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

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

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Q1. Which of the following is NOT a Kharif crop?

(a) Paddy
(b) Jowar
(c) Bajra
(d) Wheat

Q2. A fruit seller buys oranges at the rate of 12 for Rs. 60. How many oranges should he sell for Rs. 60 so as to gain 20%?

(a) 8
(b) 10
(c) 11
(d) 9

Q3. Which of the following is an example of man-made fibre?

(a) Silk
(b) Jute
(c) Linen
(d) Rayon

Q4. Select the option that is related to the third term in the same way as the second term is related to the first term.

Bat : Cricket :: Stick : _____

(a) Hockey
(b) Basketball
(c) Tennis
(d) Badminton

Q5. What is the name of Ganga cleanup program launched in 2014?

(a) Ganga Action Plan
(b) Namami Gange
(c) Clean Ganga Plan
(d) Ganga Cleanup Program

Q6. The concept of Bodhisattva is associated with:

(a) Mahayana Buddhism
(b) Jainism
(c) Hinyana Buddhism
(d) Sikhism

Q7. For a = - 5 and b = 5, value of a^2- b^2 is:

(a) 0
(b) • 50
(c) -10

(d) 100

Q8. Who was the fourth President of India?

(a) Giani Zail Singh
(b) B. D. Jatti
(c) Dr Zakir Husain
(d) Varahagiri Venkata Giri

Q9. Which among the following is NOT a property of colloids?

(a) A colloid is a heterogeneous mixture.
(b) Due to too small size, individual particles cannot be seen with naked eyes.
(c) Colloid cannot scatter a beam of light passing through it.
(d) They do not settle down when left undisturbed.

Q10. Simplify (1800 ÷ (24 ÷ 8 × 3) + 16)/(3/4 × (32 ÷ 2))

(a) 39/4
(b) 454/3
(c) 150/17
(d) 18

Q11. If tan θ = 1 (θ an acute angle) then the value of 2 sinθ cosθ - $cosec^2\theta$ is:

(a) 1
(b) -1
(c) 1 - √2
(d) • 3

Q12. The total number of ministers, including the Chief Minister, in the council of ministers in a state CANNOT exceed _____ of the total number of members of the legislative assembly of that State.

(a) 1/20
(b) 1/10
(c) 3%
(d) 15%

Q13. A can complete a piece of work in 24 days. He worked for 21 days and then B finished the remaining work in 5 days. In how many days can A and B together finish the work?

(a) 24 days
(b) 40 days
(c) 15 days
(d) 45 days

Q14. Read the given statements and conclusions carefully and decide which of the conclusions logically follow(s) from the statements.

Statements:

1. Some boys are cricketers.
2. Some girls are cricketers.

Conclusions:

1. All girls are cricketers.
2. Some cricketers are girls.

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

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Q15. Select the letter cluster that will come next in the following series.

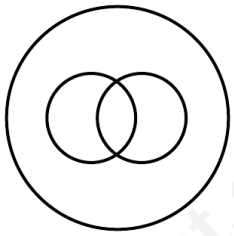
CHD, EJF, _____

(a) GLH
(b) GLG
(c) GNG
(d) GNH

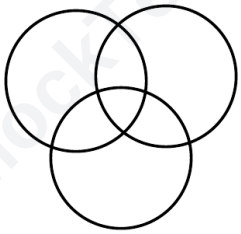
Q16. Select the Venn diagram that best represents the relationship among the given set of classes.

Earth, Country, State

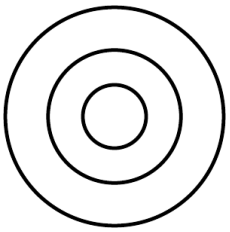
(a)



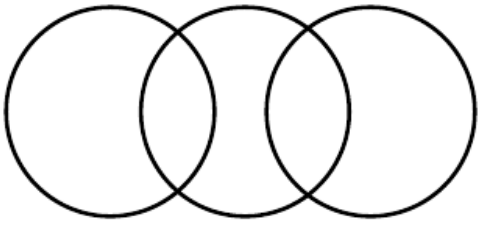
(b)



(c)



(d)



Q17. The device that uses ultrasonic waves to measure the distance, direction and speed of underwater objects is called:

(a) RADAR
(b) SONAR
(c) MASER
(d) CRO

Q18. Vinaya and Sutta Pitaka are the compilations of whose teachings?

(a) Mahavira Jaina
(b) Gautam Buddha
(c) Rishabhdev
(d) Guru Gobind Singh

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Q19. Select the option that shows the correct match of an organisation and its headquarters.

(a) ESO - Brussels
(b) INTERPOL - Washington D.C
(c) WHO - Paris
(d) GATT - Geneva

Q20. A, B and C together can do a piece of work in 14 days, whereas C alone can do the same work in 42 days. How long will A and B together take to finish it ?

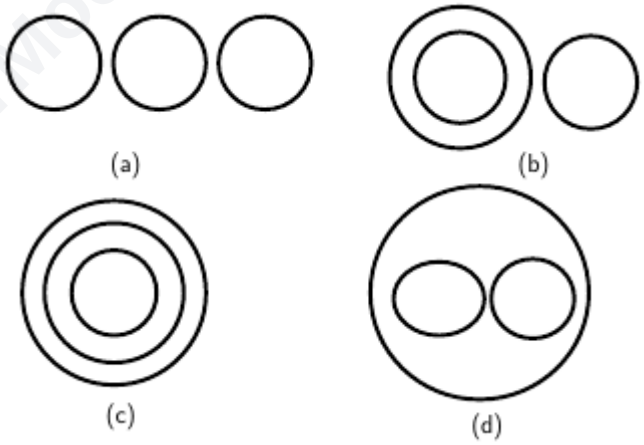
(a) 7 days
(b) 28 days
(c) 35 days
(d) 21 days

Q21. A bag contains cards numbered from 33 to 92. If one card is drawn from the bag, the probability that the number on the drawn card is a perfect square is:

(a) • 1/12
(b) 5/59
(c) 1/15
(d) 4/59

Q22. Select the Venn diagram that best represents the relationship between the following classes:

Oxygen, Hydrogen and Gases.



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

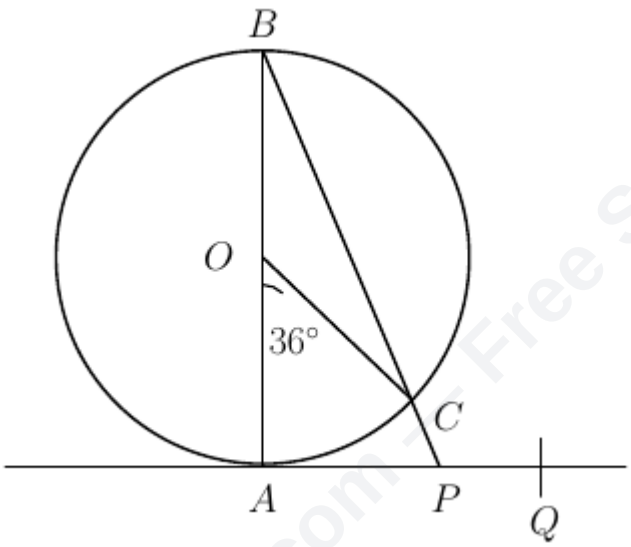
Q23. Who mentioned Adhyakshas as the superintendents of different departments in the Mauryan administration?

(a) Megasthenes
(b) Kautilya
(c) Strabo
(d) Pliny

Q24. In the given figure, AB is the diameter of the circle. AP is a tangent to circle at A. Extended BC meets the tangent at P.

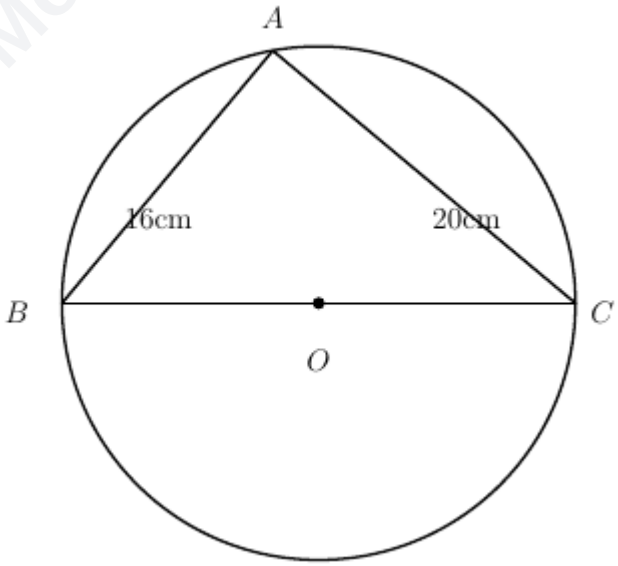
angle AOC = 36°. Find angle BPQ.

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(a) 126°
(b) 72°
(c) 108°
(d) 54°

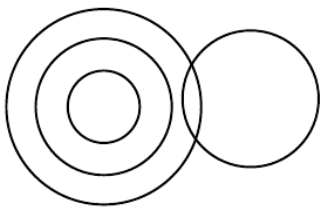
Q25. Find the area of Δ ABC



(a) 32 cm²
(b) 240 cm²
(c) 320 cm²
(d) 160 cm²

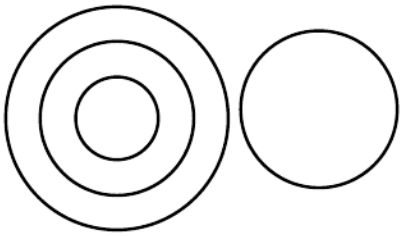
Q26. Select the Venn diagram that best represents the relationship between the following classes.
Parallelogram. Rhombus, Square, Trapezoid

(a)

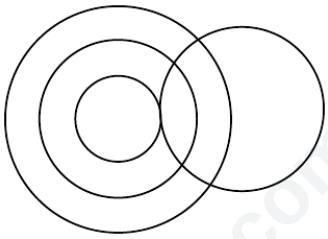


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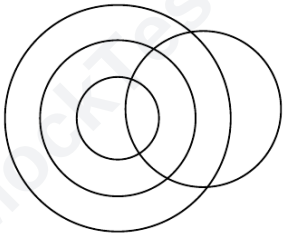
(b)



(c)



(d)



Q27. LCM of 30, 40 and 45 is:

(a) 360
(b) 5
(c) 54000
(d) 115

Q28. Which of the following does a Bandicoot refer to ?

(a) Humanoid
(b) A drainage-cleaning robot
(c) A telerobot for heart surgery
(d) A security robot

Q29. Select the option that gives decimal numbers 0.25, 1.24, 0.0882 and 2.67 arranged in ascending order.

(a) 1.24, 0.25, 2.67, 0.0882
(b) 0.25, 1.24, 0.0882, 2.67
(c) 0.0882, 0.25, 1.24, 2.67
(d) 2.67, 1.24, 0.25, 0.0882

Q30. Which district in Haryana has a nuclear power plant?

(a) Fatehabad
(b) Rohtak
(c) Sonipat
(d) Karnal

Q31. Simplify

$4\sqrt{0.000081}$

(a) 0.36
(b) 0.036
(c) 0.0018

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(d) 0.0036

Q32. If (4*y* -1) and (y + 4) both are factors of $py^2 + 15y - q$ then:

(a) p = 4 q
(b) p = q/4
(c) p = q
(d) p = - q

Q33. Kings and Queens of black colour are taken out from a deck of 52 playing cards. A card is drawn from the remaining well-shuffled cards. Probability of getting a spade card is:

(a) 1/4
(b) 11/48
(c) 11/52
(d) 11/13

Q34. Whose reign saw the largest extension of Delhi Sultanate?

(a) Muhammad bin Tughluq
(b) Alauddin Khilji
(c) Gayasuddin Balban
(d) Sikandar Lodi

Q35. In what time will Rs. 3,200 invested at 10% per annum compounded quarterly become Rs. 3,362 ?

(a) 1/2 year
(b) 2 years
(c) 21/2years
(d) 1/4 year

Q36. Which of the following is an incorrect pair of abbreviation and its full form?

(a) RAM- Random Access Memory
(b) FAX- Facsimile
(c) DBMS- Data Base Management System
(d) URL- Uniform Reserve Locator

Q37. Out of the four words listed, three are alike in some manner and one is different. Select the odd one.

(a) Australia
(b) Europe
(c) India
(d) Africa

Q38. A team of 5 members is to be selected from 6 men A, B, C, D, E and F and 6 women P, Q, R, S, T and U. C and U have to be selected together. If B is selected, then neither U nor Q can be selected. Among A, B, S and T exactly two persons are to be selected. If E is selected, then neither S nor B can be selected. If A is selected, then B will be selected. Which of the following is the correct selection of the team?

(a) P, R, S, T, D
(b) C, A, B, P, R
(c) C, U, A, B, S
(d) P. R., A. B, S

Q39. Pradhan Mantri Shram Yogi Maan-dhan (PM - SYM) Yojana which was launched on 5^(th) March 2019 is aimed at benefitting:

(a) government and public sector employees
(b) unorganised sector workers
(c) private sector employees
(d) organised sector workers

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Q40. Select the alphanumeric term that will come next in the following series.

B7K, KB7, _____

(a) K7B
(b) 7BK
(c) BK7
(d) 7KB

Q41. Which hormone regulates the blood sugar level in the body?

(a) Testosterone
(b) Thyroid
(c) Adrenaline
(d) Insulin

Q42. An attempt to obtain sensitive information such as username, password and credit card details, etc. for malicious reasons is termed as:

(a) Netting
(b) Phishing
(c) Digging
(d) Surfing

Q43. Two cars cover a certain distance by moving at speeds of 45 km/h and 50 km/h respectively. Find the distance traveled when one car takes 32 minutes more than the other to cover the distance.

(a) 240/19 km
(b) 240 km
(c) 8/3 km
(d) 152/3 km

Q44. Against which act Mahatma Gandhi asked people to observe 6 April 1919 as a day of non- violence opposition?

(a) Rowlatt Act
(b) Charter Act, 1813
(c) Arms Act
(d) Vernacular press Act

Q45. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

Some boys are birds.

All birds are animals.

Conclusions:

I. Some boys are animals.

II. Some animals are boys.

(a) Neither conclusions I and II follow.
(b) Only conclusion II follows
(c) Both conclusions I and II follow.
(d) Only conclusion I follows.

Q46. The Government of India approved the National Policy for Farmers (NPF) in:

(a) 2010
(b) 2018
(c) 2001
(d) 2007

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Q47. BuyUcoin has introduced the first Indian platform regarding wholesale trading for:

(a) plastic currency
(b) paper currency
(c) cryptocurrency
(d) gilt currency

Q48. Which of the following functions cannot be performed by NBFCs ?

(a) Providing loans
(b) Accepting demand deposits
(c) Making investments
(d) Acquisition of shares

Q49. Select the option that will fill in the blank and complete the given series.

7, 9, 13, 21,_____

(a) 27
(b) 37
(c) 30
(d) 36

Q50. Who has produced the indigenous LCA fighter jets Tejas?

(a) Hindustan Aeronautics Limited
(b) India Aeronautics Limited
(c) Bharat Dynamics Limited
(d) Hindustan Dynamics Limited

Q51. National Technology Day is observed every year to commemorate:

(a) Operation Blue Star
(b) Pokhran II
(c) Mangalyaan
(d) Operation Meghdoot

Q52. Which constitutional amendment, known as 'mini constitution', gave effect to the recommendations of Swaran Singh Committee?

