RRB NTPC CBT-I Official Paper (Held On: 16 Feb 2021 Shift 1) (Previous Year Paper)

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

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Q1. Real-time video chatting uses the following internet application :

(a) Internet Relay Chat (IRC)
(b) Internet Publish Chat (IPC)
(c) Internet Transfer Chat (ITC)
(d) Internet Broadcast Chat (IBC)

Q2. If secθ + tanθ = 2, then secθ is equal to:

(a) (3)/(4)
(b) (1)/(4)
(c) (1)/(2)
(d) (5)/(4)

Q3. The ratio of two numbers is 4 : 5 and their HCF is 3. Their LCM is:

(a) 80
(b) 60
(c) 15
(d) 20

Q4. Which polymer is used for the manufacturing of water pipes?

(a) Bakelite
(b) Glyptal
(c) PVC
(d) Polystyrene

Q5. Since 2008, the United Nations is running a program REDD to create awareness for the importance of carbon stored in the forests, reduction of carbon emissions and investment in low carbon development. What does REDD stand for?

(a) Recycling Energy from Deforestation and Forest Degradation
(b) Renewable Energy from Disintegration and Forest Degradation
(c) Reducing Emissions from Disintegration and Forest Degradation
(d) Reducing Emissions from Deforestation and Forest Degradation

Q6. In which city was the 23^(rd) National Conference on e-Governance held?

(a) Gurgaon
(b) Mumbai
(c) Lucknow
(d) New Delhi

Q7. A takes thrice the time taken by B and five times the time taken by C to complete a work. Working together, they can complete the work in 5 days. Find the number of days taken by A to complete the work alone.

(a) 45
(b) 30
(c) 40

(d) 20

Q8. Read the given statements and conclusions carefully Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow from the statements.

Statements:

1. All oranges are mangoes.
2. All mangoes are apples.
3. All apples are grapes.

Conclusions:

1. All mangoes are grapes.

II. All apples are oranges.

III. All oranges are grapes.

IV. All grapes are mangoes.

(a) Only conclusions III and IV follow.
(b) Only conclusions I and II follow.
(c) Only conclusions I and III follow.
(d) Only conclusions II and III follow.

Q9. In a certain code language PHEM is written as NEAH and PIST is written as NFOO, How will ZULO be written as in that language?

(a) YSIK
(b) YQHK
(c) XRHJ
(d) XSIJ

Q10. If the numerator of a fraction is increased by 80% and the denominator of the fraction is increased by 120%, then the resultant fraction is (7)/(22). What is the original fraction?

(a) (5)/(18)
(b) (5)/(17)
(c) (7)/(17)
(d) (7)/(18)

Q11. The work done by a woman in 6 h is equal to the work done by a man in 4 h and by a boy in 8 h. Working 8 h per day, if 8 women can complete the work in 10 days, then in how many days can 10 women, 10 men and 10 boys together finish the same work working 8 h per day?

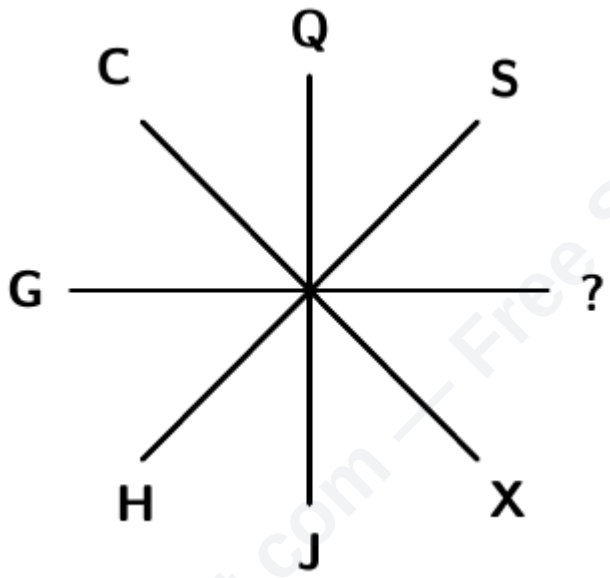
(a) 11/13
(b) 21/13
(c) 62/13
(d) 26/13

Q12. The square root of 111/25 is:

(a) 12/5
(b) 11/5
(c) 13/5
(d) 21/5

Q13. Study the given pattern carefully and select the letter that can replace the question mark (?) in it.

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(a) F
(b) T
(c) N
(d) R

Q14. The mean and median of 7 observations are 10 and 9, respectively. If 1 is subtracted from each observation, then the new mean and the new median will respectively be:
(a) 7 and 6
(b) 8 and 9
(c) 4 and 3
(d) 9 and 8

Q15. The angles of a quadrilateral are in the ratio of 1 : 2 : 3 : 4. What is the measure of the greatest of these angles?
(a) 144º
(b) 160º
(c) 120º
(d) 36º

Q16. Which of the following programmes is implemented by NABARD?
(a) Pradhan Mantri Jeevan Jyoti Bima Yojana
(b) Prime Minister Rojgar Yojana
(c) Umbrella Programme for Natural Resource Management
(d) Mid-day Meal Scheme

Q17. S is the daughter of X's father-in-law's wife Y. O is the only sibling of S and is married to J. How is X related to S?
(a) Brother-in-law
(b) Husband
(c) Uncle
(d) Wife

Q18. The position of earth in its orbit when it is at its greatest distance from the Sun is called:
(a) Perigee
(b) Perihelion
(c) Apogee
(d) Aphelion

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Q19. If a = (3 + √5)/(3 - √5) and b = (3 - √5)/(3 + √5), then find the value of $a^2 + b^2 - ab$.

(a) 41
(b) 46
(c) 40
(d) 42

Q20. Which type of natural vegetation is found in the Ganges-Brahmaputra delta?

(a) Rosewood trees
(b) Mangrove trees
(c) Mulberry trees
(d) Indian chestnut trees

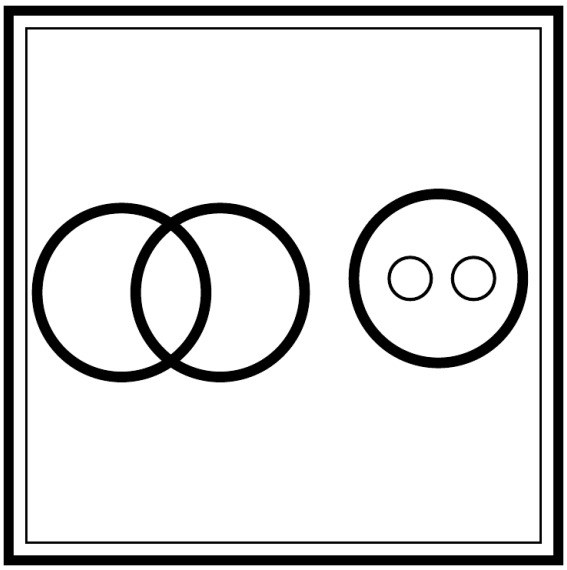
Q21. Four words have been given, out of which three are alike in some manner and one is different. Select the odd one.

(a) Stomach
(b) Ears
(c) Tongue
(d) Nose

Q22. Who organized the Independent Labour Party and Scheduled Castes Federation?

(a) Dr. Bhimrao Ramji Ambedkar
(b) Dr. Rajendra Prasad
(c) Chandra Shekhar Azad
(d) Dr. Zakir Hussain

Q23. Observe the Venn diagram below and select the relationship between the set of classes in the given options



(a) Engineers, Authors, Infants
(b) Males, Husbands, Doctors
(c) Lawyers, Women, Doctors
(d) Mothers, Infants, Females

Q24. Which function key is used to change the name of a specific file?

(a) ALT + S
(b) F2
(c) F4
(d) CTRL + E

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Q25. Select the option that is related to the third term in the same way as the second term is related to the first term.

Bhutan : Monarchy :: India : ?

(a) Parliament
(b) Country
(c) President
(d) Democracy

Q26. Anil purchases 12 apples for Rs. 50 and sells 8 apples from it for Rs. 50. Find the percentage gain.

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

Q27. In a human body, salts are transported by:

(a) Blood
(b) Plasma
(c) Haemoglobin
(d) Oxygen

Q28. Which committee adopted the cost of living as the basis for identifying poverty?

(a) YK Alagh Committee
(b) Lakdawala Committee
(c) Shah Committee
(d) Tendulkar Committee

Q29. Which of the following temples of India is called the Great Living Chola Temple?

(a) Shree Jagannath temple in Puri
(b) Kanchi Kailasanathar temple in Kanchipuram
(c) Somnath temple in Saurashtra
(d) Brihadisvara temple in Thanjavur

Q30. India joined the UNO in the year:

(a) 1947
(b) 1950
(c) 1945
(d) 1952

Q31. Wanawan is folk music from _____ which is sung during wedding ceremonies.

(a) Haryana
(b) Kashmir
(c) Maharashtra
(d) Madhya Pradesh

Q32. Consider the given statement and decide which of the given assumptions is/are implicit in the statement.

Statement:

Children are honest and outspoken.

Assumptions:

A. Children are more likely to speak their mind.

B. Children never lie.

(a) Neither assumption A nor B is implicit.
(b) Only assumption B is implicit.
(c) Both assumptions A and B are implicit.
(d) Only assumption A is implicit.

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Q33. What is the IUPAC name of glycerol?

(a) Propan-1-ol
(b) Propane-1, 2, 3-triol
(c) 2-Methylpropan-1-ol
(d) Ethane-1, 2-diol

Q34. What is the height of the geostationary orbit?

(a) 33,638 km
(b) 42,164 km
(c) 22,150 km
(d) 35,786 km

Q35. How much amount of money (in Rs.) at compound interest will amount to Rs. 5,000 in 3 years if the rate of interest is 2% for the 1st year, 3% for the 2nd year and 4% for the 3rd year?

(a) 5000/1.24
(b) 5000/(1.02 × 1.03 × 1.04)
(c) 5000
(d) 5000/(1.2 × 1.3 × 1.4)

Q36. The value of sin 1º sin 2º sin 3º .....sin 180º ....sin 196º is:

(a) 0
(b) (1)/(3)
(c) (1)/(2)
(d) (1)/(4)

Q37. At which of the following places did Gautam Buddha attain enlightenment?

(a) Kushinagar
(b) Sarnath
(c) Bodh Gaya
(d) Pavapuri

Q38. What is the range of the supersonic Akash missile?

(a) Around 20 km
(b) Around 25 km
(c) Around 35 km
(d) Around 30 km

Q39. Select the option that is related to the third term in the same way as the second number is related to the first term.

XVI : 32 :: XXIV : ?

(a) 24
(b) 44
(c) 48
(d) 28

Q40. If the difference between the areas of the circumcircle and the incircle of an equilateral triangle is 66 cm2, then the area of the triangle is:

(a) 20√(3) cm²
(b) 2√(3) cm2
(c) 21√(3) cm2
(d) 10√(3) cm2

Q41. Which of the following is the greatest number?

(a) (25)/(12)
(b) (13)/(14)
(c) (7)/(18)

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(d) (15)/(12)

Q42. What is the 69^(th) amendment to the Constitution of India?

(a) Delhi made National Capital Region and given special status.
(b) Introduced the Goods and Service Tax
(c) Bodo, Dogri included as official languages
(d) Voting age lowered from 21 to 18 years

Q43. The mean of 10 observations is 25. On checking, it was found that two of the observations were wrongly copied as 6 and 9. If the wrong observations are replaced by correct values 4 and 5, then the correct mean will be:

(a) 24.3
(b) 22.4
(c) 24.4
(d) 23.4

Q44. In 2018, which nuclear reactor did BARC re-commission with double capacity compared to its earlier version?

(a) Apsara
(b) Arihant
(c) Brahmos
(d) Agni

Q45. The sum of two numbers is 60, and their difference is (1)/(6) of their sum. Their LCM is:

(a) 150
(b) 100
(c) 175
(d) 200

Q46. If the sum of two numbers is 24 and the difference between them is 10, Then what is the value of two times the product of the numbers?

(a) 239
(b) 238
(c) 328
(d) 832

Q47. What does ASCII stand for?

(a) American Standard Code for Internet Information
(b) Asian Schema Code for Information Interchange
(c) American Standard Code for Information Interchange
(d) Asian Standard Code for Internet Interchange

Q48. In which of the following states is the Mathuri folk dance practiced?

(a) Telangana
(b) Odisha
(c) Nagaland
(d) Meghalaya

Q49. The number of revolutions a wheel of radius 21 cm makes in travelling a distance of 198 m is:

(a) 198
(b) 140
(c) 120
(d) 150

Q50. According to PBL Netherlands Environment Assessment Agency report 2018, what was the rate of greenhouse gas (GHG) emissions in India?

(a) 13%
(b) 5%

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(c) 7%
(d) 18%

Q51. If a, b and c are the sides of a triangle and $a^2 + b^2 + c^2 = ab + bc + ca$, then the triangle is:
(a) isosceles
(b) right-angled
(c) obtuse-angled
(d) equilateral

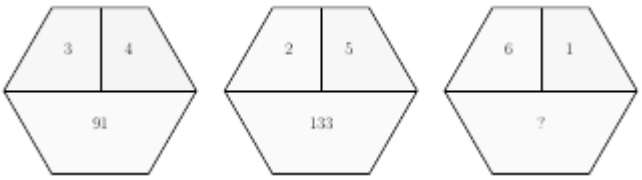
Q52. What is the sum of the first 12 multiples of 4?
(a) 324
(b) 316
(c) 312
(d) 308

Q53. Find the mean proportional between 16 and 81.
(a) 63
(b) 25
(c) 36
(d) 48

Q54. Which was the first Asian country in the world to enter the Mars orbit in its first attempt?
(a) Japan
(b) China
(c) India
(d) Philippines

Q55. Who designed the new Indian rupee symbol?
(a) Udit Raj Hitesh
(b) D Uday Kumar
(c) Padmashali
(d) Nandita Correa-Mehrotra

Q56. Study the given pattern carefully and select the number that can replace the question mark (?) in it.



