RRB NTPC CBT-I Official Paper (Held On: 28 Dec 2020 Shift 2) (Previous Year Paper)

RRB NTPC • 2020 • 100 questions • 90 minutes • Answer key and solutions

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Q1. The process of taking out stored results out of physical memory of Computers is known as:

(a) input process
(b) programming
(c) output process
(d) processing

Q2. A sum of Rs 2600 was lent in two parts in such a way that the simple interest on the first part at 10% per annum for 5 years is equal to the interest on the second part at 9% per annum for 6 years. What share is lent at 10%?

(a) Rs. 1250
(b) Rs. 1450
(c) Rs. 1150
(d) Rs. 1350

Q3. The Moplah Rebellion took place between the years:

(a) 1917-1919
(b) 1923-1924
(c) 1921-1922
(d) 1914-1915

Q4. Six friends are sitting around a round table. Mohan is sitting opposite to Rohit who is sitting between Ram and Mohit. Mohit is sitting opposite Shyam. Who is sitting opposite to Rohan?

(a) Rohit
(b) Ram
(c) Shyam
(d) Mohit

Q5. The Sahitya Akademi is headquartered at:

(a) Hyderabad
(b) Mumbai
(c) Bangalore
(d) New Delhi

Q6. Who is called the father of taxonomy ?

(a) Eichler
(b) Carl Linnaeus
(c) Engler
(d) Bentham and Hooker

Q7. Select the option that is related to the third term in the same way as the second term is related to the first term.

Dog : Guard :: Horse : ?

(a) Saddle
(b) Ride

(c) Stable
(d) Cart

Q8. On which date did Jallianwala Bagh massacre take place?
(a) 13^(th) April, 1920
(b) 13^(th) April, 1919
(c) 30th April, 1920
(d) 30th April, 1919

Q9. Out of the four number-pair listed, three are alike in some manner and one is different. Select the odd one.
(a) 7-27
(b) 4-64
(c) 6-216
(d) 9-729

Q10. Read the following information and answer the question that follows.
i) I, J, K, L, M and N are playing hockey.
(ii) I and M are sisters and N is the brother of M.
(iii) K is the only son of I's paternal uncle.
(iv) J and L are the sons of a brother of K's father.
How K is related to M?
(a) Brother
(b) Uncle
(c) Cousin
(d) Sister

Q11. Lichen is an organism which monitors
(a) gas pollution
(b) water pollution
(c) soil pollution
(d) air pollution

Q12. Choose the mirror image of CHIVALRY



(a)



(b)



(c)



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(d)



Q13. The numerator of a fraction is 2 less than the denominator. If the numerator is multiplied by 2 and the denominator is multiplied by 3, then the fraction becomes 2/9 The fraction is:

(a) 3/5
(b) 7/9
(c) 1/3
(d) 5/7

Q14. If $p^2 + q^2 - r^2 = 0$, then the value of $(p^6 + q^6 - r^6) \div p^2q^2r^2$ is:

(a) -3
(b) 1/3
(c) 3
(d) 3pqr

Q15. Yen is the currency of:

(a) Maldives
(b) Japan
(c) South Korea
(d) Indonesia

Q16. Which of the following states has a Legislative Council?

(a) Himachal Pradesh
(b) Assam
(c) Andhra Pradesh
(d) Madhya Pradesh

Q17. The difference between the mean of the first eight composite natural numbers and the mean of the first eight prime numbers, is:

(a) 1/4
(b) 3/20
(c) 1/5
(d) 1/8

Q18. What is Net National Product (NNP)?

(a) NNP = GNP - Depreciation
(b) NNP = GDP = Income from abroad
(c) NNP = GNP + Depreciation
(d) NNP = GDP - Income from abroad

Q19. A number was increased by 40% and there after decreased by 40%. The net change in the number in percentage is:

(a) 16% decrease
(b) 32% decrease
(c) no change
(d) 16% increase

Q20. The smallest number which should be subtracted from the smallest number of four digits to make it a perfect square is:

(a) 120
(b) 159
(c) 39
(d) 24

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Q21. If x satisfies the equation $x^2 - 2x + 1 = 0$, then the value of $x^3 - 1/(x^3)$ is:

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

Q22. In a school, the average age of boys and girls together is 16.8 years, the average age of boys is 15.4 years, and the average age of girls is 18.2 years. The ratio of number of boys to girls in the school is:

(a) 3 : 2
(b) 3 : 5
(c) 2 : 3
(d) 1 : 1

Q23. The Tri-Color which was hoisted in Stuttgart by Madam Cama was smuggled into British India by:

(a) Veer Savarkar
(b) Kishan Singh
(c) Indulal Yagnik
(d) Bhikaji Cama

Q24. What does NIU stand for in information technology?

(a) Nominal Internal Unit
(b) Network Interface Unit
(c) National Information Usage
(d) Networking Internal Unit

Q25. Read the given statements and conclusions (options) carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide from the options given which conclusion logically follows from the statements.

Statements:

1. No pilots are amateurs.
2. Only a few amateurs are players.

(a) Some pilots are players
(b) Some pilots are not players
(c) Some amateurs are not players
(d) Some players are pilots

Q26. The radius of the circumcircle of an equilateral triangle of $\sqrt{3}$ unit side, is:

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

Q27. Which of the following is NOT a part of auxiliary memories in a Computer system?

(a) PROM
(b) Floppy
(c) CD-ROM
(d) Magnetic tapes

Q28. Who received the Nobel Prize for Economic Sciences in 2020?

(a) James P. Allison
(b) George Smith
(c) Robert B. Wilson
(d) Dennis Mukherjee

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Q29. If √2 + √x = √3, then the value of x is equal to:

(a) 5 - 2√6
(b) -2√6 - 5
(c) 5 + 2√6
(d) 2√6 - 5

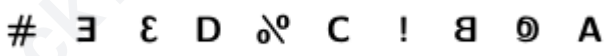
Q30. The Global Climate Change Alliance is an initiative of:

(a) European Union
(b) Continental Union
(c) World Union
(d) Greek Union

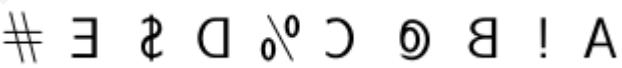
Q31. Choose the mirror image of the following A!B@C#D$E%



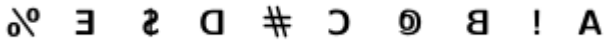
(a)



(b)



(c)



(d)



Q32. If P = 2 + 0.2 ÷ (0.2 × 2) - 1 × 2

Q = 2 - 0.2 ÷ (0.2 × 2) - 1/2 × 2, then P/Q is the equal to:

(a) 1.0
(b) 1.5
(c) 0.5
(d) -0.5

Q33. Given below is the marks obtained by 20 students in mathematics out of 30 marks.

7, 9, 12, 12, 13, 12, 14, 14, 14, 14, 15, 16, 17, 18, 18, 19, 20, 18, 20, 13. Then (2 × median — mode) of the data is equal to:

(a) 12
(b) 14
(c) 18
(d) 0

Q34. If (√(19 - x √12))/1 = √4 - √3 then the value of x is equal to:

(a) √3 - 2
(b) 2 + 4√3
(c) 2 + 2√3
(d) √3 + 2

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Q35. 'A' can complete a piece of work in 20 days and 'B' alone can complete the work in 30 days. Due to some other work, 'A' had to leave the work before completion and for the last 5 days 'B' alone did the work. The total time taken to complete the work is:

(a) 12 days
(b) 18 days
(c) 20 days
(d) 15 days

Q36. If AMBER = 27 and BROWN = 14. then GREEN will be equal to:

(a) 36
(b) 24
(c) 39
(d) 28

Q37. Which of the following was given the Filmfare Award for Best Film in 2020?

(a) Gully Boy
(b) Padman
(c) Andhadhun
(d) Article 15

Q38. The first Indian Communication satellite is

(a) Rohini
(b) MOM
(c) Aryabhatta
(d) APPLE

Q39. The region of planet Earth, where life exists is known as

(a) Biosphere
(b) Hemisphere
(c) Atmosphere
(d) Cryosphere

Q40. Which of the following Awards is associated with only Music?

(a) Grammy
(b) Tagore
(c) Oscar
(d) Cannes

Q41. Glowing surface of the sun is known as:

(a) photosphere
(b) atmosphere
(c) lithosphere
(d) chromosphere

Q42. 49^(th) parallel line is a boundary between:

(a) India and Pakistan
(b) North Korea and South Korea
(c) USA and Canada
(d) France and Germany

Q43. Jallianwala Bagh massacre took place during the term of Viceroy _____.

(a) Lord Irwin
(b) Lord Dalhousie
(c) Lord Chelmsford
(d) Lord Ripon

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Q44. Who among the following is a famous Santoor instrumentalist?

(a) Shiv Kumar Sharma
(b) Sajjad Hussain
(c) Nikhil Banerjee
(d) Ustad Binda Khan

Q45. If cos 2θ = sin θ and θ lies between 0 and 90°, then θ will be:

(a) 60°
(b) 30°
(c) 45°
(d) None of these

Q46. The sum of two numbers is 1500. Their LCM is 16379. Two numbers are:

(a) 1489, 11
(b) 1453, 47
(c) 1479, 21
(d) 1053, 447

Q47. The Theory of Relativity is associated with:

(a) Albert Einstein
(b) WC Rontgen
(c) Newton
(d) Kelvin

Q48. An article was sold at a gain of 12%. Had it been sold for Rs.33 more, the gain would have been 14%. The cost price of the article is:

(a) Rs. 1850
(b) Rs. 1750
(c) Rs. 1800
(d) Rs. 1650

Q49. Which colour is associated with the revolution in fertilisers ?

(a) Pink
(b) Golden
(c) Black
(d) Grey

Q50. Ina certain code language, MAHARAJA is written as ZNUNENWN. How will RAINDROP be coded as in that language?

(a) ENVAQEBC
(b) ENVAEQBC
(c) ENAVQEBC
(d) EVNAQEBC

Q51. Solve the following:

1/2 × 2/3 - 3/4 (1/2 × 1/3 + 5/6) × 4/21= ?

(a) 4/21
(b) 1/3
(c) 2
(d) 1/2

Q52. ABC is an equilateral triangle. P, Q and R are the midpoints of sides AB, BC and AC respectively. The length of the side of the triangle is 4 cm. The area of triangle PQR is:

(a) √3 cm²
(b) 1/4 √3 cm²

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(c) (√3)/2 cm²
(d) (√3)/9 cm²

Q53. Who fought the Battle of Plassey against the East India Company?
(a) Mir Jafar
(b) Siraj-ud-Daula
(c) Alivardi Khan
(d) Tipu Sultan

Q54. In an election, there were only two candidates. The winning candidate got 48% of the total votes. His opponent got 6800 votes which was 34% of the total votes. Some of the votes were invalid. The winning margin of the candidate who won the election and the number of invalid votes respectively are:
(a) 3200 votes, 3600 votes
(b) 3000 votes, 3600 votes
(c) 2800 votes, 3600 votes
(d) 3600 votes, 2800 votes

Q55. The length of the longest pole, that could be placed in a room of dimensions 10 m, 8 m and 6 m, is
(a) 10 √2 m
(b) 18 m
(c) 14 m
(d) 15 m

Q56. Three persons invested an amount of money in a business in the ratio 1/2 : 1/3 : 1/4. At the end of a year, the total profit was Rs.15600. The largest share received in profit will be:
(a) Rs. 7500
(b) Rs. 7000
(c) Rs. 8000
(d) Rs. 7200

Q57. The following table shows the Air Quality Index (AQT) (PM2.5) for the four weeks of February 2018. What is the difference in the average of AQI in Kolkata and Delhi in the month of February?

Toxic Trend Air Quality Index		
Period	Kolkata	Delhi
February 1^(st) – 7^(th)	306	248
February 8^(th) – 14^(th)	288	246
February 15^(th) – 21^(st)	274	246
February 22^(nd)– 28^(th)	172	236

(a) 14
(b) 18
(c) 16
(d) 12

Q58. Bhabha Atomic Research Centre (BARC) is located in:
(a) Chennai
(b) Tarapur
(c) Mumbai
(d) Hyderabad

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Q59. Which of the following is a scalar quantity?