(a) 43^(rd) constitutional amendment
(b) 44^(th) constitutional amendment
(c) 42^(nd) constitutional amendment
(d) 41^(St) constitutional amendment

Q53. If in a code language PRIME is written as KIRNV, then SPORT would be written as ____ in the same language.

(a) HKLIG
(b) GJKHF
(c) GJLHF
(d) HLLIG

Q54. Who has been named as the leader of Opposition in Rajya Sabha in Feb 2021?

(a) Rahul Gandhi
(b) Ghulam Nabi Azad
(c) Mallikarjun Kharge
(d) Anand Sharma

Q55. If circumference and area of a circle are numerically equal then radius of the circle is:

(a) 1 unit
(b) 4 units
(c) 2 units
(d) 16 units

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Q56. Two friends received a bonus of Rs. 2,000 each in their bank accounts. They already have Rs. 47,000 and Rs. 54,000 in their respective bank accounts. Ratio of the amounts in their respective accounts will be:

(a) 49 : 54
(b) 47 : 54
(c) 7 : 8
(d) 47 : 56

Q57. Which of the following is used for calculating dearness allowance to government employees for increase in prices in India?

(a) Bank rate
(b) Statutory Liquidity Ratio (SLR)
(c) Interest rate
(d) Consumer Price Index Number for Industrial Workers (CPI-IW)

Q58. Find the value of x if, 20% of 75 = 225 - x% of 420.

(a) 20
(b) 3
(c) 1535
(d) 50

Q59. To neutralise the effect of formic acid injected by ant bite, which among the following can be used?

(a) Calcium carbonate
(b) Potassium carbonate
(c) Sodium carbonate
(d) Sodium bicarbonate

Q60. Select the option that will fill in the blank and complete the given series.

3, 4, 0, 9, -7, _____

(a) • 32
(b) 18
(c) 7
(d) 8

Q61. The Reserve Bank of India was established in:

(a) 1950
(b) 1935
(c) 1947
(d) 1919

Q62. Six years from now, Kirti's age will be twice the age of her brother Kunal, but 4 years ago she was four times as old as Kunal was then. Find the present age of Kunal.

(a) 30 years
(b) 24 years
(c) 9 years
(d) 15 years

Q63. Who was the author of "The General Theory of Employment, Interest and Money" that laid the foundation of macroeconomics as a separate branch of economics?

(a) John Maynard Keynes
(b) Dr. Philip Kotler
(c) Adam Smith
(d) Dr. Keegen Alen

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Q64. Simplify

$5 + 2 \times 3 \div (3 \times 2) \times 3$

(a) 16/3
(b) 17
(c) 8
(d) 7/6

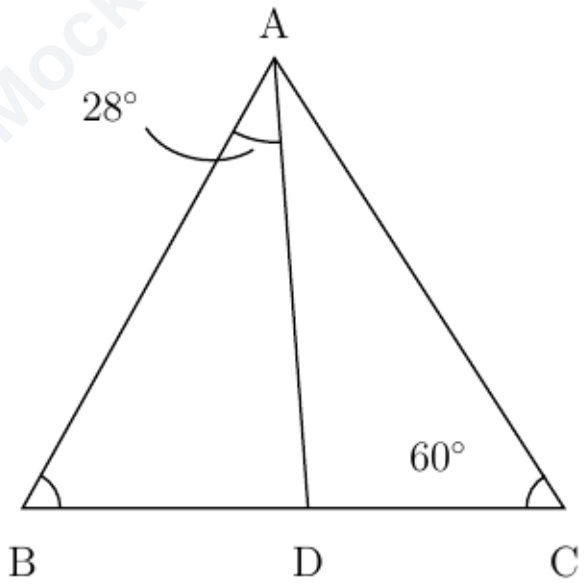
Q65. An amount doubles itself on simple interest in 4 years. What is the per cent per annum rate of interest?

(a) 100 %
(b) 12.5 %
(c) 50 %
(d) 25 %

Q66. What is the difference between 3/5 of 200 and 1/2 of 300 ?

(a) 100
(b) 60
(c) 200
(d) 30

Q67.)If (AB/AC = BD/DC then angle ABC is:



(a) 92°
(b) 64°
(c) 32°
(d) 74°

Q68. A sells an article to B at a profit of 20% and B sells it to C at a profit of 20%. If C pays Rs. 360 for it, what was the cost price for A?

(a) Rs. 120
(b) Rs. 250
(c) Rs. 144
(d) Rs. 308

Q69. Find the least multiple of 7 which when divided by 6, 8 and 12 leaves 1 as remainder.

(a) 73
(b) 169
(c) 49
(d) 25

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Q70. Name the Punjabi Muslim, who was a student at Cambridge and who coined the term 'Pak - Stan' in 1933?

(a) Khan Rehmad Khan
(b) Chaudhary Rehmat Ali
(c) Amanat Ali
(d) Nusrat Fateh Ali

Q71. Which of the following is NOT a tributary of Krishna?

(a) Ghatprabha
(b) Manjira
(c) Tungabhadra
(d) Musi

Q72. Who founded the Tattwabodhini Sabha to propagate Ram Mohan Roy's ideas?

(a) Debendranath Tagore
(b) Anandmohan Bose
(c) K.C Sen
(d) Rabindranath Tagore

Q73. By which number should 21/5 be multiplied to get 52/5?

(a) 25/11
(b) 11/27
(c) 3
(d) 31/5

Q74. P, Q, R, S, T, U and V are seven students in a class. They are compared on the basis of their height. T is shorter than S but taller than U. U is taller than P. R and Q are shorter than V but taller than S. Which of the following sequence of their height can be possible?

(a) V > R > Q > U > T > S > P
(b) V > Q > R > T > S > U > P
(c) V > Q > R > S > T > P > U
(d) V > R > Q > S > T > U > P

Q75. What is the value of 8x3 + 18xy + y3 - 27 when 2x + y - 3 = 0

(a) • 27
(b) 1
(c) 27
(d) 0

Q76. The natural aging of a lake by nutrient enrichment of its water is termed as :

(a) Eutrophication
(b) Denutriphication
(c) Nutriphication
(d) Extraction

Q77. Arun said "Deepak's mother is the mother of my father's wife". How is Deepak related to Arun?

(a) Brother
(b) Father's Brother
(c) Grandfather
(d) Mother's Brother

Q78. Two numbers are in the ratio 3 : 2. If 8 and 6 are subtracted from the first and the second number respectively, the ratio becomes 8 : 5. The numbers are:

(a) 24, 16
(b) 40, 30
(c) 3, 2

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(d) 32, 24

Q79. Equatorial plane and Orbital plane are inclined to each other at which angle?

(a) 13.5°
(b) 66.5°
(c) 23.5°
(d) 67.5°

Q80. The name of the 1^(st) electronic digital computer of the world is:

(a) ENIAC
(b) UNIVAC
(c) PROLOG
(d) PARAM

Q81. Which river is associated with the Dhuandhar falls?

(a) Kaveri
(b) Mahanadi
(c) Tapi
(d) Narmada

Q82. Below are fours pairs, each representing a state and a folk dance. Which pairing of state and folk dance is incorrect?

(a) Chattisgarh - Dagla
(b) Uttarakhand - Tapali
(c) Assam - Bihu
(d) Gujarat - Garba

Q83. Find the value of

fracCos²22° + Cos²68° 2(sin²22° + sin²68°) - sin²16° - cos 16° sin 74°

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

Q84. Which among the following ports in India has been renamed as Deendayal Port?

(a) Cochin
(b) Mormugao
(c) Kandla
(d) Tuticorin

Q85. Name the type of nutrition in that the organism takes in nutrients in solution form from dead and decaying matters.

(a) Saprophytic nutrition
(b) Heterotrophic nutrition
(c) Insectivorous nutrition
(d) Autotrophic nutrition

Q86. The given table shows the marks of various students in a class. Study the table and answer the question that follows.

Marks (out of 50)					
Name of Students	Physics	Chemistry	Maths	English	Sanskrit
A	48	47	49	46	44
B	29	33	22	15	30
C	35	36	42	40	29
D	46	49	48	48	40

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E	32	30	25	21	22

Which student got the lowest overall percentage of marks?

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

Q87. The given table shows the marks of various students in a class. Study the table and answer the question that follows.

Marks (out of 50)					
Name of Students	Physics	Chemistry	Maths	English	Sanskrit
A	48	47	49	46	44
B	29	33	22	15	30
C	35	36	42	40	29
D	46	49	48	48	40
E	32	30	25	21	22

What is the maximum overall percentage (average of percentages obtained in all subjects by any student) of marks obtained by any student among A, B, C, D and E?

(a) 93.60 %
(b) 92.40 %
(c) 92.60 %
(d) 93.40 %

Q88. The given table shows the marks of various students in a class. Study the table and answer the question that follows.

Marks (out of 50)					
Name of Students	Physics	Chemistry	Maths	English	Sanskrit
A	48	47	49	46	44
B	29	33	22	15	30
C	35	36	42	40	29
D	46	49	48	48	40
E	32	30	25	21	22

Which two students have the least difference of marks between them?

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

Q89. The given table shows the marks of various students in a class. Study the table and answer the question that follows.

Marks (out of 50)					
Name of Students	Physics	Chemistry	Maths	English	Sanskrit
A	48	47	49	46	44
B	29	33	22	15	30
C	35	36	42	40	29
D	46	49	48	48	40

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E	32	30	25	21	22

If we rank students on the basis of all five subjects and then we rank them only on the basis of physics, chemistry and maths then what will happen to the arrangement of ranks in both cases?

(a) The ranks will remain the same in both cases.
(b) Only the top two ranks will be different.
(c) Only the bottom two ranks will be different.
(d) All ranks will be different.

Q90. A man said to a woman. "Your husband's daughter is the daughter of my brother". How is the man related to the woman's daughter?

(a) Father
(b) Brother
(c) Father's Brother
(d) Mother's Brother

Q91. If in a code language CRACKS is written as DQBBLR, then how would SPROUT be written in that same code language?

(a) TQSPVU
(b) TQSNVS
(c) TOSNVU
(d) TOSNVS

Q92. Pick the odd one out.

(a) Centimeter
(b) Kilometer
(c) Meter
(d) Mile

Q93. Select the option that will fill in the blank and complete the given series.

3, 4, 31, 156,_____

(a) 500
(b) 499
(c) 373
(d) 372

Q94. Select the option that is related to the third term in the same way as the second term is related to the first term.

Kilogram : Mass :: Kilometre : _____

(a) Force
(b) Time
(c) Speed
(d) Length

Q95. Select the letter cluster that will come next in the following series.

MNOP, HIJK, _____

(a) CDEF
(b) DEFG
(c) DEFC
(d) BCDE

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

Srilanka : Island :: India : ?

(a) Plateau
(b) Peninsula
(c) Asia

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(d) Ocean

Q97. Pick the odd one out.

(a) Fluorine
(b) Nitrogen
(c) Oxygen
(d) Iron

Q98. 6 women W1, W2, W3, W4, W5 and W6 lives in different hotel P, Q, R, S, T and W (not necessarily in the same order). No two women live in same hotel. One woman live in only one hotel. W4 does not live in hotel P or R. W3 and W6 live in S and W respectively. W1 does not live in T or R. W5 does not live in R or P. Which of the following combination of woman and hotel is definitely true?

(a) W2 — P
(b) W1 —P
(c) W5 — T
(d) W4 — T

Q99. How will you write 4.14 hours in hours, minutes and seconds?

(a) 4 hours, 10 minutes, 4 seconds
(b) 4 hours, 14 minutes
(c) 4 hours, 8 minutes, 24 seconds
(d) 4 hours, 8 minutes, 4 seconds

Q100. Six members M1, M2, M3, M4, M5 and M6 of a family are sitting in a row facing towards the north (not necessarily in the same order). M3 sits to the immediate right of M5 and second to the left of M1. M4 is second to the right of M2. M5 is not sitting at the ends of the row. Who are sitting at the ends of the row?

(a) M6 and M1
(b) M6 and M3
(c) M3 and M4
(d) M6 and M4

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) Wheat

The correct answer is Wheat.

Key Points

• Wheat is primarily a Rabi crop, which means it is sown in winter and harvested in spring.
• Rabi crops are typically sown from October to December and harvested from April to June.

• Unlike Kharif crops, which rely on the monsoon rains, Rabi crops depend on irrigation for water supply.
• Common examples of Rabi crops besides wheat include barley, mustard, peas, and gram.

Additional Information

• Kharif Crops
• Kharif crops are sown at the beginning of the monsoon season, around June or July, and harvested at the end of the monsoon season, around September or October.
• Examples of Kharif crops include paddy (rice), jowar (sorghum), bajra (pearl millet), maize, and cotton.
• These crops require a hot and wet climate to grow, which is why they are dependent on the monsoon rains.
• Kharif crops are also known as monsoon crops.
• Rabi Crops
• Rabi crops are sown in the winter season, typically from October to December, and harvested in the spring, usually from April to June.
• These crops require a cooler climate during the growing season and a warm climate during the harvesting season.
• Rabi crops depend on irrigation rather than rainwater, as they are grown in the dry season.
• Examples of Rabi crops include wheat, barley, mustard, peas, and gram.
• Zaid Crops
• Zaid crops are grown between the Rabi and Kharif crop seasons, from March to June.
• These crops require warm dry weather for growth and longer daylight hours for flowering.
• Examples of Zaid crops include watermelon, cucumber, muskmelon, and various types of gourds.

Q2. Answer: (b) 10

Given:

Cost price of 12 oranges = Rs. 60

Required gain = 20%

Formula used:

Selling Price (SP) = Cost Price (CP) × (1 + Gain Percentage)

Calculation:

Cost price of one orange = 60 ÷ 12 = Rs. 5

Required selling price per orange for 20% gain = 5 × (1 + 20/100) = 5 × 1.2 = Rs. 6

Now, let the number of oranges to be sold for Rs. 60 be x.

Therefore, total selling price = x × 6

Since total selling price = Rs. 60, we have:

x × 6 = 60

→ x = 60 ÷ 6 = 10

Therefore The fruit seller should sell 10 oranges for Rs. 60 to gain 20%.

Q3. Answer: (d) Rayon

The correct answer is Rayon.

Key Points

• Rayon is a man-made fiber, often referred to as a semi-synthetic fiber.
• It is made from natural sources such as wood pulp, which undergoes a chemical process to create the fiber.
• Rayon is known for its silk-like feel and is often used in the fashion industry for its versatility and comfort.
• It was the first man-made fiber, developed in the late 19th century as a substitute for silk.

Additional Information

• Silk
• Silk is a natural fiber produced by silkworms as they spin their cocoons.
• It is known for its lustrous appearance and smooth texture.
• Silk has been used for thousands of years, particularly in China, where it was originally developed.
• It is considered a luxury material and is often used in high-end fashion and textiles.
• Jute
• Jute is a natural fiber obtained from the jute plant, primarily found in India and Bangladesh.
• It is known for its strength, durability, and eco-friendliness.
• Jute is commonly used to make burlap, hessian, and other coarse fabrics.