(a) 200
(b) 167
(c) 191
(d) 217

Q57. Who won the Man Booker Prize in Nov 2020?
(a) Anna Burns
(b) Hilary Mantel
(c) Arundhati Roy
(d) Douglas Stuart

Q58. In 1939, which Viceroy of India announced that India had entered the war along with Britain?
(a) Lord Willingdon
(b) Lord Wavell
(c) Lord Linlithgow
(d) Lord Mountbatten

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Q59. Which of the following was a para-military force of the Nizam of Hyderabad?

(a) Ansars
(b) Razakars
(c) Mujahideen
(d) Hizbul

Q60. Select the option that is related to the third term in the same way as the second term is related to the first term.

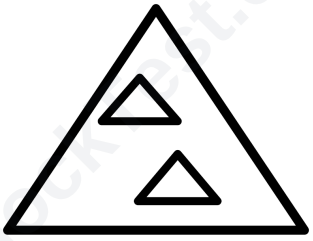
Tennis : Forehand :: Cricket : ?

(a) Square Cut
(b) Innings
(c) Over
(d) Six

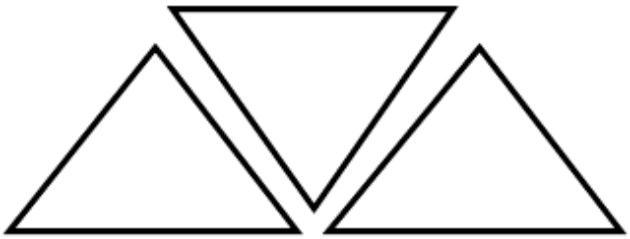
Q61. Select the Venn diagram that best represents the relationship between the classes:

Surgery, Calligraphy, Art.

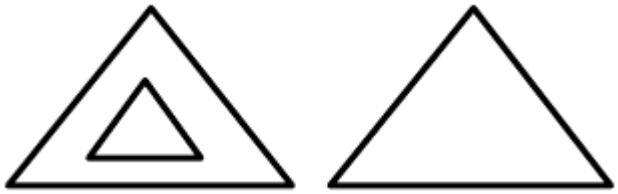
(a)



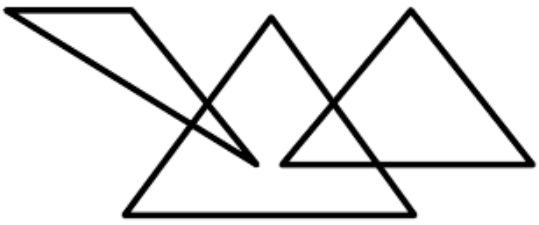
(b)



(c)



(d)



Q62. Find the value of 2. 4343... - 3. 0404... + 4. 4444...

(a) 3.63
(b) 3.60
(c) 3.83
(d) 3. 8383...

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Q63. Who got the purple cap for taking maximum number of wickets in IPL-13 season?

(a) Kagiso Rabada
(b) Dwayne Bravo
(c) Andrew Tye
(d) Bhuvneshwar Kumar

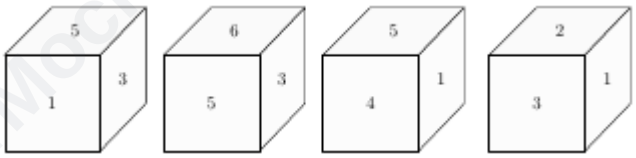
Q64. A bus covers the first 50 km of its journey in 95 min and covers the remaining 70 km in 85 min. What is the average speed of the bus?

(a) 80 km/h
(b) 50 km/h
(c) 20 km/h
(d) 40 km/h

Q65. To which family does the 'Touch-me-not' plant belong?

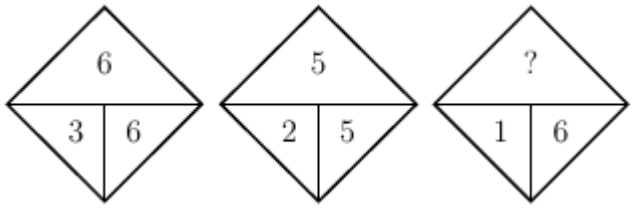
(a) Mimosaceae
(b) Malvaceae
(c) Acanthaceae
(d) Cyperaceae

Q66. Four different positions of the same dice are shown. Select the number that will be on the face opposite to the one having 5.



(a) 2
(b) 4
(c) 3
(d) 6

Q67. Study the given pattern carefully and select the number that can replace the question mark (?) in it.



(a) 4
(b) 3
(c) 2
(d) 7

Q68. If 2x - 3y = 7 and x/(x+y) = 5/6, then what is the value of x - y?

(a) 1/5
(b) 6
(c) 7
(d) 4

Q69. Solve the following.

(4 + 3 × 3 - 2)/(4 - 3 × (3 - 2)) = ?

(a) 2
(b) 10
(c) 11
(d) 12

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Q70. Which material was used to make beads in the Harappan civilisation?

(a) Carnelian stone
(b) Limestone
(c) Plastic
(d) Wood

Q71. Who won the Wildlife Photographer of the Year 2018 award in the 10 years and under category?

(a) Aadithyan Rajesh
(b) Arshdeep Singh
(c) Tanishq Abraham
(d) Randeep Singh

Q72. Which state has the highest percentage of its geographical area covered by forests, as per IFSR, 2019?

(a) Mizoram
(b) Meghalaya
(c) Assam
(d) Nagaland

Q73. If 30% of x is equal to five-sixth of y. Find x : y

(a) 9 : 25
(b) 5 : 3
(c) 25 : 9
(d) 3 : 5

Q74. In a school, there were 1400 boys and 600 girls. 40% of girls and 60% of boys passed in the examination. What is the percentage of failed candidates?

(a) 72%
(b) 46%
(c) 63%
(d) 65%

Q75. If x/49 = 196/x, find the value of 'x'.

(a) 49
(b) 100
(c) 99
(d) 98

Q76. What are the criteria to be considered to get Maharatna status?

(a) Having Miniratna category-1 status
(b) Having inter-sectoral performance
(c) Having significant global presence/international operations
(d) Having positive net profit to net worth ratio

Q77. Who among the following flight lieutenants is the first woman pilot of the IAF to qualify to undertake combat missions on a fighter jet?

(a) Gunjan Saxena
(b) Bhawana Kanth
(c) Kalpana Chawla
(d) Sunita Williams

Q78. What is the common name of the compound NaHCO3?

(a) Bleaching powder
(b) Baking soda
(c) Caustic soda
(d) Washing soda

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Q79. The total number of students in a school 240. If the number of boys in the school is 135, then what is the ratio of the total number of girls to the total number of boys in the school?

(a) 9 : 7
(b) 3 : 9
(c) 3 : 7
(d) 7 : 9

Q80. In which state is the Jog waterfalls situated?

(a) Nagaland
(b) Telangana
(c) Arunachal Pradesh
(d) Karnataka

Q81. Which state achieved the highest literacy rate through its literacy program 'Athulyam' in 2018?

(a) Bihar
(b) Kerala
(c) Arunachal Pradesh
(d) Mizoram

Q82. IRNSS - IG is the:

(a) seventh navigation satellite
(b) third navigation satellite
(c) tenth navigation satellite
(d) first navigation satellite

Q83. In May 2019, Naveen Patnaik was sworn in as the Chief Minister of Odisha for the _____ time.

(a) fourth
(b) third
(c) fifth
(d) sixth

Q84. If (x + y) : (x - y) = 7 : 3, then find (x2 + y2) : (x2 - y2).

(a) 10 : 4
(b) 20 : 29
(c) 21 : 29
(d) 29 : 21

Q85. Four words have been given, out of which three are alike in some manner and one is different. Select the odd one.

(a) Chop
(b) Boil
(c) Fry
(d) Bake

Q86. Observe the given table and answer the question.

The table shows the production of sugar from sugarcane (in tonnes) of the states Uttar Pradesh (UP), Orissa and Bihar, for the years 2015 to 2018.

states	Years			
2015	2016	2017	2018	
UP	7.2	7.8	6.2	7
Orissa	5.6	6.2	5	5.2
Bihar	6.2	6	5.8	5.6

What is the approximate percentage increase in the production of sugar from sugarcane in the state of UP in the year

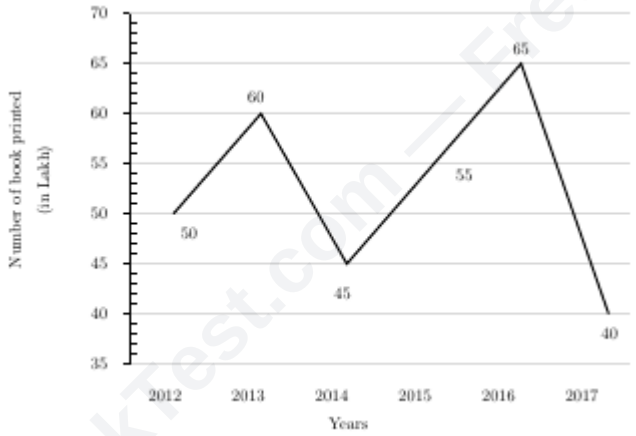
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2018 as compared to 2017?

(a) 30%
(b) 11%
(c) 25%
(d) 13%

Q87. Observe the given graph and answer the question.

The graph shows the number of books printed (in lakhs) by a printing company from 2012 to 2017.

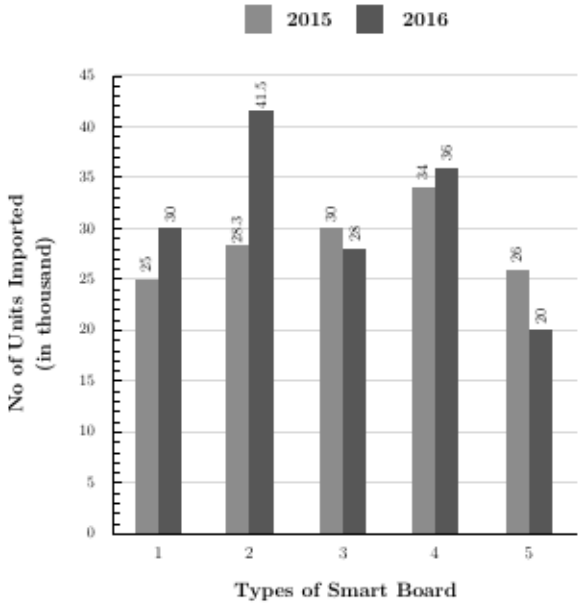


Which year accounted for the maximum percentage increase in the number of books printed?

(a) 2015
(b) 2013
(c) 2016
(d) 2014

Q88. Observe the given bar graph and answer the question.

The bar graph shows the total number of different types of smart boards 1, 2, 3, 4, 5 (in thousands) imported by a company in 2015 and 2016.

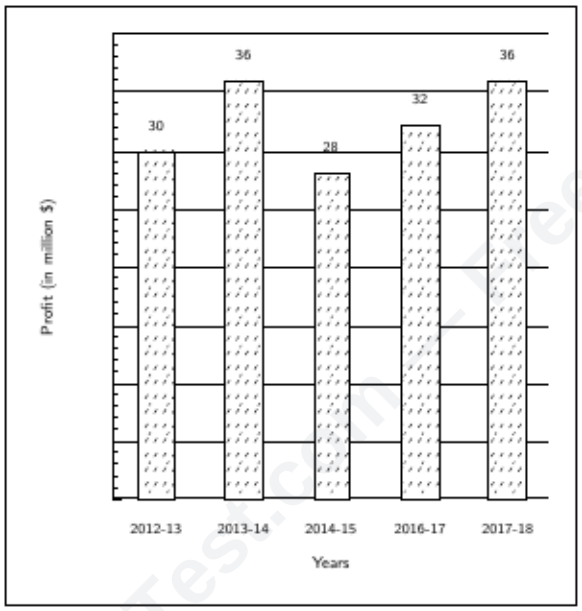


The import of type 4 smart boards in 2015 was what percentage of import of type 5 smart boards in 2016?

(a) 200%
(b) 150%
(c) 170%
(d) 100%

Q89. Observe the given bar graph and answer the question.

The bar graph shows the profit made by a certain textile company (in million $).



Which of the following is NOT true about the company's profits from 2012-13 to 2017-18?

(a) The company has recorded drop in profits for only one of the five years.
(b) The company has recorded the same increase in profits in $ terms for the past two years.
(c) Total Profit of the company for the period is 160 Million $
(d) The company has recorded profits greater than or equal to 30 Million $ for four out of five years.

Q90. In a certain code language, GOD is written as IRH and NET is written as PHX. How will SIP be written as in that language?

(a) UTL
(b) VLS
(c) UKR
(d) ULT

Q91. Consider the given statement and decide which of the given assumptions is/are implicit in the statement.

