is related to the first number.
7 : 54 :: 9 : ?
(a) 71
(b) 63
(c) 86
(d) 81

Q10. Who is known as the 'Napoleon of India'?
(a) Skandagupta
(b) Samudragupta
(c) Kumaragupta
(d) Chandragupta

Q11. What is the full form of UNDP?
(a) United Nations Development Programme
(b) United Nations Digital Programme
(c) United Nations Development Project
(d) United Nations Digital Project

Q12. Into how many constituencies was India divided for the 2019 Lok Sabha elections?
(a) 543
(b) 342
(c) 345
(d) 247

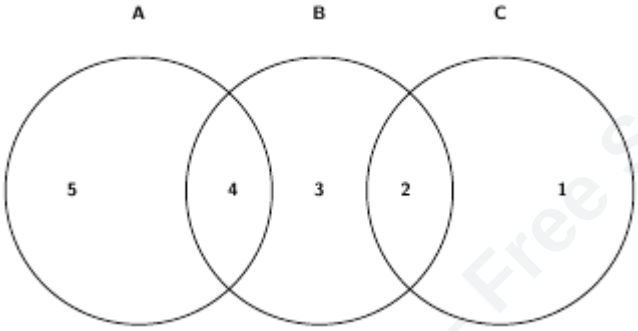
Q13. Under the Indian political system, there is reservation for women in the:
(a) Lok Sabha
(b) Panchayati Raj Institutions
(c) Rajya Sabha
(d) State Assemblies

Q14. 500 persons are taking a dip in a cuboidal pond, which is 80 m in long and 50 m in broad. What is the rise in the water level in the pond, if the average displacement of the water by one person is 0.04 m³?
(a) 1 cm
(b) 1.5 cm
(c) 0.5 cm
(d) 2.5 cm

Q15. Find the value of X such that the expression (12.95 × 12.95 + 12.95 × X + 0.03 × 0.03) will be perfect square.
(a) 0.015
(b) 0.06
(c) 0.6
(d) 0.006

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Q16. In the following diagram, A represents servicemen, B represents rich men and C represents honest men. Which number represents rich servicemen?



(a) 2
(b) 4
(c) 3
(d) 5

Q17. Which of the following satellites is India's first dedicated multi-wavelength space observatory?

(a) INSAT
(b) JUGNU
(c) IRS
(d) Astrosat

Q18. If two cubes, each with a side of 10 cm, are joined end to end, then find the surface area of the resulting cuboid.

(a) 100 cm^2
(b) 300 cm^2
(c) 500 cm^2
(d) 1000 cm^2

Q19. Which of the following is the energy currency for most cellular processes?

(a) Pyruvate
(b) Glucose
(c) ATP
(d) ADP

Q20. Which of the following airlines suspended all of its operations for an indefinite period on 17 April 2019 due to lack of funds?

(a) Air Vistara
(b) Spice Jet
(c) Kingfisher
(d) Jet Airways

Q21. If the mean of the following data is 15, then find the value of k.

x	**5**	**10**	**15**	**20**	**25**
f	6	k	5	10	5

(a) 8
(b) 10
(c) 7
(d) 6

Q22. Who among the following was NOT the member of Draft Committee of the Indian Constitution?

(a) Dr K.M. Munshi
(b) A. V. Thakkar
(c) N. Gopalaswami Ayyangar

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(d) Syed Mohammad Saadullah

Q23. A shopkeeper purchased an article for Rs. 3,000. What will be the percentage of profit (approximately) if he sells that article for Rs. 3,600?

(a) 17%
(b) 22%
(c) 20%
(d) 15%

Q24. Which country won the FIFA World Cup 2018?

(a) France
(b) Brazil
(c) Italy
(d) Croatia

Q25. Which of the following is the largest bauxite producing states of India?

(a) Bihar
(b) Odisha
(c) Punjab
(d) Maharashtra

Q26. With which of the following musical instruments was V Balsara associated?

(a) Mandolin
(b) Piano
(c) Jal Tarang
(d) Sarangi

Q27. Name the first country of the Soviet Republic (USSR) to declare its independence.

(a) Moldova
(b) Lithuania
(c) Ukraine
(d) Georgia

Q28. Find the largest three-digit number that is exactly divisible by 6, 9, 12 and 15.

(a) 895
(b) 999
(c) 900
(d) 925

Q29. Which of the following devices is based on the phenomenon of electromagnetic induction?

(a) Galvanometer
(b) Ammeter
(c) Generator
(d) Bulb

Q30. If α and β are the zeros of the polynomial $f(x) = kx^2 + 4x + 4$ such that $\alpha^2 + \beta^2 = 24$, then find the positive value of k.

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

Q31. Determine the value of a and b for which the following system of equations has infinite solutions.

$2x - (a - 4)y = 2b + 1$, $4x - (a - 1)y = 5b - 1$

(a) a = 7 and b = 1
(b) a = 7 and b = 3

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(c) a = 2 and b = 7
(d) a = 5 and b = 2

Q32. As of 2022, how many nuclear reactors are in operation of India?
(a) 12
(b) 17
(c) 22
(d) 7

Q33. Select the number from among the given options that can replace the question mark (?) in the following series.
9, 36, 144, ?
(a) 576
(b) 675
(c) 756
(d) 657

Q34. In which of the following cities is the famous Jallianwala Bagh located?
(a) Panipat
(b) Amritsar
(c) Ambala
(d) Patna

Q35. What is the full from of ASCII?
(a) American Standard Code for Information Interchange
(b) American Standard Code for International Interchange
(c) American Stable Code for Information Interchange
(d) American Stable Code for Institutional Interchange

Q36. In which year did King George-III establish the Supreme Court in Madras?
(a) 1800
(b) 1757
(c) 1774
(d) 1857

Q37. Ravi took a loan from a bank at the rate of 8% p.a. simple interest. After 5 years, he had to pay an interest of Rs. 6,400 for the period. Find the principal amount borrowed by Ravi.
(a) Rs. 16,000
(b) Rs. 15,000
(c) Rs. 10,000
(d) Rs. 18,000

Q38. In a row of girls, Vani is 6^(th) from one extreme and 8^(th) from the other. Find the total number of girls in the row.
(a) 15
(b) 12
(c) 14
(d) 13

Q39. Which of the following plant groups bear naked seeds?
(a) Thallophytes
(b) Gymnosperms
(c) Angiosperms
(d) Pteridophytes

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Q40. A man asked a boy, "Tell me a number which is greater than '4' but less than '9'. Also, it should be greater than '7' but less than '11'. The number is:

(a) 7
(b) 8
(c) 6
(d) 10

Q41. Who among the following won gold in boxing at the Asian Boxing Championships held in Bangkok in 2019?

(a) Pooja Rani
(b) Kavita Chahal
(c) Bhagyabati Kachari
(d) Mary Kom

Q42. Two statements are given followed by a conclusion. Decide whether the conclusion is true or false with respect to the statements.

Statements:

1. All that glitters is not gold.

2. Gold is glittery.

Conclusion:

Whatever glitters is other than gold.

(a) The conclusion is definitely false.
(b) The conclusion is definitely true.
(c) The conclusion is probably false.
(d) The conclusion is probably true.

Q43. Find the value of ((√3-1)/(√3 + 1)+(√3+1)/(√3-1)+(2-√3)/(2+√3)+(2+√3)/(2-√3)).

(a) 16
(b) 18
(c) 14
(d) 20

Q44. 1000 boys and 600 girls are examined in a test. If 40% of the boys and 35% of the girls passed, then find the percentage (approximately) of the total number of candidates who failed in the test.

(a) 61.88%
(b) 70.25%
(c) 31.75%
(d) 50.89%

Q45. According to a 2019 stanford study, global warming has caused the indian economy to shrink by _____ between 1961 and 2010.

(a) 39%
(b) 31%
(c) 31.6%
(d) 37%

Q46. Find the compound interest on an amount of Rs. 8,000 at 5% p.a. for 2 years, compounded annually.

(a) Rs. 630
(b) Rs. 920
(c) Rs. 820
(d) Rs. 780

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Q47. Ramesh buys an article for 15% less than its original value, and sells it for 10% more than its original value. Find the percentage of gain (approximately).

(a) 25.62%
(b) 41.52%
(c) 29.41%
(d) 31.25%

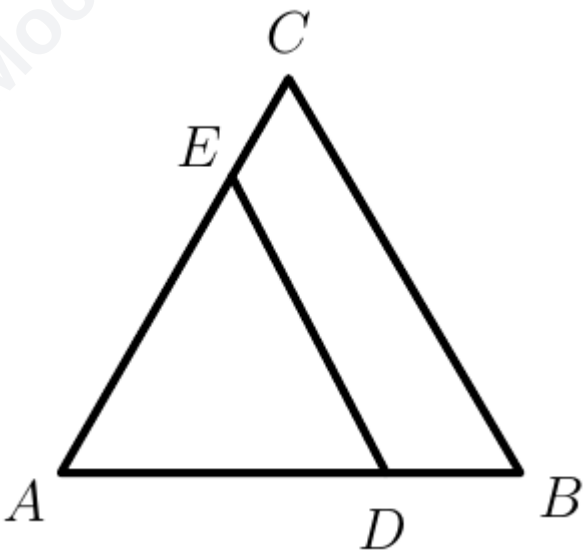
Q48. Determine the LCM of
2/3,4/9,8/15 and 10/21.

(a) 20/3
(b) 3/40
(c) 3/20
(d) 40/3

Q49. _____ honoured Prime Minister Narendra Modi with the Zayed Medal, its highest civilian honour in 2019.

(a) Kuwait
(b) Oman
(c) Saudi Arabia
(d) UAE

Q50. In the given figure, DE || BC. If AD = x, DB = x - 2, AE = x + 2 and EC = x - 1, then find the value of x.



(a) 5
(b) 2
(c) 3
(d) 4

Q51. Two trains, going in opposite directions, start at the same time from two stations that are 250 km apart. The trains meet each other at a distance of 130 km from one of the stations. Find the ratio of their speeds.

(a) 13 : 12
(b) 15 : 14
(c) 9 : 8
(d) 12 : 11

Q52. When the numerator of a fraction increases by 6, the fraction increases by three-fourth. The denominator of the fraction is:

(a) 10
(b) 6
(c) 8

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(d) 12

Q53. In a certain code language, R is written as 9, C is written as 24 and E is written as 22. How will RECITE be written as in that language?

(a) 9222418722
(b) 9222318722
(c) 9222417822
(d) 9222418227

Q54. In a certain code language, BOTTLE is written as 88. How will GREEN be written as in that language?

(a) 66
(b) 86
(c) 56
(d) 77

Q55. Find the number of terms in the sequence 4, 8, 16, 32, ... 512.

(a) 10
(b) 8
(c) 7
(d) 9

Q56. A and B can finish a project in 10 days, B and C can finish it in 20 days, and C and A can finish it in 30 days. If A, B and C work together, they will finish the project in:

(a) 120/11 days
(b) 110/7 days
(c) 120/7 days
(d) 130/11 days

Q57. A question is given followed by two arguments. Decide which of the arguments is/are strong with respect to the question.

Question:

Are joint families better than nuclear families?

Arguments:

1. Yes, joint families ensure security and the burden of work is shared.

2. No, nuclear families ensure freedom and there is no disturbance.

(a) Both arguments 1 and 2 are strong.
(b) Only argument 2 is strong.
(c) Only argument 1 is strong.
(d) Neither argument 1 nor 2 is strong.

Q58. Which of the following UN agencies promotes International Labour Rights?

(a) IMO
(b) ICAO
(c) ILO
(d) IMF

Q59. In 2019, the United Nations Environment Assembly (UNEA) adopted two resolutions piloted by India. Which were these two resolutions?

(a) Checks on air pollution and noise pollution
(b) Single-use plastic and sustainable nitrogen management
(c) Check on water pollution and better drainage systems
(d) Better living standards and pollution control

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Q60. In which of the following locations was 'Nataraja', a stone male dancing figure discovered?

(a) Rangpur
(b) Lothal
(c) Mohenjo-daro
(d) Harappa

Q61. How many banks were nationalised in India in the year 1969?

(a) 14
(b) 15
(c) 10
(d) 8

Q62. Select the option that is related to the third term in the same way as the second term is related to the first term.

Boy : Man :: Child : ?