(a) Mass
(b) Force
(c) Momentum
(d) Velocity

Q60. ABCD is a parallelogram. Side BC is produced to E such that BC = CE. Join AE which intersects side CD at P. The area of triangle ABE is:

(a) less than the area of parallelogram ABCD
(b) = to 1/2 of the area of parallelogram ABCD
(c) = to 1/3 of the area of parallelogram ABCD
(d) = to the area of parallelogram ABCD

Q61. According to which law, at a constant temperature, the volume of a gas is inversely proportional to pressure?

(a) Boyle's Law
(b) Gay-Lussac's Law
(c) Charle's Law
(d) Graham's Law

Q62. Where is the headquarters of United Nations Security Council located?

(a) Chicago
(b) New Jersey
(c) Boston
(d) New York

Q63. A man invested 1/2 of his capital at 5% rate of interest per annum, 1/3 of his capital at 8% per annum and the remaining at 10% rate of interest per annum. His total income from the three investments is Rs. 820.00 in a year. The total capital invested is:

(a) Rs. 16000
(b) Rs. 12000
(c) Rs. 6400
(d) Rs. 8000

Q64. The smallest square number which is exactly divisible by 12, 15 and 18 is:

(a) 1225
(b) 625
(c) 400
(d) 900

Q65. Select the number from among the given options that can replace the question mark (?) in the following matrix.

14	**12**	**10**	**8**
10	8	6	4
8	6	4	2
?	14	12	10

(a) 16
(b) 0
(c) 8
(d) 12

Q66. Which Nation has hosted the Commonwealth Games five times?

(a) New Zealand
(b) England
(c) Canada

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(d) Australia

Q67. By which of the following Amendments of the Constitution, Fundamental Duties of the citizens were added to the Constitution of India?

(a) 44^(th) Constitutional Amendment Act
(b) 42^(nd) Constitutional Amendment Act
(c) 86th Constitutional Amendment Act
(d) 69^(th)Constitutional Amendment Act

Q68. Sita took an auto from her home in Andheri (A) to go to her college in Fatehpuri (F). Rather than continuing straight on the direct road to the college that had no turns, the auto driver took a diversion after 10 km and tumed right at Bandra (B) crossing, then at Colaba T- point (C) after 8 km turned left, again after covering 12 km turned left at Dalhousi Building (D) and soon after 8 km turned right at Elphinston point (E) and after covering 4 km reached Fatehpuri (F). Had the auto driver taken the direct route how much less distance would Sita have actually travelled between the starting point and the destination?

(a) 16 km
(b) 18 km
(c) 10 km
(d) 12 km

Q69. Which of the following is NOT a part of the circulatory system?

(a) Large intestine
(b) Blood
(c) Heart
(d) Arteries

Q70. If 'A' means '+', 'S' means '-', 'M' means '×', 'D' means '÷', 'B' means '(' and 'F' means ')', then solve the following expression:

B700A110S90FDB9M10S10F

(a) 10
(b) 90
(c) 9
(d) 7

Q71. Who gave the idea of a constituent assembly of India for the first time?

(a) BR Ambedkar
(b) BN Rau
(c) M N Roy
(d) Dr Rajendra Prasad

Q72. A can complete a piece of work in 12 days. B is 20% less efficient than A. The number of days it will take for B to complete the work is:

(a) 16 days
(b) 18 days
(c) 20 days
(d) 15 days

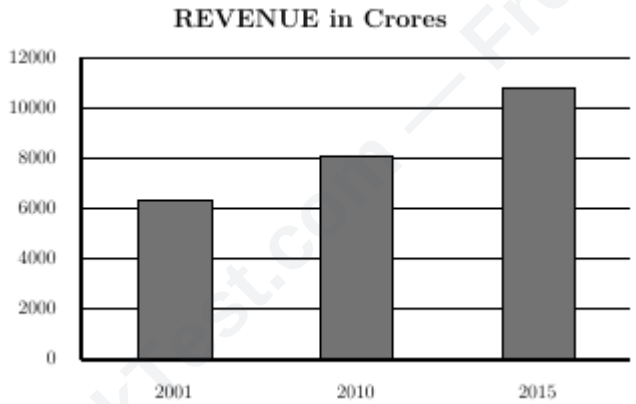
Q73. For any natural number n, $6^n - 5^n$ always ends with

(a) 7
(b) 5
(c) 3
(d) 1

Q74. The disease related with apple is known as:

(a) red rust disease
(b) tikka disease
(c) green ear disease
(d) fire blight

Q75. The revenue earned by Company A in 2001 is Rs. 6,300 crore, that earned in 2010 is Rs. 8,100 crore and that earned in 2015 is Rs. 10,800 crore. What is the ratio of the increase in revenue between 2001 to 2010 and between 2010 to 2015?



(a) 1 : 2
(b) 3 : 2
(c) 2 : 3
(d) 1 : 1

Q76. Which of the following projects is in Uttarakhand?

(a) Tehri Hydro Power Complex
(b) Sharavathi Hydroelectric Project
(c) Koyna Hydroelectric Project
(d) Chamera Hydroelectric Project

Q77. The first attempt to calculate national income in India was made by:

(a) Dadabhai Naoroji
(b) VKRV Rao
(c) PC Mahalanobis
(d) SD Tendulkar

Q78. Jan Shikshan Sansthan (JSS) operates under the aegis of:

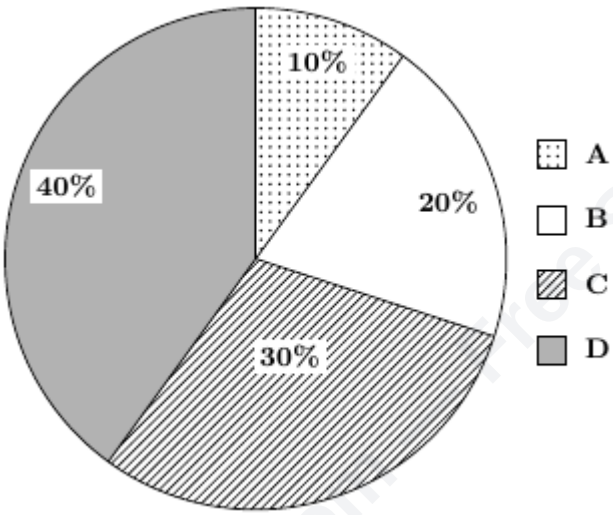
(a) Ministry of Human Resource Development
(b) Ministry of Defence
(c) Ministry of Skill Development and Entrepreneurship
(d) Ministry of Home Affairs

Q79. The capacity of working by A and B is in the ratio 3 : 4. If A takes 12 days to finish the work, the time taken by B to finish the same work is:

(a) 18 days
(b) 9 days
(c) 16 days
(d) 12 days

Q80. Of the 360 students who sat for Class X Board exams, 10% students scored A grade, 20% students scored B grade, 30% students scored C grade and 40% scored D grade. From the given pie chart, find the total number of students who scored Grade A and Grade B.

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(a) 72
(b) 108
(c) 144
(d) 36

Q81. If $x = a \sin t$, $y = b \tan t$, then $(a^2)/(x^2) - (b^2)/(y^2)$ is:
(a) 0
(b) 1
(c) -1
(d) 2

Q82. The famous Gol Gumbaz is located in:
(a) Rajasthan
(b) Karnataka
(c) Punjab
(d) Gujarat

Q83. India’s 1^(st) atomic power station was commissioned in:
(a) 1968
(b) 1969
(c) 1967
(d) 1966

Q84. The "Indradhanush” framework, an Indian government initiative, is for:
(a) resource mobilisation
(b) revamping of Public Sector Banks
(c) revamping of Private Sector Banks
(d) capacity building in Private Sector Banks

Q85. If $P = 0.3 \times 0.3 + 0.03 \times 0.03 - 0.6 \times 0.03$ and $Q = 0.54$, then P/Q is equal to:
(a) 0.45
(b) 4.05
(c) 0.135
(d) 4.5

Q86. In a certain code language, ACCESS is written as 13351919. How will EXCELLENCE be coded as in that language?
(a) 52435121251435
(b) 53351414123435
(c) 52345121414335

(d) 524351414355

Q87. Shanti's daughter Chandini is married to Abhi. Anchal is married to Sandy, the grandson of Shanti. Abhi's grandson is Karan. Rashmi is the mother of Karan. Shaurya is Anchal's son. How is Shaurya related to Karan?

(a) Nephew
(b) Brother
(c) Son
(d) Cousin

Q88. Select the letter-cluster from among the given options that can replace the question mark (?) in the following series.

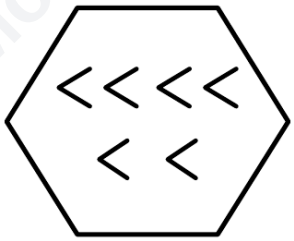
ZaF, YbE, XcD, WdC, VeB, ?

(a) UaB
(b) UfA
(c) UcD
(d) UeA

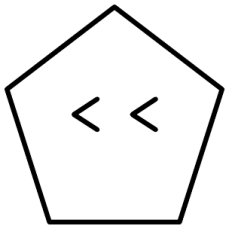
Q89. Select the figure that can replace the question mark (?) in the following series



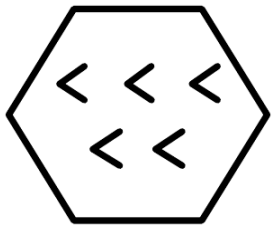
(a)



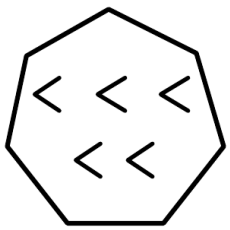
(b)



(c)



(d)

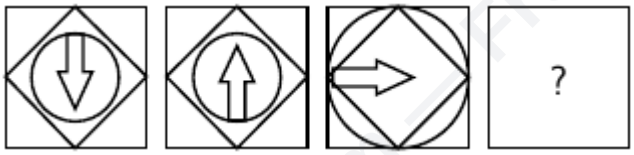


Q90. Select the option that is related to the third term in the same way as the second term is related to the first term.

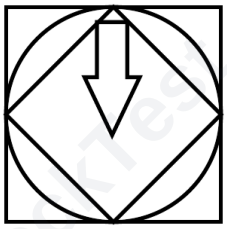
Grasshopper : Insect :: Hyena : ?

(a) Amphibian
(b) Reptile
(c) Herbivore
(d) Mammal

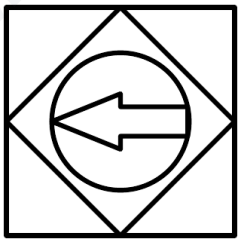
Q91. Select the figure from among the given options that when placed in the blank block with question marks (?) will complete the pattern



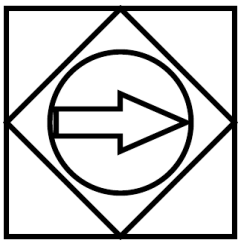
(a)



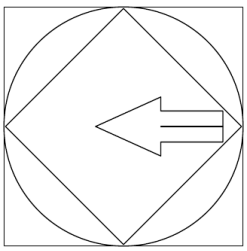
(b)



(c)



(d)



Q92. Out of the four sports listed, three are alike in some manner and one is different. Select the odd one.

Discus throw, Golf, Shot-put, Hammer throw

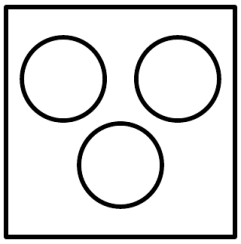
(a) Discus throw
(b) Golf
(c) Hammer throw
(d) Shot-put

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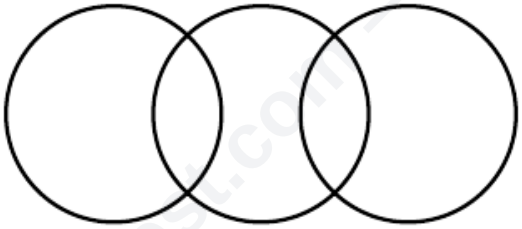
Q93. Select the Venn diagram that best represents the relationship between the following classes.