Statement:

"If you fail the test, I will cancel your plans for the picnic."- A father warns his daughter.

Assumptions:

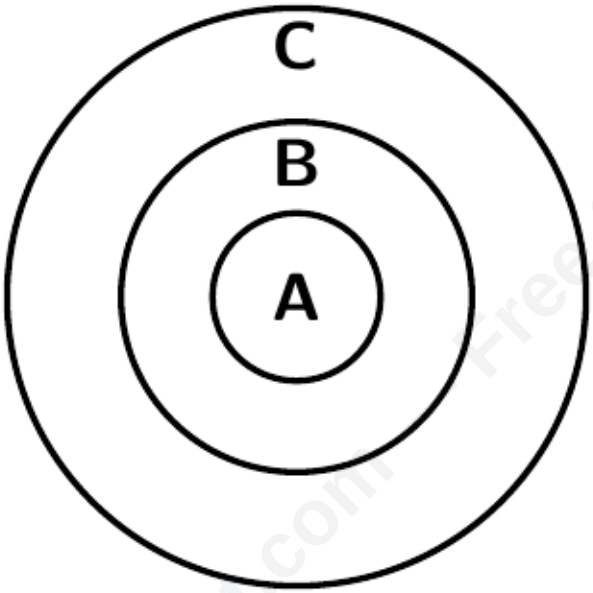
A. Desire for the picnic can boost her motivation to study sincerely for the test.

B. The daughter will fail the test if she doesn't get any warning.

(a) Both assumptions A and B are implicit.
(b) Only assumption A is implicit.
(c) Only assumption B is implicit.
(d) Either assumption A or B is implicit.

Q92. Which of the following is correct about the given diagram?

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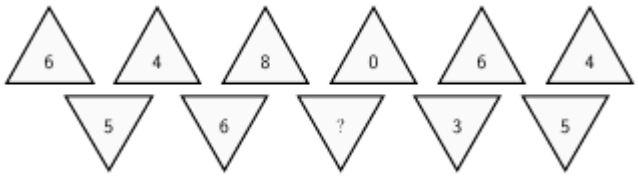


(a) All C are A
(b) All C are B
(c) All B are A
(d) All A are C

Q93. Select the correct combination of mathematical signs to sequentially replace Y and balance the following equation.
12 Y 2 Y 4 Y 30 Y 6
(a) ×, ÷, +, =
(b) ×, =, -, ÷
(c) ×, -, =, ×
(d) ÷, ×, =, -

Q94. Select the option in which the numbers are related in the same way as the numbers in the given set.
144, 36, 9
(a) 400, 100, 25
(b) 27, 9, 3
(c) 64, 8, 4
(d) 24, 12, 6

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



(a) 8
(b) 4
(c) 2
(d) 3

Q96. Four words have been given, out of which three are alike in some manner and one is different. Select the odd one.
(a) Week
(b) Day
(c) Season
(d) Month

Q97. In the series below, different letters stand for various mathematical operations and symbols as indicated:

P : +

Q : -

R : ×

S : ÷

T : =

U : >

V : <

Choose the option which is correct according to the given operations and symbols.

(a) 15 S 3 R 4 T 4 R 5
(b) 15 P 3 Q 4 R 4 T 5
(c) 15 U 3 R 4 P 5 P 4
(d) 15 T 3 Q 4 P 4 Q 5

Q98. Select the letter-cluster that can replace the question mark (?) in the following series.

DZUE, DXOE, DUIE, DQCE,?

(a) DOUE
(b) DMIE
(c) DJOE
(d) DLWE

Q99. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follows from the statements.

Statements:

A. Some girls are mangoes.

B. Some mangoes are shoes.

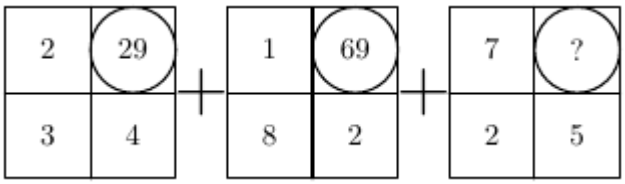
Conclusions:

A. Some girls are shoes.

B. No shoe is a mango.

(a) Only conclusion A follows.
(b) Only conclusion B follows.
(c) Neither conclusion A nor B follows.
(d) Either conclusion A or B follows.

Q100. Study the given pattern carefully and select the number that can replace the question mark (?) in it.



(a) 10
(b) 70
(c) 78
(d) 14

ANSWER KEY

1	a	2	d	3	b	4	c	5	d	6	b	7	a	8	c	9	c	10	d
11	d	12	b	13	b	14	d	15	a	16	c	17	b	18	d	19	b	20	b

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

SOLUTIONS

Q1. Answer: (a) Internet Relay Chat (IRC)

The correct answer is Internet Relay Chat (IRC)

Key Points

• Internet Relay Chat (IRC) is a protocol used for real-time communication over the internet.

• It facilitates text-based chat between users in a virtual environment known as channels.

• IRC was designed for group communication in discussion forums, called channels, but also allows one-on-one communication via private messages as well as data transfers, including file sharing.

• While IRC is mainly text-based, it can be used to facilitate real-time video chatting through various extensions and integrations with other protocols.

• It is one of the oldest chat protocols and has been widely used for real-time communication since the late 1980s.

Additional Information

• Other applications like Internet Publish Chat (IPC), Internet Transfer Chat (ITC), and Internet Broadcast Chat (IBC) do not exist or are not commonly recognized for real-time video chatting.

• Real-time video chatting can also be facilitated by other modern internet applications such as WebRTC (Web Real-Time Communication), but IRC remains a foundational protocol in the history of internet communications.

Q2. Answer: (d) (5)/(4)

Given:

If $\sec\theta + \tan\theta = 2$

Formula Used:

$\sec^2\theta - \tan^2\theta = 1$

Calculation:

Let $\sec\theta = x$ and $\tan\theta = y$

Given: $x + y = 2$

Using the identity: $\sec^2\theta - \tan^2\theta = 1$

$\Rightarrow x^2 - y^2 = 1$

From the given equation: $y = 2 - x$

Substitute y in the identity:

$\Rightarrow x^2 - (2 - x)^2 = 1$

$\Rightarrow x^2 - (4 - 4x + x^2) = 1$

$\Rightarrow x^2 - 4 + 4x - x^2 = 1$

$\Rightarrow 4x - 4 = 1$

$\Rightarrow 4x = 5$

$\Rightarrow x = 5 / 4$

The value of $\sec\theta$ is 5 / 4.

Q3. Answer: (b) 60

Given:

The ratio of two numbers = 4:5

Their HCF = 3

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Formula Used:

Product of two numbers = HCF × LCM

Calculation:

Let the numbers be 4x and 5x. Then,

Product of numbers = (4x) × (5x) = $20x^2$

Given HCF = 3

We know: Product of two numbers = HCF × LCM

=> $20x^2 = 3 \times LCM$

We need to find LCM:

=> $LCM = 20x^2 / 3$

Since HCF is 3, x must be 3:

=> x = 3

=> $LCM = 20 \times 3^2 / 3$

=> $LCM = 20 \times 9 / 3$

=> $LCM = 20 \times 3$

=> LCM = 60

The LCM of the two numbers is 60.

Q4. Answer: (c) PVC

The correct answer is PVC

Key Points

• PVC (Polyvinyl Chloride) is widely used in the manufacturing of water pipes due to its durability, chemical resistance, and affordability.

• PVC pipes are lightweight and easy to install, making them a popular choice in plumbing and water distribution systems.

• The material is also resistant to corrosion and scaling, ensuring a long lifespan for water pipes.

• PVC pipes can handle high water pressures, which makes them suitable for both residential and commercial applications.

• They are also environmentally friendly as they can be recycled and have a low carbon footprint compared to other materials like metal.

Additional Information

• Bakelite is a thermosetting plastic used in electrical insulators and plastic ware.

• Glyptal is a polymer used in paints and coatings.

• Polystyrene is a synthetic aromatic polymer used in the production of disposable cutlery, plastic models, CD and DVD cases, and smoke detector housings.

• PVC's applications extend beyond water pipes to include electrical cable insulation, medical devices, and clothing.

Q5. Answer: (d) Reducing Emissions from Deforestation and Forest Degradation

The correct answer is Reducing Emissions from Deforestation and Forest Degradation

Key Points

• Reducing Emissions from Deforestation and Forest Degradation (REDD) is a program initiated by the United Nations in 2008.

• The primary aim of REDD is to create awareness about the importance of carbon stored in forests and to reduce carbon emissions through conservation efforts.

• REDD also focuses on promoting investment in low carbon development and sustainable forest management.

• The program seeks to provide financial incentives to developing countries to reduce deforestation and forest degradation, thereby contributing to global climate change mitigation efforts.

Additional Information

• Deforestation refers to the large-scale removal of forest, leading to loss of biodiversity and disruption of ecosystems.

• Forest degradation involves the reduction in the capacity of a forest to provide goods and services, often due to logging, fire, or other disturbances.

• The REDD program is part of broader efforts under the United Nations Framework Convention on Climate Change (UNFCCC) to address climate change and promote sustainable development.

• REDD+ is an extension of REDD, which includes the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks.

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Q6. Answer: (b) Mumbai

The correct answer is Mumbai.

Key Points

• The 23rd National Conference on e-Governance was held in Mumbai.

• This conference is a significant event that brings together experts, policymakers, and other stakeholders to discuss and promote e-Governance initiatives in India.

• The conference aims to provide a platform for sharing knowledge and best practices in the field of e-Governance.

Additional Information

• The National Conference on e-Governance is organized annually by the Department of Administrative Reforms and Public Grievances (DARPG) in partnership with the Ministry of Electronics and Information Technology (MeitY).

• It serves as a platform to showcase successful e-Governance initiatives and applications developed by various government departments and agencies.

• The conference typically features discussions on various themes related to e-Governance, including digital transformation, cybersecurity, and citizen-centric services.

• Participants include senior government officials, industry leaders, academia, and representatives from international organizations.

Q7. Answer: (a) 45

Given:

A takes 3 times the time taken by B and 5 times the time taken by C to complete a work.

Working together, A, B, and C can complete the work in 5 days.

Let:

Time taken by B to complete the work = x days

Time taken by C to complete the work = y days

Time taken by A to complete the work = 3x days = 5y days

Formula used:

Work rate = 1 / Time taken

Combined work rate = Work rate of A + Work rate of B + Work rate of C

Calculation:

Since A takes both 3x days and 5y days to complete the work, we have:

3x = 5y

y = 3x / 5

Combined work rate is given by:

1 / 5 = 1 / (3x) + 1 / x + 1 / (3x / 5)

1 / 5 = 1 / (3x) + 1 / x + 5 / (3x)

1 / 5 = (1 + 3 + 5) / (3x)

1 / 5 = 9 / (3x)

x = 15 days

Find the time taken by A to complete the work:

Time taken by A = 3x = 3 × 15 = 45 days

Therefore A alone will take 45 days to complete the work.

Q8. Answer: (c) Only conclusions I and III follow.

The least possible venn diagram is shown below,

Conclusions:

1. All mangoes are grapes → True (All mangoes are apples, and all apples are grapes implies that all mangoes are grapes).

II. All apples are oranges → False (All oranges are mangoes and all mangoes are apples implies that it is possible that all apples are oranges but it is not definite).

III. All oranges are grapes → True (All oranges are mangoes, all mangoes are apples and all apples are grapes implies that all oranges are grapes).

IV. All grapes are mangoes → False (All oranges are mangoes, all mangoes are apples and all apples are grapes implies that it is possible that all grapes are mangoes but it is not definite).

Hence, the correct answer is "Only conclusions I and III follow".

Q9. Answer: (c) XRHJ

The logic followed here is,

PHEM is written as NEAH,

PIST is written as NFOO,

Similarly,

ZULO can be written as,

Hence, the correct answer is "XRHJ".

Q10. Answer: (d) (7)/(18)

Shortcut Trick

To find the original fraction, directly invert the percentage multipliers and multiply by the resultant fraction:

Original Fraction = Resultant Fraction × (New Denominator %) ÷ (New Numerator %)

New Numerator % = 100% + 80% = 180%

New Denominator % = 100% + 120% = 220%

Original Fraction = (7/22) × (220/180) = (7/22) × (22/18) = 7/18

Therefore The correct answer is 7/18.

Alternate Method

Given:

Numerator is increased by 80%.

Denominator is increased by 120%.

Resultant fraction = 7/22.

x

y

• 80%

• 120%

180% of x

220% of y

=

7

22

Original Fraction = x / y

Calculations:

=> Let the original fraction be x / y.

=> The new numerator becomes (100 + 80)% of x = 180% of x = 1.8x

=> The new denominator becomes (100 + 120)% of y = 220% of y = 2.2y

=> According to the given condition, the new fraction equals 7/22.

=> 1.8x / 2.2y = 7 / 22

=> (18 / 22) × (x / y) = 7 / 22

=> x / y = (7 / 22) × (22 / 18)

=> x / y = 7 / 18

Therefore The correct answer is 7/18.

Additional Information

Base Value in Percentages

Every quantity initially represents 100% of itself. An increase of R% makes the new value (100 + R)% of the original base value.

Equivalent Fractions

When a fraction's numerator and denominator are multiplied or divided by the same non-zero number, the overall value of the fraction remains completely unchanged.