(a) Woman
(b) Girl
(c) Adult
(d) Infant

Q63. The following table shows the number of studies of particular ages in a class of 40 students. Find the mean age of the students.

Age in years (x)	**15**	**16**	**17**	**18**	**19**	**20**
No. of students (f)	3	8	10	10	5	4

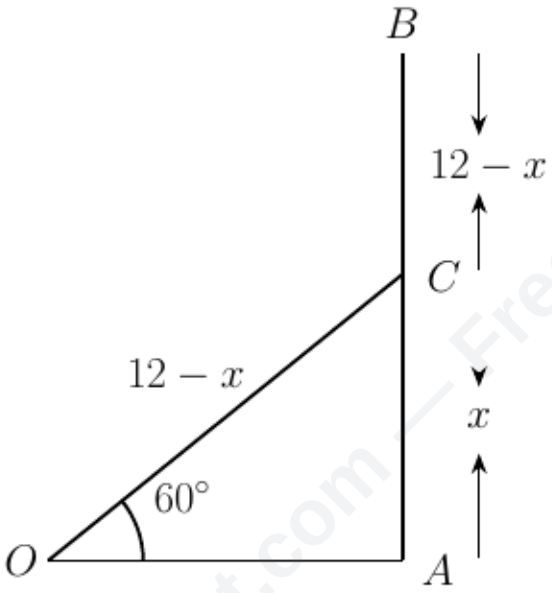
(a) 15.45
(b) 16.35
(c) 17.45
(d) 18.25

Q64. U, V, W, X, Y and Z are sitting in a circle, facing the middle of the circle. V is to the left of Y, W is to the right of Y, Z is in the middle of U and X. U is to the immediate right of W. Who is to the immediate left of V?

(a) Y
(b) Z
(c) W
(d) X

Q65. A tree, 12 m in height, is broken by the wind in such a way that its top touches the ground and makes an angle of 60° with the ground. At what height from the bottom is the tree broken by the wind?

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(a) (24√2 - 30) m
(b) 24√3 m
(c) (2√3 - 3)m
(d) (24√3 - 36) m

Q66. 'Humayun Nama' provides a glimpse into the world of Mughals. Who wrote the book?
(a) Jahanara Begum
(b) Gulbadan Begum
(c) Abu'l Fazl
(d) Nadira

Q67. In which of the following years was 'Purna Swaraj' accepted as an Indian National Congress goal at INC's Lahore session?
(a) 1928
(b) 1939
(c) 1931
(d) 1929

Q68. Which of the following is NOT a conventional source of energy?
(a) Wind mill
(b) Coal
(c) Petroleum
(d) Natural gas

Q69. What is the SI unit of power of a lens called?
(a) Myopic
(b) Dioptre
(c) Hypermetropic
(d) Presbyopic

Q70. Select the option that is related to the third fraction in the same way as the second fraction is related to the first fraction.
1/4 : 1/8 :: 1/3 : ?
(a) 1/2
(b) 1/4
(c) 1/6
(d) 1/9

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Q71. Who among the following wrote the book 'Hind Swaraj'?

(a) Mahatma Gandhi
(b) Subhash Chandra Bose
(c) Sarojini Naidu
(d) Jawaharlal Nehru

Q72. Which authority was successful in recovering Rs. 1514 crore of depositors' money from The Peerless General Finance & Investment Co Ltd. in April 2019?

(a) Reserve Bank of India (RBI)
(b) International Monetary Fund (IMF)
(c) Investor Education and Protection Fund Authority (IEPFA)
(d) Central Bureau of Investigation (CBI)

Q73. Indian Standard Time (IST) is ahead of Greenwich Mean Time (GMT) by _____.

(a) 3 h, 30 min
(b) 5 h, 30 min
(c) 6 h, 15 min
(d) 5 h, 10 min

Q74. According to the time by Rohan's watch, it is half past 6 and the watch's hands are pointing to the south. In which of the given directions will the minute-hand point AFTER exactly 24 hours?

(a) East
(b) West
(c) South
(d) North

Q75. What is the full form of JNNURM?

(a) Jawaharlal Nehru National Urban Rejuvenation Mission
(b) Jawaharlal Nehru National Utility Rural Mission
(c) Jawaharlal Nehru National Urban Renewal Mission
(d) Jawaharlal Nehru National Utility Renewal Mission

Q76. One-fourth of a number is equal to three-eighth of another number. If 30 is added to the first number, then it becomes six times that of the second number. The first number is:

(a) 20
(b) 10
(c) 15
(d) 12

Q77. If the population of a village increased from 1,75,000 to 2,62,500 in 5 years, then find the average percentage increase in the population per year.

(a) 9%
(b) 15%
(c) 10%
(d) 12%

Q78. Car A is twice as fast as car B, and car B is thrice as fast as car C. The distance covered by car C in 60 minutes will be covered by car B in:

(a) 25 minutes
(b) 18 minutes
(c) 16 minutes
(d) 20 minutes

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Q79. Find the least number by which 588 must be multiplied to make it a perfect square.

(a) 5
(b) 2
(c) 3
(d) 4

Q80. If $x = a \sin \theta$, and $y = b \tan \theta$, then find the value of $(a^2)/(x^2) - (b^2)/(y^2)$.

(a) • 1
(b) 0
(c) 2
(d) 1

Q81. _____ in Hyderabad is responsible for remote sensing satellite data acquisition and processing, data dissemination, aerial remote sensing and decision support for disaster management.

(a) National Remote Sensing Centre (NRSC)
(b) National Informatics Centre (NIC)
(c) Indian Space Research Organization (ISRO)
(d) Indian Institutes of Science Education and Research (IISER)

Q82. What among the following is the Primary purpose of The Chipko Andolan?

(a) Save Trees and forests
(b) Reserve the Water Resources
(c) Prevent Global warming
(d) Save the Earth

Q83. When did the Ministry of Human Resource Development launch Samagra Shiksha Abhiyan which the scheme focuses on improving the quality of education and using technology to empower children and teachers?

(a) July 2017
(b) March 2019
(c) May 2018
(d) January 2015

Q84. Select the option that is related to the third term in the same way as the second term is related to the first term.
Import : Export :: Expenditure : ?

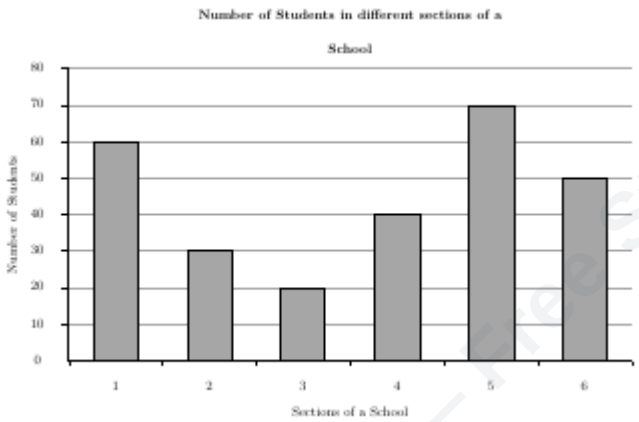
(a) Budget
(b) Economy
(c) Revenue
(d) Credit

Q85. Iodine is essential for the synthesis of _____.

(a) Cytokinin
(b) Insulin
(c) Thyroxine
(d) Oestrogen

Q86. Observe the bar graph showing the number of students in different sections of a school and answer the question.

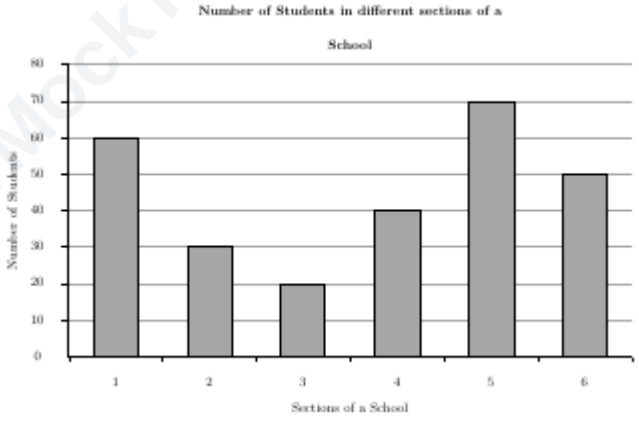
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The strength of which of the following two sections is in the ratio of 1 : 3 ?

(a) Sections 2 and 5
(b) Sections 3 and 5
(c) Sections 2 and 6
(d) Sections 3 and 1

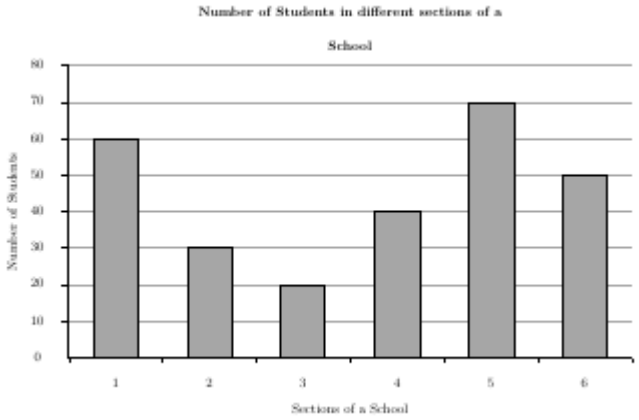
Q87. Observe the bar graph showing the number of students in different sections of a school and answer the question.



Which of the sections given below has exactly double the number of students as compared to any one of the other sections?

(a) 5
(b) 4
(c) 3
(d) 2

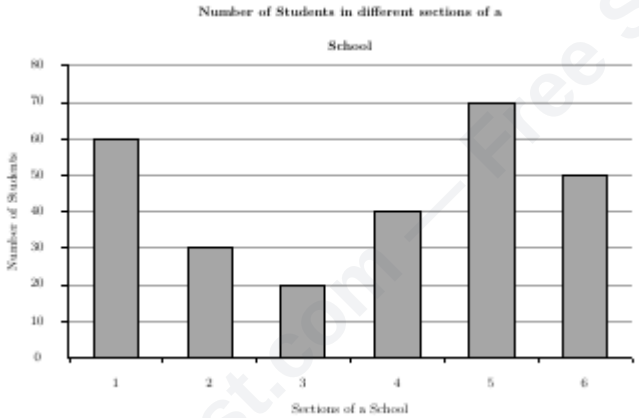
Q88. Observe the bar graph showing the number of students in different sections of a school and answer the question.



What is the difference between the average number of students in the 3 most populated sections and the 3 least populated sections?

(a) 50
(b) 30
(c) 20
(d) 40

Q89. Observe the bar graph showing the number of students in different sections of a school and answer the question.



Which section has nearly the average number of students when compared with all the 6 sections of the graph?

(a) Sections 4 and 5
(b) Sections 4 and 6
(c) Sections 2 and 3
(d) Sections 1 and 3

Q90. Select the option that is related to the third term in the same way as the second term is related to the first term.
DKQV : GNTY :: HMPS : ?

(a) RPLS
(b) MGTD
(c) KPSV
(d) SNTH

Q91. Select the number from among the given options that can replace the question mark (?) in the following series.
875, 175, 35, ?

(a) 20
(b) 15
(c) 7
(d) 5

Q92. Select the number from among the given options that can replace the question mark (?) in the following series.
2, 9, 28, 65, ?

(a) 124
(b) 217
(c) 256
(d) 126

Q93. Select the term from among the given options that can replace the question mark (?) in the following series.
ap, ds, gv, ?

(a) mq
(b) jy
(c) st
(d) lr

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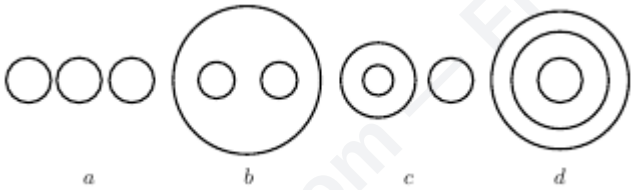
Q94. Select the number from among the given options that can replace the question mark (?) in the following series.

108, 117, 126, ?

(a) 139
(b) 136
(c) 135
(d) 169

Q95. Which of the following Venn Diagrams best represents the given sets?

Father, Daughter, Dog



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

Q96. In a certain code language, RICE is written as 73. How will FLOUR be written as in that language?