Communication, Telephone, Letter

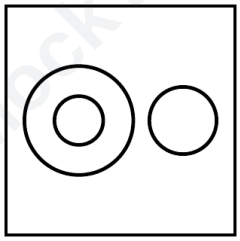
(a)



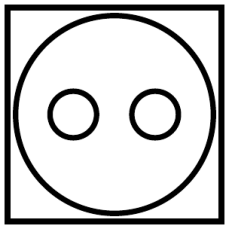
(b)



(c)



(d)



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

8, 18, 32, 50, ?

(a) 68
(b) 70
(c) 72
(d) 62

Q95. Select the number from among the given options that can replace the question mark (?) in the following series.

19, 29, 39, 49, 59, 69, 79, ?

(a) 99
(b) 119
(c) 109
(d) 89

Q96. Which of the given options best classifies the following items:

Spear, Catapult, Pistol, Rifle

(a) Battle
(b) Weapons

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(c) Guns
(d) Cannon

Q97. There are four friends Sharayn, Pinky, Tanisha and Mamta. Two study in J college. one each in X college and A college. Each one is definitely good at one subject and one is good at all the subjects. The subjects are English, Science, Maths and Computers. Of those studying in J college, one is good at Maths and the other in all subjects. Tanisha is studying in Acollege. Pinky is good at Maths. Sharayn is not good at Science.

Find who is good at all the subjects.

(a) Sharayn
(b) Mamta
(c) Tanisha
(d) Pinky

Q98. Which of the following conclusions can be derived from the given statement?

For applying for the post of lecturer, passing NET is mandatory.

(a) NET gives one an advantage in teaching
(b) NET helps to make people better teachers
(c) NET is a desirable qualification for college teaching
(d) Only those who pass NET qualify for college teaching

Q99. The table below gives the number of students passing an exam in a particular town.

Year	Girls	Boys
2016	128734	115526
2017	130567	124313
2018	129209	122131

Find the approximate average pass percentage in all three years, if the number of students appearing for the exam in any given year is 354000.

(a) 74%
(b) 68%
(c) 73%
(d) 71%

Q100. Which of the following conclusions can be derived from the given statement?

Students have to pay fine for late payment of exam fees.

(a) Many students do not pay exam fee in time.
(b) Students follow deadline only if penalised.
(c) Fines for late payment of exam fees is a large source of revenue.
(d) All fees are to be paid timely, else they must pay penalty.

ANSWER KEY

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

91 d	92 b	93 d	94 c	95 d	96 b	97 b	98 d	99 d	100 d

SOLUTIONS

Q1. Answer: (c) output process

The correct answer is the output process.

Key Points

• The process of taking stored results out of the physical memory of Computers is known as the output process.

• It is how a computer presents the results of the process.

• Outputs are returned to the user in many ways such as text on a screen, printed materials, or as sound from a speaker.

• The common output devices are monitors, printers and speakers.

• Output devices are indispensable but are not a part of the CPU.

• They are also called peripheral devices.

Q2. Answer: (d) Rs. 1350

Given:

Principal = Rs.2600

Formula used:

Simple Interest = Principal × Rate × Time/100

Calculation:

Let the part of the principal lent at 10% interest = Rs.y

According to the question:

y × 10/100 × 5 = (2600 - y) × 9/100 × 6

=> 50y = (2600 - y) × 54

=> 25y = (2600 - y) × 27

=> 25y = 70200 - 27y

=> 52y = 70200

=> y = 1350

Therefore The sum of money lent at 10% simple interest = Rs.1350

Alternate Method Let the two sum lent at 10% p.a. & 9% p.a. be A and B respectively.

Accordingly, A × 10% × 5 = B × 9% × 6

=> 25A = 27B

=> A/B = 27/25

=> A + B = 52 = 2600

=> A = 27 = 2600/52 × 27 = Rs.1350

Q3. Answer: (c) 1921-1922

The correct answer is 1921-1922.

• The Moplah Rebellion took place between the years 1921-1922.

Key Points

• Moplah:

• The uprising took inspiration from the Non-Cooperation Movement launched by Congress in 1920 along with the Khilafat Movement.

• The Moplahs are the Muslim Mapillahs of the south Malabar region of Kerala.

• It took under the leadership of Ali Musaliar and Variyankunnath Kunjahammed Haji.

• It took place between the years 1921-1922.

• The reasons for the revolt were:

• New tenancy laws

• Anti-British sentiments

• The communal angle was due to the Namboodiri Brahmins who were the landlords.

Additional Information

Agitations contemporary to the Non-cooperation movement

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Movement	Place	Year	Leader
Awadh Kisan Sabha	Uttar Pradesh	1920	Baba Ramchandra
Eka Movement	Awadh	1921	Madari Pasi

Q4. Answer: (b) Ram

1. Mohan is sitting opposite to Rohit who is sitting between Ram and Mohit.
2. Mohit is sitting opposite Shyam.

Only one person Rohan and only one position, position opposite to Ram is vacant, which implies Ram is sitting opposite to Rohan.

Case I:

Case II:

Clearly, from both the cases, Ram is sitting opposite Rohan.

Hence, 'Ram' is the correct answer.

Q5. Answer: (d) New Delhi

The correct answer is New Delhi.

• The Sahitya Akademi is headquartered in New Delhi.

Key Points

• Sahitya Akademi:

• The Sahitya Akademi is India's National Academy of Letters.

• It is an organization dedicated to the promotion of literature in the languages of India.

• It was founded on 12 March 1954.

• Its office is located in Rabindra Bhavan, Delhi.

• Rabindra Bhawan, Delhi is also the headquarters of the Sangeet Natak Akademi and Lalit Kala Akademi.

• Sahitya Akademi Award:

• It is a literary honour in India instituted in 1954, by which Sahitya Akademi, India's National Academy of Letters, annually confers on writers of outstanding works in twenty-four major Indian languages.

Q6. Answer: (b) Carl Linnaeus

The correct answer is Carl Linnaeus.

• Carl Linnaeus is called the father of taxonomy.

Key Points

• Taxonomy:

• It is the practice and science of categorization or classification of organisms.

• Carolus Linnaeus is called the father of taxonomy.

• He was the first person to formulate and adhere to a uniform system for defining and naming plants and animals.

• His binomial system of nomenclature identified species by a generic name (genus) and a specific name (species).

• His publication, Species Plantarum, described the new classification system and marked the initial use of the nomenclature for all flowering plants and ferns.

• In 1758, the binomial system of nomenclature was applied to animals.

Additional Information

• Joseph Leopold Eichler was a renowned real estate developer.

• Adolf Engler was a German botanist known for notable work on plant taxonomy and phytogeography.

• Bentham and Hooker are famous for the classification of seed plants.

Q7. Answer: (b) Ride

The logic is:

Dog : Guard → Dog is a domestic animal and many a times a dog is kept or used for security/guarding purpose.

Similarly,

Horse : ? → Horse is used for riding purpose.

Hence, 'ride' is the correct answer.

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Q8. Answer: (b) 13^(th) April, 1919

The correct answer is 13th April 1919.

• Jallianwala Bagh massacre take place on 13th April 1919.

Key Points

• Jallianwala Bagh Massacre (13th April 1919 AD)

• The arrest of Dr. Saifuddin Kitchlu and Dr. Satyapal on 10th April 1919 AD, under the Rowlatt Act in connection with Satyagraha caused serious unrest in Punjab.

• A public meeting was held on 13th April 1919 AD in Jallianwala Bagh in Amritsar.

• As soon as the meeting started, General Reginald Dyer ordered the indiscriminate heavy firing.

• As a result, hundreds of men, women, and children were killed and more than 1,200 people wounded.

• Due to this massacre, R.N. Tagore returned 'Knighthood' and Shankaran Nair resigned from the Executive Council of Viceroy.

• Mahatma Gandhi returned the Kaisar-i-Hind title as a protest against the Jallianwala Bagh massacre.

Additional Information

• Rowlatt Act (1919)

• In 1919 a Sedition Committee headed by justice Rowlatt led to the Rowlatt Act.

• This act authorized the government to imprison any person without trial and conviction by the Court of Law for 2 years.

• The law also enabled the government to suspend the right of Habeas Corpus which had been the foundation of civil liberties in Britain.

Q9. Answer: (a) 7-27

The logic is:

1. 7 - 27 → $7^3 = 343 \neq 27$

2. 4 - 64 → $4^3 = 64$

3. 6 - 216 → $6^3 = 216$

4. 9 - 729 → $9^3 = 729$

Hence, '7 - 27' is the odd one out.

Q10. Answer: (c) Cousin

By using the symbols in the table given below, we can draw the following family tree:

i) I, J, K, L, M and N are playing hockey.

(ii) I and M are sisters and N is the brother of M.

(iii) K is the only son of I's paternal uncle.

(iv) J and L are the sons of a brother of K's father.

Clearly, K is the cousin of M.

Hence, 'Cousin' is the correct answer.

Q11. Answer: (d) air pollution

The correct answer is air pollution.

• Lichen is an organism that monitors air pollution.

Key Points

• Lichens are also known as Bioindicators.

• Bioindicators are those living organisms that respond in an especially clear way to a change in the environment.

• The lichens are useful bioindicators for air pollution, especially for sulfur dioxide pollution because they derive their water and essential nutrients mainly from the atmosphere rather than from the soil.

• Lichens:

• They are a complex life form that has a symbiotic partnership of two separate organisms, a fungus, and algae.

• The lichens derive the majority of their characteristics from fungus.

Q12. Answer: (c) [figure]

The mirror image of CHIVALRY is shown below:

Hence, 'option 3' is the correct answer.

Q13. Answer: (c) 1/3

Calculation:

Let the denominator of the required fraction = a

So, the numerator will be = a - 2

According to the question:

(a - 2) × 2/a × 3 = 2/9

=> (a - 2)/a = 1/3

=> 3a - 6 = a

=> 2a = 6

=> a (denominator) = 3

=> Numerator = 3 - 2 = 1

Therefore The required fraction is 1/3.

Q14. Answer: (a) -3

Given:

p2 + q2 - r2 = 0

Formula used:

$(a + b)^3 = a^3 + b^3 + 3ab(a + b)$

Calculation:

Given that, p2 + q2 - r2 = 0

=> p2 + q2 = r2

By cubing both sides.

=> (p2 + q2)³ = r^6

=> p^6 + q^6 + 3. p².q²(p2 + q2) = r^6

=> p6 + q6 + 3. p2.q2.r² = r^6 Because [p2 + q2 = r2]

=> p6 + q6 - r6 = - 3p2q2r2

Therefore (p6 + q6 - r6) ÷ p2q2r2 = - 3

Q15. Answer: (b) Japan

The correct answer is Japan.

• The yen is the currency of Japan.

Key Points

• Japan:

• Capital: Tokyo

• Currency: Japanese yen

• Prime minister: Shigeru Ishiba

• The six main islands of Japan from north to south, are Sakhalin, Hokkaido, Honshu, Shikoku, Kyushu, and Okinawa.

• Sakhalin is a part of the Russian Federation.

• Honshu is the largest Island.

• The capital Tokyo is located on it.

Additional Information

• The currency of Maldives is Maldivian rufiyaa.

• The currency of South Korea is South Korean won.

• The currency of Indonesia is the Indonesian rupiah.

Q16. Answer: (c) Andhra Pradesh

The correct answer is Andhra Pradesh.

• Andhra Pradesh has a Legislative Council.

Key Points

• The State Legislature

• Only 6 States, Andhra Pradesh, Bihar, Karnataka, Telangana, Maharashtra, and Uttar Pradesh are having a Bicameral legislature.

• As per Article 169, if the Legislative Assembly passes a resolution for abolishing or creating of the Legislative Council by a

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majority of the total membership of the Assembly and by a majority of not less than two-thirds of the members present and voting.

• The size of the Legislative Council may vary, but its membership should not be more than 1/3rd of the membership of the Legislative Assembly but not less than 40.

• 5/6th of the total number of members of the Council is indirectly elected and 1/6th is nominated by the Governor.

• Of the total number of members of a Legislative Council:

• 1/3rd elected from local bodies (municipalities and district boards).

• 1/12th elected by graduates of 3 years standing and residing in the state.

• 1/12th elected by teachers of 3 years standing in the State, not lower in standing than secondary school.