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• It is also used in making ropes, mats, and other utility products.
• Linen
• Linen is a natural fiber made from the flax plant.
• It is valued for its strength, absorbency, and coolness in hot weather.
• Linen fabrics are commonly used in clothing, home textiles, and industrial products.
• It has been used for thousands of years, with evidence of its use dating back to ancient Egypt.
• Rayon
• Rayon is a semi-synthetic fiber made from cellulose, derived primarily from wood pulp.
• It can mimic the feel and texture of natural fibers such as silk, wool, cotton, and linen.
• Rayon is versatile and can be used in a wide range of textile products, including clothing, upholstery, and industrial textiles.
• It is often used as a cheaper alternative to silk due to its similar drape and feel.

Q4. Answer: (a) Hockey

The logic followed here is:
Logic: Sporting Equipment.
Here,
Bat : Cricket → Bat is a sporting equipment used in Cricket.
Similarly,
Stick : Hockey → Stick is a sporting equipment used in Hockey.
Hence, the correct answer is "Option 1".

Q5. Answer: (b) Namami Gange

The correct answer is Namami Gange.
Key Points
• Namami Gange is a flagship initiative of the Government of India launched in 2014.
• The program aims at the rejuvenation of the Ganga river, including its tributaries and a comprehensive improvement in the quality of water.
• It operates under the Ministry of Jal Shakti and is implemented by the National Mission for Clean Ganga (NMCG).
• The project focuses on various aspects such as sewage treatment, river surface cleaning, rural sanitation, and afforestation.
Additional Information
• Ganga Action Plan
• Launched in 1986 by Prime Minister Rajiv Gandhi, the Ganga Action Plan (GAP) was one of the earliest efforts to clean the river Ganga.
• The plan focused on treating sewage, improving water quality, and preventing pollution from industries and urban settlements.
• Despite its ambitious goals, GAP faced numerous challenges and was not able to achieve the desired results.
• National Mission for Clean Ganga (NMCG)
• NMCG is an implementation wing under the Ministry of Jal Shakti that is responsible for the execution of the Namami Gange program.
• It coordinates various efforts and projects to rejuvenate the Ganga river and its tributaries.
• NMCG works in collaboration with state governments, urban local bodies, and other stakeholders to achieve its objectives.
• Ministry of Jal Shakti
• The Ministry of Jal Shakti was formed in 2019 by merging the Ministry of Water Resources, River Development, and Ganga Rejuvenation with the Ministry of Drinking Water and Sanitation.
• It oversees the management of water resources in India and ensures the availability of clean drinking water to the population.
• The ministry plays a crucial role in implementing water conservation initiatives, river basin management, and irrigation projects.

Q6. Answer: (a) Mahayana Buddhism

The correct answer is Mahayana Buddhism.
Key Points
• The concept of Bodhisattva is central to Mahayana Buddhism.
• A Bodhisattva is an individual who seeks enlightenment not only for themselves but also strives to help others achieve it.
• This concept emphasizes compassion and altruism as essential qualities.
• Mahayana Buddhism is also known as the "Great Vehicle" and is one of the major traditions of Buddhism.

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Additional Information

• Bodhisattva

• The term "Bodhisattva" means "enlightenment being" in Sanskrit.

• It refers to someone who is on the path to becoming a Buddha but chooses to remain in the cycle of samsara to help other sentient beings achieve enlightenment.

• This selfless act embodies the highest form of compassion in Mahayana Buddhism.

• Famous Bodhisattvas include Avalokiteshvara (the Bodhisattva of Compassion) and Manjushri (the Bodhisattva of Wisdom).

• Mahayana Buddhism

• Mahayana Buddhism is one of the two main branches of Buddhism, the other being Theravada Buddhism.

• It originated in India and later spread to East Asia, including China, Korea, Japan, and Vietnam.

• Mahayana texts introduce the concept of the Bodhisattva and emphasize the importance of compassion and wisdom.

• Key scriptures in Mahayana Buddhism include the Lotus Sutra and the Heart Sutra.

• Theravada Buddhism

• Theravada Buddhism, also known as the "Teaching of the Elders," is the oldest form of Buddhism.

• It focuses on the original teachings of the Buddha as preserved in the Pali Canon.

• Theravada practitioners aim to become Arahants, individuals who have achieved personal enlightenment and liberation from the cycle of rebirth.

• This tradition is predominant in countries like Sri Lanka, Thailand, Myanmar, Laos, and Cambodia.

• Jainism

• Jainism is an ancient Indian religion that emphasizes non-violence, truth, and asceticism.

• It was founded by Mahavira in the 6th century BCE.

• Jainism teaches the path to liberation and spiritual purity through disciplined non-violence (ahimsa) and self-control.

• Key texts include the Agamas and the teachings of the Tirthankaras.

Q7. Answer: (a) 0

Given:

a = -5, b = 5

Formula used:

The expression to evaluate is: $a^2 - b^2$

Calculation:

Substitute the given values of a and b:

$a^2 - b^2 = (-5)^2 - (5)^2$

→ 25 - 25 = 0

Therefore The value of $a^2 - b^2$ is 0.

Q8. Answer: (d) Varahagiri Venkata Giri

The correct answer is Varahagiri Venkata Giri.

Key Points

• Varahagiri Venkata Giri served as the fourth President of India from 24 August 1969 to 24 August 1974.

• He was the first person to have served as both an acting president and as president of India.

• Before becoming the President, he served as the Vice President of India from 1967 to 1969.

• Giri was awarded the Bharat Ratna, India's highest civilian award, in 1975.

Additional Information

• Giani Zail Singh

• Giani Zail Singh was the seventh President of India, serving from 1982 to 1987.

• Before becoming the President, he served as the Chief Minister of Punjab and as a Union Home Minister.

• B. D. Jatti

• B. D. Jatti served as the acting President of India from 11 February 1977 to 25 July 1977 after the death of Fakhruddin Ali Ahmed.

• He was also the fifth Vice President of India from 1974 to 1979.

• Dr Zakir Husain

• Dr Zakir Husain was the third President of India from 13 May 1967 until his death on 3 May 1969.

• He was the first Muslim President of India and also served as the Governor of Bihar and the Vice President of India.

• Varahagiri Venkata Giri

• Varahagiri Venkata Giri was an Indian politician and activist who played a key role in the Indian independence movement.

• He served as the Governor of Uttar Pradesh, Kerala, and Karnataka before becoming the Vice President and later the President of India.

• His tenure as President is noted for his efforts in maintaining the dignity of the office and upholding the constitutional framework of India.

Q9. Answer: (c) Colloid cannot scatter a beam of light passing through it.

The correct answer is Colloid cannot scatter a beam of light passing through it..

Key Points

• A colloid is a heterogeneous mixture where the particle size is intermediate between true solutions and suspensions.

• Due to the small size of colloidal particles (1-1000 nm), they cannot be seen with the naked eye.

• Colloids exhibit the Tyndall effect, meaning they can scatter a beam of light passing through them, making the path visible.

• Colloidal particles do not settle down when left undisturbed due to Brownian motion.

Additional Information

• Colloids

• A colloid is a mixture where one substance of microscopically dispersed insoluble particles is suspended throughout another substance.

• Colloids are divided into different types based on the phase of the dispersed particles and the dispersion medium, such as sol, gel, foam, and emulsion.

• The Tyndall effect is the scattering of light by colloidal particles, which makes the beam of light visible in the colloid.

• Brownian motion is the random movement of colloidal particles due to their collision with the molecules of the dispersion medium.

• Heterogeneous Mixture

• A mixture in which the composition is not uniform throughout the mixture.

• The different components can be visually distinguished and physically separated.

• Scattering of Light

• The process where light rays are deflected in different directions due to the presence of particles in their path.

• This phenomenon is responsible for the visibility of the path of light in colloids (Tyndall effect).

• Brownian Motion

• The continuous and random movement of colloidal particles in a fluid due to their collision with fast-moving molecules of the dispersion medium.

• This motion prevents the particles from settling and keeps them dispersed.

Q10. Answer: (d) 18

Given:

Expression: (1800 ÷ (24 ÷ 8 × 3) + 16) / ((3/4) × (32 ÷ 2))

Formula used:

Follow BODMAS rule (Brackets, Orders, Division and Multiplication, Addition and Subtraction)

Calculation:

Step 1: Simplify the expression inside the brackets first.

First, simplify the inner division and multiplication: 24 ÷ 8 × 3 = 3 × 3 = 9

Now, the expression becomes: (1800 ÷ 9 + 16) / ((3/4) × (32 ÷ 2))

Step 2: Simplify the numerator.

1800 ÷ 9 = 200

Now, the numerator is: 200 + 16 = 216

Step 3: Simplify the denominator.

32 ÷ 2 = 16

Now, the denominator is: (3/4) × 16 = 12

Step 4: Final division.

216 ÷ 12 = 18

Therefore The simplified value of the expression is 18.

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Q11. Answer: (b) -1

Given:

tan(θ) = 1, where θ is an acute angle.

Formula used:

We need to find the value of 2sin(θ)cos(θ) - cosec²(θ).

Calculation:

Step 1: Use the given tan(θ) = 1.

tan(θ) = sin(θ) / cos(θ), so sin(θ) = cos(θ).

Step 2: Substitute sin(θ) = cos(θ) in the expression 2sin(θ)cos(θ).

2sin(θ)cos(θ) = 2cos(θ) × cos(θ) = 2cos²(θ).

Step 3: Find the value of cosec²(θ).

cosec(θ) = 1 / sin(θ), so cosec²(θ) = 1 / sin²(θ).

Step 4: Use the identity sin²(θ) + cos²(θ) = 1.

Since sin(θ) = cos(θ), we have sin²(θ) = cos²(θ).

So, sin²(θ) = 1/2 (from the identity sin²(θ) + cos²(θ) = 1).

Thus, cosec²(θ) = 1 / (1/2) = 2.

Step 5: Substitute into the expression.

Now, the original expression is:

2sin(θ)cos(θ) - cosec²(θ) = 2cos²(θ) - 2.

Step 6: Use the fact that cos²(θ) = 1/2.

2cos²(θ) - 2 = 2 × (1/2) - 2 = 1 - 2 = -1.

Therefore The value of the expression is -1.

Q12. Answer: (d) 15%

The correct answer is 0.15.

Key Points

• The total number of ministers, including the Chief Minister, in the council of ministers in a state CANNOT exceed 15% of the total number of members of the legislative assembly of that State.

• This limit was introduced by the 91st Amendment Act of 2003 to curb the growing size of council of ministers.

• The percentage is fixed at 15% to ensure better governance and reduce unnecessary expenditure.

• The amendment aims to promote a more efficient and streamlined administration by limiting the number of ministers.

Additional Information

• 91st Amendment Act of 2003

• This constitutional amendment was enacted to address issues related to the size of the council of ministers and anti-defection.

• It limits the size of the council of ministers to 15% of the total strength of the legislative assembly or Parliament, as the case may be.

• It also disallows the appointment of defectors to ministerial positions for the remainder of the term of the legislature.

• Anti-Defection Law

• Enacted by the 52nd Amendment Act of 1985, it aims to prevent political defections prompted by the lure of office or other similar considerations.

• It provides for the disqualification of members of Parliament and state legislatures who defect from one party to another.

• Council of Ministers

• The council of ministers includes the Prime Minister and other ministers appointed by the President on the advice of the Prime Minister.

• Ministers are classified into three ranks: Cabinet Ministers, Ministers of State, and Deputy Ministers.

• The council of ministers is collectively responsible to the legislative assembly of the state or the House of the People (Lok Sabha) at the center.

Q13. Answer: (c) 15 days

Given:

A can complete the work in 24 days.

A worked for 21 days, and then B completed the remaining work in 5 days.

To Find: The number of days in which A and B together can finish the work.

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Solution:
Step 1: Find A's work rate.
A can complete the work in 24 days, so A's work rate is:
Work rate of A = 1/24 (since A completes 1 whole work in 24 days).
Step 2: Calculate the amount of work A completed in 21 days.
Amount of work done by A in 21 days = A's work rate × 21 = (1/24) × 21 = 21/24 = 7/8 of the total work.
Step 3: Find the remaining work that B completed.
Remaining work = 1 - 7/8 = 1/8 of the total work.
Step 4: Find B's work rate.
B completed the remaining 1/8 of the work in 5 days, so B's work rate is:
Work rate of B = (1/8) / 5 = 1/40 (since B completes 1/8 of the work in 5 days).
Step 5: Find the combined work rate of A and B.
Combined work rate of A and B = A's work rate + B's work rate = (1/24) + (1/40).
To add the fractions, find the LCM of 24 and 40, which is 120.
Thus, (1/24) + (1/40) = (5/120) + (3/120) = 8/120 = 1/15.
Step 6: Find the time taken for A and B to complete the work together.
Time taken = 1 / (combined work rate) = 1 / (1/15) = 15 days.
Therefore, A and B together can complete the work in 15 days.

Q14. Answer: (b) Only conclusion 2 follows.

Given Statements:
1. Some boys are cricketers.
2. Some girls are cricketers.
The least possible Venn diagram:
Conclusions:
1. All girls are cricketers. - False (Because Some girls are cricketers given)
2. Some cricketers are girls. - True (Because Some girls are cricketers given. So, Some cricketers are also girls. It is definite)
Hence, the correct answer is "Only conclusion 2 follows."

Q15. Answer: (a) GLH

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

Q16. Answer: (c) [figure]

Given: Earth, Country, State
Earth encompasses everything, as all countries and states exist on Earth.
Country is a subset of Earth, since countries are divisions within the planet.
All states come inside country.
Hence, the correct answer is "Option 3".

Q17. Answer: (b) SONAR

The correct answer is SONAR.
Key Points
• SONAR stands for Sound Navigation and Ranging.
• It uses ultrasonic waves to detect and locate objects underwater.
• SONAR systems are commonly used in submarines and ships for navigation, communication, and detecting other vessels.
• It can measure the distance, direction, and speed of underwater objects by analyzing the reflected sound waves.
Additional Information
• RADAR:
• RADAR stands for Radio Detection and Ranging.
• It uses radio waves to detect and locate objects in the air or on the ground.
• RADAR is commonly used in aviation, weather forecasting, and military applications.
• It can measure the distance, direction, and speed of objects by analyzing the reflected radio waves.

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• MASER:

• MASER stands for Microwave Amplification by Stimulated Emission of Radiation.

• It is a device that amplifies microwaves using stimulated emission.

• MASERs are used in scientific research and communication technologies.

• They are similar to lasers but work with microwave frequencies instead of visible light.

• CRO:

• CRO stands for Cathode Ray Oscilloscope.

• It is an electronic device used to display and analyze the waveform of electronic signals.

• CROs are commonly used in electronics and electrical engineering for testing and troubleshooting circuits.

• They can measure the amplitude, frequency, and phase of signals.

This code provides a detailed explanation of the correct answer (SONAR) including key points and additional information about related terminologies.

Q18. Answer: (b) Gautam Buddha

The correct answer is Gautam Buddha.

Key Points

• The Vinaya Pitaka and Sutta Pitaka are two of the three main sections of the Tripitaka, also known as the Pali Canon, which is the traditional term for Buddhist scriptures.

• These texts are the earliest and most comprehensive records of the teachings of Gautam Buddha.

• The Vinaya Pitaka deals primarily with the rules and regulations for the monastic community (Sangha), including guidelines for monks and nuns.