Reversing a Percentage Change

To revert a percentage increase back to its base original value, divide the final value by the percentage multiplier (e.g., Final Value ÷ 1.8), rather than subtracting the percentage directly.

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Q11. Answer: (d) 26/13

Given:

Work done by a woman in 6 h = Work done by a man in 4 h = Work done by a boy in 8 h

8 women can complete the work in 10 days working 8 h per day

Formula Used:

Let the work done by a woman in 1 hour be W.

Work done by a man in 1 hour = (6/4)W = 1.5W

Work done by a boy in 1 hour = (6/8)W = 0.75W

Total work = Number of workers × Number of hours per day × Number of days

Calculation:

Total work done by 8 women in 10 days:

Total work = 8 women × 8 hours/day × 10 days

Total work = 640W

Now calculate the total work done by 10 women, 10 men, and 10 boys in 1 day:

Work done by 10 women in 1 day = 10 × 8 hours/day × W = 80W

Work done by 10 men in 1 day = 10 × 8 hours/day × 1.5W = 120W

Work done by 10 boys in 1 day = 10 × 8 hours/day × 0.75W = 60W

Total work done by 10 women, 10 men, and 10 boys in 1 day:

Total work done in 1 day = 80W + 120W + 60W = 260W

Number of days required to complete the work:

=> Total work / Total work done in 1 day

=> 640W / 260W

=> 64/26

=> 32/13

=> 2 6/13

10 women, 10 men, and 10 boys together can finish the work in 2 6/13 days.

Q12. Answer: (b) 11/5

Given:

The square root of (36)/(25)

Formula Used:

Square root of a fraction: √(a/b) = √a/√b

Calculation:

=> √(36/25)

=> √36/√25

=> 6/5

=> 11/5

The correct answer is option 2

Q13. Answer: (b) T

The logic followed here is:

Logic: Both the letters at the end of the line are opposite as per the positional value table.

Let's check,

(C - X) → C is opposite to X.

(Q - J) → Q is opposite to J.

(S - H) → S is opposite to H.

Similarly,

(G - ?) → G is opposite to T.

Hence, the correct answer is "Option 2".

Q14. Answer: (d) 9 and 8

Given:

Mean of 7 observations = 10

Median of 7 observations = 9

Formula Used:

New Mean = Old Mean - Change

New Median = Old Median - Change

Calculation:

If 1 is subtracted from each observation:

Change = 1

New Mean = Old Mean - Change

=> New Mean = 10 - 1

=> New Mean = 9

New Median = Old Median - Change

=> New Median = 9 - 1

=> New Median = 8

The new mean and the new median are 9 and 8, respectively.

Q15. Answer: (a) 144º

Given:

The angles of a quadrilateral are in the ratio of 1 : 2 : 3 : 4.

Formula Used:

The sum of the angles in a quadrilateral is 360º.

Calculation:

Let the angles be x, 2x, 3x, and 4x.

x + 2x + 3x + 4x = 360º

Combining like terms:

10x = 360º

Solve for x:

=> x = 360º / 10

=> x = 36º

The greatest angle is 4x:

=> 4x = 4 × 36º

=> 4x = 144º

The measure of the greatest angle is 144º

Q16. Answer: (c) Umbrella Programme for Natural Resource Management

The correct answer is Umbrella Programme for Natural Resource Management

Key Points

• Umbrella Programme for Natural Resource Management (UPNRM) is implemented by the National Bank for Agriculture and Rural Development (NABARD).

• UPNRM aims to provide financial support for projects related to natural resource management, with a focus on sustainable and inclusive growth.

• The programme encourages community-based approaches to managing natural resources, promoting the livelihood of rural communities.

• It emphasizes the sustainable use of land, water, and other natural resources to enhance productivity and ensure environmental sustainability.

• The initiative also seeks to integrate various stakeholders, including local communities, government agencies, and non-governmental organizations, in the planning and execution of resource management projects.

Additional Information

• NABARD (National Bank for Agriculture and Rural Development) was established in 1982 to promote sustainable and equitable agriculture and rural development through effective credit support, related services, institution building, and other innovative initiatives.

• NABARD plays a pivotal role in the development of the rural sector in India by providing financial and technical assistance for various development projects.

• In addition to UPNRM, NABARD also implements several other schemes and programmes aimed at enhancing agricultural productivity, rural infrastructure, and the overall quality of life in rural areas.

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• NABARD's initiatives are aligned with the broader goals of the Government of India to achieve rural prosperity and sustainable development.

Q17. Answer: (b) Husband

Preparing the family tree using the following symbols,

Given statement: S is the daughter of X's father-in-law's wife Y. O is the only sibling of S and is married to J.

Here, we can see that X is the husband of S.

Hence, the correct answer is "Option 2".

Q18. Answer: (d) Aphelion

The correct answer is Aphelion

Key Points

• The position of the Earth in its orbit when it is at its greatest distance from the Sun is called Aphelion.

• Aphelion occurs once a year, typically around early July.

• During Aphelion, the Earth is about 152.1 million kilometers (94.5 million miles) away from the Sun.

• This is in contrast to Perihelion, which is the point in the Earth's orbit where it is closest to the Sun, occurring in early January.

Additional Information

• The terms Aphelion and Perihelion are derived from Greek, where "ap-" means "away from" and "peri-" means "near". "Helion" is derived from "Helios", the Greek word for Sun.

• Despite being farther from the Sun during Aphelion, the Earth does not experience colder temperatures globally because the Earth's seasons are determined by its axial tilt, not its distance from the Sun.

• The difference in distance between Aphelion and Perihelion is about 5 million kilometers (3.1 million miles).

• Understanding these orbital points helps scientists study Earth's climate and seasonal variations.

Q19. Answer: (b) 46

Given:

If $a = (3+\sqrt{5})/(3-\sqrt{5})$ and $b = (3-\sqrt{5})/(3+\sqrt{5})$, then find the value of $a^2 + b^2 - ab$.

Formula used:

Let a = x and b = y.

$x = (3+\sqrt{5})/(3-\sqrt{5})$ and $y = (3-\sqrt{5})/(3+\sqrt{5})$

Calculation:

Multiply numerator and denominator of x by $(3+\sqrt{5})$, and y by $(3-\sqrt{5})$.

$x = ((3+\sqrt{5})^2)/(3-\sqrt{5})(3+\sqrt{5}) = (9 + 6\sqrt{5} + 5)/(9-5) = (14 + 6\sqrt{5})/4 = (7 + 3\sqrt{5})/2$

$y = ((3-\sqrt{5})^2)/(3+\sqrt{5})(3-\sqrt{5}) = (9 - 6\sqrt{5} + 5)/(9-5) = (14 - 6\sqrt{5})/4 = (7 - 3\sqrt{5})/2$

Now, calculate $a^2 + b^2 - ab$:

$a^2 + b^2 = ((7 + 3\sqrt{5})/2)^2 + ((7 - 3\sqrt{5})/2)^2$

$\Rightarrow a^2 + b^2 = ((7 + 3\sqrt{5})^2 + (7 - 3\sqrt{5})^2)/4$

$\Rightarrow a^2 + b^2 = (49 + 42\sqrt{5} + 45) + (49 - 42\sqrt{5} + 45)/4$

$\Rightarrow a^2 + b^2 = 188/4 = 47$

For ab:

$ab = ((7 + 3\sqrt{5})/2) \times ((7 - 3\sqrt{5})/2)$

$\Rightarrow ab = (7 + 3\sqrt{5})(7 - 3\sqrt{5})/4 = (49 - (3\sqrt{5})^2)/4$

$\Rightarrow ab = (49 - 45)/4 = 1$

Thus, the value of $a^2 + b^2 - ab$:

$\Rightarrow 47 - 1 = 46$

Therefore The correct answer is 46.

Q20. Answer: (b) Mangrove trees

The correct answer is Mangrove trees

Key Points

• Mangrove trees are the type of natural vegetation found in the Ganges-Brahmaputra delta.

• The Ganges-Brahmaputra delta, also known as the Sundarbans, is famous for its dense mangrove forests.

• Mangroves are adapted to survive in the harsh conditions of coastal environments, including high salinity, tidal changes, and muddy soil.

• These forests provide critical habitat for a wide range of wildlife, including the Bengal tiger, various species of fish, and numerous bird species.

• The roots of mangrove trees help in stabilizing the coastline by reducing erosion and protecting the land from storm surges and tsunamis.

Additional Information

• The Sundarbans is a UNESCO World Heritage Site and spans across India and Bangladesh.

• Mangrove forests play a crucial role in carbon sequestration, helping to mitigate climate change.

• Conservation efforts are ongoing to protect the unique biodiversity of the Sundarbans, which is threatened by human activities and climate change.

• The Sundarbans also act as a natural barrier, protecting inland areas from the brunt of cyclones and other coastal hazards.

Q21. Answer: (a) Stomach

The logic followed here is:

Stomach	Digestive organ
Ears	Sensory organ
Tongue	Sensory organ
Nose	Sensory organ

Ears, Tongue, Nose all are Sensory organs,

Whereas,

Stomach is a Digestive organ.

Hence, the correct answer is "Stomach".

Q22. Answer: (a) Dr. Bhimrao Ramji Ambedkar

The correct answer is Dr. Bhimrao Ramji Ambedkar

Key Points

• Dr. Bhimrao Ramji Ambedkar organized the Independent Labour Party and Scheduled Castes Federation.

• Dr. Ambedkar was a prominent social reformer and the principal architect of the Constitution of India.

• The Independent Labour Party was founded in 1936 to represent the interests of the labor class and marginalized communities.

• The Scheduled Castes Federation was established in 1942 to work specifically for the upliftment of the Scheduled Castes in India.

• Dr. Ambedkar's efforts were aimed at achieving social justice and equality for the oppressed sections of society.

Additional Information

• Dr. Bhimrao Ramji Ambedkar was born on 14th April 1891 and is also known as the father of the Indian Constitution.

• He was the first Law and Justice Minister of independent India.

• Dr. Ambedkar's contributions extend beyond politics to social reforms, particularly in the fight against untouchability and caste discrimination.

• He played a crucial role in the establishment of the Reserve Bank of India (RBI).

• Dr. Ambedkar's legacy continues to influence social and political reforms in India.

Q23. Answer: (a) Engineers, Authors, Infants

The correct set of classes for the given venn diagram is shown below,

→ Some Engineers are Authors. Infant cannot be either Engineer or Author.

Hence, the correct answer is "Option 1".

Q24. Answer: (b) F2

The correct answer is F2

Key Points

• F2 is the function key used to change the name of a specific file.

• When you select a file and press F2, it allows you to rename the file directly.

• This shortcut is widely used in various operating systems, including Windows, to quickly rename files without using the context menu.

• Using F2 improves efficiency and saves time when managing files.

Additional Information

• In addition to renaming files, the F2 key can also be used in various applications to edit text or cell content, such as in Microsoft Excel.

• Other function keys also have specific uses; for example, F1 is typically used to open help documentation, and F5 is often used to refresh content.

• Understanding and utilizing keyboard shortcuts can significantly enhance productivity in computer operations.

Q25. Answer: (d) Democracy

The logic followed here is:

Logic: Form of Government

Here,

Bhutan : Monarchy → Monarchy is the form of government in Bhutan.

Similarly,

India : Democracy → Democracy is the form of government in India.

Hence, the correct answer is "Option 4".

Q26. Answer: (b) 50%

Given:

Anil purchases 12 apples for Rs. 50.

Anil sells 8 apples for Rs. 50.

Formula Used:

Cost Price (CP) per apple = Total Cost Price / Number of apples

Selling Price (SP) per apple = Total Selling Price / Number of apples sold

Percentage Gain = [(SP - CP) / CP] × 100

Calculation:

Cost Price (CP) of 12 apples = Rs. 50

CP per apple = 50 / 12

CP per apple = Rs. 4.17 (approx)

Selling Price (SP) of 8 apples = Rs. 50

SP per apple = 50 / 8

SP per apple = Rs. 6.25

Percentage Gain = [(6.25 - 4.17) / 4.17] × 100

=> Percentage Gain = [2.08 / 4.17] × 100

=> Percentage Gain = 0.5 × 100

=> Percentage Gain = 50%

The correct answer is option 2.

Q27. Answer: (a) Blood

Key Points

• Blood is responsible for transporting salts in the human body.

• It is part of the circulatory system that delivers nutrients, oxygen, and salts to cells and carries away waste products.

• Plasma, a component of blood, contains dissolved salts and helps in their transport.

Additional Information

• Plasma is the liquid component of blood and makes up about 55% of its total volume.

• It is composed mostly of water, proteins, and dissolved salts.

• Plasma plays a crucial role in maintaining blood pressure and volume and supplying critical proteins for blood clotting and immunity.

• It also serves as a medium for exchanging vital minerals and nutrients between tissues and organs.

Q28. Answer: (d) Tendulkar Committee

The correct answer is Tendulkar Committee

Key Points

• The Tendulkar Committee adopted the cost of living as the basis for identifying poverty.

• This committee was established to review the methodology for poverty estimation in India.

• The Tendulkar Committee suggested a shift from the calorie-based norm to a broader measure that includes expenditure on

food, education, and health.

• Based on its recommendations, the poverty line was redefined to reflect the cost of living in both rural and urban areas.

Additional Information

• The Tendulkar Committee was constituted in 2005 by the Planning Commission of India.