• 1/3rd elected by the members of the Legislative Assembly of the State from amongst persons, who are not members of the assembly.

Q17. Answer: (d) 1/8

Concept:

Composite Numbers = They are those numbers that have more than two factors. For example, 6 (1 × 2 × 3) is a composite number since it has three factors.

Prime Numbers = They are natural numbers greater than 1 and are not a product of two smaller natural numbers. A prime number has exactly two factors, that is, 1 and the number itself.

Formula used:

Mean/ Average = Sum of all observations/ Total no of all observations

Calculation:

First eight composite natural numbers = 4, 6, 8, 9, 10, 12, 14, 15

First eight prime numbers = 2, 3, 5, 7, 11, 13, 17, 19

Mean of the first 8 composite numbers = (4 + 6 + 8 + 9 + 10 + 12 + 14 + 15) ÷ 8

=> 78 ÷ 8

Mean of the first 8 prime numbers = (2 + 3 + 5 + 7 + 11 + 13 + 17 + 19) ÷ 8 = 77 ÷ 8

Therefore The required difference = 78 ÷ 8 - 77 ÷ 8 = 1/8

Q18. Answer: (a) NNP = GNP - Depreciation

The correct answer is NNP = GNP - Depreciation.

• Net National Product (NNP) is NNP = GNP - Depreciation.

Key Points

• Net National Product (NNP):

• NNP is obtained by subtracting depreciation value (i.e. capital stock consumption) from GNP.

Additional Information

• Gross Domestic Product (GDP):

• It is the total money value of all final goods and services produced within the geographical boundaries of the country during a given period of time.

• GDP = C + G + I

• C = Consumption expenditure

• G = Government expenditure

• I = Investment expenditure

• Gross National Product (GNP):

• It refers to the money value of the total output of production of final goods and services produced by the nationals of a country during a given period of time, generally a year.

• National Income (NI):

• When NNP is calculated at factor cost (FC) it is called National Income.

• The measure is calculated by deducting indirect taxes and adding subsidies in NNP at Market Price (MP).

• In India, the Wholesale Price Index (WPI) is the weighted average price of 676 items with the base year 2017-18.

Q19. Answer: (a) 16% decrease

Given:

Increase/Decrease percent = 40%

Calculation:

Let the number be = 100%

The number after increase & decrease = 100% × (100 + 40)% × (100 - 40)%
=> 100% × 140/100 × 60/100
=> 84%
Therefore The net change percent = 100% - 84% = 16% decrease
Alternate Method Percentage change = x + y ± xy/100
{ + for increase, - for decrease)
Net change = + 40 - 40 - (40 × 40)/100
=> - 16 or 16% decrease

Q20. Answer: (c) 39

Concept:
The smallest number of four digits = 1000
Calculation:
First, the square root of 1000 is needed to be calculated.
√ 1000 = √ 2 × 2 × 2 × 5 × 5 × 5 = 10 √ 10 = 10 × 3.162 = 31.622
Now, as we observe that the square root of 1000 is slightly more than 31, we need to find out the square of 31.
=> $31^2 = 961$
Now, let us subtract 961 from 1000.
=> 1000 - 961 = 39
Therefore 39 must be subtracted from 1000 to make it a perfect square.
Alternate MethodBy using the hit and trial method.
Option 1) 1000 - 120 = 880 ≠ perfect square
Option 2) 1000 - 159 = 841 = perfect square but 159 is not the least number to be subtracted.
Option 3) 1000 - 39 = 961 = perfect square
Option 4) 1000 - 24 = 976 ≠ perfect square
Therefore The required least number is 39.

Q21. Answer: (d) 0

Given:
x2 - 2x + 1 = 0
Formula used:
$(a - b)^2 = a^2 + b^2 - 2ab$
(a - b)3 = a3 - b3 - 3ab(a - b)
Calculation:
By dividing the equation x2 - 2x + 1 = 0 by x, we get;
=> x - 2 + 1/x = 0
=> x + 1/x = 2
By squaring both sides.
=> $x^2 + 1/x^2 + 2 \times x \times 1/x = 4$
=> x2 + 1/x2 = 2
Now, by subtracting 2 on both sides.
=> x2 + 1/x2 - 2 = 2 - 2
=> $(x - 1/x)^2 = 0$
Therefore (x - 1/x) = 0
By cubing both sides.
$(x - 1/x)^3 = 0$
=> $x^3 - 1/x^3 - 3 x \times 1/x (x - 1/x) = 0$
=> x3 - 1/x3 = 0 - 3(x - 1/x) = 0 - 3 × 0 = 0 [(x - 1/x) = 0]
Therefore x3 - 1/x3 = 0
Alternate Method Following are some important results that need to be remembered while solving these types of questions.
If (x + 1/x) = a, then $(x - 1/x) = \sqrt{(a^2 - 4)}$
If (x - 1/x) = a, then $(x^3 - 1/x^3) = a^3 + 3a$

Calculation:

If (x + 1/x) = 2, then (x - 1/x) = √(4 - 4) = 0

If (x - 1/x) = 0, then (x3 - 1/x3) = 03 + 3 × 0 = 0

Q22. Answer: (d) 1 : 1

Given:

Average age of boys and girls together = 16.8 years

Average age of boys = 15.4 years

Average age of girls = 18.2 years

Formula used:

Let the number of boys be B and the number of girls be G.

We can use the formula for the combined average:

Combined average = (Sum of ages of boys + Sum of ages of girls) / (Number of boys + Number of girls)

=> 16.8 = (15.4B + 18.2G) / (B + G)

Calculation:

Multiplying both sides by (B + G):

=> 16.8(B + G) = 15.4B + 18.2G

Expanding:

=> 16.8B + 16.8G = 15.4B + 18.2G

Rearranging the equation:

=> 16.8B - 15.4B = 18.2G - 16.8G

=> 1.4B = 1.4G

=> B / G = 1.4 / 1.4

=> B / G = 1 / 1

=> The ratio of the number of boys to girls = 1:1

Therefore The ratio of the number of boys to girls in the school is 1:1.

Q23. Answer: (c) Indulal Yagnik

The correct answer is Indulal Yagnik.

• The Tri-Color which was hoisted in Stuttgart by Madam Cama was smuggled into British India by Indulal Yagnik.

Key Points

• Madam Bhikaji Cama:

• She was the first lady to first hoist India’s flag on foreign soil.

• The tri-colour flag was hoisted at the International Socialist Conference at Stuttgart in Germany in 1907.

• The tri-colour consisted of green, saffron, and red stripes.

• The flag hoisted by Madam Bhikaji Cama was smuggled into British India by Indulal Yagnik.

• It is now on display at the Maratha and Kesari Library in Pune.

• She started a newspaper called Bande Mataram.

Additional Information

• Vinayak Damodar was also known as Veer Savarkar.

• He started Abhinav Bharat in 1904.

Q24. Answer: (b) Network Interface Unit

The correct answer is Network Interface Unit.

• NIU stand for Network Interface Unit in information technology.

Key Points

• Network Interface Unit:

• It is a physical enclosure, located at the service endpoint, that connects between the HFC network and local residential wiring.

• It establishes a point of demarcation between the HFC network and the subscriber premise and may include a variety of functional elements.

• It demarcates the HFC network from the subscriber’s HFC networks.

Additional Information

Some of the abbreviations are:

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Abbreviation	Full-Form
ROM	Read-Only Memory
CPU	Central Processing Unit
URL	Uniform Resource Locator
USB	Universal Serial Bus
VIRUS	Vital Information Resource Under Siege
TCP	Transmission Control Protocol
UPS	Uninterruptible Power Supply
SATA	Serial Advanced Technology Attachment
RAM	Random Access Memory
SMPS	Switched-Mode Power Supply
CD	Compact Disc

Q25. Answer: (c) Some amateurs are not players

The least possible Venn diagram is:

1. Some pilots are players → False (As, there is no definite relation between pilots and players. Hence, false)
2. Some pilots are not players → False (Nothing regarding pilots not being players is given in the statements.)
3. Some amateurs are not players → True (As only a few amateurs are players given, some amateurs will not be players definitely.)
4. Some players are pilots → False (As, there is no definite relation between pilots and players. Hence, false)

Hence, 'Some amateurs are not players' is the correct answer.

Additional Information'Only a few' is equivalent to 'Some' + 'Some not'.

If it is given that 'Only a few A are B' then conclusions 'Some A are B' and Some A are not B' would always be considered as True.

Q26. Answer: (b) 1 unit

Given:

The side of the equilateral triangle = √3 unit

Formula used:

The circumradius of the equilateral triangle = Side of the triangle ÷ √3

Calculation:

According to the question,

The radius of the circumcircle of the equilateral triangle = Side of the triangle/√3

=> √3 ÷ √3

=> 1

Therefore The radius of the circumcircle of the equilateral triangle is 1 unit.

Q27. Answer: (a) PROM

The correct answer is PROM.

• PROM is not a part of auxiliary memories in a Computer system.

Key Points

• Secondary Memory/ Auxiliary memory:

• An Auxiliary memory is the lowest-cost, highest-capacity and slowest-access storage in a computer system.

• It is permanent in nature, so it is also called non-volatile.

• In these memories, programs and data are kept for long-term storage or when not in immediate use.

• Examples of auxiliary memories are magnetic tapes, Floppy, CD-ROM and magnetic disks.

• The PROM (Programmable Read-Only Memory) has the option of being programmed.

• It is not a part of auxiliary memory.

Additional Information

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• Primary Memory:
• It is often referred to as the working memory of the main memory of a computer system.
• It is temporary in nature, so it is also called volatile memory.
• Its example is RAM.

Q28. Answer: (c) Robert B. Wilson

The correct answer is Robert B. Wilson.
• Robert B. Wilson received the Nobel Prize for Economic Sciences in 2020.
Key Points
Nobel Prize 2020 Winners

Field	Winner
Physics	Roger Penrose, Reinhard Genzel, Andrea Ghez
Chemistry	Emmanuelle Charpentier, Jennifer A. Doudna
Physiology or Medicine	Harvey J. Alter, Michael Houghton, Charles M. Rice
Literature	Louise Glück
Nobel Peace Prize	World Food Programme (WFP)
Economic Sciences	Paul R. Milgrom, Robert B. Wilson

Additional Information
• Nobel Prize:
• The Nobel Prizes are given under the will of Alfred Bernhard Nobel, who died in 1896.
• Nobel Prizes are given each year in the six fields.
• The Nobel Prizes for Peace, Physics, Chemistry, Medicine, and Literature were started in 1901.
• The Nobel Prize for Economics was started in 1968.
• The prize-awarding bodies are the
• Swedish Academy of literature awards the Prize in Literature.
• The Royal Swedish Academy of Sciences awards the prize in Physics and Chemistry.
• The Nobel Assembly of Karolinska Chirurgical (Sweden) awards the prize in Medicine (Physiology).
• The Bank of Sweden awards the Prize in Economics.
• The Committee of the Norwegian Parliament awards the prize for Peace.

Q29. Answer: (a) 5 - 2√6

Given:
√2 + √x = √3
Formula used:
(a - b)2 = a2 + b2 - 2ab
Calculation:
√2 + √x = √3
=> √x = √3 - √2
By squaring both sides:
=> x = (√3)² + (√2)²- 2 ×√3 × √2
=> x = 3 + 2 - 2√ 6
Therefore x = 5 - 2√ 6

Q30. Answer: (a) European Union

The correct answer is European Union.
• The Global Climate Change Alliance is an initiative of the European Union.
Key Points
• The Global Climate Change Alliance:
• The objective of the initiative is to build a new alliance on climate change between the European Union and the poor developing countries that are most affected and that have the least capacity to deal with climate change.

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• It was created in 2007.

• After the Paris Agreement on Climate Change in 2015, the GCCA became the GCCA+ initiative and has expanded to include middle-income countries and supporting the implementation of Nationally Determined Contributions (NDCs).

• The eight sectors in which GCCA/GCCA+ operates are:

• Agriculture and food security which includes fisheries.

• Economic development and tourism

• Education and research

• Environment and natural resources which includes forestry.

• Water and sanitation

• Disaster risk reduction DRR

• Energy

• Infrastructure, transport, waste management, and information and communication technology (ICT).