• The Sutta Pitaka contains more than 10,000 suttas (teachings) attributed to Gautam Buddha and his close companions, encompassing a wide range of topics from ethics and meditation to philosophy and metaphysics.

Additional Information

• Gautam Buddha

• Gautam Buddha, also known as Siddhartha Gautama, was the founder of Buddhism. He lived and taught in the northeastern part of ancient India between the 6th and 4th centuries BCE.

• Buddha's teachings are centered on the Four Noble Truths and the Eightfold Path, which outline the nature of suffering and the path to liberation from it.

• The Tripitaka, also referred to as the Pali Canon, is the traditional term for the Buddhist scriptures and is divided into three "baskets" (pitaka): the Vinaya Pitaka, Sutta Pitaka, and Abhidhamma Pitaka.

• The teachings of Buddha are considered a path to enlightenment, aiming to end the cycle of rebirth and suffering through ethical conduct, mental discipline, and wisdom.

• Vinaya Pitaka

• The Vinaya Pitaka is one of the three main sections of the Tripitaka and focuses on the rules and regulations for the monastic community (Sangha).

• It includes detailed guidelines on monastic discipline, the code of conduct for monks and nuns, and procedures for dealing with offenses within the monastic community.

• The Vinaya Pitaka is essential for maintaining the integrity and harmony of the monastic order.

• Sutta Pitaka

• The Sutta Pitaka is another main section of the Tripitaka, comprising a vast collection of discourses (suttas) attributed to Gautam Buddha and his close disciples.

• The suttas cover a wide range of topics, including ethics, meditation, philosophy, and metaphysics, providing a comprehensive record of Buddha's teachings.

• The Sutta Pitaka is divided into five nikayas (collections): Digha Nikaya, Majjhima Nikaya, Samyutta Nikaya, Anguttara Nikaya, and Khuddaka Nikaya.

Q19. Answer: (d) GATT - Geneva

The correct answer is GATT - Geneva.

Key Points

• The General Agreement on Tariffs and Trade (GATT) was established in 1947 to promote international trade by reducing or eliminating trade barriers such as tariffs or quotas.

• GATT was replaced by the World Trade Organization (WTO) on January 1, 1995, which continues to operate from Geneva, Switzerland.

• Geneva is a major global city that hosts numerous international organizations, including the WTO, UN agencies, and the

International Red Cross.

• The location of these organizations in Geneva reflects the city's history of diplomacy and international cooperation.

Additional Information

• European Southern Observatory (ESO)

• ESO is an intergovernmental astronomy organization in Europe.

• Its headquarters are located in Garching, near Munich, Germany, not Brussels.

• International Criminal Police Organization (INTERPOL)

• INTERPOL is an international organization that facilitates international police cooperation.

• Its headquarters are located in Lyon, France, not Washington D.C.

• World Health Organization (WHO)

• WHO is a specialized agency of the United Nations responsible for international public health.

• Its headquarters are located in Geneva, Switzerland, not Paris.

• General Agreement on Tariffs and Trade (GATT)

• GATT was a multilateral agreement regulating international trade, which later led to the establishment of the World Trade Organization (WTO).

• Its headquarters were in Geneva, Switzerland.

Q20. Answer: (d) 21 days

Given:

A, B, and C together can complete the work in 14 days.

C alone can complete the work in 42 days.

To Find: The time taken by A and B together to finish the work.

Solution:

Step 1: Find C's work rate.

C alone can complete the work in 42 days. Therefore, C's work rate is:

Work rate of C = 1/42 (since C completes 1 whole work in 42 days).

Step 2: Find the combined work rate of A, B, and C.

A, B, and C together can complete the work in 14 days. Therefore, their combined work rate is:

Combined work rate of A, B, and C = 1/14 (since they complete 1 whole work in 14 days).

Step 3: Find the combined work rate of A and B.

We know that the combined work rate of A, B, and C is the sum of A, B's work rate and C's work rate. Therefore:

Combined work rate of A and B = (Combined work rate of A, B, and C) - (Work rate of C)

Combined work rate of A and B = (1/14) - (1/42)

To subtract the fractions, find the LCM of 14 and 42, which is 42. So:

(1/14) - (1/42) = (3/42) - (1/42) = 2/42 = 1/21

Step 4: Find the time taken for A and B to complete the work.

Time taken = 1 / (combined work rate of A and B) = 1 / (1/21) = 21 days.

Therefore, A and B together will take 21 days to complete the work.

Q21. Answer: (c) 1/15

Shortcut Trick

Total numbers from 33 to 92 = 92 − 33 + 1 = 60.

Perfect squares in range: 6^2=36, 7^2=49, 8^2=64, 9^2=81 (Total 4 numbers).

Probability = Favorable cases ÷ Total cases = 4 ÷ 60 = 1/15.

Therefore The correct answer is 1/15.

Alternate Method

Given: Numbers on cards are from 33 to 92.

Formula: P(E) = n(E) / n(S)

=> Total number of cards n(S) = (92 − 33) + 1 = 60.

=> Perfect squares between 33 and 92 are:

=> 6^2 = 36

=> 7^2 = 49

=> $8^2 = 64$

=> $9^2 = 81$

=> Total favorable outcomes n(E) = 4.

=> Probability P(E) = 4 / 60 = 1 / 15.

Therefore The correct answer is 1/15.

Additional Information

Definition of Probability

The probability of an event is the ratio of the number of favorable outcomes to the total number of outcomes in the sample space.

Counting Numbers in a Range

To find the total numbers between 'a' and 'b' (inclusive), use the formula: (b − a) + 1.

Perfect Squares

A perfect square is an integer that is the square of an integer; for example, 1, 4, 9, 16, 25, etc. are perfect squares.

Q22. Answer: (d) d

Given: Oxygen, Hydrogen and Gases

Oxygen and Hydrogen are specific types of gases.

Gases include both oxygen and hydrogen.

Hence, the correct answer is "d".

Q23. Answer: (b) Kautilya

The correct answer is Kautilya.

Key Points

• Kautilya, also known as Chanakya or Vishnugupta, was an ancient Indian teacher, philosopher, economist, jurist, and royal advisor.

• He is traditionally identified as the author of the ancient Indian political treatise, the Arthashastra, a comprehensive manual on governance and statecraft.

• The Arthashastra, written by Kautilya, mentions the concept of Adhyakshas, who were the superintendents of various government departments in the Mauryan administration.

• Kautilya played a significant role in the establishment of the Mauryan Empire, particularly as an advisor and mentor to its founder, Chandragupta Maurya.

Additional Information

• Arthashastra

• The Arthashastra is an ancient Indian treatise on statecraft, economic policy, and military strategy.It is attributed to Kautilya and is one of the oldest known works on economics and political science.

• The text is divided into 15 books, covering a wide range of topics including governance, administration, law, economics, and military strategy.

• It provides detailed insights into the functioning of the Mauryan administration and the role of various officials, including the Adhyakshas.

• Mauryan Administration

• The Mauryan Empire, founded by Chandragupta Maurya in 322 BCE, was one of the largest and most powerful empires in ancient India.

• The administration of the Mauryan Empire was highly organized and centralized, with a well-defined bureaucracy and a network of officials overseeing various aspects of governance.

• Key officials in the administration included the Samaharta (chief collector of revenue), the Sannidhata (treasurer), and the Adhyakshas (superintendents of different departments).

• The Adhyakshas were responsible for supervising various activities such as trade, agriculture, mining, and manufacturing, ensuring efficient management and regulation of these sectors.

• Kautilya's Contributions

• Kautilya's Arthashastra is considered a seminal work in the field of political science and economics, providing valuable insights into ancient Indian governance and administration.

• His teachings and strategies have had a lasting impact on Indian political thought and continue to be studied and referenced by scholars and policymakers.

• Kautilya's emphasis on realpolitik and pragmatic governance laid the foundation for a strong and efficient administrative system in the Mauryan Empire.

• His work also highlights the importance of ethical conduct and justice in governance, advocating for the welfare and prosperity of

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the state and its citizens.

Q24. Answer: (c) 108°

Shortcut Trick

The angle subtended by arc AC at the circumference (angle ABC) is half the angle subtended at the center (angle AOC).

=> angle ABC = 1/2 × angle AOC = 1/2 × 36°ree; = 18°ree;.

In right-angled triangle PAB (angle PAB = 90°ree; as AP is a tangent):

=> angle APB = 180°ree; − (90°ree; + 18°ree;) = 72°ree;.

The exterior angle angle BPQ = angle PAB + angle PBA = 90°ree; + 18°ree; = 108°ree;.

Therefore The correct answer is 108 °ree;.

Alternate Method

Given: AB is the diameter, AP is the tangent at A, angle AOC = 36°ree;.

Formula Used: Angle at center property, Tangent-Radius theorem, and Exterior Angle theorem.

Step-by-step Calculations:

=> In triangle OBC, OB = OC (radii of the same circle).

=> Therefore angle OBC = angle OCB (angles opposite to equal sides).

=> In triangle OBC, angle AOC is an exterior angle at O.

=> angle AOC = angle OBC + angle OCB = 2 × angle OBC.

=> 36°ree; = 2 × angle OBC => angle OBC = 18°ree;.

=> Since AP is a tangent at A, OA perpendicular to AP => angle PAB = 90°ree;.

=> Consider triangle PAB, where angle BPQ is the exterior angle at vertex P.

=> angle BPQ = angle PAB + angle PBA.

=> angle BPQ = 90°ree; + 18°ree; = 108°ree;.

Therefore The correct answer is 108 °ree;.

Additional Information

Angle Subtended by Arc

The angle subtended by an arc at the center is twice the angle subtended by it at any point on the remaining part of the circle (Angle at Center = 2 × Angle at Circumference).

Tangent-Radius Property

A tangent at any point of a circle is perpendicular to the radius through the point of contact, making a 90°ree; angle with the diameter line.

Exterior Angle Theorem

The exterior angle of a triangle is equal to the sum of the two opposite interior angles of that triangle.

Q25. Answer: (d) 160 cm²

Given:

AB = 16 cm

AC = 20 cm

BC is the diameter of the circle.

Approach:

Identify the base and height:

Since BC is the diameter of the circle, it is perpendicular to AB and AC, making them the heights of the triangle.

Calculate the area:

We can use the formula for the area of a triangle:

Area = (1/2) × Base × Height

Since we have two heights, we can use either AB or AC as the base and the other as the height. Let's use AB as the base and AC as the height.

Area = (1/2) × 16 cm × 20 cm = 160 cm²

Therefore The area of triangle ABC is 160 cm².

Conclusion:

The correct answer is option 4) 160 cm².

Q26. Answer: (b) [figure]

Given: Parallelogram. Rhombus, Square, Trapezoid

Square as a subset of Rhombus.

Rhombus is a specific type of parallelogram where all sides are equal in length.

Parallelogram is a quadrilateral where opposite sides are parallel.

Trapezoid is a quadrilateral with at least one pair of parallel sides.

Hence, the correct answer is "Option 2".

Q27. Answer: (a) 360

Given:

30, 40, 45

Formula used:

LCM(x, y) = (x × y) / GCD(x, y)

Calculations:

Step 1: Find the LCM of 30 and 40:

GCD(30, 40) = 10

LCM(30, 40) = (30 × 40) / 10

=> LCM(30, 40) = 120

Step 2: Find the LCM of 120 and 45:

GCD(120, 45) = 15

LCM(120, 45) = (120 × 45) / 15

=> LCM(120, 45) = 360

Therefore The LCM of 30, 40, and 45 is 360.

Q28. Answer: (b) A drainage-cleaning robot

The correct answer is A drainage-cleaning robot.

Key Points

• The Bandicoot robot is specifically designed for cleaning drainage systems.

• It was developed by Genrobotics, an Indian robotics company.

• The robot aims to eliminate the hazardous practice of manual scavenging by automating the cleaning of sewers.

• Bandicoot robots are equipped with advanced sensors and cameras to navigate and clean drainage systems efficiently.

Additional Information

• Manual Scavenging

• Manual scavenging involves the removal of human excreta from sewers or septic tanks by hand.

• It is a highly dangerous and inhumane practice that is banned in India under the Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013.

• The practice exposes workers to toxic gases and harmful pathogens, leading to severe health issues and fatalities.

• Genrobotics

• Genrobotics is an Indian company focused on developing robotic solutions for addressing social issues.

• The company was founded by a group of engineers with a mission to eliminate manual scavenging through technological innovations.

• In addition to Bandicoot, Genrobotics has developed other robotic solutions for healthcare and industrial applications.

• Robotic Automation

• Robotic automation involves using robots to perform tasks that are repetitive, dangerous, or require high precision.

• Automation helps improve efficiency, safety, and productivity in various industries, including manufacturing, healthcare, and utilities.

• Advanced robotic systems are equipped with sensors, artificial intelligence, and machine learning algorithms to perform complex tasks autonomously.

Q29. Answer: (c) 0.0882, 0.25, 1.24, 2.67

Given:

0.25, 1.24, 0.0882, 2.67

Formula used:

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Ascending order: Arrange the numbers from the smallest to the largest.

Calculations:

Step 1: Compare the values of the numbers:

0.0882 < 0.25 < 1.24 < 2.67

Therefore The numbers in ascending order are: 0.0882, 0.25, 1.24, 2.67.

Q30. Answer: (a) Fatehabad

The correct answer is Fatehabad.

Key Points

• Fatehabad district in Haryana is the location of the Gorakhpur Nuclear Power Plant.

• The Gorakhpur Nuclear Power Plant is being constructed by the Nuclear Power Corporation of India Limited (NPCIL).

• The power plant aims to enhance the energy security of India by increasing the share of nuclear power in the energy mix.

• Once completed, the Gorakhpur Nuclear Power Plant is expected to generate 2,800 MW of electricity from its four reactors.

Additional Information

• Nuclear Power Corporation of India Limited (NPCIL)

• NPCIL is a government-owned corporation that is responsible for the generation of nuclear power for electricity.

• It operates under the Department of Atomic Energy (DAE), Government of India.

• The corporation was founded in 1987 with the objective of implementing and operating nuclear power plants for the generation of electricity.

• NPCIL plays a key role in India's nuclear power sector, contributing significantly to the country's energy security and sustainability.

• Nuclear Power Plants in India

• India has a number of operational nuclear power plants, including the Tarapur Atomic Power Station, Rajasthan Atomic Power Station, and Kudankulam Nuclear Power Plant.

• Nuclear power contributes about 3-4% of the total electricity generation in India.

• India plans to increase its nuclear power capacity significantly in the coming years to meet its growing energy demands and to reduce its carbon footprint.

• Energy Security

• Energy security refers to the uninterrupted availability of energy sources at an affordable price.

• It is crucial for economic stability, national security, and the overall well-being of a country.

• India is focusing on diversifying its energy sources, including the development of nuclear energy, to enhance its energy security.

Q31. Answer: (b) 0.036

Given:

4√(0.000081)

Formula used:

√(a × b) = √a × √b

Calculations:

Step 1: Simplify the square root expression:

√(0.000081) = √(81 × 10^(-6)) = 9 × 10^(-3)

Step 2: Multiply by 4:

4 × 9 × 10^(-3) = 36 × 10^(-3) = 0.036

Therefore The simplified value is 0.036.