(a) 83
(b) 63
(c) 53
(d) 93

Q97. In a certain code language, S is written as 8, A is written as 26 and E is written as 22. How will STORAGE be written as in that language?

(a) 87129262022
(b) 87129226022
(c) 87129262122
(d) 88129262022

Q98. In a certain code language, N is written as 13, P is written as 11 and T is written as 7. How will APPARENT be written as in that language?

(a) 25111129622137
(b) 26111126621237
(c) 26111126922137
(d) 11616118514207

Q99. Select the number-pair from the given options where the first number is NOT related to the second number as in the given number-pair:

4 : 8

(a) 8 : 32
(b) 2 : 2
(c) 3 : 9
(d) 6 : 18

Q100. According to the time by Rekha's watch, it is quarter past 9 and the hour-hand is pointing to the west. In which of the given directions will the minute-hand point AFTER 75 minutes?

(a) North
(b) East
(c) West
(d) South

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ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) Binary

The correct answer is Binary.

Key Points

• A binary language:

• It is the one that represents texts, instructions for processors, or other data using the two-symbol system, generally, the two numbers used by the binary language in computers are 1 and 0.

• It represents text, PC processor directions, or other information utilizing any two-image framework, yet frequently the double number framework's 0 and 1.

• A bit string deciphered as a paired number can be converted into a decimal number.

• It helps in preparing the data and also the guidelines while performing tasks in PC processing.

• The 0s and 1s in binary represent OFF or ON, respectively.

• In a transistor, 0 represents no flow of electricity, and 1 represents electricity is allowed to flow.

• In this way, numbers are represented physically inside the computing device, permitting calculations.

Q2. Answer: (a) 65.46%

The correct answer is 65.46%.

Key Points

• Literacy rate in India

• The results of the 2011 census revealed that there has been an increase in literacy in the country.

• The literacy rate in the country is 74.04 percent, 82.14 for males and 65.46 for females. Hence, Option 1 is correct.

• The literacy rates for the country as a whole increased from 18.33 percent in 1951 to 65.38 percent in 2001 with the literacy rate for males at 75.85 percent and that for females at 54.16 percent.

• Among the states in India, Kerala had the highest literary rate with 94 percent in 2011.

• Chandigarh, Himachal Pradesh, and the capital territory of Delhi followed Kerala with above-average literacy rates.

• Notably, all the leading states in the country had more literate males than females at the time of the census.

• Jains are the most literate community in India.

Q3. Answer: (a) .wav files, .mid files

The correct answer is .wav files, .mid files.

Key Points

• Sound effects files that can be added in Microsoft PowerPoint:

• Wave files and MIDI files (.wav files and .mid files) are used in a PowerPoint presentation. Hence, Option 1 is correct.

• Not all audio and video file types work in PowerPoint, and many are not cross-platform, so you need to know what computer you are using (Mac or Windows) as well as what additional software is available if you are presenting on a computer that is not your own.

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• Sound formats that work with PowerPoint include: .wav, .mp3., .wma, .midi, .aiff, and .au. RealAudio (.ra) files will not work directly in PowerPoint, and will need to be converted.

• Video formats that work with PowerPoint include: .avi, .mpg, and .mpeg. QuickTime (.mov) and RealVideo (.ram or .rv) will not work directly in PowerPoint, and will need to be converted or hyperlinked.

• Additionally, PowerPoint will support HD formats, which include .mov and .mp4 videos with H.264 video and AAC audio encoding.

Q4. Answer: (a) 2024

Given:

The series = (22 + 42 + 62 + ... 222).

Formula Used:

The sum squares of the first n natural numbers = n(n + 1)(2n + 1)/6, where n is the total number of terms.

Solution:

The given series = (22 + 42 + 62 + ... 222).

=> [$2^2(1^2 + 2^2 + 3^2 + ... + 11^2)$]

=> [4 × 11 × (11 + 1) × (2 × 11 + 1)/6]

=> (4 × 11 × 12 × 23)/6

=> 2024

Therefore \thTherefore eren(n+1)(2n+1)6Therefore n (n+1)(2n+1)6

Q5. Answer: (d) 20 : 9

GIVEN:

15% of B = 1 / 3 × G

FORMULA USED:

Percentage = (value / Total value) × 100%

SOLUTION:

15% of B = 1 / 3 × G

=> (15 / 100) × B = 1 / 3 × G

=> B = 1 / 3 × G × (100 / 15)

=> B / G = 1 / 3 × (100 / 15)

=> B / G = 100 / 45

=> B / G = 20 / 9

=> B : G = 20 : 9

Hence option 4 is the valid answer.

Q6. Answer: (b) 1.24

GIVEN:

The value = 0.868 × 0.237 + 0.868 × 0.763 / 0.7 × 0.936 + 0.7 × 0.064

CALCULATION:

=> (0.205 + 0.6622) / (0.6552 + 0.0448)

=> 0.8672 / 0.7

=> 1.2388 ≈ 1.24

Hence option 2 is the valid answer.

Q7. Answer: (a) 162

The logic followed here is:-

Hence, "option 1" is the correct answer.

Q8. Answer: (c) 312/25

GIVEN:

tanθ = 12 / 13

FORMULA USED:

tanθ = sinθ / cosθ

2sinθ × cosθ = sin2θ

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$\cos^2\theta - \sin^2\theta = \cos2\theta$

SOLUTION:

$\Rightarrow 2\sin\theta \times \cos\theta / \cos2\theta - \sin2\theta = \sin2\theta / \cos2\theta$

$\Rightarrow \sin2\theta / \cos2\theta = \tan2\theta$

$\Rightarrow \tan2\theta = 2\tan\theta / 1 - \tan^2\theta$

$\Rightarrow 2\tan\theta / 1 - \tan2\theta = (2\times 12/13)/(1-(12/13)^2)$

$\Rightarrow (24\times 169)/(13(169 - 144))$

$\Rightarrow 312 / 25$

Hence option 3 is the valid answer.

Q9. Answer: (c) 86

The logic followed here is:-

• $7^2 + 5 = 49 + 5 = 54$

Similarly,

• $92 + 5 = 81 + 5 = 86$

Hence, "option 3" is the correct answer.

Q10. Answer: (b) Samudragupta

The correct answer is Samudragupta.

Key Points

• Samudragupta:

• He ruled from 335 AD to 380 AD.

• Samudragupta was the greatest king of the Gupta dynasty.

• The most detailed and authentic record of Samudragupta's reign is preserved in the Prayaga Prasasti/Allahabad pillar inscription, composed by his court poet Harisena.

• Samudragupta's military campaigns justify the description of him as the Napoleon of India by V.A. Smith. Hence, Option 2 is correct.

• He assumed titles such as Kaviraja Param Bhagavat Ashvamedha- parakrama Vikram Sarva-rajochchhetta only Gupta ruler had the title of Sarva-raj-ochchhetta.

Additional Information

• Skandagupta repulsed the ferocious Hunas' attacks twice.

• The heroic deed entitled him the title Vikramaditya (Bhitari Stone Inscription).

• He was the last important ruler of the Gupta dynasty.

• Chandragupta II was the son of Samudra Gupta and grandson of Chandragupta I.

• He assumed the title of Vikramaditya.

• Chandragupta I:

• He was the first Gupta ruler to assume the title of Maharajadhiraja.

Q11. Answer: (a) United Nations Development Programme

The correct answer is United Nations Development Programme.

Key Points

• UNDP:

• It stands for United Nations Development Programme. Hence, Option 1 is correct.

• It works in 170 countries and territories to eradicate poverty and reduce inequality. It helps countries to develop policies, leadership skills, partnering abilities, institutional capabilities, and to build resilience to achieve the Sustainable Development Goals.

• It is based on the merging of the United Nations Expanded Programme of Technical Assistance, created in 1949, and the United Nations Special Fund, established in 1958. UNDP, as we know it now, was established in 1966 by the General Assembly of the United Nations.

• Headquarters: New York, United States

• Objective: UNDP's mandate is to end poverty, build democratic governance, rule of law, and inclusive institutions. It advocates for change and connects countries to knowledge, experience, and resources to help people build a better life.

• Administrator of the United Nations Development Programme: Achim Steiner (As of Jan 2022) of Germany as the new Administrator of UNDP for a term of four years.

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Q12. Answer: (a) 543

The correct answer is 543.

Key Points

• For the purpose of constituting the Lok Sabha, the whole country has been divided into 543 Parliamentary Constituencies. Hence, Option 1 is correct.

• Each one of the constituencies elects one member.

• The members of the Lok Sabha are elected directly by the eligible voters.

• In January 2020, the Anglo-Indian reserved seats in the Parliament and State Legislatures of India were abolished by the 104th Constitutional Amendment Act, 2019.

• 131 seats are reserved for representatives of Scheduled Castes and Scheduled Tribes in Lok Sabha.

• Some seats are reserved in Lok Sabha for the members of the Scheduled Castes and Scheduled Tribes.

• As per the order issued by the Delimitation Commission in 2008, 412 are general, 84 seats are reserved for Scheduled Castes, and 47 seats for the Scheduled Tribes.

• Earlier it was 79 and 41 for Scheduled Castes and Scheduled Tribes respectively.

Additional Information

• Speaker of Lok Sabha is elected by Members of Lok Sabha.

• He is elected by members of Lok Sabha from amongst its members, as soon as, after the first meeting.

• He remains in his office during the life of the Lok Sabha. He vacates office earlier in any of the following cases:

• If he ceases to be a member of Lok Sabha;

• If he resigns by writing to the Deputy Speaker; and

• If he is removed by a resolution passed by a majority of all the members of the Lok Sabha.

• Such a resolution can be moved only after giving 14 days' advance notice.

• He maintains order and decorum in the House for conducting its business.

• He adjourns the House to suspend the meeting in the absence of a quorum (presence of only 1-10th of the total strength of the House).

• He does not vote in the first instance, but he can exercise a casting vote in the case of a tie (deadlock)

Important Points

• The maximum strength of the Lok Sabha can be 552 members.

• Out of these 552 members, 530 members are elected from the States, and 20 members are elected from the Union Territories.

• President has the power to summon or prorogue the Houses of Parliament and to dissolve the Lok Sabha.

Q13. Answer: (b) Panchayati Raj Institutions

The correct answer is Panchayati Raj bodies.

Key Points

• Women Reservation in India:

• In India, seats are reserved for women in Panchayat Raj bodies which are local self-governing bodies.

• According to the 73rd amendment act, 1/3rd of seats are reserved for women apart from the total number of seats. Hence, Option 2 is correct.

• Clause (3) of Article 243D of the Constitution ensures participation of women in Panchayati Raj Institutions by mandating not less than one-third reservation for women out of the total number of seats to be filled by direct election and number of offices of chairpersons of Panchayats.

• 20 States namely Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, Uttarakhand, and West Bengal have made provisions of 50% reservation for women in Panchayati Raj Institutions in their respective State Panchayati Raj Acts.

Additional Information

• Women’s Reservation Bill (The Constitution (108 Amendment) Bill, 2023):

• The bill seeks to reserve 33% seats in Lok Sabha and all state legislative assemblies for women.

• Reserved seats may be allotted by rotation to different constituencies in the state or union territory.

• Reservation of seats for women shall cease to exist 15 years after the commencement of this Amendment Act.

Q14. Answer: (c) 0.5 cm

GIVEN:

Average displacement by one person = 0.04 m3

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Length of the pond, l = 80 m

The breadth of pond, b = 50 m

The number of persons taking a dip in a cuboidal pond = 500.

FORMULA USED:

The volume of water raised in pond = l × b × h

SOLUTION:

Average displacement by one person = 0.04 m3

Average displacement by 500 persons = 500 × 0.04 = 20 m3

Hence, the volume of water raised in pond = 20 m3

Now,

The volume of water raised in pond = l × b × h

=> V = 80 × 50 × h

=> V = 4000 × h

=> 20 m3 = 4000 × h

=> h = 0.005 m

=> h = 0.005 × 100

=> h = 0.5 cm

Hence option 3 is the valid answer.

Q15. Answer: (b) 0.06

GIVEN:

The expression = (12.95 × 12.95 + 12.95 × X + 0.03 × 0.03)

FORMULA USED:

$(a + b)^2 = a^2 + 2ab + b^2$

SOLUTION:

Now comparing (12.95 × 12.95 + 12.95 × X + 0.03 × 0.03) with a2 + 2ab + b2

=> a = 12.95 and b = 0.03

=> X = 2b

=> X = 2 × 0.03

=> X = 0.06

Q16. Answer: (b) 4

• A represents servicemen,

• B represents rich men and

• C represents honest men.