Additional Information

Some of the World organizations:

Organization	Headquarters	Year of Establishment
United Nations	New York (USA)	1945
World Health Organization	Geneva (Switzerland)	1948
International Labor Organization	Geneva (Switzerland)	1919
International Committee of the Red Cross	Geneva (Switzerland)	1863
World Trade Organization	Geneva (Switzerland)	1995
World Meteorological Organization	Geneva (Switzerland)	1950
International Atomic Energy Agency	Vienna (Austria)	1957
Organization of Petroleum Exporting Countries	Vienna (Austria)	1960
International Monetary Fund	Washington DC (USA)	1944
World Bank	Washington DC (USA)	1944

Q31. Answer: (c) [figure]

The mirror image of A!B@C#D$E% is shown below:

Hence, ‘option 3’ is the correct answer.

Q32. Answer: (a) 1.0

Follow BODMAS rule to solve this question, as per the order given below,

Given:

P = 2 + 0.2 ÷ (0.2 × 2) - 1 × 2

Q = 2 - 0.2 ÷ (0.2 × 2) - 1/2 × 2

Calculation:

P = 2 + 0.2 ÷ 0.4 - 2 = 1/2

Q = 2 - 0.2 ÷ 0.4 - 1 = 1/2

Therefore P/Q = 1/2 ÷ 1/2 = 1 or 1.0

Q33. Answer: (b) 14

Given:

No of students (n) = 20

The marks in ascending order are as follows:

7, 9, 12, 12, 12, 13, 13, 14, 14, 14, 14, 15, 16, 17, 18, 18, 18, 19, 20, 20

Formula used:

Mode : It is calculated as the highest occurring frequency in a given data.

Median:

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When n is even, median = [(n/2)^(th) term + (n/2 + 1)^(th) term] ÷ 2

Calculation:

Mode = As 14 has occurred 4 times, which is the highest frequency in the given data. Hence, 14 is the mode.

Median = [20/2 + (20/2 + 1)] ÷ 2 = [10th + 11th]term ÷ 2

=> [14 + 14] ÷ 2 = 14

Therefore (2 × median - mode) = (2 × 14 - 14) = 14

Q34. Answer: (c) 2 + 2√3

Given:

(√(19 - x √12))/1 = √4 - √3

Formula used:

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

Calculation:

√(19 - x √12) = √4 - √3

By squaring both sides:

=> 19 - x √ 12 = (√ 4 - √ 3)²

=> 19 - x √ 12 = 4 + 3 - 2 × 2 × √ 3

=> 19 - 7 + 4√ 3 = x √ 12

=> 12 + 4√ 3 = 2√ 3 x

=> 4 × √ 3 × √ 3 + 4√ 3 = 2√ 3 x

=> 2√ 3 (2√ 3 + 2) = 2√ 3 x

=> x = (2√ 3 + 2)

Therefore The required value = (2 + 2√ 3)

Q35. Answer: (d) 15 days

Given:

No of days A takes to do the job = 20

No of days B takes to do the job = 30

Formula used:

Total work = No of days taken × One day Efficiency

Calculation:

Let the total work be the LCM of days taken by A and B to complete the work as the common multiple.

=> LCM (20, 30) = 60

Days taken Total work Efficiency

A (20) 3 units per day

60 units

B (30) 2 units per day

No of days for which B alone worked = 5

So, Total work = 60 units

5 days work by B (2 × 5) = 10 units

Remaining work done by A and B = (60 - 10) 50 units

No of days taken by A and B to do the remaining work = 50 days ÷ (3 + 2)

=> 10

Therefore Total time taken by A and B to complete the work is (5 + 10) = 15 days

Q36. Answer: (a) 36

The pattern followed here is:

According to the alphabetical positions of the letters,

AMBER → A (1) + M (13) + B (2) + E (5) + R (18) = 1 + 13 + 2 + 5 + 18 = 39 and 3 × 9 = 27

BROWN = 14 → B (2) + R (18) + O (15) + W (23) + N (14) = 72 and 7 × 2 = 14

Similarly,

GREEN → G (7) + R (18) + E (5) + E (5) + N (14) = 7 + 18 + 5 + 5 + 14 = 49 and 4 × 9 = 36

Hence, ‘36’ is the correct answer.

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Q37. Answer: (a) Gully Boy

The correct answer is Gully Boy.

• Gully Boy was given the Filmfare Award for Best Film in 2020.

Key Points

• 65th Filmfare Awards:

• The award is given to honour artistic and technical excellence in the Hindi-language film industry of India.

• It was first introduced by the Filmfare magazine of The Times Group in 1954.

• 65th Filmfare Awards were held at Indira Gandhi Athletic Stadium, Guwahati

• Winners:

• Best Film: Gully Boy

• Best Director: Zoya Akhtar – Gully Boy

• Best Actor: Ranveer Singh – Gully Boy

• Best Actress: Alia Bhatt – Gully Boy

Additional Information

• Dada Saheb Phalke Award:

• Dadasaheb Phalke Award is India's highest award in cinema.

• It is presented annually at the National Film Awards ceremony by the Directorate of Film Festivals (an organization set up by the Ministry of Information and Broadcasting).

• The award prize consists of a golden lotus, a cash prize of Rs. 10 lakh and a shawl.

• The award is given to people for their outstanding contribution to the growth and development of Indian cinema.

• It was first presented in 1969.

• The first recipient of the award was actress Devika Rani, “the first lady of Indian cinema.

Q38. Answer: (d) APPLE

The correct answer is APPLE.

• The first Indian Communication satellite is APPLE.

Key Points

• Ariane Passenger Payload Experiment (APPLE):

• It was an experimental communication satellite successfully launched by Ariane-1, from French Guiana on June 19, 1981.

• It was India's first communication satellite.

• The satellite provided experience in building and operating a payload experiment three-axis stabilized communication satellite.

Additional Information

• Rohini RS-1 was India’s first indigenous satellite launch.

• It was used for measuring the in-flight performance of the second experimental launch of SLV-3.

• It was launched on 18 July 1980.

• Aryabhatta:

• It was India’s first satellite.

• It was launched on 19 April 1975 using u-11 Interkosmos.

• Mars Orbiter Mission (MOM):

• The Mars Orbiter Mission (MOM), informally called Mangalyaan is India’s first Mars orbiter.

• It was launched on 5 November 2013.

Q39. Answer: (a) Biosphere

The correct answer is Biosphere.

• The region of planet Earth, where life exists is known as Biosphere.

Key Points

• Biosphere

• The part of the earth where life exists is called the Biosphere.

• It is composed of both living organisms (biota) and the abiotic (nonliving) factors from which they derive energy and nutrients.

Additional Information

• A hemisphere is a half of a ball-shaped object made by the division of the equator which divides the earth into the northern and southern hemispheres.

• An atmosphere is a layer of gases that envelope a planet and is held in place by the gravity of the earth.

• A cryosphere is the frozen water part of the Earth system.

Q40. Answer: (a) Grammy

The correct answer is Grammy.

• Grammy Awards is associated with only Music.

Key Points

• Grammy Awards:

• The award is presented annually in the United States by the National Academy of Recording Arts & Sciences (NARAS).

• NARAS is also called the Recording Academy.

• It is given to recognize achievement in the music industry.

• The trophy represents a gilded gramophone.

• 2021 Grammy Award Winners:

• Record of the Year: "Everything I Wanted"- Billie Eilish.

• Album of the Year: Folklore- Taylor Swift.

• Song of the Year: "I Can't Breathe"- Dernst Emile

Additional Information

• Oscar Award:

• It was instituted in 1929 and is conferred annually by the Academy of Motion Pictures in the United States.

• Mahboob Khan's Mother India was the first Indian film to be nominated in the best foreign film category in 1958.

• The first Indian to share the Oscar was Bhanu Athaiya for the film 'Gandhi'.

• Satyajeet Ray was the first Indian who was awarded Oscar for lifetime achievement in cinema in 1992.

• Cannes:

• It is an international film festival.

• It is named after a resort town on the French Riviera.

Q41. Answer: (a) photosphere

The correct answer is the photosphere.

• The glowing surface of the sun is known as the photosphere.

Key Points

• Sun:

• Its diameter is 14 lakh km.

• It is composed of 71% Hydrogen, 26.5% helium and 2.5% other elements.

• Within the sun, hydrogen is converted to helium due to nuclear fusion releasing a tremendous amount of heat and light.

• The shining surface of the sun is called Photosphere.

• The outer layer of the sun's atmosphere made up of thin hot gases is called Corona.

• The middle surface is the chromosphere.

• The temperature of the Photosphere is 6000°C, that of the chromosphere is about 32400°C and that of Corona is about 2700000°C.

• Light takes about 8 minutes 20 seconds to reach the earth from the sun.

Additional Information

• The lithosphere is the uppermost layer of the earth's crust which is capable of supporting life.

• Andromeda is the nearest galaxy to Milky Way.

• The nearest star to our solar system is Proxima Centauri.

Q42. Answer: (c) USA and Canada

The correct answer is USA and Canada.

• 49th parallel is a boundary between the USA and Canada.

Key Points

• 49th parallel:

• The 49th parallel lies in the Northern Hemisphere.

• It is a circle of latitude that is 49° north of Earth's equator.

• It was demarcated after the Anglo-American Convention of 1818 and the Oregon Treaty of 1846.

• The line also forms the international border between the northern USA and Canada.

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Additional Information

• Some of the International boundaries are:

Name	Demarcating Nations
17th Parallel	South Vietnam and North Vietnam
20th Parallel	Libya and Sudan
25th Parallel	Mauritania and Mali
31st Parallel	Iran and Iraq
38th Parallel	South Korea and North Korea
Durand Line	Pakistan and Afghanistan
Hindenburg Line	Poland and Germany
McMahon Line	China and India
Maginot Line	Germany and France
Mannerheim Line	Russia and Finland
Radcliffe Line	India and Pakistan
Siegfried Line	France and Germany
Blue Line	Lebanon and Israel

Q43. Answer: (c) Lord Chelmsford

The correct answer is Lord Chelmsford.

• Jallianwala Bagh massacre took place during the term of Viceroy Lord Chelmsford.

Key Points

• Jallianwala Bagh Massacre (13th April 1919 AD)

• The arrest of Dr. Saifuddin Kitchlu and Dr. Satyapal on 10th April 1919 AD, under the Rowlatt Act in connection with Satyagraha caused serious unrest in Punjab.

• A public meeting was held on 13th April 1919 AD in Jallianwala Bagh in Amritsar.

• It took place during the term of Viceroy Lord Chelmsford

• As soon as the meeting started, General Reginald Dyer ordered the indiscriminate heavy firing.

• As a result, hundreds of men, women, and children were killed and more than 1,200 people wounded.

• Due to this massacre, R.N. Tagore returned ‘Knighthood’ and Shankaran Nair resigned from the Executive Council of Viceroy.

• Mahatma Gandhi returned the Kaisar-i-Hind title as a protest against the Jallianwala Bagh massacre.

Additional Information

• Lord Irwin was viceroy from 1926 AD-1931 AD.

• Lord Dalhousie served as the Governor-general of India from the year 1848-1856.

• Lord Ripon was viceroy from 1880-84.

• Rowlatt Act (1919)

• In 1919 a Sedition Committee headed by justice Rowlatt led to the Rowlatt Act.

• This act authorized the government to imprison any person without trial and conviction by the Court of Law for 2 years.

• The law also enabled the government to suspend the right of Habeas Corpus which had been the foundation of civil liberties in Britain.

Q44. Answer: (a) Shiv Kumar Sharma

The correct answer is Shiv Kumar Sharma.

• Shiv Kumar Sharma is a famous Santoor instrumentalist.

Key Points

• Shiv Kumar Sharma:

• He is a music composer and a santoor maestro.

• He hails from the Union territory of Jammu & Kashmir.

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• Santoor:
• It is a trapezoid-shaped hammered dulcimer instrument.
• It is a traditional instrument of the UT of Jammu and Kashmir.
Additional Information
• Ustad Binda Khan is a Sarangi maestro.
• Sajjad Hussain was a music composer.
• Nikhil Banerjee is a Sitar maestro.