Q32. Answer: (c) p = q

Given:

(4y - 1) and (y + 4) are factors of $py^2 + 15y - q$

Formula used:

When two expressions are factors of a quadratic polynomial, we can express the polynomial as a product of these two factors:

$py^2 + 15y - q = (4y - 1)(y + 4)$

Calculations:

Step 1: Multiply (4y - 1)(y + 4):

$(4y - 1)(y + 4) = 4y^2 + 16y - y - 4$

= $4y^2 + 15y - 4$

Step 2: Compare with the given polynomial $py^2 + 15y - q$:

We can now equate the coefficients of y^2 and constant terms from both polynomials:

From the y^2 term: p = 4

From the constant term: -q = -4, so q = 4

Therefore The values of p and q are:

p = 4, q = 4

Therefore The correct answer is p = q

Q33. Answer: (b) 11/48

Given:

Total number of cards in a deck = 52

Cards of black color (spades and clubs) = 26

Kings and Queens of black color = 2 (King and Queen of spades, King and Queen of clubs)

Cards remaining after removing black Kings and Queens = 52 - 4 = 48

Number of spade cards remaining = 13 - 2 (removed King and Queen) = 11

Formula used:

Probability = (Number of favorable outcomes)/(Total number of possible outcomes)

Calculation:

Probability of drawing a spade card = 11/48

Therefore The probability of drawing a spade card is 11/48.

Q34. Answer: (a) Muhammad bin Tughluq

The correct answer is Muhammad bin Tughluq.

Key Points

• Muhammad bin Tughluq was the Sultan of Delhi from 1325 to 1351.

• His reign is marked by the largest territorial expansion of the Delhi Sultanate.

• Muhammad bin Tughluq succeeded his father, Ghiyasuddin Tughluq, and led campaigns that extended the Sultanate's domain significantly.

• He was known for his ambitious projects and administrative reforms, although many of them failed due to poor execution.

Additional Information

• Delhi Sultanate:

• The Delhi Sultanate was a Muslim kingdom based mostly in Delhi that stretched over large parts of the Indian subcontinent for 320 years (1206–1526).

• It was ruled by several dynasties such as the Mamluk, Khilji, Tughlaq, Sayyid, and Lodi dynasties.

• Ghiyasuddin Tughluq:

• He was the founder of the Tughlaq dynasty and ruled the Delhi Sultanate from 1320 to 1325.

• He is credited with consolidating the Sultanate and laying the foundation for its expansion under his son Muhammad bin Tughluq.

• Administrative Reforms of Muhammad bin Tughluq:

• Muhammad bin Tughluq introduced several ambitious projects such as shifting the capital from Delhi to Daulatabad, introducing token currency, and expansive military campaigns.

• However, many of these reforms failed due to lack of planning and execution, leading to significant financial strain and unrest.

• Territorial Expansion:

• Under Muhammad bin Tughluq, the Delhi Sultanate expanded to its greatest extent, including territories in South India.

• His military campaigns extended the Sultanate’s borders, although maintaining control over these vast territories proved challenging.

Q35. Answer: (a) 1/2 year

Given:

Principal (P) = Rs. 3200

Amount (A) = Rs. 3362

Rate (r) = 10% per annum

Compounding frequency = Quarterly

Formula used:

A = P × (1 + r / (4 × 100))^(4t)

Where:

P = Principal, A = Amount, r = Annual rate, t = Time in years

Calculations:

3362 = 3200 × (1 + 10 / (4 × 100))^(4t)

=> 3362 = 3200 × (1 + 1 / 40)^(4t)

=> 3362 = 3200 × (1.025)^(4t)

=> 3362 / 3200 = (1.025)^(4t)

=> 1.050625 = (1.025)^(4t)

=> log(1.050625) = 4t × log(1.025)

=> log(1.050625) = 0.022088, log(1.025) = 0.010723

=> 0.022088 = 4t × 0.010723

=> t = 0.022088 / (4 × 0.010723)

=> t = 0.022088 / 0.042892

=> t ≈ 0.5147 years

=> t ≈ 1/2 years (approximately)

Therefore The time required is approximately ½ years.

Q36. Answer: (d) URL- Uniform Reserve Locator

The correct answer is URL- Uniform Reserve Locator.

Key Points

• RAM stands for Random Access Memory, which is a type of computer memory that can be accessed randomly.

• FAX stands for Facsimile, which is a method of transmitting scanned printed material (both text and images) via telephone lines.

• DBMS stands for Data Base Management System, which is software for creating and managing databases.

• The correct full form of URL is Uniform Resource Locator, not Uniform Reserve Locator.

Additional Information

• Random Access Memory (RAM)

• RAM is a form of computer memory that can be read and changed in any order, typically used to store working data and machine code.

• It is a volatile memory, meaning that it requires power to maintain the stored information.

• RAM is much faster to read from and write to than other kinds of storage such as a hard disk drive (HDD), solid-state drive (SSD), or optical drive.

• There are two main types of RAM: Dynamic RAM (DRAM) and Static RAM (SRAM).

• Facsimile (FAX)

• Facsimile, commonly referred to as fax, is the telephonic transmission of scanned printed material (both text and images).

• The original document is scanned with a fax machine, which processes the contents (text or images) as a single fixed graphic image, converting it into a bitmap, and then transmitting it through the telephone system.

• Fax machines are still used in many industries for their ability to transmit documents securely and reliably.

• Data Base Management System (DBMS)

• A DBMS is a software package designed to define, manipulate, retrieve and manage data in a database.

• It generally manipulates the data itself, the data format, field names, record structure, and file structure.

• Popular DBMS include MySQL, PostgreSQL, SQLite, Oracle Database, and Microsoft SQL Server.

• DBMSs are used to store, retrieve, and manage data in databases, ensuring data consistency, integrity, and security.

• Uniform Resource Locator (URL)

• A URL is a reference (an address) to a resource on the Internet.

• A URL has two main components: Protocol identifier (e.g., HTTP, HTTPS) and resource name (e.g., www.example.com).

• It is used to specify addresses on the World Wide Web.

• The format for a URL is: protocol://hostname/path.

Q37. Answer: (c) India

The logic followed here is:

Australia	Continent
Europe	Continent
India	Country
Africa	Continent

Australia, Europe, and Africa are continents.

Whereas, India is a country and not a continent.

Hence, the correct answer is "India".

Q38. Answer: (a) P, R, S, T, D

Given: A team of 5 members is to be selected from 6 men A, B, C, D, E and F and 6 women P, Q, R, S, T and U.

1) C and U have to be selected together

→ If C is in the team, U must also be included, and vice versa.

2) If B is selected, then neither U nor Q can be selected.

→ This means B and U/Q cannot coexist in the team.

3) Among A, B, S, and T, exactly two persons are to be selected.

→ Any valid team must have precisely two members from this subset.

4) If E is selected, then neither S nor B can be selected.

→ This excludes S and B if E is part of the team.

5) If A is selected, then B will also be selected.

→ A and B are dependent; if A is included, B must also be included.

Now, checking the options,

Option 1) P, R, S, T, D → This satisfy all the conditions.

Option 2) C, A, B, P, R → Can't form a team because C and U have to be selected together.

Option 2) C, U, A, B, S → Can't form a team because Among A, B, S, and T, exactly two persons are to be selected and in this combination 3 person are selected.

Option 2) P, R, A, B, S → Can't form a team because Among A, B, S, and T, exactly two persons are to be selected and in this combination 3 person are selected

So, the correct combination of a team is "P, R, S, T, D".

Hence, the correct answer is "Option 1".

Q39. Answer: (b) unorganised sector workers

The correct answer is unorganised sector workers.

Key Points

• The government of India has introduced a pension scheme for unorganized workers namely Pradhan Mantri Shram Yogi Maan-Dhan (PM-SYM) to ensure old age protection for Unorganized Workers.

• PM Narendra Modi, on 5 March 2019, launched the Pradhan Mantri Shram Yogi Maandhan (PM-SYM) Yojana at Vastral in Gujarat.

• The Pradhan Mantri Shram Yogi Maandhan Yojana was introduced in the Interim Budget 2019-20 presented by the Union Minister for Finance, Corporate Affairs, Railways & Coal, Shri Piyush Goyal in Parliament on 1 February 2019.

• PM-SYM is meant for old age protection and social security of Unorganized Workers (UW) who are mostly engaged as rickshaw pullers, street vendors, mid-day meal workers, head, brick kiln workers, cobblers, rag pickers, domestic workers, washermen, home-based, agricultural workers, construction workers, beedi workers, handloom workers, leather workers, audio-visual workers or in similar other occupations.

• There are an estimated 42 crore such unorganized workers in the country. The entry age for the beneficiary is 18-40 years and he/she should not be a member of ESIC/EPFO or an income taxpayer.

• The schemes are being implemented through the Life Insurance Corporation (LIC) of India and Common Service Centers. LIC is the Fund Manager and is responsible for pension pay-out.

Additional Information

• Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (AB-PMJAY)

• It is a national health insurance scheme spearheaded by the Ministry of Health and Family Welfare

• It is considered to be the world's largest government-financed health assurance initiative.

• It aims to provide free access to health insurance coverage for India's low-income earners.

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• AB-PMJAY provides a cover of Rs. 5 lakhs per family per year, catering specifically to secondary and tertiary care hospitalization across public and private impanelled hospitals throughout the country.

• This significant scheme is fully financed by the Indian government, serving as an important stepping stone towards achieving universal healthcare in India.

• Pradhan Mantri Suraksha Bima Yojana (PMSBY)

• It is a government-backed accident insurance scheme in India launched on May 9, 2015, by PM Narendra Modi.

• PMSBY aims to provide a highly affordable insurance scheme for the poor and underprivileged people.

• It is available to individuals in the age group of 18 to 70 years who own a bank account.

• At a nominal annual premium of Rs.12, beneficiaries receive a risk coverage of Rs.2 lakh for accidental death and full disability, and Rs.1 lakh for partial disability.

• This prime ministerial scheme plays a pivotal role in uplifting the vulnerable strata of society and is a step towards protection against unforeseen risks.

• Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY)

• It was launched on 9th May 2015 by PM Narendra Modi

• It is a government-backed life insurance scheme in India aimed at increasing the penetration of life insurance coverage among Indians.

• It is available to individuals aged 18 to 50 years with a bank account.

• This scheme offers a life cover of Rs. 2 lakhs for a one-year period, which extends from June 1st to May 31st of the next year.

• The annual premium for this policy is Rs. 436 (US$5.50).

• The amount will be automatically debited from the subscriber's account annually.

• The PMJJBY scheme is an important initiative taken by the Indian government to provide affordable life insurance to its citizens.

Q40. Answer: (d) 7KB

The logic followed here is:

Given series: B7K, KB7, _____

Hence, the correct answer is "7KB".

Q41. Answer: (d) Insulin

The correct answer is Insulin.

Key Points

• Insulin is a hormone produced by the pancreas.

• It plays a crucial role in regulating blood glucose levels by facilitating the uptake of glucose into cells.

• Insulin helps store glucose in the liver as glycogen for future energy needs.

• A deficiency or resistance to insulin can lead to diabetes mellitus, a condition characterized by high blood sugar levels.

Additional Information

• Testosterone

• It is a primary male sex hormone produced mainly in the testes.

• It is responsible for the development of male reproductive tissues and secondary sexual characteristics such as increased muscle and bone mass.

• It also plays a role in health and well-being.

• Thyroid Hormones

• The thyroid gland produces hormones like thyroxine (T4) and triiodothyronine (T3).

• These hormones regulate the body's metabolism, energy production, and overall growth and development.

• Imbalances can lead to conditions like hypothyroidism or hyperthyroidism.

• Adrenaline

• It is a hormone secreted by the adrenal glands, especially during stress or excitement.

• It increases heart rate, expands air passages of the lungs, and is part of the 'fight or flight' response.

• Adrenaline also helps in increasing blood flow to muscles and output of the heart.

• Insulin

• As mentioned, insulin is vital for maintaining blood glucose levels.

• It enables cells to absorb glucose to be used for energy or stored as glycogen in the liver and muscles.

• Lack of insulin or insulin resistance leads to diabetes, necessitating external administration of insulin or other medications.

Q42. Answer: (b) Phishing

The correct answer is Phishing.

Key Points

• Phishing is a type of cyber-attack where attackers impersonate legitimate organizations to trick individuals into providing sensitive information.

• It often involves fraudulent emails, websites, or text messages that appear to come from a trusted source.

• The goal of phishing is to steal sensitive data such as login credentials, credit card numbers, and personal information.

• Phishing attacks can lead to identity theft, financial loss, and unauthorized access to personal and corporate accounts.

Additional Information

• Netting

• Netting is a financial term that refers to the process of consolidating multiple financial transactions to reduce the number of transactions that need to be settled.

• It is commonly used in the context of reducing the number of payments and settlements between parties.

• Digging

• Digging is not a term commonly associated with cybersecurity or online attacks.

• It usually refers to the act of breaking or moving the earth, typically in the context of construction or gardening.

• Surfing

• Surfing generally refers to the activity of browsing the internet.

• It involves moving from one website to another, often aimlessly or for leisure.

• Surfing can be a target for phishing attacks if users are not cautious about the websites they visit.

This source code provides a detailed solution for the question about phishing and includes key points about phishing and additional information about the other terms mentioned in the options.

Q43. Answer: (b) 240 km

Given:

Speed of first car (S1) = 45 km/h

Speed of second car (S2) = 50 km/h

Time difference = 32 minutes = 32/60 hours

Formula used:

Time = Distance / Speed

Calculations:

Let the distance be D km.

Time taken by the first car = D / 45 hours

Time taken by the second car = D / 50 hours

According to the problem, the time difference between the two cars is 32 minutes, which is 32 / 60 hours.

=> (D / 45) - (D / 50) = 32 / 60

=> (50D - 45D) / (45 × 50) = 32 / 60

=> 5D / 2250 = 32 / 60

=> D / 450 = 8 / 15

=> D = (8 × 450) / 15

=> D = 3600 / 15

=> D = 240 km

Therefore The distance traveled is 240 km.

Q44. Answer: (a) Rowlatt Act

The correct answer is Rowlatt Act.

Key Points

• The Rowlatt Act was passed by the British government in India in March 1919.

• It gave the government enormous powers to repress political activities and allowed detention of political prisoners without trial for two years.

• This act was officially known as the Anarchical and Revolutionary Crimes Act of 1919.

• It was enacted to extend the repressive provisions of the Defence of India Act 1915, which were intended to curb nationalist and revolutionary activities during the First World War.

Additional Information

• Charter Act, 1813

• The Charter Act of 1813 was an Act of the Parliament of the United Kingdom which renewed the charter issued to the British East India Company and continued the company's rule in India.

• It is notable for ending the trade monopoly of the East India Company in India, except for trade in tea and trade with China.

• Arms Act

• The Arms Act of 1878 was enacted by the British to disarm the Indian population.

• It prohibited Indians from possessing firearms without licenses and was aimed at preventing any potential rebellion against British rule.

• Vernacular Press Act

• The Vernacular Press Act was enacted in 1878 by Lord Lytton, the then Viceroy of India.

• It was aimed at curbing the freedom of the Indian-language press and was seen as a means to suppress the rising nationalist sentiments among Indians.

Q45. Answer: (c) Both conclusions I and II follow.

Statements:

Some boys are birds.

All birds are animals.

The least possible Venn diagram:

Conclusions:

I. Some boys are animals. - True (Because Some boys are birds and All birds are animals. So, Some boys are also animals.)