• The shaded region shows rich servicemen is 4.

Hence, "option 2" is the correct answer.

Q17. Answer: (d) Astrosat

The correct answer is Astrosat.

Key Points

• Astrosat:

• It is India’s first dedicated multi-wavelength space observatory.

• This scientific satellite mission was launched on September 28, 2015, and endeavours for a more detailed understanding of our universe.

• Its objective was to study celestial sources in X-ray, optical, and UV spectral bands as it will help in the better understanding of the universe.

• It has a mission life of 5 years.

• Its successful launch made India members of the select elite group of nations comprising the US, Japan, Russia, and Europe have their own space observatory.

Additional Information

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SRMSat	**By the students and faculty of SRM University**	**• The nanosatellite SRMSat weighing 10.9 kg is developed to attempt to address the problem of Global warming and pollution levels in the atmosphere by monitoring Carbon dioxide (CO2) and water vapor (H2O).**
SARAL	ISRO	• The Satellite with ARGOS and ALTIKA (SARAL) is a joint Indo-French satellite, designed for oceanographic studies. - SARAL performs altimetric measurements designed to study ocean circulation and sea surface elevation.
JUGNU	IIT, Kanpur	• To prove the indigenously developed camera system for imaging the Earth in the near-infrared region and test image processing algorithms.

Q18. Answer: (d) 1000 cm²

GIVEN:

Each with a side of 10 cm i.e Height = 10 cm and width = 10 cm.

FORMULA USED:

Total surface area of cuboid = 2(LB + BH + HL)

SOLUTION:

The length of the resulting cuboid = 2 x 10 cm = 20 cm

Total surface area of cuboid = 2(LB + BH + HL)

=> 2(20 × 10 + 10 × 10 + 10 × 20)

=> 1000 cm²

Hence option 4 is the valid answer.

Q19. Answer: (c) ATP

The correct answer is ATP.

Key Points

• ATP(Adenosine Triphosphate):

• It is an organic compound composed of phosphate groups, adenine, and sugar ribose.

• These molecules provide energy for various biochemical processes in the body.

• That is why it is called Energy Currency of the Cell. Hence, Option 3 is correct.

• The ATP molecule was discovered in the year 1929 by German chemist Karl Lohmann.

• These ATP molecules are synthesized by Mitochondria, therefore it is called the powerhouse of the cell.

• In the year 1948, Scottish biochemist Alexander Todd was the first person to synthesize the ATP molecule.

Additional Information

• ADP(Adenosine diphosphate):

• It is an important organic compound in metabolism and is essential to the flow of energy in living cells.

• It is essential in photosynthesis and glycolysis.

• It is the end-product when adenosine triphosphate ATP loses one of its phosphate groups.

• The energy released in the process is used to power up many vital cellular processes.

• ADP reconverts to ATP by the addition of a phosphate group to ADP.

Q20. Answer: (d) Jet Airways

The correct answer is Jet Airways.

Key Points

• Jet Airways:

• It suspended operations in April 2019. Hence, Option 4 is correct.

• Jet Airways, which became a scheduled airline in 1995, suspended operations due to financial distress on April 17, 2019.

• It had started as an air taxi operator on May 5, 1993, with a fleet of four leased Boeing 737-300 aircraft.

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• The airline got listed on domestic bourses in February 2005.
• Jet Airways Ltd is an Indian international airline currently based in Delhi NCR with a training and development centre in Mumbai.
• It was one of the largest airlines in India, with a 21.2% passenger market share in February 2016.
• Jet Airways to resume operations in the first quarter of 2022. Once among India's largest airlines, Jet Airways will resume operations from the first quarter of 2022. This will be the first airline to be revived after more than two years.

Q21. Answer: (a) 8

GIVEN:
Mean = 15
FORMULA USED:
Mean = (Sum of the terms/Number of the terms)
SOLUTION:
∑f = 26 + k
∑f × x = 430 + 10k
Mean = ∑f × x / ∑f
=> 15 = (430 + 10k / 26 + k)
=> 15 × (26 + k) = 430 + 10k
=> 390 + 15k = 430 + 10k
=> 5k = 40
=> k = 8
Hence option 1 is the valid answer.

Q22. Answer: (b) A. V. Thakkar

The correct answer is A. V. Thakkar.
Key Points
• The Drafting Committee:
• It was an important committee appointed by the constituent assembly.
• It is responsible to prepare the draft constitution.
• The Drafting Committee was appointed on 29^(th) August 1947.
• Dr. B.R. Ambedker was appointed as the chairman of the Drafting Committee.
• The Drafting Committee appointed 7 members team including the chairman to prepare the draft of the new constitution.
• The Drafting Committee members were:
• Dr. B.R. Ambedkar.
• Alladi Krishnaswamy Iyer.
• Dr. K. M. Munshi
• Syed Mohammad Saadulla.
• N. Gopalaswami Ayyangar.
• B.L. Mitter.
• D.P. Khaitan.
• The Drafting Committee submitted the draft constitution to the president of the constituent assembly on 21^(st) February 1948.
• Hence, Option 2 is correct.

Q23. Answer: (c) 20%

GIVEN:
Cost Price = 3000
Selling Price = 3600
FORMULA USED:
Profit percentage = (Selling price - Cost price) / Cost price × 100
SOLUTION:
Cost Price = 3000
Selling Price = 3600
Profit percentage = (Selling price - Cost price) / Cost price × 100
Profit percentage = (3600 - 3000) / 3000 × 100

Profit percentage = 600 / 3000 × 100

Profit percentage = 0.2 × 100

Profit percentage = 20

Hence option 3 is the valid answer.

Q24. Answer: (a) France

The correct answer is France.

Key Points

• France won the title by defeating Croatia by 4–2 in the final of the FIFA world cup played on 15 July 2018 at Luzhniki Stadium in Moscow. Hence, Option 1 is correct.

• France received the distinction of becoming the World Cup winner for the second time under the captainship of Didier Deschamps.

• Now Didier Deschamps is the coach of the team.

• France won the FIFA world cup in 1998 also.

• It played the World Cup final for the second time in 2006 where Italy had denied them the title, but for the third time, France succeeded in winning the title.

Additional Information

• 2018 FIFA Men's World Cup was hosted by Russia.

• FIFA stands for Federation of International Football Association.

• It is the highest governing body of Football.

• It was founded in 1904.

• Its headquarter is in Zurich, Switzerland.

• The current President of FIFA is Mr. Giovanni Vincenzo Infantino (As of Jan 2022).

• The 2022 FIFA World Cup will be hosted by Qatar in the last months of the year 2022.

Q25. Answer: (b) Odisha

The correct answer is Odisha.

Key Points

• Odisha is the largest Bauxite producing state in the country. It almost produces more than half of the country's total production. Hence, Option 2 is correct.

• Bauxite is the principal ore of aluminium production and a very important non-ferrous metal.

• India is having 3896 million tonnes of bauxite resources which is sufficient for both domestic and export demands.

• Kalahandi and Koraput is the main bauxite belt in Odisha. It also extends up to Andhra Pradesh.

Additional Information

State	Bauxite reserves in percentage
Odisha	51%
Andhra Pradesh	16%
Gujarat	9%
Jharkhand	6%
Maharashtra	5%
Madhya Pradesh	4%
Chhattisgarh	4%

Q26. Answer: (b) Piano

The correct answer is Piano.

Key Points

• Vistas Ardeshir Balsara:

• V. Balsara, who was a wizard with instrumental orchestration had composed music for 32 Bengali films and 12 Hindi films during his career and has over 200 albums to his credit.

• He was known for his versatility with an array of musical instruments including piano, Univox, and melodica.

• Vistas Ardeshir Balsara, known as V Balsara in the music world was born on June 22, 1922, in Bombay to a Gujarati-speaking

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Parsi Zoroastrian family.

• From childhood, he was inclined towards Western music.

• By the time he was six, he had given a public performance at the Cowasjee Jehangir Hall in Mumbai on the pedal harmonium.

• Over the years, he would go on to master the piano, the keyboard, the piano accordion, and many more instruments. It is said that he learnt the piano from a German musician named Hildafeld. Hence, Option 2 is correct.

• V.Balsara, the gentleman musician passed away on 23 March 2005. His music, according to many stalwarts, will remain a treasure trove for future generations.

Q27. Answer: (b) Lithuania

The correct answer is Lithuania.

Key Points

• Lithuania:

• Officially the Republic of Lithuania is a country in the Baltic region of Europe.

• It is one of three Baltic states and lies on the eastern shore of the Baltic Sea.

• Lithuania was the first republic to break away from the Soviet Union, by proclaiming the restoration of its pre-war independence.

• On March 11, 1990, Lithuania declared that it was an independent nation, the first of the Soviet republics to do so. Hence, Option 2 is correct.

• Lithuanians insist that their incorporation into the Soviet Union in 1940.

Additional Information

• Capital: Vilnius

• Currency: Euro

• President: Gitanas Nausėda (As of Jan 2022).

• Population: 27.9 lakhs

Q28. Answer: (c) 900

SOLUTION:

Factors of 6 = 2 × 3

Factors of 9 = 2 × 3

Factors of 12 = 2 × 2 × 3

Factors of 15 = 3 × 5

LCM of 6, 9, 12, 15 = 180

The greatest possible 3 digit number = 999

Now divide 999 by 180 we get;

=> 999/180 = 5.55

Now multiply 5 with 180 we get,

=> 5 × 180 = 900

Hence option 3 is the valid answer.

Q29. Answer: (c) Generator

The correct answer is Generator.

Key Points

• Electromagnetic induction

• It was first discovered by Faraday's, therefore, it is also known as Faraday's laws of electromagnetic induction.

• We know, the generator basic principle of operation, is electromagnetic induction. Hence, Option 3 is correct.

• When a change in flux linkages is changed, an emf or voltage is induced, thus we get voltage and hence current as our output which is desired for generators.

• We know, in generators, the input is mechanical and the output is electrical.

• So, with this change in the magnetic field, we get an induced emf and hence current.

• The mechanical force is used to bring in the changes in magnetic flux which in turn produces electricity.

Q30. Answer: (c) 2/3

GIVEN:

α and β are the Roots of the polynomial f(x) = kx2 + 4x + 4.

α2 + β2 = 24

FORMULA USED:

(a + b)2 = a2 + 2ab + b2

Sum of the roots (α + β) = - b / a and Product of roots (αβ) = c / a, where a = k, b = 4 and c = 4

SOLUTION:

=> α + β = - 4 / k

=> αβ = 4 / k

=> $(\alpha + \beta)^2 = \alpha 2 + \beta 2 + 2\alpha\beta$

=> (- 4 / k)2 = 24 + 8 / k

=> $16 / k^2 = 24 + 8 / k$

=> 16 / k2 - 8 / k = 24

=> $(16 - 8k) / k^2 = 24$

=> $16 - 8k = 24 k^2$

=> 24k2 + 8k - 16 = 0

=> 3k2 + k - 2 = 0

=> 3k2 + 3k - 2k - 2 = 0

=> 3k × (k + 1) - 2(k + 1) = 0

=> (3k - 2) × (k + 1) = 0

=> (3k - 2) = 0

=> k = 2 / 3

=> (k + 1) = 0

=> k = -1

Positive value of k = 2 / 3

Hence option 3 is the valid answer.

Q31. Answer: (b) a = 7 and b = 3

Shortcut Trick

For infinite solutions, the ratio of coefficients must be equal: a1/a2 = b1/b2 = c1/c2.

Comparing x-coefficients: 2/4 = 1/2.

Equating y-coefficients: (a − 4)/(a − 1) = 1/2 => 2a − 8 = a − 1 => a = 7.

Equating constants: (2b + 1)/(5b − 1) = 1/2 => 4b + 2 = 5b − 1 => b = 3.

Therefore The correct answer is a = 7 and b = 3.