Q45. Answer: (b) 30°

Given:
cos 2θ = sin θ
Identity used:
Sin (90° - θ) = cos θ
Calculation:
Cos 2θ = sin θ
=> Sin (90° - 2θ) = sin θ
=> 90° - 2θ = θ
=> 3θ = 90°
=> θ = 30°

Q46. Answer: (a) 1489, 11

Concept:
HCF : The sum of any two numbers is divisible by their HCF.
Product of two numbers = HCF × LCM
Given:
Sum of two numbers = 1500
LCM = 16379
Calculation:
Let the two numbers be = a & b
=> a + b = 1500
=> b = 1500 - a
Let by dividing 1500 by the HCF say h, we get any number, say p.
=> 1500 ÷ HCF = p
Let by dividing 16379 by HCF say h, we get any number, say q
=> 16379 ÷ HCF = q [p & q are integers]
=> h is the HCF of 1500 and 16379
Now, 16379 ÷ 1500 × p = q
$1500 = 2^2 \times 3 \times 5^3$
16379 = 11 × 1489
Clearly, The HCF (h) of 1500 and 16379 is 1.
As we know, a × (1500 - a) = HCF × LCM = 1 × 16379
=> $1500a - a^2 = 16379$
=> $a^2 - 1500a - 16379 = 0$
=> $a^2 - 1489a - 11a - 16379 = 0$
=> a (a - 1489) - 11(a - 1489) = 0
=> (a - 11) (a - 1489) = 0
=> a = 11, 1489
For a = 11, b = 1500 - 11 = 1489
For a = 1489, b = 1500 - 1489 = 11
Therefore In both the cases, two numbers are 11 and 1489.

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Q47. Answer: (a) Albert Einstein

The correct answer is Albert Einstein.

• The Theory of Relativity is associated with Albert Einstein.

Key Points

• The Theory of Relativity was given by Albert Einstein.

• The theory encompasses two interrelated theories of Albert Einstein that are special relativity and general relativity.

• The theories were proposed and published in the years 1905 and 1915.

• Special relativity applies to all physical phenomenon in the absence of gravity.

• General relativity explains the law of gravitation and its relation to the other forces of nature.

Additional Information

• WC Rontgen is known for the production and detection of electromagnetic radiation in a wavelength range known as X-rays.

• He was given the Nobel Prize in Physics in 1901.

• Isaac Newton is known for his formulation of the three laws of motion which are the basic principles of modern physics.

• Kelvin is the base unit of temperature in the International System of Units.

• It is named after the physicist William Thomson, 1st Baron Kelvin.

Q48. Answer: (d) Rs. 1650

Given:

Gain percent = 12%

Formula used:

The profit is calculated on the cost price which is 100% of itself.

Selling price = Cost price + Gain

Calculation:

Old selling Price = (100% + 12%) of Cost price = 112% CP

It is given that if the article had been sold for Rs.33 more, there would a gain of 14%.

=> New selling price = (100% + 14%) of Cost price = 114%

Accordingly, New SP - Old SP = (114% - 112%) of CP = Rs.33

=> 2% of CP = Rs.33

=> 100% of CP = Rs.33 ÷ 2% × 100% = Rs.1650

Therefore The cost price of the article is Rs.1650

Shortcut Trick (114% - 112%) CP = 33

=> 100% CP = 33/2% × 100% = Rs.1650

Q49. Answer: (d) Grey

The correct answer is Grey.

• Grey colour is associated with the revolution in fertilisers.

Key Points

Agriculture Revolutions in India and their respective Colours:

Name of the Revolution	Associated Field
Yellow Revolution	Oilseeds
White Revolution	Milk
Black Revolution	Petroleum Production
Red Revolution	Meat and Tomato Products
Round Revolution	Potato
Silver Fiber Revolution	Cotton
Blue Revolution	Fish
Pink Revolution	Shrimp
Grey Revolution	Fertilizers
Green Revolution	Food Grains

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Golden Revolution	Honey and Horticulture
Silver Revolution	Egg and Poultry
Brown Revolution	To enhance infrastructure facilities for increasing production/marketing and export of high quality horticultural crops
Golden Fibre Revolution	Jute production in India

Q50. Answer: (a) ENVAQEBC

The pattern followed here is:

According to the alphabetical positions of the letters,

Similarly,

Hence, 'ENVAQEBC' is the correct answer.

Q51. Answer: (a) 4/21

Follow BODMAS rule to solve this question, as per the order given below,

Calculation:

1/2 × 2/3 - 3/4 (1/2 × 1/3 + 5/6) × 4/21= ?

=> (1/2) × (2/3) - 3/4(1/6 + 5/6) × 4/21 = ?

=> 1/3 - 3/4 × (4/21) = ?

=> 1/3 - 1/7 = ?

=> (7 - 3)/21 = ?

Therefore 4/21 = ?

Q52. Answer: (a) √3 cm²

Concept:

Median triangle: The segments joining the midpoints of the sides of an equilateral triangle form a medial triangle. The line segments joining the midpoints divide the equilateral triangle into 4 equal parts with equal areas.

Given:

Side of the equilateral triangle ABC = 4cm

Formula used:

Area of an equilateral triangle = (√3/4)× side²

Calculation:

Area of triangle PQR = 1/4 × Area of triangle ABC

=> 1/4 × (√3/4)× 4 × 4 = √ 3 cm²

Therefore The required area = √ 3 cm2

Q53. Answer: (b) Siraj-ud-Daula

The correct answer is Siraj-ud-Daula.

• Siraj-ud-Daula fought the Battle of Plassey against the East India Company.

Key Points

• Battle of Plassey:

• On 23rd June 1757 AD, the East India Company's forces under Robert Clive won the battle against Siraj-ud- Daula and compelled the Nawab to concede all the demands.

• Mir Zafar (Mir Bakhsh), Manik Chand, Officer in charge of Calcutta, Aminchand, rich Sikh merchant Jagat Seth, banker Khadim Khan, Commander of Nawab's army, all were in the English side and betrayed the Nawab.

• Nawab Siraj-ud-Daula was killed by Mir Zafar's son Miran.

• Siraj-ud-Daula (1756 AD-1757 AD):

• He was the grandson of Alivardi Khan.

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

• He was responsible for the Blackhole tragedy.

• Robert Clive recovered Calcutta and the Treaty of Alinagar was signed on 2nd January 1757 AD.

Additional Information

• Alivardi Khan prevented the English and the French from fortifying their factories at Calcutta and Chandranagore.

• Mir Jafar granted undisputed right to free trade in Bengal, Bihar, and Orissa to the East India Company.
• Tipu Sultan signed the Treaty of Mangalore (1784 AD) which ended the Second Anglo-Mysore War.

Q54. Answer: (c) 2800 votes, 3600 votes

Given:

Percentage of total votes that the winning candidate got = 48%

No of votes which the losing candidates got that is 34% of the total votes = 6800

Calculation:

No of votes gained by losing candidate = 6800

=> 34% = 6800

=> 100% (Total votes) = 20000

No of votes got by the winning candidate = 20000 × 48/100 = 9600

Therefore The winning margin of the winning candidate = 9600 - 6800 = 2800

Therefore Number of invalid votes = Total votes - votes given to winning and losing candidates

=> 20000 - (9600 + 6800) = 3600

Q55. Answer: (a) 10 √2 m

Concept:

The length of a longest pole means the longest distance in a room. Given that room is in the form of cuboid so the longest length of a line in the cuboid is a diagonal of the cuboid.

Given:

Length (l), breadth (b) and height (h) = 10m, 8m and 6m

Formula used:

Length of the diagonal of the cuboid = $\sqrt{l^2 + b^2 + h^2}$

Calculation:

The length of the longest pole = $\sqrt{10^2 + 8^2 + 6^2} = \sqrt{100 + 64 + 36} = \sqrt{200}$

=> $\sqrt{2^3 \times 5^2} = 2 \times 5\sqrt{2} = 10\sqrt{2}$ m

Therefore The longest pole in the room is $10\sqrt{2}$ m long.

Q56. Answer: (d) Rs. 7200

Shortcut Trick

Convert the investment ratio to integers by multiplying with the LCM of denominators (2, 3, 4) = 12.

Ratio = 6 : 4 : 3. Total parts = 6 + 4 + 3 = 13 units.

Unitary method: 13 units = Rs. 15600 => 1 unit = Rs. 1200.

Largest share (6 units) = 6 × 1200 = Rs. 7200.

Therefore The correct answer is Rs. 7200.

Alternate Method

Given: Investment ratio = 1/2 : 1/3 : 1/4 and Total Profit = Rs. 15600.

Formulas: Profit Share prop. to Investment × Time | Total Profit = Sum of individual shares.

=> Ratio of profit = (1/2 × 12) : (1/3 × 12) : (1/4 × 12) = 6 : 4 : 3.

=> Let the shares be 6x, 4x, and 3x. Sum = 13x.

=> 13x = 15600 => x = 15600 ÷ 13 = 1200.

=> Largest share = 6x = 6 × 1200 = 7200.

Therefore The correct answer is Rs. 7200.

Additional Information

Partnership Principles

When the time period of investment is the same for all partners, the profit is distributed directly in the ratio of their capital investments.

Ratio Simplification

To simplify a fractional ratio, multiply each term by the Least Common Multiple (LCM) of all the denominators to maintain the proportion in whole numbers.

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Q57. Answer: (c) 16

Formula used:

Average = Sum of all observations ÷ Total no of observations

Calculation:

Average of AQI in Kolkata = (306 + 288 + 274 + 172) ÷ 4 = 1040 ÷ 4 = 260

Average of AQI in Delhi = (248 + 246 + 246 + 236) ÷ 4 = 976 ÷ 4 = 244

Therefore The required difference in averages = 260 - 244 = 16

Q58. Answer: (c) Mumbai

The correct answer is Mumbai.

• Bhabha Atomic Research Centre (BARC) is located in Mumbai.

Key Points

• Bhabha Atomic Research Centre:

• It was established in 1954.

• Its headquarters is in Trombay, Mumbai.

• Earlier, it was known as Atomic Energy Establishment.

• At present, BARC house has eight research reactors:

• Apsara, a one MW Swimming pool-type reactor.

• Cirus, a 40 MW reactor.

• Dhruva, a 100 MW high power nuclear research reactor.

• Zerliana, Purnima I, Purnima II, Purnima III and Kamini

• It comes under the aegis of the Department of Atomic Energy.

Additional Information

• Other Atomic Research Centres in India:

• Atomic Minerals Directorate for Exploration and Research (AMD) is located in Hyderabad.

• Indira Gandhi Centre for Atomic Research (IGCAR) is located in Kalpakkam, Tamil Nadu.

• Variable Energy Cyclotron Centre (VECC) is located in Kolkata.

Q59. Answer: (a) Mass

The correct answer is Mass.

• Mass is a scalar quantity.

Key Points

• Scalar Quantities

• Physical quantities which have magnitude only and no direction are called scalar quantities.

• Example: Mass, Speed, Volume, etc.

Additional Information

• Vector Quantities:

• Physical quantities which have magnitude and direction both and which obey triangle law are called vector quantities.

• Example: Displacement, Velocity, momentum.

Q60. Answer: (d) = to the area of parallelogram ABCD

Given:

ABCD is a parallelogram

BC is produced to E such that BC = CE

Concept:

Midpoint theorem:- When one of the sides of the triangle is parallel to the line segment made by joining the midpoint of the other two sides.

=> PC = 1/2 × AB

Solution:

BC = CE & AB || PC (given)

Therefore PC = 1/2 × AB (midpoint theorem)

Also, AB = DC (opposite sides of ||gm)

Therefore PC = 1/2 × DC => PD = 1/2 × DC

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Now, triangle ABE has the base of line AB i.e. one of the bases of ABCD.

Therefore Area of triangle ABE = Area of parallelogram ABCD (Base area property)

Alternate Method

In the above-given figure, we have let the sides of parallelogram ABCD be 2 units and 4 units for understanding.

So, AB = 2, AD = 4

By mid point theorem:

PC = 1/2 × DC = 1/2 × AB = 1/2 × 2 = 1

By base area property:

Triangles having the same base are equal in area.

So, ABCD can be divided into 3 parts of triangles ABP, ADP, and BCP.