II. Some animals are boys. - True (Because Some boys are birds and All birds are animals. So, Some animals are also boys.)

So, Both conclusions I and II follow.

Hence, the correct answer is "Both conclusions I and II follow."

Q46. Answer: (d) 2007

The correct answer is 2007.

Key Points

• The Government of India approved the National Policy for Farmers (NPF) in 2007.

• The policy was formulated based on the recommendations of the National Commission on Farmers, chaired by Dr. M.S. Swaminathan.

• The NPF aims to address the issues faced by farmers and improve their socio-economic conditions.

• The policy includes measures for increasing the profitability of farming, ensuring access to resources, and promoting sustainable agricultural practices.

Additional Information

• National Policy for Farmers (NPF)

• The NPF was introduced to address the various challenges faced by farmers in India, including low income, lack of access to credit, and poor infrastructure.

• It emphasizes the importance of ensuring the economic well-being of farmers and improving their quality of life.

• The policy covers a wide range of areas, including soil health, water use efficiency, credit support, crop insurance, and market access.

• It also focuses on promoting agro-processing, value addition, and the use of technology in agriculture.

• National Commission on Farmers

• The National Commission on Farmers was established by the Government of India in 2004.

• It was chaired by Dr. M.S. Swaminathan, a renowned agricultural scientist.

• The commission was tasked with recommending measures to improve the economic condition of farmers and ensure their sustainable livelihoods.

• The recommendations of the commission formed the basis for the National Policy for Farmers.

• Sustainable Agricultural Practices

• Sustainable agricultural practices are those that maintain and improve the health of the environment while ensuring the economic viability of farming.

• These practices include crop rotation, organic farming, integrated pest management, and conservation tillage.

• Sustainable agriculture aims to reduce the negative impact of farming on the environment and promote long-term productivity.

• The National Policy for Farmers includes measures to promote sustainable agricultural practices among farmers.

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• Access to Resources

• Access to resources is crucial for the success of farming activities.

• Resources include inputs like seeds, fertilizers, and water, as well as services like credit, insurance, and extension support.

• The National Policy for Farmers aims to ensure that farmers have timely and adequate access to these resources.

• This includes measures to improve the availability of quality inputs, enhance credit support, and provide comprehensive insurance coverage.

Q47. Answer: (c) cryptocurrency

The correct answer is cryptocurrency.

Key Points

• BuyUcoin has launched the first Indian platform dedicated to wholesale trading of cryptocurrency.

• The platform aims to facilitate large-scale transactions and provide a seamless trading experience for wholesale buyers and sellers.

• Cryptocurrencies are digital or virtual currencies that use cryptography for security and operate independently of a central authority.

• BuyUcoin's initiative is a significant step towards the mainstream adoption of cryptocurrencies in India.

Additional Information

• Cryptocurrency

• Cryptocurrencies are decentralized digital assets that use blockchain technology to secure transactions.

• Bitcoin, created in 2009, was the first decentralized cryptocurrency and remains the most well-known and valuable.

• Other popular cryptocurrencies include Ethereum, Ripple (XRP), Litecoin, and Bitcoin Cash.

• Cryptocurrencies can be used for various purposes, including online purchases, investment, and remittances.

• Blockchain Technology

• Blockchain is a distributed ledger technology that records transactions across many computers to ensure data integrity and security.

• Each block in the blockchain contains a list of transactions, and once a block is completed, it is added to the chain in a linear, chronological order.

• Blockchain technology is the backbone of cryptocurrencies and is also used in various other applications such as supply chain management, voting systems, and identity verification.

• Decentralization

• Decentralization refers to the distribution of authority, governance, and data storage across a network, rather than being centralized in a single entity or location.

• In the context of cryptocurrencies, decentralization means that no single authority, such as a government or financial institution, controls the currency.

• This decentralization provides increased security, transparency, and resistance to censorship and fraud.

• Wholesale Trading

• Wholesale trading involves buying and selling goods or assets in large quantities, typically at lower prices, compared to retail trading.

• In the context of cryptocurrency, wholesale trading platforms like BuyUcoin facilitate large-volume transactions between institutional investors, traders, and businesses.

• Wholesale trading can provide better pricing, liquidity, and market access for participants.

Q48. Answer: (b) Accepting demand deposits

The correct answer is Accepting demand deposits.

Key Points

• NBFCs (Non-Banking Financial Companies) are financial institutions that provide various financial services and products but do not hold a banking license.

• Unlike banks, NBFCs are not allowed to accept demand deposits from the public. Demand deposits are funds deposited at a bank that can be withdrawn at any time without any notice.

• NBFCs can engage in activities such as providing loans, making investments, and acquisition of shares, but they cannot issue cheques drawn on themselves.

• NBFCs are regulated by the Reserve Bank of India (RBI) under the Reserve Bank of India Act, 1934.

Additional Information

• Types of NBFCs:

• Asset Finance Company (AFC): Provides finance for physical assets supporting productive/economic activity.

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• Loan Company (LC): Provides finance by making loans or advances.
• Investment Company (IC): Engages in the acquisition of securities.
• Differences between Banks and NBFCs:
• Banks can accept demand deposits, whereas NBFCs cannot.
• Banks are part of the payment and settlement system and can issue cheques, while NBFCs cannot.
• Deposit insurance facility of DICGC is not available to depositors of NBFCs, unlike in banks.
• Regulation of NBFCs:
• NBFCs are regulated by the Reserve Bank of India (RBI) under the Reserve Bank of India Act, 1934.
• They must follow the prudential norms set by the RBI.
• They are required to maintain a certain level of capital adequacy and provisioning for bad debts.
• Functions of NBFCs:
• Provide loans and credit facilities.
• Trade in money market instruments.
• Underwrite stocks and shares and other obligations.
• Offer hire-purchase, leasing, and insurance products.

Q49. Answer: (b) 37

The logic followed here is:

Hence, the correct answer is "37".

Q50. Answer: (a) Hindustan Aeronautics Limited

The correct answer is Hindustan Aeronautics Limited.

Key Points

• Hindustan Aeronautics Limited (HAL) is an Indian state-owned aerospace and defense company, headquartered in Bangalore, India.
• HAL is primarily involved in the design, fabrication, and assembly of aircraft, jet engines, helicopters, and their spare parts.
• The company was established as Hindustan Aircraft Limited in 1940 and was renamed Hindustan Aeronautics Limited in 1964.
• HAL's main products include fighter aircraft like LCA Tejas, military helicopters, and transport aircraft.

Additional Information

• LCA Tejas
• The Light Combat Aircraft (LCA) Tejas is a multirole light fighter developed by the Aeronautical Development Agency (ADA) and Hindustan Aeronautics Limited (HAL) for the Indian Air Force and Indian Navy.
• It is a single-engine, fourth-generation multirole light fighter designed to replace the aging Mig-21 aircraft in the Indian Air Force.
• The Tejas is the second supersonic fighter developed by HAL after the HAL HF-24 Marut.
• The aircraft has a tail-less compound delta-wing configuration which provides high maneuverability.
• It is equipped with advanced avionics, fly-by-wire flight control system, and multi-mode radar.
• Tejas can carry a variety of air-to-air, air-to-surface, precision-guided, and standoff weaponry.
• Hindustan Aeronautics Limited (HAL)
• HAL is one of the oldest and largest aerospace and defense manufacturers in the world today.
• It has a diversified product portfolio that includes fighter planes, helicopters, engines, avionics, and ground support equipment.
• HAL also provides maintenance, repair, and overhaul (MRO) services to the Indian Armed Forces.
• The company has contributed significantly to India's self-reliance in defense production.
• HAL has production facilities in various locations in India, including Bangalore, Nashik, Koraput, Hyderabad, and Lucknow.
• Indian Air Force (IAF)
• The Indian Air Force is the air arm of the Indian Armed Forces and its primary responsibility is to secure Indian airspace and conduct aerial warfare during armed conflicts.
• It was officially established on 8 October 1932 as an auxiliary air force of the British Empire and has since grown to become one of the largest air forces in the world.
• The IAF operates a variety of aircraft, including fighters, transports, and helicopters, and is a key player in India's defense strategy.

Q51. Answer: (b) Pokhran II

The correct answer is Pokhran II.

Key Points

• National Technology Day is observed every year on May 11th to commemorate the successful nuclear tests conducted at Pokhran, Rajasthan in 1998, known as Pokhran II.

• Pokhran II was a series of five nuclear bomb test explosions conducted by India under Operation Shakti.

• The tests were led by Dr. APJ Abdul Kalam, who later became the President of India, and Dr. R. Chidambaram.

• National Technology Day celebrates not just the nuclear tests, but also India's progress in technological advancements and innovations.

Additional Information

• Operation Blue Star

• Operation Blue Star was a military operation carried out between 1-8 June 1984, ordered by Prime Minister Indira Gandhi.

• Its aim was to remove militant religious leader Jarnail Singh Bhindranwale and his followers from the Golden Temple in Amritsar, Punjab.

• This operation led to significant casualties and remains a controversial and sensitive topic in Indian history.

• Mangalyaan

• Mangalyaan, also known as the Mars Orbiter Mission (MOM), is a space probe launched by the Indian Space Research Organisation (ISRO) on 5 November 2013.

• It made India the first Asian nation to reach Martian orbit and the first nation in the world to do so in its maiden attempt.

• The mission aims to explore Mars' surface and atmosphere and to develop the technology for interplanetary missions.

• Operation Meghdoot

• Operation Meghdoot was the code-name for the Indian Armed Forces' operation to seize control of the Siachen Glacier in Kashmir, launched on 13 April 1984.

• The operation resulted in India gaining control over all of the Siachen Glacier, including its strategic passes.

• This operation has led to the world's highest battlefield conflicts between India and Pakistan, with both countries maintaining a military presence in the region.

Q52. Answer: (c) 42^(nd) constitutional amendment

The correct answer is 42nd constitutional amendment.

Key Points

• The 42nd Amendment of the Constitution of India, officially known as The Constitution (Forty-second Amendment) Act, 1976, is regarded as the most comprehensive amendment to the Constitution.

• This amendment is often referred to as the 'mini-Constitution' due to the extensive changes it made to the Constitution.

• The 42nd Amendment Act was enacted during the Emergency period (1975-1977) under the government of Prime Minister Indira Gandhi.

• It gave effect to the recommendations of the Swaran Singh Committee, which was constituted to suggest changes to the Constitution and strengthen the executive power of the Parliament and the Prime Minister.

Additional Information

• Constitutional Amendment:

• A constitutional amendment refers to changes or additions to the Constitution. In India, amendments can be made under Article 368.

• Amendments are essential to address evolving needs and contexts, ensuring the Constitution remains relevant and effective.

• Swaran Singh Committee:

• The Swaran Singh Committee was set up by the Government of India in 1975 during the Emergency period.

• It was tasked with recommending changes to the Indian Constitution to make the executive more powerful and ensure stability in governance.

• Emergency Period (1975-1977):

• The Emergency was a 21-month period from 1975 to 1977 when Prime Minister Indira Gandhi had a state of emergency declared across the country.

• During this period, civil liberties were suspended, and many opposition leaders were arrested.

• Impact of the 42nd Amendment:

• The 42nd Amendment significantly altered the structure and functioning of the Indian polity, leading to a shift towards a more centralized form of governance.

• It extended the term of Lok Sabha and State Assemblies from five to six years, curtailed the powers of the judiciary, and enhanced the powers of the Parliament.

• Many of its provisions were later repealed or altered by subsequent amendments, especially the 44th Amendment Act, 1978.

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Q53. Answer: (a) HKLIG

The logic followed here is:

PRIME is written as KIRNV

Similarly, SPORT would be written as:

Hence, the correct answer is "HKLIG ".

Q54. Answer: (c) Mallikarjun Kharge

The correct answer is Mallikarjun Kharge.

Key Points

• Mallikarjun Kharge was appointed as the Leader of Opposition in Rajya Sabha in February 2021.

• He succeeded Ghulam Nabi Azad, who had held the position prior to him.

• Mallikarjun Kharge is a senior leader of the Indian National Congress (INC).

• He has previously served in various capacities including as the Leader of the Congress in the Lok Sabha.

Additional Information

• Rajya Sabha

• The Rajya Sabha or Council of States is the upper house of the Parliament of India.

• It is a permanent body and is not subject to dissolution.

• Members of the Rajya Sabha are elected by the elected members of State Legislative Assemblies and by the members of the Electoral college for Union Territories.

• The Rajya Sabha can have a maximum of 250 members, out of which 238 are elected and 12 are nominated by the President of India.

• Leader of Opposition

• The Leader of Opposition in Rajya Sabha is a statutory position under the Salary and Allowances of Leaders of Opposition in Parliament Act, 1977.

• The role of the Leader of Opposition is to provide constructive criticism of the government and act as a check and balance in the legislative process.

• The Leader of Opposition is the leader of the largest party in the Rajya Sabha that is not in government.

• They are accorded the status and facilities equivalent to that of a cabinet minister.

• Indian National Congress (INC)

• The Indian National Congress is one of the two major political parties in India, the other being the Bharatiya Janata Party (BJP).

• Founded in 1885, the INC played a crucial role in the Indian independence movement against British rule.

• It has been the ruling party in India for the majority of its post-independence history.

• The party's symbol is the hand, and its ideology is centered around social democracy and secularism.

Q55. Answer: (c) 2 units

Given:

Let the radius of the circle be r.

Formula used:

Circumference of the circle = $2\pi r$

Area of the circle = πr^2

Calculations:

According to the problem, the circumference and area are numerically equal.

=> $2\pi r = \pi r^2$

=> $2r = r^2$ (dividing both sides by π)

=> $r^2 - 2r = 0$

=> $r(r - 2) = 0$

=> $r = 0$ or $r = 2$

Since the radius cannot be zero, we have:

=> $r = 2$

Therefore The radius of the circle is 2 units.

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Q56. Answer: (c) 7 : 8

Given:

First friend's initial amount = Rs. 47,000

Second friend's initial amount = Rs. 54,000

Bonus received by each friend = Rs. 2,000

Formula used:

New amount for first friend = Initial amount + Bonus = 47,000 + 2,000

New amount for second friend = Initial amount + Bonus = 54,000 + 2,000

Calculations:

New amount for first friend = 47,000 + 2,000 = Rs. 49,000

New amount for second friend = 54,000 + 2,000 = Rs. 56,000

Now, we need to find the ratio of the amounts in their respective accounts:

Ratio = 49,000 : 56,000

=> 49,000 ÷ 7 : 56,000 ÷ 7

=> 7,000 : 8,000

=> 7 : 8

Therefore The ratio of the amounts in their respective accounts is 7 : 8.

Q57. Answer: (d) Consumer Price Index Number for Industrial Workers (CPI-IW)

The correct answer is Consumer Price Index Number for Industrial Workers (CPI-IW).

Key Points

• The Consumer Price Index for Industrial Workers (CPI-IW) is used as a measure to calculate the Dearness Allowance (DA) for government employees in India.

• It reflects the changes in the cost of living and thus helps in adjusting the salaries of government employees to compensate for the increase in prices.

• The CPI-IW is compiled by the Labour Bureau in the Ministry of Labour and Employment.

• This index specifically focuses on the consumption pattern of industrial workers, which includes a significant proportion of the working population.