Alternate Method

Given equations:

2x − (a − 4)y = 2b + 1

4x − (a − 1)y = 5b − 1

Formula Used:

For a system of linear equations a1x + b1y = c1 and a2x + b2y = c2 to have infinite solutions:

a1/a2 = b1/b2 = c1/c2

Calculations:

=> a1 = 2, b1 = −(a − 4), c1 = 2b + 1

=> a2 = 4, b2 = −(a − 1), c2 = 5b − 1

=> 2/4 = −(a − 4)/−(a − 1) = (2b + 1)/(5b − 1)

=> 1/2 = (a − 4)/(a − 1)

=> a − 1 = 2(a − 4)

=> a − 1 = 2a − 8

=> 2a − a = 8 − 1 => a = 7

=> 1/2 = (2b + 1)/(5b − 1)

=> 5b − 1 = 2(2b + 1)

=> 5b − 1 = 4b + 2

=> 5b − 4b = 2 + 1 => b = 3

Therefore The correct answer is a = 7 and b = 3.

Additional Information

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Unique Solution Condition

A system of linear equations has a unique solution if the lines intersect at one point, which occurs when a1/a2 ≠ b1/b2.

No Solution Condition

A system has no solution if the lines are parallel and never intersect, which occurs when a1/a2 = b1/b2 ≠ c1/c2.

Coincident Lines

Infinite solutions occur when the two equations represent coincident lines (the same line), meaning one equation is a non-zero multiple of the other.

Q32. Answer: (c) 22

The correct answer is 22.

Key Points

• List of Nuclear Power Plants in India 2022:

• Nuclear Power is the fifth-largest source of generating electricity in India after coal, gas, wind power, and hydroelectricity.

• At present, India has 22 operational nuclear reactors with an installed capacity of about 6,780 MW. Hence, Option 3 is correct.

• The nuclear energy programme in India was launched around the time of independence under the leadership of Homi J. Bhabha.

• Asia's first nuclear reactor is the Apsara Research Reactor situated in Mumbai.

• The domestic uranium reserve in India is small and the country is dependent on uranium imports from other countries to provide fuel to its nuclear power industry.

• Since the 1990s, Russia has been a major supplier of nuclear fuel to India.

Additional Information

• Important Nuclear Power Plants in India

Power Plant	Location
Kaiga	Karnataka
Kakrapar	Gujarat
Kudankulam	Tamil Nadu
Madras (Kalpakkam)	Tamil Nadu
Narora	Uttar Pradesh
Rawatbhata	Rajasthan
Tarapur	Maharashtra

Q33. Answer: (a) 576

• The pattern followed here is:

Hence, "option 1" is the correct answer.

Q34. Answer: (b) Amritsar

The correct answer is Amritsar.

Key Points

• The Jallianwala Bagh massacre:

• It is also known as the Amritsar massacre.

• It happened on April 13, 1919, when Acting Brigadier-General Reginald Dyer ordered British Indian Army troops to fire their rifles at a crowd of unarmed Indian civilians in Jallianwala Bagh, Amritsar, Punjab. Hence, Option 2 is correct.

• The Asian Awards honoured the Jalianwala Bagh Martyrs with the prestigious Founders Award in April 2019.

• Colonel Reginald Edward Harry Dyer was a Bengal Army general.

• His military career started to serve briefly in the regular British Army before being transferred to serve with India's presidential armies.

• He was responsible as a temporary brigadier-general for the Amritsar massacre at Jallianwala Bagh.

Additional Information

• After Rowlatt satyagraha got huge support in Punjab.

• The Government handed over the administration to the military authorities under General Dyer to suppress this violent situation ongoing.

• Political leaders were detained and all public meetings were banned by General Dyer.

• Being unaware of the prohibitory orders in the city, a large crowd had gathered on a Baisakhi Day in this small park to protest against the arrest of their leaders Dr. Saifuddin Kitchlew and Dr. Satyapal.

• Under orders from General Dyer, the gathering was surrounded by the army, they blocked the only exit point and opened fire on the unarmed crowd.

• A large number of people lost their lives.

Q35. Answer: (a) American Standard Code for Information Interchange

The correct answer is American Standard Code for Information Interchange.

Key Points

• ASCII:

• It stands for American Standard Code for Information Interchange. Hence, Option 1 is correct.

• It is a standard data-transmission code that is used by smaller and less-powerful computers to represent both textual data (letters, numbers, and punctuation marks) and noninput-device commands (control characters).

• It's a 7-bit character code where every single bit represents a unique character.

• It converts information into standardized digital formats that allow computers to communicate with each other and to efficiently process and store data.

• On this webpage, you will find 8 bits, 256 characters, ASCII table according to Windows-1252 (code page 1252) which is a superset of ISO 8859-1 in terms of printable characters.

• In the range, 128 to 159 (hex 80 to 9F), ISO/IEC 8859-1 has invisible control characters, while Windows-1252 has writable characters.

• Windows-1252 is probably the most-used 8-bit character encoding in the world.

Q36. Answer: (a) 1800

The correct answer is 1800.

Key Points

• King George – III founded the Supreme Courts of Madras and Bombay on December 26, 1800, and December 8, 1823, respectively. Hence, Option 1 is correct.

• The Supreme Court was set up in Calcutta by the East India Company in 1773.

• The King of England's Regulating Act of 1773 cleared the stage for the formation of the Supreme Court of Judicature in Calcutta.

• On March 26, 1774, Letters of Patent were issued to establish the Supreme Court of Judicature at Calcutta.

• It was established as a Court of Record, with full power and authority to hear and determine all complaints about any crimes, as well as to entertain, hear, and determine any suits or actions brought against any of His Majesty's subjects in Bengal, Bihar, and Orissa(present-day Odisha).

Additional Information

• The Constitution of India was enacted on January 26, 1950, after India gained independence in 1947.

• The Supreme Court of India was also established, with its inaugural meeting on January 28, 1950.

• The Supreme Court is established and constituted according to Article 124.

• The Supreme Court is the highest court in the country's judicial system.

• It is located in Tilak Marg, New Delhi.

Q37. Answer: (a) Rs. 16,000

GIVEN:

Rate = 8%

Time = 5 years

Simple Interest = 6400

FORMULA USED:

SI = (P × R × T) / 100

SOLUTION:

According to the given conditions;

SI = (P × R × T) / 100 by substituting values we get;

=> 6400 = (P × 8 × 5) / 100

=> 6400 × 100 = (P × 8 × 5)

=> P = (6400 × 100) / 8 × 5

=> P = 16000

Hence option 1 is the valid answer.

Q38. Answer: (d) 13

Given that:-

• Vani is 6th from one extreme and 8th from the other.

The diagram is given below:-

• Total number of girls in the row = 13

Hence, "option 4" is the correct answer.

Alternate MethodTotal number of girls in the row = Vani's position from left end + Vani's position from the right end - 1

Total number of girls in the row = 6 + 8 - 1 = 14 - 1 = 13

Q39. Answer: (b) Gymnosperms

The correct answer is Gymnosperms.

Key Points

• Gymnosperms:

• The word gymnosperm means naked seed and the seeds are not enclosed inside the fruit but are instead exposed or on the scales of cones, like a pine cone. Hence, Option 2 is correct.

• Gymnosperms belong to the kingdom ‘Plantae‘.

• The gymnosperms consist of s, cycads, gnetophytes, and the species of Gynkgophyta division and Ginkgo biloba.

• - The characteristics of Gymnosperms:

• They do not produce flowers.

• Seeds are not formed inside a fruit.

• They are not differentiated into an ovary, style, and stigma.

• Since stigma is not present, they are pollinated directly by the wind.

• Examples of Gymnosperms:

• Cycas

• Pinus

• Cedrus

• Picea

• Juniperus

Q40. Answer: (b) 8

The logic followed here is:-

• The numbers which are greater than 4 but less than 9 are 5, 6, 7, and 8.

• Also, it should be greater than 7 but less than 11 are 8, 9, and 10.

• So, the common number is 8 from the above two statements.

• So, the number is 8.

Hence, "option 2" is the correct answer.

Q41. Answer: (a) Pooja Rani

The correct answer is Pooja Rani.

Key Points

• Pooja Rani

• She stunned reigning world champion, Wang Lina of China, in the 81kg weight division.

• She is an Indian woman boxer born on 17th February 1991.

• She hails from the Nimriwali village of Haryana’s Bhiwani. Pooja Rani represents India in 75 kg at global tournaments.

• She got interested in boxing at a very young age. She comes from a state that has produced well-known names in boxing and wrestling.

• She made her debut at the Asian Boxing Championships in 2012, wherein she won a Silver medal in the Middleweight category.

• At the 2015 Asia Boxing Championships, she won a Bronze medal.

• Pooja won her first Asian Games medal by clinching the Bronze in 2014. She was one of the 5 Indian boxing medalists at the 2014 Asian Games.

• In 2019, Pooja shot to fame after she won a Gold at the Asian Boxing Championships held in Bangkok, Thailand. Hence, Option 1 is correct.

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Q42. Answer: (a) The conclusion is definitely false.

The statements produce two key points -

• Everything that glitters is not gold, which means that just because something is glittery, it will not be called as gold. It may be something else that glitters. Thus, the quality of glittering is not the only aspect that will mark a substance as gold.

• Statement 2 clarifies that gold is a glittery substance.

Thus, any substance that glitters may or may not be gold.

• Therefore, the conclusion is definitely false.

Hence the correct answer is option 1.

Q43. Answer: (b) 18

SOLUTION:

Simplify the value we get;

=> ((√3 - 1 / √3 + 1) + (√3 + 1 / √3 - 1)) + ((2 - √3 / 2 + √3) + 2 +√3 / 2 - √3))

=> [(√3 - 1)² + (√3 + 1)²] / √3 + 1 × √3 - 1 + [(2 - √3)² + (2 + √3)²] / 2 - √3 × 2 + √3

Now by using the identity (a + b)2 = a2 + 2ab + b² and (a + b)(a - b) = a² - b² we get;

=> [(3 + 2√3 + 1 + 3 - 2√3 + 1) / (√3)² - 1²] + [(4 - 4√3 + 3 + 4 + 4√3 + 4) / 2² - √3²]

=> 8 / 2 + 14 / 1

=> 4 + 14

=> 18

Hence option 2 is correct answer.

Q44. Answer: (a) 61.88%

GIVEN:

Number of Boys = 1000

Number of Girls = 600

Percentage of boys who passed the exam = 40%

Percentage of Girls who passed the exam = 35%

FORMULA USED:

Percentage = (value / Total value) × 100%

SOLUTION:

According to the given conditions;

Number of boys who passed the exam = 40% of 1000

=> (40 / 100) × 1000

=> 400

Percentage of Girls who passed the exam = 35% of 600

=> (35 / 100) × 600

=> 210

Total number of students passed the exam = 400 + 210 = 610

So the total number of students = 1600

Then the total number of students who failed the exam = Total number of students - Total number of students passed the exam

=> 1600 - 610

=> 990

So, the percentage of the total number of candidates who failed the test = (990 / 1600) × 100

=> 61.88%

Hence option 1 is the valid answer.

Q45. Answer: (b) 31%

The correct answer is 31%.

Key Points

• 2019 Stanford study:

• According to a 2019 Stanford study, global warming has caused the Indian economy to shrink by 31% between 1961 and 2010. Hence, Option 2 is correct.

• India’s economy is now 31% smaller than it would have been in the absence of global warming, a new study assessing the

impact of climate change on economic growth has found.

• The impact of temperature changes may seem small from year to year but they can yield dramatic gains or losses over time, highlight climate scientists from Stanford University who published their findings in the peer-reviewed journal Proceedings of the National Academy of Sciences (PNAS).

• According to the study, global warming from 1961 to 2010 decreased the wealth per person in the world's poorest countries by 17% to 30%.

Q46. Answer: (c) Rs. 820

GIVEN:

Amount = 8000

Rate = 5%

Time = 2 years

FORMULA USED:

A = P × (1 + r / 100)^t

SOLUTION:

=> A = P × (1 + r / 100)t

=> A = 8000 × (1 + 5 / 100)²

=> A = 8000 × (1.05)²

=> A = 8820

Compound Interest = Amount - Principal

=> CI = 8820 - 8000

=> CI = 820

Hence option 3 is the correct answer.

Shortcut Trick=> Principle → Amount

=> 1st yr. 20 → 21

=> 2nd yr. 20 → 21

=> For 2 yrs complete.

=> Principle = (20)² = 400

=> Amount = (21)² = 441

=> But according to Question,

=> 400 → 8000

=> 1 → 20

Therefore Compound Interest = 41 → 41 × 20 = 820.