Area of triangles (ABP + ADP + BCP) = 2 + 1 + 1 = 4 sq. units

Now, Area of triangle ABF can be divided into 3 parts of triangle ABP, BCP, PCE.

Area of triangles (ABP + BCP + PCE) = 2 + 1 + 1 = 4 sq. units

Therefore Area of triangle ABE = Area of parallelogram ABCD

Q61. Answer: (a) Boyle's Law

The correct answer is Boyle's Law.

• According to Boyle's Law at a constant temperature, the volume of a gas is inversely proportional to pressure.

Key Points

• Boyle's Law

• At constant temperature, the volume of a definite mass of a gas is inversely proportional to the pressure.

• P. V = constant

Additional Information

• Charles' Law:

• At constant pressure, the volume of a fixed mass of a gas is directly proportional to its absolute temperature.

• V prop. to T

• Gay-Lussac's Law

• At constant volume, the pressure of a given mass of a gas is directly proportional to the temperature in Kelvin.

• P prop. to T

• Graham's Law of Diffusion

• According to this law, the rate of diffusion of a gas is inversely proportional to the square root of its density.

Q62. Answer: (d) New York

The correct answer is New York.

• The headquarters of the United Nations Security Council is located in New York.

Key Points

• United Nations Security Council:

• The main aim of the Security Council is the maintenance of international peace and security.

• Security Council comprises five permanent members, namely China, UK, Russia, France, and USA, and 10 non-permanent members, elected for a term of 2 years by a two-thirds majority of the General Assembly, five non-permanent members retire every year.

• The headquarter of the Security Council is in New York (US).

Additional Information

• United Nations:

• The UNO was formed on 24 October 1945.

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

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

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

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

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Q63. Answer: (b) Rs. 12000

Given:

Half of capital invested at = 5% p.a.

1/3 of capital invested at = 8% p.a.

Remaining part (1/6) of capital invested at = 10% p.a.

Formula used:

Interest = Capital × Time × Rate%

Calculation:

Let the capital invested be Rs.600a being the LCM of 1/2, 1/3 and 1/6 for the convenience of calculation.

According to the question:

(600a × 1/2 × 5/100 × 1 + 600a × 1/3 × 8/100 × 1 + 600a × 1/6 × 10/100 × 1) = 820

=> 15a + 16a + 10a = 41a = 820

=> a = 820/41 = 20

Therefore The capital invested (600a) = 600 × 20 = Rs.12000

Q64. Answer: (d) 900

Concept:

For finding out the smallest square number that is divisible by 12, 15, and 18, we need to calculate the LCM of these numbers.

Calculation:

LCM (12, 15, 18) = 180

=> 180 = 2 × 2 × 3 × 3 × 5

So, in order to make any perfect square no divisible by 180, we need to multiply it by 5.

=> 180 × 5 = 900

Therefore The smallest perfect square number that is divisible by 12, 15, and 18 is 900.

Q65. Answer: (a) 16

The logic is:

(Column 1 - Column 2) = (Column 3 - Column 4)

Row 1: 14 - 12 = 2 and 10 - 8 = 2

Row 2: 10 - 8 = 2 and 6 - 4 = 2

Row 3: 8 - 6 = 2 and 4 - 2 = 2

Similarly,

Row 4:

Let the missing number be 'x'

So, x - 14 = 2

=> x = 2 + 14

=> x = 16

and 12 - 10 = 2

Hence, ‘16’ is the correct answer.

Q66. Answer: (d) Australia

The correct answer is Australia.

• Australia has hosted the Commonwealth Games five times.

Key Points

• Commonwealth Games:

• The Commonwealth Games is the second-largest sports festival in the world after the Olympics.

• The Games are held once in four years but only in the middle of the Olympic years.

• The first Commonwealth Games were held in Hamilton, Canada in 1930.

• India participated for the first time in the second Commonwealth Games held in London in 1934.

• Commonwealth Games are the festival of games of Commonwealth countries.

• Since 1930, the Games have been held every four years except in 1940 and 1946.

• Australia has hosted the Commonwealth Games five times i.e. in 1938, 1962, 1982, 2006, and 2018.

• The last Commonwealth Games was held in the year 2018 in Gold Coast, Queensland, Australia.

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Additional Information

• Commonwealth countries:

• It is a political association of 54 member states which were the former territories of the British Empire.

• England hosted the commonwealth games in the years 1934 and 2002.

• The 2022 commonwealth games will be held in England.

• New Zealand hosted the commonwealth games in the years 1950, 1974 and 1990.

• Canada hosted the commonwealth games in the years 1930,1954, 1978, 1994.

Q67. Answer: (b) 42^(nd) Constitutional Amendment Act

The correct answer is the 42nd Constitutional Amendment Act.

• By the 42nd Constitutional Amendment Act, Fundamental Duties of the citizens were added to the Constitution of India.

Key Points

• Fundamental Duties:

• In 1976, the Fundamental Duties of citizens were added by 42nd Constitutional Amendment Act on the basis of the Swaran Singh Committee Report.

• The list of Fundamental Duties are:

• It shall be the duty of every citizen of India:

• (a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;

• (b) to cherish and follow the noble ideals that inspired the national struggle for freedom;

• (c) to uphold and protect the sovereignty, unity, and integrity of India;

• (d) to defend the country and render national service when called upon to do so;

• (e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities and to

• renounce practices derogatory to the dignity of women;

• (f) to value and preserve the rich heritage of the country's composite culture;

• (g) to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures;

• (h) to develop scientific temper, humanism and the spirit of inquiry and reform;

• (i) to safeguard public property and to abjure violence;

• (j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement; and

• (k) to provide opportunities for education to his child or ward between the age of six and fourteen years.

• This duty was added by the 86th Constitutional Amendment Act, 2002.

Additional Information

• 86th Constitutional Amendment Act added a new Art. 21A after Art. 21 which makes the right of education for children of the age of 6 to 14 years a Fundamental Right.

• 69th Constitutional Amendment Act: Delhi was given the status of National Capital Territory of India.

• 44th Constitutional Amendment Act, 1978: Right to property was taken away from the list of Fundamental Rights and placed in a new Art. 300A as an ordinary legal right.

Q68. Answer: (a) 16 km

According to given conditions,

Total distance travelled by the auto driver (from A to F) = (10 + 8 + 12 + 8 + 4) Km = 42 Km

Straight distance from point A to point F = (10 + 12 + 4) Km = 26 Km

Therefore, had the auto driver taken the direct route, less distance Sita would have actually travelled between the starting point and the destination = (42 - 26) Km = 16 Km

Hence, '16 Km' is the correct answer.

Q69. Answer: (a) Large intestine

The correct answer is Large intestine.

• The Large intestine is not a part of the circulatory system.

Key Points

• Circulatory System:

• The discovery of blood circulation was done by William Harvey.

• It is also called the cardiovascular system.
• It delivers oxygen and nutrients to cells and removes wastes.
• The heart and its parts, capillaries, veins, and blood are part of the circulatory system.
• The heart pumps oxygenated and deoxygenated blood.

Q70. Answer: (c) 9

Letters	A	S	M	D	B	F
Meaning	•	•	×	÷	(	)

Given expression: B700A110S90FDB9M10S10F
After replacing the letters by their meaning, we get:
(700 + 110 – 90) ÷ (9 × 10 – 10)
= (810 – 90) ÷ (90 – 10)
= 720 ÷ 80
= 9
Hence, '9' is the correct answer.

Q71. Answer: (c) M N Roy

The correct answer is M N Roy.
• The idea of a constituent assembly of India for the first time was given by M N Roy.
Key Points
• The idea for a Constituent Assembly was proposed in 1934 by M.N.Roy.
• The Cabinet Mission, 1946 envisaged the establishment of a Constituent Assembly to frame the constitution as well as an interim government.
• It took two years, eleven months, and eighteen days for the Constituent Assembly to finalize the Constitution.
• The Assembly appointed the Drafting Committee with Dr. B.R. Ambedkar as the Chairman on August 29, 1947.
Additional Information
• Dr Sachidanand Sinha was the first President of the Constituent Assembly.
• Dr Rajendra Prasad was elected the President of the Assembly.
• B.N. Rau was appointed as the Constitutional Advisor of the Assembly.

Q72. Answer: (d) 15 days

Given:
No of days taken by A to do the work = 12
The efficiency of A and B respectively = 100% and 80%
Formula used:
Total work = Efficiency × No of days
Calculation:
Let the efficiency of A and B respectively = 100a and 80a
Total work = 100a × 12 days = 1200a units
No of days taken by B to complete the work = 1200a units ÷ 80a
Therefore The required no days = 15

Q73. Answer: (d) 1

Concept:
The numbers 6^n and 5^n always end with 6 and 5 respectively for any natural number.
Calculation:
For n = 1; $6^1 - 5^1 = 1$
For n = 2; $6^2 - 5^2 = 36 - 25 = 1$
For n = 5; 6^5 - 5^5= 7776 - 3125 = 1 and so on.
Therefore 6n - 5n always ends with 1 for any natural number.

Q74. Answer: (d) fire blight

The correct answer is fire blight.

• The disease related to apples is known as fire blight.

Key Points

• Fire blight disease:

• It is a common and very destructive bacterial disease that appears in apples and pears.

• It is caused by the bacterium Erwinia amylovora.

• The disease kills blossoms, fruit, shoots, twigs, branches, and entire apple trees.

• The disease appears in the spring when temperatures get above 19^0 C.

• Climatic conditions like rain, heavy dew and high humidity favour the infection.

Additional Information

• The red rust disease is a disease of the tea plant in which orange-brown, velvety spots develop on the leaves of infected plants.

• The tikka disease is a disease of the groundnut plant.

• The green ear disease is a disease of the pearl millet.

Q75. Answer: (c) 2 : 3

Given:

Revenue earned by Company A in 2001 = Rs.6300 crore

Revenue earned by Company A in 2010 = Rs.8100 crore

Revenue earned by Company A in 2015 = Rs.10800 crore

Calculation:

Increase in the revenue from 2001 to 2010 = 8100 - 6300 = 1800 crore

Increase in the revenue from 2010 to 2015 = 10800 - 8100 = 2700 crore

Therefore The required ratio = 1800 : 2700 = 2 : 3

Q76. Answer: (a) Tehri Hydro Power Complex

The correct answer is Tehri Hydro Power Complex.

• Tehri Hydro Power Complex is in Uttarakhand.

Key Points

• Tehri Hydro Power Complex:

• It is located in the Tehri district of Uttarakhand.

• Tehri Dam is the largest hydroelectric power plant in India.

• The 2,400MW Tehri Hydro Power Complex is built on the river Bhagirathi.

• It consists of projects:

• Tehri Dam & Hydro Power Plant (1000 MW)

• Koteshwar Hydro Electric Project (400 MW)

• Tehri Pumped Storage Plant (PSP) (1000 MW)

• Tehri Hydro Development Corporation Limited:

• It comes under the ownership of National Thermal Power Corporation Limited (NTPC), Ministry of Power.

• It was founded on 12 July 1988.

• Its headquarters are in Rishikesh, Uttarakhand.

Additional Information

• Sharavathi Hydro Power Plant is located in Karnataka.

• Koyna Hydroelectric Project is located in Satara, Maharashtra.

• It is located on the river Koyna.

• It is the second-largest hydroelectric power plant in India.

• Chamera Hydroelectric Project is located in Himachal Pradesh.

• It is located on the river Ravi.

Q77. Answer: (a) Dadabhai Naoroji

The correct answer is Dadabhai Naoroji.

• The first attempt to calculate national income in India was made by Dadabhai Naoroji.

Key Points

• The first attempt to calculate the national income of India was made by Dadabhai Naoroji.
• He estimated a National Income of Rs.340 crore and per capita income of Rs.20 in the year 1867-68.
• Dadabhai Naoroji:
• He was also known as the Indian Gladstone and Grand Old Man of India.
• He was the first Indian to be elected to the House of Commons on a Liberal Party ticket.
• He highlighted the draining of wealth from India by the British and its effect in his book Poverty and unBritish Rule in India (1901).
• He was the first Indian to demand Swaraj in the Calcutta Session of INC, 1906.