• The committee's report was submitted in 2009 and has been a significant reference point in discussions about poverty in India.

• Prior to the Tendulkar Committee, the Lakdawala Committee was responsible for poverty estimation, which primarily used calorie intake as the measure.

• The change in methodology was aimed at providing a more comprehensive understanding of poverty and improving the targeting of welfare schemes.

Q29. Answer: (d) Brihadisvara temple in Thanjavur

The correct answer is Brihadisvara temple in Thanjavur

Key Points

• The Brihadisvara temple in Thanjavur is recognized as the Great Living Chola Temple.

• This temple is a part of the UNESCO World Heritage Site known as the "Great Living Chola Temples" which includes the Brihadisvara Temple at Thanjavur, the Brihadisvara Temple at Gangaikonda Cholapuram, and the Airavatesvara Temple at Darasuram.

• The Brihadisvara temple was built by the Chola emperor Raja Raja Chola I between 1003 and 1010 AD.

• It is a magnificent example of Chola architecture, showcasing the advanced techniques and grandeur of the Chola dynasty.

• The temple is dedicated to Lord Shiva and is renowned for its massive tower (vimana), intricate sculptures, and expansive courtyards.

Additional Information

• The Chola dynasty was one of the longest-ruling dynasties in the history of southern India, known for its contributions to art, architecture, and culture.

• The Chola temples are characterized by their grand scale, intricate carvings, and use of granite.

• The Brihadisvara temple is also known as Rajarajeswaram and Peruvudaiyar Kovil.

• The temple's central tower, or Vimana, is one of the tallest of its kind in the world, standing at about 66 meters (216 feet).

• The temple complex includes shrines for various deities, a massive statue of Nandi (the bull), and numerous other sculptures and frescoes depicting various aspects of Hindu mythology.

Q30. Answer: (c) 1945

The correct answer is 1945

Key Points

• India joined the United Nations Organization (UNO) in the year 1945.

• The UNO was established on 24th October 1945, after World War II, to promote international cooperation and to prevent future conflicts.

• India was one of the original 51 founding members of the United Nations.

• India has since played a significant role in various UN activities, including peacekeeping missions and promoting sustainable development.

Additional Information

• The United Nations is an international organization founded in 1945 and is currently made up of 193 Member States.

• The mission and work of the United Nations are guided by the purposes and principles contained in its founding Charter.

• The UN has six main organs: the General Assembly, the Security Council, the Economic and Social Council, the Trusteeship Council, the International Court of Justice, and the UN Secretariat.

• The UN headquarters is located in New York City, with other main offices in Geneva, Nairobi, Vienna, and The Hague.

• India's contributions to the UN include its participation in peacekeeping missions and its advocacy for the rights of developing nations.

Q31. Answer: (b) Kashmir

The correct answer is Kashmir

Key Points

• Wanawan is a traditional folk music genre from Kashmir.

• This music is an integral part of wedding ceremonies in Kashmir and is often performed by women.

• The songs in Wanawan typically include blessings, advice, and good wishes for the bride and groom.

• The music is characterized by its melodic and rhythmic patterns, which are unique to the region.

Additional Information

• Kashmir has a rich cultural heritage, and its folk music plays a significant role in preserving the region's traditions.

• Other popular forms of Kashmiri folk music include Rouf, Chakri, and Sufiana Kalam.

• Music and dance are integral to Kashmiri celebrations, reflecting the region's vibrant cultural landscape.

• Kashmiri weddings are known for their elaborate rituals and the use of traditional music to enhance the joyous atmosphere.

Q32. Answer: (d) Only assumption A is implicit.

Given Statement: Children are honest and outspoken.

Now,

Assumptions:

A. Children are more likely to speak their mind - Implicit (Since children are described as honest and outspoken, it suggests they are likely to express their thoughts openly.)

B. Children never lie - Not Implicit (Although children are described as honest, it doesn't necessarily mean they never lie. The statement does not rule out the possibility of occasional dishonesty.)

Here, Only assumption A is implicit.

Hence, the correct answer is "Option 4".

Q33. Answer: (b) Propane-1, 2, 3-triol

The correct answer is Propane-1, 2, 3-triol

Key Points

• Propane-1, 2, 3-triol is the IUPAC name for glycerol.

• Glycerol, also known as glycerin, is a simple polyol compound.

• It is a colorless, odorless, viscous liquid that is sweet-tasting and non-toxic.

• Glycerol has three hydroxyl (OH) groups, hence the name propane-1, 2, 3-triol.

• It is widely used in pharmaceutical formulations.

Additional Information

• Glycerol is a key component of triglycerides and phospholipids, which are essential components of cell membranes.

• It is also used in the food industry as a sweetener and humectant, as well as in cosmetics and personal care products.

• In the chemical industry, glycerol serves as a precursor to various chemical compounds.

• Its hygroscopic nature allows it to absorb moisture from the air, making it useful in various applications.

• Glycerol can be derived from both natural sources (such as plant and animal fats) and synthetic processes.

Q34. Answer: (d) 35,786 km

The correct answer is 35,786 km

Key Points

• The height of the geostationary orbit is 35,786 km above Earth's equator.

• A geostationary orbit is a circular orbit directly above the Earth's equator, allowing satellites to match the Earth's rotation.

• Satellites in this orbit appear stationary relative to an observer on the ground, making them ideal for telecommunications, weather monitoring, and broadcasting.

• Geostationary orbits are also known as geosynchronous equatorial orbits (GEO).

Additional Information

• The concept of a geostationary satellite was first proposed by the science fiction writer Arthur C. Clarke in 1945.

• Geostationary satellites are an essential part of global communication networks, allowing for consistent satellite coverage over specific areas.

• Maintaining a geostationary orbit requires precise calculations to counteract the gravitational pull of the Earth and other celestial bodies.

• The first geostationary satellite, SYNCOM 3, was launched by NASA in 1964.

Q35. Answer: (b) 5000/(1.02 × 1.03 × 1.04)

Given:

Final amount (A) = Rs. 5,000

Time (T) = 3 years

Rate for 1st year (R1) = 2% = 0.02

Rate for 2nd year (R2) = 3% = 0.03

Rate for 3rd year (R3) = 4% = 0.04

Formula Used:

Compound Interest formula for different rates each year:

A = P (1 + R1)(1 + R2)(1 + R3)

Calculation:

We need to find the principal amount (P) that will amount to Rs. 5,000 in 3 years.

Given A = Rs. 5,000, we have:

5,000 = P (1 + 0.02)(1 + 0.03)(1 + 0.04)

=> 5,000 = P (1.02)(1.03)(1.04)

=> P = 5,000 / (1.02 × 1.03 × 1.04)

The amount of money at compound interest that will amount to Rs. 5,000 in 3 years is approximately Rs. 5,000 / (1.02 × 1.03 × 1.04).

Q36. Answer: (a) 0

Given:

The value of sin 1º sin 2º sin 3º .....sin 180º ....sin 196º is:

Formula Used:

Product of sine functions from 1º to 180º

Calculation:

sin 180º = 0

Since the sine of 180º is 0, the product of any number of sine terms including sin 180º will be 0.

Therefore:

=> sin 1º × sin 2º × sin 3º × ... × sin 180º × ... × sin 196º = 0

The value of sin 1º sin 2º sin 3º .....sin 180º ....sin 196º is 0.

`

Q37. Answer: (c) Bodh Gaya

The correct answer is Bodh Gaya

Key Points

• Bodh Gaya is the place where Gautam Buddha attained enlightenment.

• It is located in the state of Bihar, India.

• The site is marked by the Mahabodhi Temple, which is a UNESCO World Heritage Site.

• The exact spot where Buddha is believed to have attained enlightenment is under the Bodhi Tree.

• Bodh Gaya is one of the most important and sacred Buddhist pilgrimage sites in the world.

Additional Information

• Gautam Buddha, also known as Siddhartha Gautama, was the founder of Buddhism.

• Buddha's enlightenment is celebrated as Buddha Purnima or Vesak by Buddhists around the world.

• After attaining enlightenment, Buddha gave his first sermon at Sarnath, another important Buddhist site.

• The teachings of Buddha are compiled in the Tripitaka, which is the traditional term for Buddhist scriptures.

• Bodh Gaya attracts thousands of pilgrims and tourists annually, contributing to its cultural and historical significance.

Q38. Answer: (b) Around 25 km

The correct answer is Around 25 km

Key Points

• The range of the supersonic Akash missile is around 25 km.

• The Akash missile is a medium-range surface-to-air missile (SAM) system developed by the Defence Research and Development Organisation (DRDO) in India.

• It is capable of engaging aerial threats such as fighter jets, cruise missiles, and air-to-surface missiles.

• The missile system has a multi-target engagement capability, which enhances its effectiveness in combat scenarios.

• Akash is an integral part of India's defense strategy and has been deployed by the Indian Army and Air Force.

Additional Information

• The Akash missile system is designed to provide air defense against aerial threats in all weather conditions.

• It is equipped with a high-explosive, pre-fragmented warhead and has a command guidance system.

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• The system includes a launcher, a control center, a multi-function radar, and support vehicles, making it a comprehensive air defense solution.

• Akash has undergone several successful tests and has been inducted into the Indian armed forces, enhancing India's defense capabilities.

• The missile system has the potential to be integrated with other defense systems and can be deployed in various terrains, providing flexibility in defense operations.

Q39. Answer: (c) 48

The logic followed here is:

Logic: The number on the right side is the double of the letters on the left side which represents Roman numbers.

XVI : 32

Similarly,

XXIV : ?

Hence, the correct answer is "Option 3".

Q40. Answer: (c) 21√(3) cm2

Given:

The difference between the areas of the circumcircle and the incircle of an equilateral triangle = 66 cm².

Formula Used:

Area of circumcircle = πR²

Area of incircle = πr²

Side of the equilateral triangle = a

Radius of circumcircle (R) = a/√3

Radius of incircle (r) = a/(2√3)

Area of equilateral triangle = (√3/4) × a²

Calculation:

Difference between areas of circumcircle and incircle:

=> πR² - πr² = 66

=> π(a/√3)² - π(a/(2√3))² = 66

=> π(a²/3) - π(a²/12) = 66

=> πa²(1/3 - 1/12) = 66

=> πa²((4 - 1)/12) = 66

=> πa²(3/12) = 66

=> πa²(1/4) = 66

=> a² = 66 × 4 / π

=> a² = 264 / π

Area of equilateral triangle:

=> (√3/4) × a²

=> (√3/4) × (264 / π)

=> 21√3 cm²

The area of the triangle is 21√3 cm².

Q41. Answer: (a) (25)/(12)

Given:

Option 1: 2512251225122512251225122512

Option 2: 1314131413141314131413141314

Option 3: 718718718718718718

Option 4: 1512151215121512151215121512

Formula Used:

To compare the fractions, find their decimal values.

Calculation:

Option 1: 2512251225122512251225122512

=> 25 ÷ 12

=> 2.0833

Option 2: 13141314

=> 13 ÷ 14

=> 0.9286

Option 3: 718718

=> 7 ÷ 18

=> 0.3889

Option 4: 15121512

=> 15 ÷ 12

=> 1.25

The correct answer is option 1

Q42. Answer: (a) Delhi made National Capital Region and given special status.

The correct answer is Delhi made National Capital Region and given special status

Key Points

• The 69th Amendment to the Constitution of India was enacted in 1991.

• This amendment granted special status to the Union Territory of Delhi by redesignating it as the National Capital Territory (NCT) of Delhi.

• The amendment also provided for the creation of a Legislative Assembly and a Council of Ministers for the NCT of Delhi.

• The Chief Minister of Delhi would be the head of the Council of Ministers, aiding and advising the Lieutenant Governor.

• This special status aimed to give Delhi partial statehood with a legislative assembly that could legislate on all matters except public order, police, and land.

Additional Information

• The Constitution of India was adopted by the Constituent Assembly on 26th November 1949 and came into effect on 26th January 1950.

• It lays down the framework defining fundamental political principles, establishes the structure, procedures, powers, and duties of government institutions, and sets out fundamental rights, directive principles, and the duties of citizens.

• The Constitution of India is the longest written constitution of any country in the world.

• It declares India a sovereign, socialist, secular, and democratic republic, assuring its citizens justice, equality, and liberty, and endeavors to promote fraternity.

• The Seventh Schedule of the Constitution contains three lists which delineate the subjects under the Union, State, and Concurrent lists.

• Amendments to the Constitution can be made through a process outlined in Article 368.

• The Union List has been amended several times to meet the evolving needs of the nation.

Q43. Answer: (c) 24.4

Given:

The mean of 10 observations = 25

Wrong observations = 6 and 9

Correct observations = 4 and 5

Formula Used:

Mean = Sum of observations / Number of observations

Calculation:

Sum of 10 observations = Mean × Number of observations

Sum of 10 observations = 25 × 10

Sum of 10 observations = 250

Sum of wrong observations = 6 + 9

Sum of wrong observations = 15

Sum of correct observations = 4 + 5

Sum of correct observations = 9

Corrected sum of observations = 250 - 15 + 9

Corrected sum of observations = 244

Correct Mean = Corrected sum of observations / Number of observations

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Correct Mean = 244 / 10

=> (244) / (10)

Correct Mean = 24.4

The correct mean is 24.4.

Q44. Answer: (a) Apsara

The correct answer is Apsara

Key Points

• Apsara is the nuclear reactor that BARC re-commissioned in 2018 with double the capacity compared to its earlier version.