Q47. Answer: (c) 29.41%

GIVEN:

Cost Price = 15% less than original value.

Selling Price = 10% more than the original price.

FORMULA USED:

Profit percentage = [(S.P - C.P) /C.P] × 100

Where, S.P = Selling price

And C.P = Cost price

Calculation:

Let the original value be 100 Rs.

So the Cost Price of article for Ramesh = 15% less than 100;

=> CP = 100 - (15 / 100) × 100

=> CP = 85 Rs.

Selling Price of article = 10% more than the original value

=> SP = 100 + (10 / 100) × 100

=> SP = 110 Rs.

Now,

Profit percentage = [(S.P - C.P) /C.P] × 100

=> (110 - 85) / 85 × 100

=> 29.41%

Hence option 3 is the valid answer.

Q48. Answer: (d) 40/3

GIVEN:

Fractions 2 / 3, 4 / 9, 8 / 15, 10 / 21.

FORMULA USED:

LCM of fractions = LCM of numerator / HCF of denominator.

SOLUTION:

LCM of numerator 2, 4, 8, 10 = 2 × 2 × 2 × 5

LCM of numerator = 40

HCF of denominator 3, 9, 15, 21 = 3

LCM of fractions = LCM of numerator / HCF of denominator.

LCM of fractions = 40 / 3

Hence option 4 is the valid answer.

Q49. Answer: (d) UAE

The correct answer is UAE.

Key Points

• The United Arab Emirates(UAE) has awarded the ZAYED Medal, the highest civilian award to the Prime Minister of India for consolidating the long-standing friendship and joint strategic cooperation between the two nations. Hence, Option 4 is correct.

• It can be noted that recently India was invited by the host UAE as the "Guest of Honour" to attend the 46^(th) Session of the Council of Foreign Ministers of the Organisation of Islamic Cooperation (OIC) held in Abu Dhabi, United Arab Emirates (UAE).

• This was the first time that India was invited to any OIC meeting as a guest of honour.

Additional Information

• Zayed Medal:

• The Order of Zayed is awarded to the Head of Government/Head of State for their international relations with the UAE.

• The order is in the name of Sheikh Zayed bin Sultan Al Nahyan, the founding father of the UAE.

• It consists of a collar cantered by a medallion bearing the name 'Zayed'.

• In the past, this award has been conferred to

• Russian President Vladimir Putin,

• Former US President George W Bush,

• Former French President Nicholas Sarkozy,

• German Chancellor Angela Merkel,

• Chinese President Xi Jinping

• UK's Queen Elizabeth II.

Q50. Answer: (d) 4

GIVEN:

DE || BC

AD = x, DB = x - 2, AE = x + 2 and EC = x - 1

FORMULA USED:

By basic proportionality, the theorem states that, if a line is parallel to the side of the triangle which interacts with the remaining two sides into two distinct points then the lines divide the sides into proportion.

AD / DB = AE / EC

SOLUTION:

By basic proportionality

AD / DB = AE / EC

=> x / x - 2 = x + 2 / x - 1

=> x(x - 1) = (x + 2)(x - 2)

=> $x^2 - x = x^2 + 2x - 2x - 4$

=> x = 4

Hence option 4 is the correct answer.

Q51. Answer: (a) 13 : 12

GIVEN:

Distance between two trains (T_A and T_B) = 250 km

FORMULA USED:

Speed is directly proportional to distance,

S1 / S2 = D1 / D2

SOLUTION:

If T_A will run 130 km, T_B will run 120 km.

If both Trains run at same time then,

S1 / S2 = D1 / D2

SA / SB = 130 / 120

SA / S_B = 13 / 12

Hence option 1 is correct answer.

Q52. Answer: (c) 8

SOLUTION:

If the fraction be a / b, then;

According to the given condition,

=> a + 6 / b = a / b + 3 / 4

=> a + 6 / b - a / b = 3 / 4

=> 6 / b = 3 / 4

=> b = 8

Hence option 3 is the correct answer.

Q53. Answer: (a) 9222418722

The logic followed here is:-

• R is written as 9, C is written as 24, and E is written as 22, which means the place value of the opposite letter.

Hence, "option 1" is the correct answer.

Q54. Answer: (b) 86

SOLUTION:

By using the opposite letter concept.

Position of B = Y = 25

Position of O = L = 12

Position of T = G = 7

Position of L = O = 15

Position of E = V = 22

Now add all the numbers we get;

=> 25 + 12 + 7 + 7 + 15 + 22 = 88

Similarly For Green

Position of G = T = 20

Position of R = I = 9

Position of E = V = 22

Position of N = M = 13

Now add all the numbers we get;

=> 20 + 9 + 22 + 22 + 13 = 86

Hence option 2 is the correct answer.

Q55. Answer: (b) 8

GIVEN:

GP series = 4, 8, 16, 32, ... 512.

FORMULA USED:

T_n = ar^((n-1))

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SOLUTION:

GP series = 4, 8, 16, 32, ... 512.

Tn = ar(n-1)

=> 512 = 4 × 2^((n - 1))

=> 128 = 2(n - 1)

=> 2^7 = 2(n - 1)

Now comparing powers we obtain;

=> n - 1 = 7

=> n = 8

Hence option 2 is correct.

Q56. Answer: (a) 120/11 days

GIVEN:

A and B can finish a project in 10 days.

B and C can finish it in 20 days.

C and A can finish it in 30 days.

FORMULA USED:

Efficiency = Total work / Time

SOLUTION:

Let the total work done by A, B, and C be 60 units.

Efficiency of A + B = 6 units.

Efficiency of B + C = 3 units.

Efficiency of C + A = 2 units.

Efficiency of 2 (A + B + C) = 11 units

Efficiency of (A + B + C) = 11 / 2 units

Hence time taken by A, B, C = 60 / (11 / 2) = 120 / 11 days

Hence option 1 is the valid answer.

Q57. Answer: (a) Both arguments 1 and 2 are strong.

The question asks whether joint families or nuclear families are better.

• Argument 1 stands in favor of joint families with a logical justification that joint families are more secure and have an advantage of work getting shared. Thus, Argument 1 is strong.

• Argument 2 talks in favor of nuclear families and justifies that nuclear families provide the required freedom and privacy. Thus, Argument 2 is also strong.

• Thus, both arguments are strong because they use significant benefits as their justifications.

Hence the correct answer is option 1.

Q58. Answer: (c) ILO

The correct answer is ILO.

Key Point

• The International Labor Organization (ILO):

• It is devoted to promoting social justice and internationally recognized human and labour rights, pursuing its founding mission that labour peace is essential to prosperity. Hence, Option 3 is correct.

• Established as an agency for the League of Nations following World War I.

• Established by the Treaty of Versailles in 1919.

• It became the first specialized agency of the United Nations (UN) in the year 1946.

• It got the Nobel Peace Prize in 1969.

• It is the only tripartite U.N. agency. It brings together governments, employers, and workers.

• Headquarters: Geneva, Switzerland.

• Guy Ryder (As of Jan 2022) was elected the tenth ILO Director-General by the ILO's Governing Body in May 2012 and took office in October that same year. In 2016, he was re-elected for another five-year term which started on 1 October 2017.

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Q59. Answer: (b) Single-use plastic and sustainable nitrogen management

The correct answer is Single-use plastic and sustainable nitrogen management.

Key Points

• The United Nations Environment Assembly (UNEA) has adopted two resolutions piloted by India on single-use plastics and sustainable nitrogen management. Hence, Option 2 is correct.

• According to a statement released by the Ministry of Environment, Forests and Climate Change (MoEFCC), the resolutions were adopted at the fourth session of UNEA which was held in Nairobi from March 11 to 15 on 'Innovative Solutions for Environmental Challenges and Sustainable Production and Consumption.

Additional Information

• UN Environment Assembly:

• The United Nations Environment Assembly is the world's highest-level decision-making body on the environment. It addresses the critical environmental challenges facing the world today.

• The Environment Assembly meets biennially to set priorities for global environmental policies and develop international environmental law.

• The Assembly is the governing body of the UN Environment Programme (UN Environment) and the successor of its Governing Council, which was composed of 58 member States.

• The UN Environment Assembly, with universal membership, is now composed of 193 Member States.

• The United Nations Environment Assembly was created in June 2012, when world leaders called for UN Environment to be strengthened and upgraded during the United Nations Conference on Sustainable Development, also referred to as RIO+20.

Q60. Answer: (d) Harappa

The correct answer is Harappa.

Key Points

• Nataraja', a stone male dancing figure discovered at Harappa. Hence, Option 4 is correct.

• | Site | Excavator | Region | Findings |

Harrapan	**Dayaram Sahani (1921)**	**Montogomery district of Pakistan, Left bank of river Ravi.**	**• Rows of 6 granaries. - Stone lingam & yoni figures. - Wheat & Barley in the wooden altar. - Dancing Nataraja. - Copper scale, mirror, vanity box, dice.**
Mohenjodaro	RD Banerjee (1922)	Larkana district in Sindh on the right bank of Indus.	• Pashupati seals. - Bronze sculpture of a dancing girl. - Steatite image of a breaded man. - Terracotta figurine of Mother Goddess. - Three cylindrical seals.
Surkotada	Shri Jagat Pati (1964-68)	Situated in the Shadi Kaur river in Gujarat's Kutch district.	Evidence of horse.
Amri	MG Majumdar (1929)	Situated in Sindh, on the bank of the river Indus.	Evidence of antelope.
Chanhudaro	MG Majumdar (1931)	Situated in Sindh, on the bank of the river Indus.	• A huge number of copper implements. - Specialized drills for brad making. - Shops of shell ornament makers.
Kalibangan	A Ghosh (1953-60)	Situated in Rajasthan on the left bank of the river Ghaggar.	• Seven fire altars. - Cylindrical seals. - Wheels of toy carts. - Black bangles. - Joint burials.
Kot Diji	Fazal Ahmed (1953-54)	Situated on the left bank of the river Indus	• Wheels made painted pottery. - Artistic toys. - Five figurines of Mother Goddess

Q61. Answer: (a) 14

The correct answer is 14.

Key Points

• Nationalisation of Bank in India:

• On July 19, 1969, Indira Gandhi who was both Prime Minister and Finance Minister at that time decided to nationalise the 14 largest private banks of the country. Hence, Option 1 is correct.

• The largest and the oldest bank which is still in existence is the State Bank of India (SBI).

• It originated and started working as the Bank of Calcutta in mid-June 1806.

• In 1809, it was renamed the Bank of Bengal.

• This was one of the three banks founded by a presidential government, the other two were the Bank of Bombay in 1840 and the Bank of Madras in 1843.

• The three banks were merged in 1921 to form the Imperial Bank of India, which upon India's independence, became the State Bank of India in 1955.

• For many years, the presidency banks had acted as quasi-central banks, as did their successors, until the Reserve Bank of India was established in 1935, under the Reserve Bank of India Act, 1934.

• In 1960, the State Banks of India was given control of eight state-associated banks under the State Bank of India (Subsidiary Banks) Act, 1959. These are now called associate banks.

• In 1969, the Government of India nationalised 14 major private banks; one of the big banks as Bank of India. In 1980, 6 more private banks were nationalised.

• These nationalised banks are the majority of lenders in the Indian economy.

• They dominate the banking sector because of their large size and widespread networks.

Q62. Answer: (c) Adult

The logic followed here is:-

• A grown-up boy is usually called a man.

• Similarly, a grown-up child is usually called an adult.

Hence, "option 3" is the correct answer.

Q63. Answer: (c) 17.45

Shortcut Trick

Assume the assumed mean (A) = 17.

Calculate the deviations (d = x − 17) multiplied by their respective frequencies (f):

$\sum fd = (-2 \times 3) + (-1 \times 8) + (0 \times 10) + (1 \times 10) + (2 \times 5) + (3 \times 4)$

$\sum fd = -6 - 8 + 0 + 10 + 10 + 12 = 18$

Mean deviation = $\sum fd \div \sum f = 18 \div 40 = 0.45$

Actual Mean = A + Mean deviation = 17 + 0.45 = 17.45 years

Therefore The correct answer is 17.45 years.