Additional Information

• Bank Rate:

• The bank rate is the rate at which the central bank of a country lends money to commercial banks.

• It is a tool used by the central bank to control the money supply in the economy and influence interest rates.

• Statutory Liquidity Ratio (SLR):

• SLR is the minimum percentage of deposits that a commercial bank has to maintain in the form of liquid cash, gold, or other securities.

• It is a tool used by the central bank to control the credit growth in the economy.

• Interest Rate:

• The interest rate is the amount charged, expressed as a percentage of principal, by a lender to a borrower for the use of assets.

• Interest rates are typically noted on an annual basis, known as the annual percentage rate (APR).

• Consumer Price Index (CPI):

• The Consumer Price Index (CPI) measures the average change over time in the prices paid by consumers for a basket of goods and services.

• The CPI is a statistical estimate constructed using the prices of a sample of representative items whose prices are collected periodically.

Q58. Answer: (d) 50

Given:

20% of 75 = 225 - x% of 420

Formula used:

Percentage of a number = (Percentage × Number) / 100

Calculations:

20% of 75 = (20 × 75) / 100 = 1500 / 100 = 15

Now, substitute in the equation:

15 = 225 - (x × 420) / 100

=> 15 = 225 - (420x) / 100

=> (420x) / 100 = 225 - 15

=> (420x) / 100 = 210

=> 420x = 210 × 100

=> 420x = 21,000

=> x = 21,000 / 420

=> x = 50

Therefore The value of x is 50.

Q59. Answer: (d) Sodium bicarbonate

The correct answer is Sodium bicarbonate.

Key Points

• Sodium bicarbonate is commonly known as baking soda.

• It is a mildly alkaline compound that can neutralize acids, including the formic acid injected by ant bites.

• Applying a paste of sodium bicarbonate mixed with water to the affected area can help to neutralize the acid and reduce pain and swelling.

• Sodium bicarbonate is often used in household remedies for various minor ailments, including insect bites and stings.

Additional Information

• Formic Acid

• Formic acid is a colorless liquid with a pungent odor, commonly found in the venom of ants and bees.

• It is a naturally occurring substance used by insects as a defense mechanism to deter predators.

• Formic acid can cause irritation and pain when it comes into contact with human skin.

• Neutralization Reaction

• A neutralization reaction occurs when an acid and a base react to form water and a salt.

• In the case of an ant bite, the formic acid (acid) is neutralized by sodium bicarbonate (base), resulting in relief from the pain and irritation.

• Other Household Remedies for Insect Bites

• Calamine lotion: Can soothe and protect the skin.

• Aloe vera: Has anti-inflammatory properties that can help reduce swelling and pain.

• Ice packs: Can reduce swelling and numb the affected area to alleviate pain.

• Vinegar: Mildly acidic and can help neutralize the venom of certain insect bites and stings.

Q60. Answer: (b) 18

The logic followed here is:

Hence, the correct answer is "18".

Q61. Answer: (b) 1935

The correct answer is 1935.

Key Points

• The Reserve Bank of India (RBI) was established on April 1, 1935.

• It was initially set up based on the recommendations of the Hilton Young Commission.

• The original headquarters of RBI was located in Kolkata, but it was permanently moved to Mumbai in 1937.

• The RBI was initially set up as a private entity but was nationalized in 1949 after India's independence.

Additional Information

• Hilton Young Commission

• The Hilton Young Commission, also known as the Royal Commission on Indian Currency and Finance, was set up in 1926 to investigate and recommend changes to the monetary system in India.

• The commission recommended the establishment of a central bank to manage India's currency and credit, which led to the formation of the RBI.

• Functions of RBI

• The RBI acts as the regulator of the entire financial system in India, ensuring its stability and efficiency.

• It manages the country's currency and monetary policy and serves as the banker to the government and other banks.

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• The RBI also oversees the foreign exchange market and maintains the foreign exchange reserves of India.

• Nationalization of RBI

• In 1949, the Reserve Bank of India was nationalized, meaning it was taken over by the government of India.

• This step was taken to ensure a greater degree of control over the credit and monetary policy, aligning it with the nation's economic interests.

• Role in Economic Development

• The RBI plays a crucial role in the economic development of India through its monetary policies, regulation of financial institutions, and management of the payment system.

• It also focuses on financial inclusion, aiming to make financial services accessible to the unbanked and underbanked population.

Q62. Answer: (c) 9 years

Given:

Let Kirti's present age be K and Kunal's present age be N.

Formula used:

In six years, Kirti's age = 2 × Kunal's age

Four years ago, Kirti's age = 4 × Kunal's age

Calculations:

In six years, Kirti's age = K + 6 and Kunal's age = N + 6

=> K + 6 = 2(N + 6)

=> K + 6 = 2N + 12

=> K = 2N + 6 ...(1)

Four years ago, Kirti's age = K - 4 and Kunal's age = N - 4

=> K - 4 = 4(N - 4)

=> K - 4 = 4N - 16

=> K = 4N - 12 ...(2)

Now, equate equations (1) and (2):

=> 2N + 6 = 4N - 12

=> 6 + 12 = 4N - 2N

=> 18 = 2N

=> N = 18 / 2 = 9

Therefore Kunal's present age is 9 years.

Q63. Answer: (a) John Maynard Keynes

The correct answer is John Maynard Keynes.

Key Points

• John Maynard Keynes was a British economist whose ideas fundamentally changed the theory and practice of macroeconomics and the economic policies of governments.

• His most famous work, "The General Theory of Employment, Interest and Money," published in 1936, is considered to be the foundation of modern macroeconomics.

• Keynes advocated for increased government expenditures and lower taxes to stimulate demand and pull the global economy out of the Great Depression.

• His theories are the basis for the school of thought known as Keynesian economics, which emphasizes the total spending in the economy (aggregate demand) and its effects on output and inflation.

Additional Information

• Macroeconomics:

• Macroeconomics is a branch of economics that studies how the aggregate economy behaves. In macroeconomics, a variety of economy-wide phenomena are thoroughly examined such as inflation, national income, gross domestic product (GDP), and changes in unemployment.

• John Maynard Keynes is considered the father of modern macroeconomics because of his role in developing the field.

• Keynesian Economics:

• Keynesian economics is an economic theory of total spending in the economy and its effects on output and inflation.

• Keynesian economics was developed by John Maynard Keynes during the 1930s in an attempt to understand the Great Depression.

• Keynes advocated for increased government expenditures and lower taxes to stimulate demand and pull the global economy out

of the depression.

• Aggregate Demand:

• Aggregate demand is the total demand for final goods and services in an economy at a given time.

• It specifies the amounts of goods and services that will be purchased at all possible price levels.

• Keynes believed that changes in aggregate demand, whether anticipated or unanticipated, have their greatest short-run effect on real output and employment, not on prices.

• The Great Depression:

• The Great Depression was a severe worldwide economic depression that took place mostly during the 1930s, beginning in the United States.

• The timing of the Great Depression varied across the world; in most countries, it started in 1929 and lasted until the late 1930s.

• It was the longest, deepest, and most widespread depression of the 20th century.

• John Maynard Keynes' work on "The General Theory of Employment, Interest and Money" was a response to the Great Depression.

Q64. Answer: (c) 8

Given:

5 + 2 × 3 ÷ (3 × 2) × 3

Formula used:

Follow BODMAS rule (Brackets, Orders, Division, Multiplication, Addition, Subtraction).

Calculations:

5 + 2 × 3 ÷ (3 × 2) × 3

=> 5 + 2 × 3 ÷ 6 × 3

=> 5 + 2 × 0.5 × 3

=> 5 + 1 × 3

=> 5 + 3

=> 8

Therefore The simplified value is 8.

Q65. Answer: (d) 25 %

Given:

The amount doubles itself on simple interest in 4 years. We need to find the rate of interest per annum.

Formula used:

A = P + (P × R × T)/100

Calculation:

Since the amount doubles: 2P = P + (P × R × 4)/100

Simplifying: 2P - P = (P × R × 4)/100

P = (P × R × 4)/100

Cancel P from both sides: 1 = (R × 4)/100

Solve for R: R × 4 = 100

R = 100/4 = 25

Therefore The rate of interest is 25% per annum.

Q66. Answer: (d) 30

Given:

We are asked to find the difference between 3/5 of 200 and 1/2 of 300.

Solution:

1. Find 3/5 of 200:

3/5 × 200 = 120

2. Find 1/2 of 300:

1/2 × 300 = 150

3. Find the difference:

150 - 120 = 30

Conclusion:

The difference is 30.

Q67. Answer: (b) 64°

Shortcut Trick

The condition AB/AC = BD/DC is the property of the Internal Angle Bisector Theorem, meaning AD bisects angle BAC.

If angle BAD = 32° (as given in the standard diagram for this problem), then angle BAC = 2 × 32° = 64°.

Given angle ACB = 52°, the triangle property (sum = 180°) yields angle ABC = 180° − (64° + 52°) = 64°.

Therefore The correct answer is 64°.

Alternate Method

Given: In ΔABC, AB/AC = BD/DC. From the diagram, angle BAD = 32° and angle ACB = 52°.

Formula Used: Internal Angle Bisector Theorem states that if a line bisects an angle of a triangle, it divides the opposite side into segments proportional to the other two sides.

=> According to the Angle Bisector Theorem, since AB/AC = BD/DC, AD is the angle bisector of angle BAC.

=> angle BAC = angle BAD + angle DAC

=> angle BAC = 32° + 32° = 64°

=> In ΔABC, the sum of all internal angles is 180°.

=> angle ABC + angle BAC + angle ACB = 180°

=> angle ABC + 64° + 52° = 180°

=> angle ABC + 116° = 180°

=> angle ABC = 180° − 116° = 64°

Therefore The correct answer is 64°.

Additional Information

Internal Angle Bisector Theorem

The angle bisector of an angle of a triangle divides the opposite side into two segments that are proportional to the other two sides of the triangle (AB/AC = BD/DC).

Angle Sum Property

The sum of the measures of the interior angles of any triangle is always 180° (angle A + angle B + angle C = 180°).

Exterior Angle Bisector Theorem

For an external angle bisector at A meeting BC extended at D, the ratio holds as AB/AC = BD/CD.

Q68. Answer: (b) Rs. 250

Given:

A sells an article to B at a profit of 20%. B sells it to C at a profit of 20%. C pays Rs. 360 for the article.

Formula used:

The formula for selling price after profit is:

Selling Price = Cost Price × (1 + Profit %/100)

Calculation:

Let the cost price of A be x.

1. A sells to B:

Selling Price of A to B = x × 1.2

2. B sells to C:

Selling Price of B to C = x × 1.44

We know that C pays Rs. 360:

x × 1.44 = 360

x = 360 / 1.44 = 250

Conclusion:

The cost price for A was Rs. 250.

Q69. Answer: (c) 49

Given:

We need to find the least multiple of 7 which, when divided by 6, 8, and 12, leaves a remainder of 1.

Formula used:

The number we are looking for should satisfy the following condition:

$x \equiv 1 \pmod 6$, $x \equiv 1 \pmod 8$, $x \equiv 1 \pmod{12}$

This means that x - 1 must be divisible by 6, 8, and 12.

Calculation:

Step 1: Find the least common multiple (LCM) of 6, 8, and 12:

LCM(6, 8, 12) = 24

Step 2: Since x - 1 must be divisible by 24, let x - 1 = 24k, then x = 24k + 1.

Step 3: The number x must also be a multiple of 7, so:

x = 24k + 1 must be divisible by 7.

$24k + 1 \equiv 0 \pmod 7$

$3k + 1 \equiv 0 \pmod 7$

$3k \equiv 6 \pmod 7$

$k \equiv 2 \pmod 7$

Step 4: Find the least value of x:

x = 168m + 49

The least value of x occurs when m = 0:

x = 49

Conclusion:

The least multiple of 7 which, when divided by 6, 8, and 12, leaves a remainder of 1 is 49.

Q70. Answer: (b) Chaudhary Rehmat Ali

The correct answer is Chaudhary Rehmat Ali.

Key Points

• Chaudhary Rehmat Ali was a Punjabi Muslim student at Cambridge University.

• In 1933, he coined the term 'Pakstan' by combining the names of the regions of Punjab, Afghan (North-West Frontier Province), Kashmir, Sindh, and Baluchistan.

• He played a significant role in the Pakistan Movement, advocating for a separate Muslim state in the Indian subcontinent.

• Rehmat Ali's pamphlet, titled "Now or Never; Are We to Live or Perish Forever?" published in 1933, outlined his vision for the creation of Pakistan.

Additional Information

• Pakistan Movement:

• The Pakistan Movement was a political movement in the first half of the 20th century that aimed for the creation of Pakistan, a separate nation for Muslims, from the regions in the Indian subcontinent with a Muslim majority.

• The movement was spearheaded by the All-India Muslim League and led by prominent leaders such as Muhammad Ali Jinnah.

• The demand for Pakistan was formally adopted by the Muslim League at its Lahore session in 1940, known as the Lahore Resolution.

• Ultimately, the movement culminated in the partition of India and the creation of Pakistan on August 14, 1947.

• Cambridge University:

• Cambridge University, located in Cambridge, England, is one of the world's oldest and most prestigious universities.

• Founded in 1209, it has produced a significant number of notable alumni, including scientists, writers, politicians, and world leaders.

• The university is renowned for its rigorous academic programs and significant contributions to research and scholarship.

• Punjab:

• Punjab is a region in South Asia, divided between India and Pakistan, known for its rich cultural heritage and history.

• The name "Punjab" derives from the Persian words "panj" (five) and "ab" (water), referring to the five major rivers that flow through the region.

• Punjab played a crucial role in the history and politics of the Indian subcontinent, particularly during the partition in 1947.

• Baluchistan:

• Baluchistan is a region located in the southwestern part of Pakistan and southeastern Iran.

• It is known for its diverse ethnic groups, including the Baloch people, and its arid, mountainous terrain.

• Baluchistan has significant strategic and economic importance due to its natural resources and geographical location.

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Q71. Answer: (b) Manjira

The correct answer is Manjira.

Key Points

• Manjira is a tributary of the Godavari River, not the Krishna River.

• The Manjira river originates in the Balaghat range of hills near Ahmednagar district in Maharashtra.

• It flows through the states of Maharashtra, Karnataka, and Telangana before joining the Godavari River.

• Manjira is an important source of drinking water for the city of Hyderabad.

Additional Information

• Krishna River

• The Krishna River is one of the longest rivers in India, originating in the Western Ghats near Mahabaleshwar in Maharashtra.

• It flows through the states of Maharashtra, Karnataka, Telangana, and Andhra Pradesh before emptying into the Bay of Bengal.

• The Krishna River is known for its significant role in agriculture, providing irrigation to a large area in the Deccan Plateau.

• The river has several major tributaries including Ghatprabha, Malaprabha, Bhima, Tungabhadra, and Musi.

• Tributaries of Krishna River

• Ghatprabha: Originates in the Western Ghats and joins the Krishna River in Karnataka.

• Tungabhadra: Formed by the confluence of the Tunga and Bhadra rivers, it is one of the major tributaries of the Krishna River.

• Musi: Originates in the Ananthagiri Hills and flows through Hyderabad before joining the Krishna River.

• Bhima: Originates in the Bhimashankar hills in Maharashtra and joins the Krishna River in Karnataka.