• Apsara is significant as it was the first nuclear reactor in Asia.

• The re-commissioning of Apsara marks a significant milestone in India's nuclear research capabilities.

• The upgraded reactor is expected to enhance the scope of nuclear research and development in various fields including neutron activation analysis and radiation damage studies.

Additional Information

• BARC stands for Bhabha Atomic Research Centre, which is India's premier nuclear research facility.

• BARC was established in 1954 and has been at the forefront of India's nuclear research and development.

• The re-commissioning of Apsara is part of BARC's ongoing efforts to maintain and expand India's nuclear research infrastructure.

• The upgraded Apsara reactor will also support various applications in medicine, agriculture, and industry.

Q45. Answer: (c) 175

Given:

The sum of two numbers = 60

Their difference = (1/6) of their sum = (1/6) × 60 = 10

Formula Used:

LCM of two numbers

Calculation:

Let the two numbers be x and y.

Given:

x + y = 60

x - y = 10

Adding these two equations:

x + y + x - y = 60 + 10

=> 2x = 70

=> x = 35

Substituting x in the first equation:

35 + y = 60

=> y = 25

LCM of 35 and 25:

Prime factorization of 35: 5 × 7

Prime factorization of 25: 5^2

LCM = Highest power of all prime factors = $5^2 \times 7$

LCM = 25 × 7

LCM = 175

The LCM of the two numbers is 175.

Q46. Answer: (b) 238

Given:

Sum of two numbers = 24

Difference between the numbers = 10

Formula Used:

Let the numbers be x and y.

x + y = 24

x - y = 10

Product of the numbers = x × y

Calculation:

Adding the two equations:

x + y = 24

x - y = 10

=> 2x = 34

=> x = 17

Substitute x = 17 into x + y = 24:

17 + y = 24

=> y = 7

Product of the numbers = 17 × 7

Product = 119

Two times the product = 2 × 119

Two times the product = 238

The value of two times the product of the numbers is 238.

`

Q47. Answer: (c) American Standard Code for Information Interchange

The correct answer is American Standard Code for Information Interchange

Key Points

• American Standard Code for Information Interchange (ASCII) is a character encoding standard for electronic communication.

• ASCII codes represent text in computers, telecommunications equipment, and other devices that use text.

• Each letter, digit, or symbol is assigned a number from 0 to 127.

• For example, the ASCII code for uppercase A is 65, and for lowercase a is 97.

• It was developed from telegraph code and first published as a standard in 1963.

• ASCII is now largely replaced by Unicode, which includes ASCII as a subset.

Additional Information

• ASCII originally used 7 bits to represent each character, allowing for 128 unique symbols.

• Extended ASCII uses 8 bits, allowing for 256 symbols, which includes additional characters for graphical symbols and foreign language letters.

• ASCII has been incorporated into many other coding schemes, such as UTF-8, which is compatible with ASCII and can represent any character in the Unicode standard.

• The widespread adoption of ASCII has ensured that text files can be easily shared and understood across different types of computer systems.

Q48. Answer: (a) Telangana

The correct answer is Telangana

Key Points

• Mathuri folk dance is a traditional dance form practiced in the state of Telangana.

• This dance is primarily associated with the Gond tribe, which is one of the largest tribal communities in India.

• The dance is usually performed during festivals and significant cultural events in the tribal areas.

• Mathuri dance reflects the rich cultural heritage and traditions of the Gond tribe and is an integral part of their social and cultural life.

• The dance involves intricate footwork, vibrant costumes, and rhythmic music that showcases the tribal way of life.

Additional Information

• Telangana was formed as the 29th state of India on 2nd June 2014, after its separation from Andhra Pradesh.

• The state is known for its distinct cultural identity, language, and traditions which include various forms of arts, music, and dance.

• Telangana's diverse cultural heritage is also reflected in its festivals, cuisine, and crafts.

• The state government actively promotes and preserves its cultural heritage through various initiatives and cultural programs.

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Q49. Answer: (d) 150

Given:

Radius of the wheel = 21 cm

Distance travelled = 198 m

Formula Used:

Number of revolutions = Distance travelled / Circumference of the wheel

Calculation:

First, find the circumference of the wheel:

Circumference = 2 × π × Radius

Radius = 21 cm = 0.21 m

Circumference = 2 × π × 0.21

Circumference = 2 × 227227227227227227

× 0.21

Circumference = 1.32 m

Next, calculate the number of revolutions:

Number of revolutions = (Distance travelled) / (Circumference)

Number of revolutions = 198 / 1.32

=> Number of revolutions ≈ 150

The number of revolutions the wheel makes in travelling a distance of 198 m is 150.

Q50. Answer: (c) 7%

The correct answer is 7%

Key Points

• 7% was the rate of greenhouse gas (GHG) emissions in India according to the PBL Netherlands Environment Assessment Agency report of 2018.

• This report highlights the emission statistics and trends for various countries, including India.

• India's contribution to global GHG emissions is significant given its large population and rapid industrialization.

• Efforts are being made by the Indian government to mitigate GHG emissions through various policies and initiatives.

Additional Information

• The Paris Agreement, adopted in 2015, is a global framework to combat climate change, and India is a signatory to it.

• India has committed to reducing the emissions intensity of its GDP by 33-35% by 2030 from 2005 levels.

• Various initiatives such as the National Action Plan on Climate Change (NAPCC) and the promotion of renewable energy sources are part of India's strategy to reduce emissions.

• The government has also introduced policies to enhance energy efficiency and promote sustainable practices across different sectors.

• Public awareness and participation are crucial for the successful implementation of these initiatives to curb GHG emissions.

Q51. Answer: (d) equilateral

Given:

If a, b, and c are the sides of a triangle and $a^2 + b^2 + c^2 = ab + bc + ca$, then the triangle is:

Formula used:

For an equilateral triangle, the identity $a^2 + b^2 + c^2 = ab + bc + ca$ holds true.

Calculation:

Given: $a^2 + b^2 + c^2 = ab + bc + ca$

For an equilateral triangle, a = b = c.

=> $a^2 + a^2 + a^2 = a \times a + a \times a + a \times a$

=> $3a^2 = 3a^2$

This equation holds true for all sides being equal.

Therefore The correct answer is: Equilateral triangle.

Q52. Answer: (c) 312

Given:

The first 12 multiples of 4.

Formula Used:

Sum of the first n multiples of a number = n × number × (n+1) / 2

Calculation:

Here, n = 12 and number = 4

Sum of the first 12 multiples of 4 = 12 × 4 × (12 + 1) / 2

=> Sum = 12 × 4 × 13 / 2

=> Sum = 12 × 2 × 13

=> Sum = 24 × 13

=> Sum = 312

The sum of the first 12 multiples of 4 is 312.

Q53. Answer: (c) 36

Shortcut Trick

The mean proportional between two numbers a and b is given directly by √(a × b).

Here, a = 16 and b = 81.

Mean proportional = √(16 × 81)

=> 4 × 9 = 36

Therefore The correct answer is 36.

Alternate Method

Given:

The two given numbers are 16 and 81.

Formula Used:

If x is the mean proportional between a and b, they form a continuous proportion: a : x :: x : b

=> $x^2 = a \times b$

16

:

x

::

x

:

81

Calculation:

Let the mean proportional be x.

=> 16 : x = x : 81

=> 16 ÷ x = x ÷ 81

=> $x^2 = 16 \times 81$

=> x = √(16 × 81)

=> x = √16 × √81

=> x = 4 × 9

=> x = 36

Therefore The correct answer is 36.

Additional Information

Third Proportional

If a : b :: b : c, then c is the third proportional to a and b. It is calculated using the formula $c = b^2 \div a$.

Fourth Proportional

If a : b :: c : d, then d is the fourth proportional to a, b, and c. It is given by d = (b × c) ÷ a.

Duplicate Ratio

The duplicate ratio of a : b is defined as $a^2 : b^2$, while the sub-duplicate ratio is √a : √b.

Q54. Answer: (c) India

The correct answer is India

Key Points

• India became the first Asian country to enter the Mars orbit in its first attempt.

• The Mars Orbiter Mission (Mangalyaan) was launched by the Indian Space Research Organisation (ISRO) on November 5, 2013.

• India's successful mission to Mars was achieved on September 24, 2014.

• This achievement made India the fourth space agency to reach Mars, after Roscosmos, NASA, and the European Space Agency.

• The mission was completed at a fraction of the cost compared to other Mars missions, showcasing India's cost-effective space technology.

Additional Information

• The Mars Orbiter Mission (MOM) is also known as Mangalyaan, which means "Mars-craft" in Sanskrit.

• The primary objective of the mission was to develop the technologies required for interplanetary missions.

• The mission carried out scientific studies of Mars' surface, morphology, atmosphere, and mineralogy from orbit.

• The success of the mission has put ISRO among the world's leading space agencies and has bolstered India's space exploration capabilities.

• The mission also aimed to explore the feasibility of future missions to Mars and other interplanetary missions.

Q55. Answer: (b) D Uday Kumar

The solution is in Hindi. Read it online.

Q56. Answer: (d) 217

The logic followed here is:

Logic: The lower number is the sum of the cube of the two upper number.

→ 91 = $(3)^3 + (4)^3$

→ 91 = 27 + 64

→ 133 = (2)3 + (5)3

→ 133 = 8 + 125

Similarly,

→ ? = (6)3 + (1)3

→ ? = 216 + 1 = 217

Hence, the correct answer is "Option 4".

Q57. Answer: (d) Douglas Stuart

The correct answer is Douglas Stuart

Key Points

• Douglas Stuart won the Man Booker Prize in November 2020.

• He won the prize for his debut novel "Shuggie Bain."

• The novel is set in 1980s Glasgow and explores themes of poverty, addiction, and family dynamics.

• The Man Booker Prize is one of the most prestigious literary awards in the English-speaking world, awarded annually for the best original novel written in the English language and published in the UK.

• Douglas Stuart's win was widely celebrated for its emotional depth and powerful storytelling.

Additional Information

• The Man Booker Prize was first awarded in 1969 and has since recognized many notable authors.

• The award aims to promote the finest in fiction by rewarding the best novel of the year, written in English and published in the United Kingdom.

• Previous winners include acclaimed authors such as Salman Rushdie, Margaret Atwood, and Hilary Mantel.

• The prize not only brings significant recognition but also boosts book sales and readership for the winning novel.

Q58. Answer: (c) Lord Linlithgow

The correct answer is Lord Linlithgow

Key Points

• Lord Linlithgow was the Viceroy of India in 1939.

• He announced that India had entered World War II alongside Britain without consulting Indian leaders.

• This decision led to widespread protests and dissatisfaction among Indian political leaders and the public.

• The Indian National Congress demanded immediate independence in return for support in the war, which was not accepted by the British government.

Additional Information

• Lord Linlithgow served as Viceroy and Governor-General of India from 1936 to 1943.

• His tenure saw significant events such as the outbreak of World War II and the Quit India Movement in 1942.

• The unilateral declaration of India's entry into the war was a major factor that intensified the struggle for Indian independence.

• During his tenure, the British government faced increased pressure from Indian leaders to grant self-governance to India.

Q59. Answer: (b) Razakars

The correct answer is Razakars.

Key Points

• Razakars was a para-military force of the Nizam of Hyderabad.

• These were the private military force of the Nizam.

• These were organized by Qasim Razvi to support the rule of Nizam Osman Ali Khan, Asaf Jah VII.

• Rajakaars were initially volunteers of the Majlis.

Additional Information

• Ansar were a group of people consisting of three or four tribes living in Madinah, who gave aid and protection to prophet Mohammed and his followers.

• Mujahideen members of a number of guerrilla groups operating in Afghanistan during the Afghan War.

• Hizbul Mujahideen, is an Islamist militant group operating in Jammu and Kashmir.

• Its goal is to separate Kashmir from India and merge it with Pakistan.

Q60. Answer: (a) Square Cut

The logic followed here is:

Logic: Types of shots in sports.

Here,

Tennis : Forehand → Forehand is a specific type of shot in the sport Tennis.

Similarly,

Cricket : Square Cut → Square Cut is a specific type of shot in the sport Cricket.

Hence, the correct answer is "Option 1".

Q61. Answer: (c) [figure]

The correct venn diagram representing the relation between Surgery, Calligraphy, Art is shown below,

→ Calligraphy is an art form. Surgery is not related to art, it is a medical treatment.

Hence, the correct answer is "Option 3".

Q62. Answer: (d) 3. 8383...

Given:

Find the value of 2. 4343... - 3. 0404... + 4. 4444...

Formula used:

Repeating decimal n is expressed as n/9 where n is the repeating digit(s).

Calculation:

2. 4343... = 2 + 43/99

3. 0404... = 3 + 4/99

4. 4444... = 4 + 44/99

Now, find the value:

=> 2. 4343... - 3. 0404... + 4. 4444... = (2 + 43/99) - (3 + 4/99) + (4 + 44/99)

=> (2 + 4 - 3) + 43/99 - 4/99 + 44/99

=> 3 + (43 - 4 + 44)/99

=> 3 + 83/99

=> 3 + 0.8383...

=> 3.8383...

Therefore The correct answer is 3. 8383...

Q63. Answer: (a) Kagiso Rabada

The correct answer is Kagiso Rabada

Key Points

• Kagiso Rabada won the purple cap in the IPL-13 season for taking the maximum number of wickets.