Alternate Method

Given:

Age in years (x) = [15, 16, 17, 18, 19, 20]

Number of students (f) = [3, 8, 10, 10, 5, 4]

Formula Used:

Mean (μ) = $\sum(f \times x) \div \sum f$

Calculations:

=> Total number of students ($\sum f$) = 3 + 8 + 10 + 10 + 5 + 4 = 40

=> Sum of ages ($\sum fx$) = (15 × 3) + (16 × 8) + (17 × 10) + (18 × 10) + (19 × 5) + (20 × 4)

=> $\sum fx$ = 45 + 128 + 170 + 180 + 95 + 80

=> $\sum fx$ = 698

=> Mean age = $\sum fx \div \sum f$

=> Mean age = 698 ÷ 40

=> Mean age = 17.45 years

Explanation of Options:

Option (1) 15.45 is incorrect because the majority of students (20 out of 40) are aged 17 and 18, so the mean must lie closer to 17-18, not 15.

Option (2) 16.35 is incorrect as it underestimates the weight of the higher age groups (18, 19, 20).

Option (4) 18.25 is incorrect as it overestimates the mean, which is pulled down by the students aged 15 and 16.

Therefore The correct answer is 17.45 years.

Additional Information

Arithmetic Mean for Grouped Data

Formula: Mean = ∑(f × x) ÷ ∑f, where x represents the class mark or individual value and f represents the frequency.

Assumed Mean Method

Formula: Mean = A + (∑fd ÷ ∑f), where A is the assumed mean and d = x − A is the deviation of each value from the assumed mean.

Median of Discrete Frequency Distribution

To find the median, calculate cumulative frequencies (cf). The median is the value of x for which the cumulative frequency is just greater than or equal to N ÷ 2.

Mode of Discrete Frequency Distribution

The mode is the value of x that has the highest frequency. In this dataset, both 17 and 18 have the highest frequency of 10, making it a bimodal distribution.

Q64. Answer: (d) X

Given that: U, V, W, X, Y and Z are sitting in a circle, facing the middle of the circle.

• U is to the immediate right of W.

• Z is in the middle of U and X.

• W is to the right of Y.

• V is to the left of Y.

• X is the immediate left of V.

Hence, "option 4" is the correct answer.

Q65. Answer: (d) (24√3 - 36) m

GIVEN:

Height of tree = 12 m

Angle made by the unbroken tree with a ground = 60°

FORMULA USED:

Sinθ = Perpendicular / Hypotenuse

SOLUTION:

Let the height of unbroken part = x

Height of broken part = 12 - x

Angle made by the unbroken tree with a ground = 60°

Hence the broken, unbroken part and the ground make a right-angled triangle.

Sinθ = Perpendicular / Hypotenuse

Sin60 = x / 12 - x

√3 / 2 = x / 12 - x

√3 (12 - x) = 2x

12√3 - x√3 = 2x

x = 12√3 / √3 + 2

Now by using rationalize we get;

x = 12√3 / √3 + 2 × √3 - 2 / √3 - 2

x = 24√3 - 36 m

Hence option 4 is the correct answer.

Q66. Answer: (b) Gulbadan Begum

The correct answer is Gulbadan Begum.

Key Points

• Humayun Nama:

• It was the Akbar who encouraged Gulabadan Begum(his aunt) to write Humayun-Nama.

• She wrote the book in the Persian Language with the original title known as "The Ahwal Humayun Padshah Jamah Kardom Gulbadan Begum bint Babur Padshah amma Akbar Padshah". Lately, Known as the Humanyun-Namah. Hence, Option 2 is correct.

• Gulbadan Begum was one of the daughters of The Mughal Empire Babur and the sister of Humanyun.

• She fled back to India after two years of Humayun established the Empire of Delhi, accompanied by other Mughal women of the harem, and back to Agra.

• She wrote all his memoirs, glory days, joys, and all his battles fought by his Brother in his era.

• Gulbadan Begum was married at the age of Seventeen to Khizr Khwaja Khan(Chagatai Mughal).

Additional Information

• About Humanyun:

• He was the son of The Mughal Empire Babur. He was the Second Mughal Empire who served as the reign(1530-1540) and after fifteen years he established his empire again from (1555- 1556) for one year.

• His original name was Nasir-Ud-Din-Muhammad born on 6th March 1508. He succeeded to the throne after the death of his father Babur in 1530.

• Humayun lost all his controlled territories to the Afghan ruler Sher Shah Suri with whom he fought the famous Battle of Chausa in 1539 but regained his control after 15 years with the help of the Safavid Dynasty.

• He lost his life after he had fallen from the Library staircase on 24th January 1556. He died after Three days and was buried in the Purana Qila.

Q67. Answer: (d) 1929

The correct answer is 1929.

Key Points

• Purna Swaraj:

• The Indian National Congress on 19 December 1929, passed 'Purna Swaraj' at its Lahore session. Hence, Option 4 is correct.

• Jawaharlal Nehru was the president of the Indian National Congress during the Lahore session.

• Jawaharlal Nehru hoisted the national flag of India on 31 December 1929 on the banks of the Ravi river as a part of 'Purna Swaraj'.

• A public declaration on 'Purna Swaraj' was made by Congress on 26 January 1930.

• Congress asked the people of India to observe the 26th of January as Independence Day since 1930 (later it changes and made 15th August as the official Independence Day.)

• The declaration of 'Purna Swaraj' was passed due to the breakdown of negotiations between Indian Freedom Fighters and the British government over the question of dominion status for India.

• To commemorate the 1930 declaration India decided to celebrate January 26 as Republic day.

• Lord Irwin was the viceroy of India during the declaration of 'Purna Swaraj'.

Q68. Answer: (a) Wind mill

The correct answer is Windmill.

Key Points

• Energy:

• It is the basic and universal measure for all kinds of work by nature and human beings. Every activity in nature has a flow of energy.

• Energy can be categorized into two types

• Conventional

• Non-conventional

• Non-conventional source of energy

• It is renewable energy that is used by human beings for a long time.

• This type of energy is continuously produced in nature and is inexhaustible.

• Non-conventional sources of energy include solar energy, wind, and biomass.

• These sources do not produce any pollution in the environment.

• Examples are Wood, Solar energy, wind energy, hydropower, tidal energy, geothermal energy, Biomass Energy, etc. Hence, Option 1 is correct.

• A conventional source of energy

• It is a natural resource that is available in nature and is available in limited quantities.

• They are also known as a non-renewable source of energy as once depleted, they cannot be re-generated easily.

• They are formed from decay matter over hundreds and millions of years.
• Examples are Oil, Coal, petroleum, natural gas, nuclear fuels, hydel power, etc.

Q69. Answer: (b) Dioptre

The correct answer is Dioptre.

Key Points

• Dioptre
• It is the S.I. Unit of Power of a lens. Hence, Option 2 is correct.
• A dioptre is equal to the reciprocal of the focal length measured in meters.
• The Power of a lens is the ability of a lens to converge or diverge light rays depending on its focal length.
• The power of the lens is the ability of the lens to converge the rays of light falling on it. Definition: The power of a lens is the reciprocal of its focal length in meters.
• When, f = 1 m, P = 1/f = 1/1 = 1 dioptre.
• 1 dioptre is the power of a lens whose focal length is 1 meter.

Additional Information

• Concave lens: It is a diverging lens that diverges the parallel beam of light.
• It can also gather light from all directions and project it as a parallel beam.
• The focal length of the concave lens is negative.
• It has a virtual focus from the diverging rays of light that seem to converge.
• Convex lens: The lens whose refracting surface is upside is called a convex lens.
• The convex lens is also called a converging lens.
• The focal length of a convex lens is positive.

Q70. Answer: (c) 1/6

The logic followed here is:-

• Multiply by 2 in the denominator.
• 1/(4×2) = 1/8

Similarly,

• 1/(3×2) = 1/6

Hence, "option 3" is the correct answer.

Q71. Answer: (a) Mahatma Gandhi

The correct answer is Mahatma Gandhi.

Key Points

Hind Swaraj

• It was written by Mohandas Karamchand Gandhi expressing his views on Swaraj and Modern civilisation in 1909.
• It is written in a dialogic form i.e., as a discussion between the Reader and the Editor of a journal/newspaper.
• Hind Swaraj or Indian Home Rule comprises 20 short chapters.
• Primarily Hind Swaraj deals with two issues:
• a critique of modern civilization,
• the nature and structure of Indian Swaraj and the means and methods to achieve it.
• This book was primarily written in the Gujarati language which was the native language of Mahatma Gandhi.
• It was written during the traveling phase of Gandhiji from London to South Africa.

Additional Information

Author	Books
Lala Lajpat Rai	Unhappy India
Subhash Chandra Bose	The Indian Struggle
Mohandas Karamchand Gandhi	The Story of My Experiments with Truth
Jawaharlal Nehru	The Discovery of India

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Q72. Answer: (c) Investor Education and Protection Fund Authority (IEPFA)

The correct answer is Investor Education and Protection Fund Authority (IEPFA).

Key Points

• Investor Education and Protection Fund Authority:

• The Investor Education and Protection Fund (IEPF) Authority in a major success has recovered deposits worth Rs 1,514 crore from Kolkata-based Peerless General Finance and Investment Company. This money of depositors was pending with the company for the last 15 years. Hence, Option 3 is correct.

• Investor Education and Protection Fund (IEPF) was established by the central government under Section 125 of the Companies Act 2013.

• It is a statutory body established under the Ministry of Corporate Affairs.

• The Secretary in the Ministry of Corporate Affairs is the Chairperson of IEPF.

• The authority aims to administer the Investor Education and Protection Fund with the objective of promoting Investor's Education, Awareness, and Protection.

• It is empowered to undertake various initiatives to fulfill its objectives through Investor Awareness Programmes and various other mediums like print, Electronic, Social Media, and Community Radio.

• Further to enhance its reach, the IEPF Authority is also in the process of commissioning an online facility to collect primary information directly from retail investors about the deposits which have matured and are still pending with various entities for repayment or payment of interests.

Q73. Answer: (b) 5 h, 30 min

The correct answer is 5 hours 30 minutes.

Key Points

• Indian Standard Time (IST):

• It is 5 hours 30 minutes ahead of Greenwich Mean Time (GMT). Hence, Option 2 is correct.

• In India, the longitude of 82.5° E is treated as the Standard Meridian.

• The Indian Standard Time is calculated from 82°30'E meridian passing through Mirzapur.

• The local time at the meridian is taken as the Standard Time for the whole country.

• It is known as the Indian Standard Time (IST).

• The Prime Meridian is a 0° and is known as the Greenwich line as it passes through Greenwich near London, where the British Royal Observatory is located.

• Longitudes have one very important function i.e. they determine Local Time in relation to Greenwich Mean Time (GMT).

• Local Time is the time reckoned by the noon-sun at a given place and Standard Time is the Local Time of the Standard Meridian of a country.

Additional Information

• Greenwich Mean Time (GMT)

• Greenwich Mean Time (GMT), the name for the mean solar time of the longitude (0°) of the Royal Greenwich Observatory in England.

• The meridian at this longitude is called the prime meridian or Greenwich meridian.

Q74. Answer: (c) South

• At half past 6, the hands of the clock are pointing south as shown below:

• • After exactly 24 hours, the time will be half past 6 again.

• So, the hands of the clock will be pointing south again.

• • Hence, "south" is the correct answer.

Q75. Answer: (c) Jawaharlal Nehru National Urban Renewal Mission

The correct answer is Jawaharlal Nehru National Urban Renewal Mission.

Key Point

• JNNURM:

• It stands for Jawaharlal Nehru National Urban Renewal Mission (JNNURM).

• It aims at integrated development of slums through projects for providing shelter, basic services, and other related civic amenities with a view to providing utilities to the urban poor.

• It has two components Basic Services for Urban poor (BSUP) and Integrated Housing and Slum Development Programme (IHSDP).

• Reforms have been taken under JNNURM:

• Earmarking of 25% of the municipal budget for the urban poor for the provision of basic services including affordable housing to the urban poor.

• Implementation of 7- Point Charter, namely provision of land tenure, affordable housing, water, sanitation, education, health, and social security to the poor in a time-bound manner ensuring convergence with other programmes.

• Reservation of 25% of developed land in all housing projects, public or private, is critical for slum improvement.

Q76. Answer: (b) 10

SOLUTION:

Let the number first number be x and the second number be y.