Additional Information

• The first scientific method was made by Prof. V.K.R.V. Rao in the year 1931.
• The results of which were unsatisfactory.
• The first official attempt was made by the National Income Committee headed by Prof. P.C. Mahalanobis in 1949.

Important Points

• The Central Statistical Organization (CSO) calculates the National Income.

Q78. Answer: (c) Ministry of Skill Development and Entrepreneurship

The correct answer is the Ministry of Skill Development and Entrepreneurship.

• Jan Shikshan Sansthan (JSS) operates under the aegis of the Ministry of Skill Development and Entrepreneurship.

Key Points

• Jan Shikshan Sansthan (JSS):
• It was earlier known as the Shramik Vidyapeeth.
• The institution provides vocational skills to non-literate, neo-literates, and school drop-outs by identifying skills that have a market in the region of their establishment.
• It comes under the aegis of the Ministry of Skill Development and Entrepreneurship in July-2018.
• Earlier, it was under the aegis of the Ministry of Human Resource Development.
• The name of the Ministry of Human Resource Development was changed to the Ministry of education.
• The target groups also include socio-economically backward and educationally disadvantaged groups of the rural and urban population.
• Priority is also given to women, SC, ST, OBC, and Minorities.

Additional Information

• Ministry of Skill Development and Entrepreneurship:
• It was set up in the year 2014.
• The mission of the ministry is to coordinate all skill development efforts across the country.
• The ministry is currently headed by Union Minister Dharmendra Pradhan.
• Dharmendra Pradhan also holds the portfolio of the Ministry of Education.
• Rajnath Singh is the current the Minister of defense.
• Amit Shah holds the portfolio of the Ministry of Home Affairs and the Ministry of Co-operation of India.

Q79. Answer: (b) 9 days

Given:

Ratio of efficiency of A and B = 3 : 4

No of days taken by A = 12

Formula used:

Total work = Efficiency × No of days

Calculation:

Let the efficiency of A and B = 3x and 4x

Total work = 3x × 12 = 36x units

Therefore No of days taken by B = 36x ÷ 4x = 9

Q80. Answer: (b) 108

Given:

No of students = 360

Calculation:

The percentage of students who scored grade A and grade B = 10% + 20% = 30%
The no of students who scored grade (A + B) = 360 × 30/100 = 108
Therefore The required no of students = 108

Q81. Answer: (b) 1

Given:
x = a sin t
y = b tan t
Identity used:
$Cosec^2 A - cot^2 A = 1$
Calculation:
a/x = 1/ sin t = cosec t
By squaring; $a^2/x^2 = cosec^2 t$ .....(I)
b/y = 1/ tan t = cot t
By squaring; $b^2/y^2 = cot^2 t$ .....(II)
(I) - (II)
$(a^2)/(x^2) - (b^2)/(y^2) = cosec2\ t - cot2\ t = 1$
Therefore The required result = 1

Q82. Answer: (b) Karnataka

The correct answer is Karnataka.
• The famous Gol Gumbaz is located in Karnataka.
Key Points
• Gol Gumbaz:
• It was built by Mohammad Adil Shah.
• It is located in Bijapur, Karnataka.
• It is the largest masonry dome in the world.

Important Points
• Adil Shahis of Dynasty (1490 AD-1686 AD):
• It was founded by Yusuf Adil Shah.
• The dynasty was later annexed by Aurangzeb.
• The greatest ruler of the kingdom was Ibrahim Adil Shah.
• He introduced Dakini in place of the Persian language.

Q83. Answer: (b) 1969

The correct answer is 1969.
• India's first nuclear power station was commissioned in 1969.
Key Points
• India's first nuclear power station was Tarapur Atomic Power Station.
• It was commissioned in the year 1969.
• It is located in the Thane District of Maharashtra.
• It was built with the help of the United States, and the International Atomic Energy Agency (IAEA).
• The Atomic Power Station is operated by the Nuclear Power Corporation of India (NPCIL).
Additional Information
• Other atomic power plants in India:
• Rajasthan Atomic Power Station, Rawatbhata, Rajasthan.
• Narora Atomic Power Plant, Uttar Pradesh.

Q84. Answer: (b) revamping of Public Sector Banks

The correct answer is revamping of Public Sector Banks.
• The "Indradhanush" framework, an Indian government initiative is for the revamping of Public Sector Banks.
Key Points

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• Mission Indradhanush for PSBs:

• It was launched in the year 2015.

• It is a 7 components plan due to which is called Mission Indradhanush.

• The main aim of this mission is at revamping the functioning of the Public Sector Banks and to enable them to compete with the Private Sector Banks.

• The 7 components are appointments, Banks board bureau(BBB), capitalization, de-stressing, empowerment, a framework of accountability, and governance reforms (ABCDEFG).

• The public sector banks account for more than 92% of the entire banking business in India occupying a dominant position in commercial banking.

• The State Bank of India and 12 banks are the public sector banks.

Additional Information

• Mission Indhradhanush:

• It was launched by the Ministry of Health and Family Welfare in December 2014.

• The aim of the scheme is to expand immunization coverage to all children across India.

• Children across socio-economic, cultural and geographical backgrounds in India, are being immunized under this program.

Q85. Answer: (c) 0.135

Follow BODMAS rule to solve this question, as per the order given below,

Calculation:

P = 0.3 × 0.3 + 0.03 × 0.03 - 0.6 × 0.03

=> 0.09 + 0.0009 - 0.018 = 0.0729

Q = 0.54

Therefore P/Q = 0.0729/0.54 = 0.135

Q86. Answer: (a) 52435121251435

The pattern followed here is:

Here letters of the words are coded according to their positional values in English alphabetical series.

A	C	C	E	S	S
1	3	3	5	19	19

Similarly,

E	X	C	E	L	L	E	N	C	E
5	24	3	5	12	12	5	14	3	5

Hence, ‘52435121251435’ is the correct answer.

Q87. Answer: (d) Cousin

By using the symbols in the table given below, we can draw the following family tree:

We do not know the gender of Shanti.

Clearly, Shaurya is the cousin of Karan.

Hence, ‘Cousin’ is the correct answer.

Q88. Answer: (b) UfA

The pattern followed here is:

According to the alphabetical positions of the letters,

Hence, ‘UfA’ is the correct answer.

Q89. Answer: (c) [figure]

The figure that can replace the question mark (?) in the following series is shown below:

The first figure is Octagon, second figure is heptagon, so the third figure must be hexagon and the fourth figure is pentagon, which means the number of lines in each figure decreases by one as we move along the series.

The number of less than signs '<' in each figure decreases by one as we move along the series. In the first figure, there are 7 '<' signs, in the second figure, there are 6 '<' signs, so the next figure must have 5 '<' signs.

Option 3 figure satisfies all the conditions, so it will replace '?' in the given series.

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Hence, ‘option 3’ is the correct answer.

Q90. Answer: (d) Mammal

The logic is:

Grasshopper : Insect → Grasshopper is an Insect.

Similarly,

Hyena : ? → Hyena is a mammal.

Hence, 'Mammal' is the correct answer.

Q91. Answer: (d) [figure]

The figure from among the given options that when placed in the blank block with question marks (?) will complete the pattern is shown below:

Hence, 'option 4' is the correct answer.

Q92. Answer: (b) Golf

The description is as follows:

Option	Description	
1.	Discus throw	The discus throw, also known as disc throw, is a track and field event.
2.	Golf	Golf is a club-and-ball sport.
3.	Hammer throw	The hammer throw at the Summer Olympics is one of four track and field throwing events.
4.	Shot-put	The shot put is a track and field event.

Hence, ‘Golf’ is the odd one out.

Q93. Answer: (d) [figure]

The Venn diagram that best represents the relationship between Communication, Telephone, and Letter is shown below:

Letter and Telephone are means of Communication.

Hence, ‘option 4’ is the correct answer.

Q94. Answer: (c) 72

The logic is as follows:

Hence, ‘72’ is the correct answer.

Q95. Answer: (d) 89

The logic is as follows:

19 + 10 = 29

29 + 10 = 39

39 + 10 = 49

49 + 10 = 59

59 + 10 = 69

69 + 10 = 79

79 + 10 = 89

Hence the missing term is 89.

NOTE:

The question has been rectified as the question was erroneous.

Q96. Answer: (b) Weapons

The meaning of each word is:

Spear → Spear is a weapon with a pointed tip, typically of steel, and a long shaft, used for thrusting or throwing.

Catapult → Catapult is a forked stick with an elastic band fastened to the two prongs, used by children for shooting small stones.

Pistol → A gun, designed to be held in one hand.

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Rifle → A rifle is a long-barrelled firearm designed for accurate shooting.

Clearly, all the words are name of different kinds of Weapons.

Hence, 'Weapons' is the correct answer.

Q97. Answer: (b) Mamta

Persons – Sharayn, Pinky, Tanisha and Mamta.

1. Tanisha is studying in A college

2. Pinky is good at Maths.

3. Of those studying in J college, one is good at Maths and the other in all subjects.

4. Sharayn is not good at Science.

From 2 and 3, it is clear that Pinky studies in J Colelge.

Also, from 3 and 4, it is clear that Sharayn does not studies in J College as Sharayn is not good at Science and Of those studying in J college, one is good at Maths and the other in all subjects.

From the above statements, it is clear that Mamta studies in J College and is good in all subjects and Sharayn is from College X.

Persons	College	Subject
Sharayn	X	Science
Pinky	J	Maths
Tanisha	A	Science
Mamta	J	English, Science, Maths and Computers

Mamta is good at all the subjects.

Hence, ‘Mamta’ is the correct answer.

Q98. Answer: (d) Only those who pass NET qualify for college teaching

1. NET gives one an advantage in teaching

The conclusion cannot be be derived from the given statement as there is no mention about any advantage if one qualifies NET.

2. NET helps to make people better teachers

The conclusion cannot be be derived from the given statement as the statement does not mentions qualifying NET will help people make better teachers or not.

3. NET is a desirable qualification for college teaching

The conclusion cannot be be derived from the given statement as NET is not a desirable qualification, NET is mandatory to qualify for College Teaching.

4. Only those who pass NET qualify for college teaching

The conclusion can be derived from the given statement 'For applying for the post of lecturer, passing NET is mandatory'. The statement means one must qualify NET to become a Lecturer in College.

Hence, 'Only those who pass NET qualify for college teaching' is the correct answer.

Q99. Answer: (d) 71%

Given:

Total no of students appearing for exam each year = 354000

Total no of students passed exam in 2016 = 128734 + 115526 = 244260

Total no of students passed exam in 2017 = 130567 + 124313 = 254880

Total no of students passed exam in 2018 = 129209 + 122131 = 251340

Formulas used:

Average = Sum of observations ÷ No of observations

Percentage of passed students = Passed students ÷ Total no of appeared students × 100

Calculation:

Percentage of students passed in 2016 = 244260 ÷ 354000 × 100 = 69%

Percentage of students passed in 2017 = 254880 ÷ 354000 × 100 = 72%

Percentage of students passed in 2018 = 251340 ÷ 354000 × 100 = 71%

Average pass percentage in 3 years = (69% + 72% + 71%) ÷ 3 = 70.66

Therefore Approximate average pass percentage = 71%

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Alternate Method Total no of students passed in 3 years = 244260 + 254880 + 251340 = 750480

Total no of students appeared in 3 years = 3 × 354000 = 1062000

Therefore Approximate average pass % = 750480 ÷ 1062000 × 100 = 70.66% or 71%

Q100. Answer: (d) All fees are to be paid timely, else they must pay penalty.

1. Many students do not pay exam fee in time.

The statement does not tells if many students or less students do not pay exam fee in time. So, the conclusion cannot be derived from the given statement.

2. Students follow deadline only if penalised.

The given statement does not mentions any such thing that a student follows deadline only if penalised. Therefore, the conclusion cannot be derived from the given statement.

3. Fines for late payment of exam fees is a large source of revenue.

The given statement does not mentions any data about the source of revenue. Therefore, conclusion cannot be derived from the given statement.

4.All fees are to be paid timely, else they must pay penalty.

All fees are to be paid timely, else they must pay penalty clearly means students have to pay fine for late payment of exam fees.

Hence, 'All fees are to be paid timely, else they must pay penalty' is the correct answer.

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