• The purple cap is awarded to the highest wicket-taker in the Indian Premier League (IPL) each season.

• Rabada, representing the Delhi Capitals, took a total of 30 wickets during the IPL-13 season.

• His exceptional performance played a crucial role in Delhi Capitals' journey to the finals.

Additional Information

• The IPL (Indian Premier League) is a professional Twenty20 cricket league in India, contested by teams representing different cities.

• IPL was founded by the Board of Control for Cricket in India (BCCI) in 2008.

• It has since become one of the most popular and lucrative cricket leagues in the world.

• The league features some of the best cricket talents from around the globe, alongside emerging local players.

• Each season, the player with the most runs receives the Orange Cap, while the player with the most wickets receives the Purple Cap.

Q64. Answer: (d) 40 km/h

Given:

Distance for the first part = 50 km

Time for the first part = 95 min

Distance for the second part = 70 km

Time for the second part = 85 min

Formula Used:

Average speed = Total distance travelled / Total time taken

Calculation:

Convert time from minutes to hours:

Time for the first part = 95 min = 95 / 60 hours

Time for the second part = 85 min = 85 / 60 hours

Total Distance = 50 km + 70 km = 120 km

Total Time = (95 / 60) hours + (85 / 60) hours

Total Time = (95 + 85) / 60

Total Time = 180 / 60

Total Time = 3 hours

Average Speed = Total Distance / Total Time

Average Speed = 120 km / 3 hours

Average Speed = 40 km/h

The average speed of the bus is 40 km/h.

Q65. Answer: (a) Mimosaceae

The correct answer is Mimosaceae

Key Points

• The Touch-me-not plant, also known as Mimosa pudica, belongs to the Mimosaceae family.

• The plant is well-known for its rapid movement, where its leaves fold inward and droop when touched or shaken, a phenomenon called thigmonasty or seismonasty.

• This plant is native to South America and Central America but is now a common invasive weed in tropical regions worldwide.

• It is often used in traditional medicine for its various purported health benefits.

Additional Information

• The family Mimosaceae is a part of the order Fabales and is closely related to the Leguminosae (Fabaceae) family.

• Plants in the Mimosaceae family are typically characterized by their compound leaves and small, often fragrant flowers that are usually arranged in spherical clusters.

• The Touch-me-not plant is often studied in botanical and environmental sciences due to its unique response to physical stimuli.

• While primarily considered a weed, it also has ecological value in soil stabilization and as a nitrogen-fixer, benefiting the soil quality in its habitat.

Q66. Answer: (a) 2

In Second and fourth dice,

Logic: If two dice have the same face value in the given image then their clockwise or anticlockwise wise number are known as opposite numbers in dice.

In the first dice and second dice. The number 3 is common.

The left numbers will be opposite each other writing them clockwise starting from 3.

Number	Opposite
5	2
6	1

Here, we can see that the number opposite to 5 is 2.

Hence, the correct answer is "Option 1".

Q67. Answer: (a) 4

The logic follows here is:

Logic: (Top number)^2 = Bottom Number

→ $6^2 = 36$

→ $5^2 = 25$

→ $4^2 = 16$

Hence, the correct answer is "Option 1".

Q68. Answer: (d) 4

Given:

If 2x - 3y = 7 and x/(x+y) = 5/6, then what is the value of x - y?

Formula used:

Use the given equations to solve for x and y:

1. 2x - 3y = 7

2. x/(x+y) = 5/6

Calculation:

From the second equation:

x/(x+y) = 5/6

=> 6x = 5(x + y)

=> 6x = 5x + 5y

=> x = 5y

Substitute x = 5y into the first equation:

2(5y) - 3y = 7

=> 10y - 3y = 7

=> 7y = 7

=> y = 1

Substitute y = 1 into x = 5y:

=> x = 5(1) = 5

Now, find x - y:

=> x - y = 5 - 1 = 4

Therefore The correct answer is 4.

Q69. Answer: (c) 11

Given:

(4 + 3 × 3 - 2)/(4 - 3 × (3 - 2)) = ?

Formula used:

Follow BODMAS (Bracket, Order, Division, Multiplication, Addition, Subtraction).

Calculation:

Numerator: 4 + 3 × 3 - 2

=> 4 + 9 - 2 = 11

Denominator: 4 - 3 × (3 - 2)

=> 4 - 3 × 1 = 4 - 3 = 1

Now, the expression becomes:

=> 11/1 = 11

Therefore The correct answer is 11.

Q70. Answer: (a) Carnelian stone

The correct answer is Carnelian stone

Key Points

• Carnelian stone was one of the primary materials used to make beads in the Harappan civilization.

• The Harappan civilization, also known as the Indus Valley Civilization, flourished around 2500 BCE in what is now Pakistan and northwest India.

• Beads made from carnelian stone were often highly polished and crafted into various shapes, indicating advanced bead-making techniques.

• Other materials used for bead-making in the Harappan civilization included agate, shell, and faience.

• The use of carnelian stone for beads highlights the Harappans' access to diverse raw materials and their trade connections.

Additional Information

• The Harappan civilization is one of the world's oldest urban cultures, known for its advanced city planning, architecture, and social organization.

• Artifacts such as beads, pottery, and seals provide significant insights into the daily life, trade, and culture of the Harappans.

• The civilization had a well-developed trade network, both within the region and with distant lands, as evidenced by the variety of materials found in Harappan sites.

• Archaeological discoveries continue to shed light on the complexities and achievements of this ancient civilization.

Q71. Answer: (b) Arshdeep Singh

The correct answer is Arshdeep Singh

Key Points

• Arshdeep Singh won the Wildlife Photographer of the Year 2018 award in the 10 years and under category.

• Arshdeep Singh is an Indian photographer known for his remarkable talent at a young age.

• The Wildlife Photographer of the Year is an annual international wildlife photography competition organized by the Natural History Museum in London.

• Winning this prestigious award at such a young age highlights Arshdeep's exceptional skill and passion for wildlife photography.

Additional Information

• Wildlife Photographer of the Year was first launched in 1965 by BBC Wildlife Magazine, which at the time was called Animals.

• The competition is open to photographers of all ages and skill levels from around the world.

• Each year, the competition receives thousands of entries, showcasing the beauty and diversity of the natural world.

• The winning images are exhibited at the Natural History Museum in London and then tour internationally.

• Arshdeep Singh's winning photograph demonstrated not only technical excellence but also a deep understanding and appreciation of wildlife.

Q72. Answer: (a) Mizoram

The correct answer is Mizoram

Key Points

• Mizoram has the highest percentage of its geographical area covered by forests, as per the India State of Forest Report (ISFR) 2019.

• According to the ISFR 2019, Mizoram has approximately 85.41% of its total geographical area under forest cover.

• This high percentage is attributed to the state's hilly terrain and favorable climatic conditions for forest growth.

• Mizoram's commitment to forest conservation is reflected in its policies and community participation in forest management.

Additional Information

• The India State of Forest Report (ISFR) is a biennial publication by the Forest Survey of India (FSI), which assesses the forest and tree resources of the country.

• The report provides valuable data on forest cover, tree cover, mangroves, growing stock, and forest carbon.

• Forest cover is categorized into very dense forest, moderately dense forest, and open forest based on the canopy density.

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• Effective forest management is crucial for biodiversity conservation, climate regulation, and sustaining the livelihoods of forest-dependent communities.

Q73. Answer: (c) 25 : 9

Given:

30% of x is equal to five-sixth of y.

Formula used:

30% of x = (30 / 100) × x

Five-sixth of y = (5 / 6) × y

Given:

(30 / 100) × x = (5 / 6) × y

Calculation:

Cross-multiply to find the ratio x : y:

30x / 100 = 5y / 6

Cross-multiply to solve for x and y:

30x × 6 = 5y × 100

180x = 500y

Divide both sides by 180:

x / y = 500 / 180 = 5 / 1.8 = 50 / 18 = 25 / 9

Therefore The ratio x : y is 25 : 9.

Q74. Answer: (b) 46%

Given:

Total number of boys = 1400

Total number of girls = 600

Percentage of boys who passed = 60%

Percentage of girls who passed = 40%

Formula Used:

Percentage of failed candidates = [(Total students - Passed students) / Total students] × 100

Calculation:

Number of boys who passed = 1400 × 60%

=> Number of boys who passed = 1400 × 0.60

=> Number of boys who passed = 840

Number of girls who passed = 600 × 40%

=> Number of girls who passed = 600 × 0.40

=> Number of girls who passed = 240

Total number of students = 1400 + 600

=> Total number of students = 2000

Total number of students who passed = 840 + 240

=> Total number of students who passed = 1080

Total number of students who failed = 2000 - 1080

=> Total number of students who failed = 920

Percentage of failed candidates = (920 / 2000) × 100

=> Percentage of failed candidates = (920/2000) × 100

=> Percentage of failed candidates = 46%

The percentage of failed candidates is 46%.

Q75. Answer: (d) 98

Given:

If =, find the value of 'x'.

Formula used:

Cross multiply to solve for x:

Calculation:

Cross multiplying the equation:

=> x × x = 49 × 196

=> $x^2 = 49 \times 196$

=> $x^2 = 49 \times 14^2$

=> x = 49^(1/2) × 14

=> x = 7 × 14

=> x = 98

Therefore The correct answer is 98.

Q76. Answer: (c) Having significant global presence/international operations

The correct answer is Having significant global presence/international operations

Key Points

• To be eligible for the Maharatna status, a company must have a significant global presence/international operations.

• Other criteria include having a Miniratna Category-1 status, a positive net profit to net worth ratio, and inter-sectoral performance.

• The status is granted to Central Public Sector Enterprises (CPSEs) in India, allowing them greater autonomy in decision-making.

• Maharatna status is aimed at enabling CPSEs to expand their operations and emerge as global giants.

Additional Information

• The Maharatna status was introduced by the Government of India in December 2009 to empower mega CPSEs to expand their operations and emerge as global giants.

• Currently, there are several CPSEs that have been granted Maharatna status, including ONGC, Indian Oil Corporation, and NTPC.

• With this status, these enterprises have enhanced powers to invest in joint ventures and subsidiaries and to undertake mergers and acquisitions.

• Companies with Maharatna status can invest up to 15% of their net worth in a single project without seeking government approval, subject to a cap of Rs. 5,000 crores.

Q77. Answer: (b) Bhawana Kanth

The correct answer is Bhawana Kanth

Key Points

• Bhawana Kanth is the first woman pilot of the Indian Air Force (IAF) to qualify to undertake combat missions on a fighter jet.

• She was inducted into the IAF fighter squadron in June 2016.

• Bhawana Kanth, along with two other female pilots, Avani Chaturvedi and Mohana Singh, were the first women to be commissioned as flying officers in the IAF fighter stream.

• She flew solo on a MiG-21 Bison in March 2018, a significant milestone in her career.

• This marked a historic moment for the Indian Air Force and for women in the armed forces in India.

Additional Information

• The induction of women into the fighter stream of the Indian Air Force is a part of the broader initiative to increase the role of women in the Indian armed forces.

• Women were first allowed to join the Indian Air Force as short-service commissioned officers in 1992.

• In 2015, the Indian government approved the induction of women into the fighter stream, marking a significant step towards gender equality in the armed forces.

• Bhawana Kanth's achievement is a testament to the evolving opportunities for women in the Indian military.

• The Indian Air Force continues to encourage and support women in various roles, including combat positions.

Q78. Answer: (b) Baking soda

The correct answer is Baking soda

Key Points

• Baking soda is the common name for the compound sodium bicarbonate (NaHCO3).

• It is a white crystalline powder that is commonly used in baking as a leavening agent.

• When baking soda reacts with acidic components in the batter, it releases carbon dioxide gas, which causes the batter to rise and become fluffy.

• In addition to its culinary uses, baking soda has various other applications, including as a cleaning agent, in personal hygiene products, and in fire extinguishers.

Additional Information

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• Sodium bicarbonate is also used in medical treatments, such as for acid indigestion and heartburn, due to its ability to neutralize stomach acid.

• It is often found in household products like toothpaste and deodorants because of its mild abrasive and odor-neutralizing properties.

• In science, it is used in chemical laboratories for various experiments and as a buffering agent.

• It is important to store baking soda in a dry place to prevent it from reacting with moisture in the air.

Q79. Answer: (d) 7 : 9

Given:

Total number of students in the school = 240

Number of boys in the school = 135

Formula Used:

Number of girls = Total number of students - Number of boys

Ratio of girls to boys = Number of girls / Number of boys

Calculation:

Number of girls = 240 - 135

Number of girls = 105

Ratio of girls to boys = 105 / 135

Ratio of girls to boys = 105/135

Ratio of girls to boys = 7/9

Ratio of girls to boys = 7 : 9

The ratio of the total number of girls to the total number of boys in the school is 7 : 9.

Q80. Answer: (d) Karnataka

The correct answer is Karnataka

Key Points

• Jog Falls is located in the state of Karnataka, India.

• It is the second highest plunge waterfall in India, created by the Sharavathi River dropping from a height of 253 meters (830 feet).

• The falls are a major tourist attraction and are particularly spectacular during the monsoon season when the water flow is at its peak.

• Jog Falls is also known as Gersoppa Falls or Jogada Gundi.

• The waterfall is divided into four distinct segments—Raja, Rani, Rover, and Rocket—which present a magnificent view when the water cascades down the rocky cliffs.