According to the given conditions;

=> x / 4 = 3 / 8 × y

=> x = 12 / 8 × y 1

=> x + 30 = 6y 2

Now comparing 1 and 2 equations we get;

=> 12 / 8 × y + 30 = 6y

=> 3 / 2 × y + 30 = 6y

=> y = 20 / 3

Now to determine the first number, x = 12 / 8 × y

=> x = 12 / 8 × 20 / 3

=> x = 10

Hence option 2 is the valid answer.

Q77. Answer: (c) 10%

GIVEN:

Population of a village increased from 1,75,000 to 2,62,500 in 5 years.

FORMULA USED:

Average = sum of terms/number of terms

SOLUTION:

Increased Population = 262500 - 175000

Increased Population = 87500

Increased % = 87500 / 175000 × 100

Increased % = 50%

Average percentage increase in the population per year = 50%/5 = 10%.

Hence option 3 is the correct answer.

Q78. Answer: (d) 20 minutes

Given:

Car A is twice as fast as car B, and car B is thrice as fast as car C.

The distance covered by car C in 60 minutes

Concept used:

Speed = Distance/Time

Speed prop. to 1/Time

Calculation:

Car A is twice as fast as car B, and car B is thrice as fast as car C.

=> A = 2B

=> B = 3C

Speed ratio of A : B : C

A/B = 2/1 & B/C = 3/1

=> A : B : C = (2 × 3) : (1 × 3) : (1 × 1)

=> A : B : C = 6 : 3 : 1

Time is inversely proportional to the speed, Then time ratio

=> A : B : C = 1/6 : 1/3 : 1/1 ----(1)

Multiply by LCM 6 of the denominator (6, 3, 1) in the above equation (1)

=> A : B : C = 1 : 2 : 6

According to the question, The distance covered by car C in 60 minutes

=> 6 unit → 60 min

=> 1 unit → 10 min

Car B has taken covered the same distance in

=> 2 unit → 2 × 10

=> 20 min

Therefore The distance covered by car C in 60 minutes will be covered by car B in 20 min.

Q79. Answer: (c) 3

GIVEN:

The number = 588

SOLUTION:

Determine the prime factors of 588 we get,

588 = 2 × 2 × 7 × 7 × 3

Common factors = 2 × 7

Uncommon factor = 3

Now only 3 which is an uncommon factor that is not in pair. So the least number by which 588 be multiplied to get a perfect number is 3.

Hence Option 3 is the valid answer.

Q80. Answer: (d) 1

GIVEN:

$x = a \sin \theta$

$y = b \tan \theta$

FORMULA USED:

From trignometric identity;

$1 + \cot^2 \theta = \text{cosec}^2 \theta$

SOLUTION:

$\Rightarrow a^2 / x^2 - b^2 / y^2 = a2 / (a \sin \theta)\ 2 - b2 / (b \tan \theta)2$

$\Rightarrow 1 / \sin^2 \theta - 1 / \tan^2 \theta$

$\Rightarrow \text{cosec}^2 \theta - \cot^2 \theta$

From trignometric identity $1 + \cot^2 \theta = \text{cosec}^2 \theta$

$\Rightarrow \text{cosec}^2 \theta - \cot^2 \theta = 1$

Hence option 4 is the valid answer.

Q81. Answer: (a) National Remote Sensing Centre (NRSC)

The correct answer is National Remote Sensing Centre (NRSC).

Key Points

• National Remote Sensing Centre (NRSC):

• National Remote Sensing Centre (NRSC) at Hyderabad.

• It is responsible for remote sensing satellite data acquisition and processing. It is also responsible for data dissemination, aerial remote sensing, and decision support for disaster management. Hence, Option 1 is correct.

• National Remote Sensing Centre (NRSC) at Hyderabad has been converted into a full-fledged centre of ISRO since September 1, 2008.

• Earlier, NRSC was an autonomous body called the National Remote Sensing Agency (NRSA) under the Department of Space (DOS).

• NRSC has a data reception station at Shadnagar near Hyderabad for acquiring data from Indian remote sensing satellites as well as others.

• NRSC Ground station at Shadnagar acquires Earth Observation data from Indian remote-sensing satellites as well as from different foreign satellites.

• NRSC is also engaged in executing remote sensing application projects in collaboration with the users.

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Q82. Answer: (a) Save Trees and forests

The correct answer is to Save Trees and forests.

Key Point

• The Chipko movement:

• It was a peaceful social and environmental movement led by rural villagers, mainly women In India in the 1970s.

• The initiative intended to protect trees and forests that were planned for logging by the government.

• In 1973, the movement began in the Himalayan state of Uttarakhand (then a part of Uttar Pradesh) and swiftly spread across India's Himalayas.

• The primary purpose was to Save Trees and forests. Hence, Option 1 is correct.

• Chipko is a Hindi word that means "to hug" or "to cling to," and it refers to the demonstrators' principal method of clutching trees in order to obstruct loggers.

• Sunderlal Bahuguna, a Gandhian activist, was instrumental in steering the movement in the right direction.

• The Right Livelihood Award was given to the Chipko movement in 1987 "for its dedication to the conservation, rehabilitation, and environmentally sound use of India's natural resources."

• The famous Chipko Movement inspired the villagers of the Uttara Kannada district of Karnataka Province in southern India to launch a similar movement to save their forests.

Q83. Answer: (c) May 2018

The correct answer is May 2018.

Key Points

• Samagra Shiksha:

• Ministry of Human Resource Development is implementing the Scheme of Vocationalisation of School Education.

• Samagra Shiksha is an overarching programme for the school education sector extending from pre-school to class 12.

• The scheme has been prepared with the broader goal of improving school effectiveness measured in terms of equal opportunities for schooling and equitable learning outcomes.

• It subsumes the three Schemes of Sarva Shiksha Abhiyan (SSA), Rashtriya Madhyamik Shiksha Abhiyan (RMSA), and Teacher Education (TE).

• It was launched in May 2018. Hence, Option 3 is correct.

• The above scheme is being implemented under the umbrella of ‘Samagra Shiksha – an integrated scheme for school education.

• Samagra Shiksha is an integrated scheme for school education extending from pre-school to class XII to ensure inclusive and equitable quality education at all levels of school education.

• It subsumes the three Schemes of Sarva Shiksha Abhiyan (SSA), Rashtriya Madhyamik Shiksha Abhiyan (RMSA), and Teacher Education (TE).

• The change in name of the Ministry of Human Resource Development (MHRD) as Ministry of Education.

• The current Education Minister of India is Shri Dharmendra Pradhan (As of Jan 2022).

Q84. Answer: (c) Revenue

The logic followed here is:-

• Import is the antonym of export.

• Similarly, expenditure is the antonym of revenue.

Hence, "option 3" is the correct answer.

Q85. Answer: (c) Thyroxine

The correct answer is Thyroxine.

Key Points

• Thyroid gland:

• The thyroid gland is known to be the largest endocrine gland.

• The thyroid gland is a bilobed, high vascular organ.

• The thyroid gland is composed of follicles (round in shape) and stromal tissues.

• Each thyroid follicle is composed of follicular cells, enclosing a cavity.

• Iodine is an important constituent of Thyroxine because it regulates the synthesis of thyroxine in thyroid glands. Hence, Option 3 is correct.

• Iodine (in diet) is essential for the normal rate of hormone synthesis in the thyroid.

• Deficiency of iodine in our diet results in hypothyroidism and enlargement of the thyroid gland commonly called goitre.

• When the rate of synthesis and secretion of thyroid hormones is increased to abnormally high levels then this condition is known as Hyperthyroidism. It adversely affects the body physiology of an organism.

Additional Information

• Thyroxine hormone has the following functions in humans:

• They maintain the basal metabolic rate of the body.

• They promote the growth of body tissues and the development of mental faculties.

• They stimulate tissue differentiation.

• Thyroxine also controls the working of kidneys. Its deficiency results in decreased urine output and vice-versa.

Q86. Answer: (d) Sections 3 and 1

SOLUTION:

The ratio of the number of students in section 2 and 5 = 30: 70 = 3: 7

The ratio of the number of students in a sections 3 and 5 = 20 : 70 = 2 : 7

The ratio of number of students in a section 2 and 6 = 30 : 50 = 3 : 5

The ratio of number of students in a section 3 and 1 = 20 : 60 = 1 : 3

Hence option 4 is the valid answer.

Q87. Answer: (b) 4

SOLUTION:

According to the graph showing the number of students in different sections of a school. The lowest number of students is in section 3 which is equal to 20.

Number of students in section 3 = 20

Number of students in section 4 = 40

Therefore Four sections have exactly twice the number of students than any other section.

Q88. Answer: (b) 30

SOLUTION:

The 3 most populated sections are section 1, Section 5, Section 6.

The 3 least populated sections are Section 3, Section 2, Section 4.

The number of Students in Section 1 = 60

The number of Students in Section 5 = 70

The number of Students in Section 6 = 50

The number of Students in Section 3 = 20

The number of Students in Section 4 = 40

The number of Students in Section 2 = 30

The average number of students in the 3 most populated sections and the 3 least populated sections = 70 + 60 + 50 / 3 - 20 + 30 + 40 / 3

Average = 60 - 30

Average = 30

Hence option 2 is the valid answer.

Q89. Answer: (b) Sections 4 and 6

SOLUTION:

The average number of students in 6 sections = 60 + 30 + 20 + 40 + 70 + 50 / 6 = 45

Average number of 4 and 5 sections = 40 + 70 / 2 = 55

Average number of 4 and 6 sections = 40 + 50 / 2 = 45

Average number of 2 and 3 sections = 30 + 20 / 2 = 25

Average number of 1 and 3 sections = 60 + 20 / 2 = 40

Hence option 2 is the valid answer.

Q90. Answer: (c) KPSV

The logic followed here is:-

Similarly,

Hence, "option 3" is the correct answer.

Q91. Answer: (c) 7

The logic followed here is:-

Hence, "option 3" is the correct answer.

Q92. Answer: (d) 126

The logic followed here is:-

Hence, "option 4" is the correct answer.

Alternate Method

The logic followed here is:-

Hence, "option 4" is the correct answer.

Q93. Answer: (b) jy

The logic followed here is:-

Hence, "option 2" is the correct answer.

Q94. Answer: (c) 135

The logic followed here is:-

Hence, "option 3" is the correct answer.

Q95. Answer: (d) a

• Father, daughter, and dog have no characteristics common to each other.

• The best Venn diagram representation is as follows:

Hence, "option 4" is the correct answer.

Q96. Answer: (b) 63

The logic followed here is:-

• Addition of the positional values of the opposite letters.

• R → opposite is I

• I → opposite is R

• C → opposite is X

• E → opposite is V

• => R + I + C + E = I + R + X + V = 9 + 18 + 24 + 22 = 73

Similarly,

• F → opposite is U

• L → opposite is O

• O → opposite is L

• U → opposite is F

• R → opposite is I

• => F + L + O + U + R = 21 + 15 + 12 + 6 + 9 = 63

Hence, "option 2" is the correct answer.

Q97. Answer: (a) 87129262022

The logic followed here is:-

• S is written as 8, A is written as 26, and E is written as 22, which means the place value of the opposite letter.

Hence, "option 1" is the correct answer.

Q98. Answer: (c) 26111126922137

The logic followed here is:-

• N is written as 13, P is written as 11, and T is written as 7, which means the place value of the opposite letter.

• Hence, "option 3" is the correct answer.

Q99. Answer: (c) 3 : 9

Important Points

• NOT Related means "We have to find a pair that is different from the given pair."

• The logic followed here is: Second number = First number × (First number ÷ 2)

• Given: 4 : 8 => 4 × (4 ÷ 2) = 4 × 2 = 8

1. 8 : 32 => 8 × (8 ÷ 2) = 8 × 4 = 32

2. 2 : 2 => 2 × (2 ÷ 2) = 2 × 1 = 2

3. 3 : 9 => 3 × (3 ÷ 2) = 3 × 1.5 = 4.5 ≠ 9

4. 6 : 18 => 6 × (6 ÷ 2) = 6 × 3 = 18

Hence, "option 3" is the correct answer.

Q100. Answer: (d) South

• According to the time by Rekha's watch, it is quarter past 9 and the hour-hand is pointing to the west.

• The hands of the clock at 9.15 will appear as shown below.

• After 75 minutes, the time will be 9.15 + 75 mins = 10.30.

• Thus, the hands of the clock will appear as shown below.

• Now, the minute-hand is pointing towards the South.

Hence, "option 4" is the correct answer.

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