Additional Information

• Karnataka is known for its rich natural resources and diverse landscapes, including numerous rivers, waterfalls, forests, and beaches.

• Other famous waterfalls in Karnataka include Abbey Falls, Shivanasamudra Falls, and Unchalli Falls.

• Karnataka is also home to several national parks and wildlife sanctuaries, such as Bandipur National Park, Nagarhole National Park, and Bannerghatta National Park.

• The state has a rich cultural heritage, with historic cities like Mysore, Hampi, and Belur attracting tourists from around the world.

• Karnataka is known for its contributions to classical Indian music, dance, and literature, and it is a hub for technology and innovation in India.

Q81. Answer: (b) Kerala

The correct answer is Kerala

Key Points

• Kerala achieved the highest literacy rate through its literacy program 'Athulyam' in 2018.

• The 'Athulyam' program was aimed at achieving 100% primary education in the state.

• Kerala has consistently been at the forefront in terms of literacy rates in India.

• The program focused on educating those who had missed out on formal education, including elderly people and marginalized communities.

Additional Information

• Kerala's literacy rate has been one of the highest in India for several years, often cited as a model for other states to follow.

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• The state has a robust education system that includes a high number of schools, colleges, and universities.

• Kerala's government has implemented various programs over the years to reduce dropout rates and improve educational outcomes.

• The success of 'Athulyam' further solidified Kerala's reputation as the most literate state in India.

Q82. Answer: (a) seventh navigation satellite

The correct answer is seventh navigation satellite

Key Points

• IRNSS - IG is the seventh navigation satellite in the Indian Regional Navigation Satellite System (IRNSS) series.

• The IRNSS is an autonomous satellite navigation system developed by the Indian Space Research Organisation (ISRO).

• The system is designed to provide accurate position information services to users in India and the surrounding region extending up to 1,500 km.

• It is intended to provide two types of services, namely Standard Positioning Service (SPS) for civilian use and Restricted Service (RS) for authorized users.

• IRNSS - IG was launched to complete the constellation of seven satellites in the IRNSS series, ensuring full operational capability of the navigation system.

Additional Information

• IRNSS is also known as NavIC (Navigation with Indian Constellation).

• The first satellite in the IRNSS series, IRNSS-1A, was launched on 1st July 2013.

• IRNSS provides accurate position information to users in India and the region extending up to 1,500 km from its boundary, which is its primary service area.

• The system provides position accuracy better than 20 meters in the primary service area.

• IRNSS is designed to provide accurate position information to users in India and the surrounding region, which is beneficial for terrestrial, aerial, and marine navigation.

Q83. Answer: (c) fifth

The correct answer is fifth

Key Points

• Naveen Patnaik was sworn in as the Chief Minister of Odisha for the fifth time on May 2019.

• He is a member of the Biju Janata Dal (BJD) and has been in office since 2000.

• Under his leadership, the BJD won a landslide victory in the 2019 Odisha Legislative Assembly elections.

• Naveen Patnaik is known for his focus on development and welfare programs in the state.

• His tenure has seen significant progress in areas such as infrastructure, healthcare, and education.

Additional Information

• Naveen Patnaik is one of the longest-serving chief ministers in India.

• He is the son of former Chief Minister of Odisha, Biju Patnaik, after whom the Biju Janata Dal is named.

• Under his leadership, Odisha has also been praised for its disaster management efforts, especially during cyclones.

• He is known for his clean image and has been consistently ranked as one of the most popular chief ministers in India.

Q84. Answer: (d) 29 : 21

Shortcut Trick

Applying the Componendo and Dividendo rule:

$x / y = (7 + 3) / (7 − 3) = 10 / 4 = 5 / 2$

Assume $x = 5$ and $y = 2$.

Substitute directly: $(x^2 + y^2) : (x^2 − y^2)$

Ratio = $(5^2 + 2^2) : (5^2 − 2^2) = (25 + 4) : (25 − 4) = 29 : 21$

Therefore The correct answer is 29 : 21.

Alternate Method

Given:

$(x + y) : (x − y) = 7 : 3$

x + y = 7 partsx − y = 3 partsx = 5 partsy = 2 parts

Calculation:

=> $(x + y) / (x − y) = 7 / 3$

=> Cross-multiplying the terms, we get:

=> 3 × (x + y) = 7 × (x − y)
=> 3x + 3y = 7x − 7y
=> 7y + 3y = 7x − 3x
=> 10y = 4x
=> x / y = 10 / 4 = 5 / 2
=> Let x = 5k and y = 2k.
Now, finding the value of $(x^2 + y^2) : (x^2 − y^2)$
=> $((5k)^2 + (2k)^2) : ((5k)^2 − (2k)^2)$
=> $(25k^2 + 4k^2) : (25k^2 − 4k^2)$
=> $29k^2 : 21k^2$
=> 29 : 21
Therefore The correct answer is 29 : 21.
Additional Information
Componendo and Dividendo
If a / b = c / d, then by applying this rule, we obtain (a + b) / (a − b) = (c + d) / (c − d). This simplifies complex ratio terms easily.
Proportion Property
If a : b = c : d, then the product of extremes equals the product of means (a × d = b × c).
Duplicate and Sub-duplicate Ratios
For a ratio a : b, its duplicate ratio is $a^2 : b^2$, and its sub-duplicate ratio is √a : √b.

Q85. Answer: (a) Chop

The logic followed here is:

Chop	Cut into pieces
Boil	Cook in water
Fry	Cook in oil
Bake	Cook in oven

Boil, Fry, Bake all are methods of cooking,
Whereas,
Chop is a method of cutting.
Hence, the correct answer is "Chop".

Q86. Answer: (d) 13%

Calculation:
According to the question,
The production of sugar from sugarcane in the state of UP in the year 2018 as compared to 2017
Increase in Percentage = (7 - 6.2)/6.2
=> 0.1290
In percentage = 0.1290 × 100
=> 13% Approx.
Therefore The approximate percentage increase in the production of sugar from sugarcane in the state of UP in the year 2018 as compared to 2017 is 13%.

Q87. Answer: (a) 2015

Given:
The graph shows the number of books printed (in lakhs) by a printing company from 2012 to 2017.
Formula used:
Percentage Increase = (New Value - Old Value)/(Old Value) × 100%
Calculation:
For 2013 over 2012:
Number of books in 2013 = 60 lakhs, in 2012 = 50 lakhs
=> Percentage Increase = (60 - 50)/50 × 100% = 2%

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For 2015 over 2014:

Number of books in 2015 = 55 lakhs, in 2014 = 45 lakhs

=> Percentage Increase = (55 - 45)/45 × 100% = 2.22%

For 2016 over 2015:

Number of books in 2016 = 65 lakhs, in 2015 = 55 lakhs

=> Percentage Increase = (65 - 55)/55 × 100% = 1.81%

Therefore The maximum percentage increase was in the year 2015.

Q88. Answer: (c) 170%

Given:

The import of type 4 smart boards in 2015 was what percentage of the import of type 5 smart boards in 2016?

Formula used:

Percentage =

Calculation:

Import of type 4 smart boards in 2015 = 34 thousand

Import of type 5 smart boards in 2016 = 20 thousand

Percentage = (34/20)× 100

=> Percentage = 170%

Therefore The correct answer is 170%.

Q89. Answer: (c) Total Profit of the company for the period is 160 Million $

Given :-

Profit given by textile company in different years (million)

2012-2013 = 30

2013-2014 = 36

2014-2015 = 28

2016 -2017 = 32

2017-2018 = 36

Calculation :-

=> The company has recorded drop in profits for only one of the five years (statement is true because year 2013-2014 → 2014-2015 profit drop)

=> The company has recorded the same increase in profits in $ terms for the past two years (statement is true because year 2012-2013 → 2013-2014 & 2016 -2017 → 2017-2018 same increase in profit)

=> Total Profit of the company for the period is 160 Million $(statement is incorrect because Total Profit of the company for the period = 30 +36 +28 +32+36 =162 million)

=> The company has recorded profits greater than or equal to 30 Million $ for four out of five years.(statement is true because year 2012-2013, 2013-2014, 2016 -2017, 2017-2018 profit greater than 30 million $)

Q90. Answer: (d) ULT

The logic followed here is,

GOD is written as IRH,

NET is written as PHX,

Similarly,

SIP can be written as,

Hence, the correct answer is "ULT".

Q91. Answer: (b) Only assumption A is implicit.

Given Statement: "If you fail the test, I will cancel your plans for the picnic."- A father warns his daughter.

Now,

Assumptions:

1. Desire for the picnic can boost her motivation to study sincerely for the test - Implicit (The father's warning implies that he believes the threat of canceling the picnic will motivate his daughter to study hard and pass the test.)

2. The daughter will fail the test if she doesn't get any warning - Not Implicit (The statement doesn't necessarily imply that the daughter will fail without the warning; it only shows the father's concern and his method to ensure she studies.)

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Here, Only assumption A is implicit.

Hence, the correct answer is "Option 2".

Q92. Answer: (d) All A are C

The given venn diagram is shown below,

Let's check each option,

1) All C are A → False (Because, some C are A)

2) All C are B → False (Because, some C are B)

3) All B are A → False (Because, some B are A)

4) All A are C → True (All A are C can be seen in the given venn diagram)

Hence, the correct answer is "All A are C".

Q93. Answer: (d) ÷, ×, =, -

Let's check each option,

1) ×, ÷, +, =

→ 12 × 2 ÷ 4 + 30 = 6

→ 12 × 1/2 + 30 = 6

→ 6 + 30 = 6

→ 36 ≠ 6

→ LHS ≠ RHS

2) ×, =, -, ÷

→ 12 × 2 = 4 - 30 ÷ 6

→ 12 × 2 = 4 - 5

→ 24 ≠ -1

→ LHS ≠ RHS

3) ×, -, =, ×

→ 12 × 2 - 4 = 30 × 6

→ 24 - 4 = 180

→ 20 ≠ 180

→ LHS ≠ RHS

4) ÷, ×, =, -

→ 12 ÷ 2 × 4 = 30 - 6

→ 6 × 4 = 30 - 6

→ 24 = 30 - 6

→ 24 = 24

→ LHS = RHS => Satisfies the equation.

Hence, the correct answer is "Option 4".

Q94. Answer: (a) 400, 100, 25

The logic followed here is:

Logic: 1st number ÷ 4 = 2nd number; 2nd number ÷ 4 = 3rd number.

Now,

For, 144, 36, 9

=> 144 ÷ 4 = 36

=> 36 ÷ 4 = 9

Similarly, for Option 1) 400, 100, 25

=> 400 ÷ 4 = 100

=> 100 ÷ 4 = 25

Hence, the correct answer is "Option 1".

Q95. Answer: (b) 4

The logic followed here is:

Logic: The number in the lower triangle is the half of the sum of the numbers of its two upper triangles.

Let's check,
=> 5 = (6 + 4) ÷ 2
=> 6 = (4 + 8) ÷ 2
=> 3 = (0 + 6) ÷ 2
=> 5 = (6 + 4) ÷ 2
Similarly,
=> ? = (8 + 0) ÷ 2 = 4
Hence, the correct answer is "4".

Q96. Answer: (c) Season

The logic followed here is:

Week	Unit of time
Day	Unit of time
Season	Period of the year
Month	Unit of time

Week, Day, Month all are units of time,
Whereas,
Season is a period of the year and not a specific unit of time.
Hence, the correct answer is "Season".

Q97. Answer: (a) 15 S 3 R 4 T 4 R 5

Letters	P	Q	R	S	T	U	V
Means	•	•	×	÷	=		<

Let's check each option,
1) 15 S 3 R 4 T 4 R 5
→ 15 ÷ 3 × 4 = 4 × 5
→ 5 × 4 = 4 × 5
→ 20 = 20
→ LHS = RHS => Satisfies the equation.
2) 15 P 3 Q 4 R 4 T 5
→ 15 + 3 - 4 × 4 = 5
→ 15 + 3 - 16 = 5
→ 18 - 16 = 5
→ 2 ≠ 5
→ LHS ≠ RHS
3) 15 U 3 R 4 P 5 P 4
→ 15 > 3 × 4 + 5 + 4
→ 15 > 12 + 5 + 4
→ 15 > 21 → This is not correct.
4) 15 T 3 Q 4 P 4 Q 5
→ 15 = 3 - 4 + 4 - 5
→ 15 = 7 - 4 - 5
→ 15 = -2
→ LHS ≠ RHS
Hence, the correct answer is "Option 1".

Q98. Answer: (d) DLWE

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

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Q99. Answer: (c) Neither conclusion A nor B follows.

The least possible Venn diagram for the given statement is:

Conclusions:

A. Some girls are shoes → False (Some girls are mangoes and some mangoes are shoes implies that it is possible that some girls are shoes but not definite).

B. No shoe is a mango → False (Some mangoes are shoes implies that atleast some shoes are mango).

Hence, the correct answer is "Neither conclusion A nor B follows".

Q100. Answer: (c) 78

The logic followed here is:

Logic: The number in the circle is the sum of the squares of the other three numbers.

→ $29 = (2)^2 + (3)^2 + (4)^2$

→ 29 = 4 + 9 + 16

→ 69 = (1)2 + (8)2 + (2)2

→ 69 = 1 + 64 + 4

Similarly,

→ ? = (7)2 + (2)2 + (5)2

→ ? = 49 + 4 + 25 = 78

Hence, the correct answer is "78".

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