• Godavari River

• The Godavari River is the second longest river in India, originating in the Western Ghats in Maharashtra.

• It flows through the states of Maharashtra, Telangana, Andhra Pradesh, Chhattisgarh, and Odisha before emptying into the Bay of Bengal.

• The river has several major tributaries including Manjira, Indravati, Pranahita, and Sabari.

Q72. Answer: (a) Debendranath Tagore

The correct answer is Debendranath Tagore.

Key Points

• Debendranath Tagore was a prominent figure in the Brahmo Samaj movement, an influential socio-religious reform movement in 19th century Bengal.

• He founded the Tattwabodhini Sabha in 1839 to propagate the ideas of Raja Ram Mohan Roy, particularly focusing on religious and social reforms.

• The Tattwabodhini Sabha played a crucial role in the spread of Brahmo Samaj's ideals and was instrumental in the revival of Vedantic philosophy in Bengal.

• Debendranath Tagore, father of the famous poet Rabindranath Tagore, was an intellectual and a philosopher who contributed significantly to Indian society.

Additional Information

• Brahmo Samaj

• The Brahmo Samaj was a reformist movement of the Hindu religion that appeared during the Bengal Renaissance.

• Founded by Raja Ram Mohan Roy in 1828, it aimed at reforming the social and religious abuses prevalent in contemporary Hindu society.

• It emphasized the worship of one god, the rejection of the caste system, and the promotion of women’s rights.

• The Brahmo Samaj played a pivotal role in the socio-religious reform movements in India and influenced subsequent reform movements.

• Raja Ram Mohan Roy

• Considered the father of the Indian Renaissance, Raja Ram Mohan Roy was a social and educational reformer who challenged traditional Hindu culture and indicated the lines of progress for Indian society under British rule.

• He founded the Brahmo Samaj, an influential religious and social reform movement in Bengal in 1828.

• He campaigned against practices such as sati, child marriage, and polygamy and promoted widow remarriage.

• His efforts were instrumental in the eventual abolition of the practice of sati by the British Government in 1829.

• Vedanta

• Vedanta is one of the six orthodox schools of Hindu philosophy, focusing on the end part of the Vedas (the Upanishads) and the concepts of Brahman (the ultimate reality) and Atman (the individual soul).

• It emphasizes the idea that the true self (Atman) is identical with the ultimate reality (Brahman).

• The philosophy of Vedanta was revived and popularized in Bengal by figures like Debendranath Tagore and later by Swami Vivekananda.

Q73. Answer: (a) 25/11

Given:

We need to find the number by which 2 (1/5) should be multiplied to get 5 (2/5).

Formula used:

Let the number be x. The equation is:

2 (1/5) × x = 5 (2/5)

Calculation:

Step 1: Convert the mixed fractions to improper fractions:

2(1/5) = 11/5

5(2/5) = 27/5

Step 2: Set up the equation:

11/5 × x = 27/5

Step 3: Solve for x:

x = (27/5) ÷ (11/5) = (27/11)

Step 4: Convert the improper fraction back to a mixed fraction:

27/11 = 2(5/11)

Conclusion:

The number by which 2 (1/5) should be multiplied to get 5 (2/5) is 2 (5/11).

Q74. Answer: (d) V > R > Q > S > T > U > P

According to the given information:

1) T is shorter than S but taller than U.

S > T > U

2) U is taller than P.

U > P

3) R and Q are shorter than V but taller than S.

V > R > S or V > Q > S

Thus final arrangement:

V > R > S > T > U > P ---------- (i)

V > Q > S > T > U > P ---------- (ii)

Option 1) V > R > Q > U > T > S > P → Cannot be possible (S > T)

Option 2) V > Q > R > T > S > U > P → Cannot be possible (S > T)

Option 3) V > Q > R > S > T > P > U → Cannot be possible (U > P)

Option 4) V > R > Q > S > T > U > P → Can be possible

"V > R > Q > S > T > U > P" sequence of their height can be possible.

Hence, the correct answer is "V > R > Q > S > T > U > P".

Q75. Answer: (d) 0

Given:

2x + y - 3 = 0

Rearranging:

y = 3 - 2x

Substituting y in the expression:

$8x^3 + 18x(3 - 2x) + (3 - 2x)^3 - 27$

Expanding and simplifying:

$= 8x^3 + 54x - 36x^2 + (27 - 54x + 36x^2 - 8x^3) - 27$

$= 8x^3 + 54x - 36x^2 + 27 - 54x + 36x^2 - 8x^3 - 27$

Notice that many terms cancel each other:

= 0

Therefore, the value of the expression $8x^3 + 18xy + y^3 - 27$ is 0 when 2x + y - 3 = 0.

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Q76. Answer: (a) Eutrophication

The correct answer is Eutrophication.

Key Points

• Eutrophication is the process by which a body of water becomes enriched in dissolved nutrients (such as phosphates) that stimulate the growth of aquatic plant life usually resulting in the depletion of dissolved oxygen.

• This phenomenon can lead to the excessive growth of algae and other aquatic plants, known as algal blooms, which can harm water quality, aquatic life, and ecosystem balance.

• Eutrophication can be a natural process, but it is often accelerated by human activities such as agriculture, urban runoff, and wastewater discharge.

• Management strategies for eutrophication include reducing nutrient inputs, controlling runoff, and restoring affected ecosystems.

Additional Information

• Denutrification

• It is a process that reduces the concentration of nutrients, particularly nitrogen, in the soil.

• This process is essential in mitigating the effects of nutrient runoff into water bodies, which can lead to eutrophication.

• Denutrification involves the conversion of nitrate (NO3-) into nitrogen gas (N2), which is then released into the atmosphere.

• Nutriphication

• This term is often confused with eutrophication but is not commonly used in scientific literature.

• It refers to the enrichment of an ecosystem with nutrients.

• Extraction

• In the context of environmental science, extraction refers to the process of removing substances or materials from a natural environment.

• Examples include mining minerals, extracting oil, and harvesting timber.

• Extraction processes can have significant environmental impacts, including habitat destruction, pollution, and resource depletion.

Q77. Answer: (d) Mother's Brother

Family Chart:

Given: Arun said, "Deepak's mother is the mother of my father's wife".

So, Deepak is the 'Mother's Brother' of Arun.

Hence, the correct answer is "Mother's Brother".

Q78. Answer: (a) 24, 16

Given:

The two numbers are in the ratio 3:2.

If 8 is subtracted from the first number and 6 from the second number, the ratio becomes 8:5.

Let the two numbers be:

First number = 3x and Second number = 2x.

According to the second condition:

The new ratio after subtraction becomes:

(3x - 8)/(2x - 6) = 8/5.

Step-by-step calculation:

Cross-multiply the equation:

5(3x - 8) = 8(2x - 6)

Expand both sides:

15x - 40 = 16x - 48

Move terms with x to one side and constants to the other:

15x - 16x = -48 + 40

-x = -8

Solve for x:

x = 8.

Now substitute x = 8:

First number = 3x = 3 * 8 = 24

Second number = 2x = 2 * 8 = 16.

Conclusion:

The two numbers are 24 and 16.

Q79. Answer: (c) 23.5°

The correct answer is 23.5º.

Key Points

• The equatorial plane and the orbital plane of the Earth are inclined to each other at an angle of 23.5º.

• This angle is known as the axial tilt or obliquity of the Earth.

• The axial tilt is responsible for the changing seasons on Earth as it orbits the Sun.

• The tilt causes different parts of the Earth to receive varying amounts of solar energy throughout the year.

Additional Information

• Equatorial Plane:

• The equatorial plane is an imaginary plane that is perpendicular to the Earth's rotational axis and divides the Earth into the Northern Hemisphere and the Southern Hemisphere.

• It is aligned with the equator, which is the latitude 0°.

• Orbital Plane:

• The orbital plane, also known as the ecliptic plane, is the plane in which the Earth orbits around the Sun.

• All the planets in the Solar System have orbits that lie roughly in the same plane.

• Axial Tilt (Obliquity):

• The axial tilt is the angle between the Earth's rotational axis and its orbital axis.

• The current axial tilt is approximately 23.5°, but it varies over long periods of time due to gravitational interactions with other celestial bodies.

• This tilt is crucial for the variation in solar radiation received at different latitudes, leading to the seasons.

• Seasons:

• Due to the axial tilt, different parts of the Earth receive varying amounts of sunlight at different times of the year.

• This variation causes the seasonal changes, with the Northern and Southern Hemispheres experiencing opposite seasons at any given time.

• For example, when it is summer in the Northern Hemisphere, it is winter in the Southern Hemisphere, and vice versa.

Q80. Answer: (a) ENIAC

The correct answer is ENIAC.

Key Points

• ENIAC stands for Electronic Numerical Integrator and Computer.

• It was the first electronic general-purpose digital computer.

• ENIAC was designed and built at the University of Pennsylvania's Moore School of Electrical Engineering by John W. Mauchly and J. Presper Eckert.

• It was completed in 1945 and was used primarily by the United States Army during World War II.

Additional Information

• UNIVAC (Universal Automatic Computer)

• It was one of the first commercially produced computers in the United States.

• UNIVAC was developed by the same team that created ENIAC, including John W. Mauchly and J. Presper Eckert.

• The first UNIVAC was delivered to the United States Census Bureau in 1951.

• It was known for being one of the first computers to use magnetic tape for data storage.

• PROLOG

• It is a logic programming language associated with artificial intelligence and computational linguistics.

• PROLOG stands for "Programming in Logic."

• It was created by Alain Colmerauer and his team in Marseille, France, in 1972.

• PROLOG is not a computer but a programming language used for solving problems involving objects and relationships between them.

• PARAM

• PARAM is a series of supercomputers designed and assembled by the Centre for Development of Advanced Computing (C-DAC) in Pune, India.

• The PARAM series was initiated in 1988 and the first machine, PARAM 8000, was installed in 1991.

• PARAM stands for "Parallel Machine."

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• It was a significant milestone in India's efforts to develop indigenous supercomputing capabilities.

Q81. Answer: (d) Narmada

The correct answer is Narmada.

Key Points

• The Dhuandhar Falls is located on the Narmada River in the Indian state of Madhya Pradesh.

• The falls are located in Bhedaghat, which is about 30 km from the city of Jabalpur.

• The name 'Dhuandhar' is derived from two Hindi words - 'Dhuan' meaning smoke and 'Dhar' meaning flow, referring to the smoky mist created by the waterfall.

• The Narmada River is one of the major rivers in central India and flows westward over a length of 1,312 km before draining into the Arabian Sea.

Additional Information

• Narmada River

• The Narmada River, also known as the Rewa, is the fifth largest river in the Indian subcontinent.

• It is one of the three major rivers in peninsular India that run from east to west; the other two are the Tapti and the Mahi.

• The river flows through the states of Madhya Pradesh, Maharashtra, and Gujarat.

• The Narmada River is considered sacred by Hindus and is worshipped as a goddess.

• Dhuandhar Falls

• The Dhuandhar Falls are a popular tourist attraction, known for their scenic beauty.

• The falls create a misty appearance due to the force of the water, which gives the illusion of smoke (hence the name 'Dhuandhar').

• Visitors can enjoy a cable car ride over the river to get a panoramic view of the falls and the surrounding marble rocks.

• The best time to visit the Dhuandhar Falls is during the monsoon season when the water flow is at its peak, creating a more impressive sight.

• Geological Significance

• The region around the falls is known for its marble rocks, which are mined and used for various purposes.

• The marble rocks near the falls have been shaped by the river over centuries, creating a unique and picturesque landscape.

• The area is also known for the Marble Rocks of Bhedaghat, which are a major attraction for tourists and geologists alike.

• The falls and the surrounding areas are part of the Narmada Valley, which is rich in biodiversity and holds significant ecological importance.

Q82. Answer: (b) Uttarakhand - Tapali

The correct answer is Uttarakhand - Tapali.

Key Points

• Chattisgarh - Dagla: Dagla is a popular folk dance in Chattisgarh, performed during various festivals and celebrations.

• Assam - Bihu: Bihu is the most famous folk dance of Assam, performed during the Bihu festival which marks the Assamese New Year.

• Gujarat - Garba: Garba is a traditional folk dance from Gujarat, performed during the Navratri festival.

• Uttarakhand - Tapali: Tapali is not recognized as a traditional folk dance of Uttarakhand. Uttarakhand is known for folk dances like Barada Nati, Langvir Nritya, and others.

Additional Information

• Folk Dances of India

• Chattisgarh: Chattisgarh is known for its vibrant folk dances such as Panthi, Raut Nacha, and Soowa dance.

• Uttarakhand: Uttarakhand has a rich cultural heritage with folk dances like Barada Nati, Chholiya, Jhora, Langvir Nritya, and Thali.

• Assam: Besides Bihu, Assam is also known for other folk dances like Bagurumba, Jhumur, and Ali Ai Ligang.

• Gujarat: In addition to Garba, Gujarat is known for other dances like Dandiya Raas, Padhar, and Tippani Juriun.

• Importance of Folk Dances

• Folk dances are an integral part of the cultural heritage of a region, reflecting the traditions, customs, and lifestyle of the people.

• They are usually performed during festivals, weddings, and other significant events.

• Folk dances help in preserving the cultural identity of a community and passing it on to future generations.

• Festivals Associated with Folk Dances

• Bihu Festival: Celebrated in Assam during April, marking the Assamese New Year.

• Navratri Festival: Celebrated in Gujarat with Garba and Dandiya Raas, marking the worship of Goddess Durga.

• Chhattisgarh Festivals: Various festivals like Bastar Dussehra and Pola are celebrated with traditional folk dances.

Q83. Answer: (a))- (1/2

Given:

$(\cos^2 22° + \cos^2 68°) / (2 \times (\sin^2 22° + \sin^2 68°)) - \sin^2 16° - \cos 16° \times \sin 74°$

Solution:

We will break down the expression step by step.

Step 1: Simplify the first part of the expression

Start by simplifying $\cos^2 22° + \cos^2 68°$ and $\sin^2 22° + \sin^2 68°$. Note that:

$\cos 68° = \sin 22°$ (using the identity $\cos(90° - x) = \sin x$). So, we can rewrite the terms:

$\cos^2 22° + \cos^2 68° = \cos^2 22° + \sin^2 22° = 1$

$\sin^2 22° + \sin^2 68° = \sin^2 22° + \cos^2 22° = 1$

Now substitute these values into the first part of the expression:

1 / 2

Step 2: Simplify the second part of the expression

We need to simplify $\sin^2 16° + \cos 16° * \sin 74°$. Notice that $\sin 74° = \cos 16°$ (again using the identity $\sin(90° - x) = \cos x$). Therefore:

$\cos 16° \times \sin 74° = \cos 16° \times \cos 16° = \cos^2 16°$

The second part becomes:

$\sin^2 16° + \cos^2 16° = 1$

Step 3: Combine the results

Now, combine the two parts:

1 / 2 - 1 = -1 / 2

Conclusion:

The value of the expression is -1/2.

Q84. Answer: (c) Kandla

The correct answer is Kandla.

Key Points

• Kandla Port has been renamed as Deendayal Port to honor Pandit Deendayal Upadhyaya.

• The renaming was officially announced by the Government of India on 25 September 2017.

• Kandla Port is one of the major ports on the west coast of India, located in the Kutch District of Gujarat.

• It is one of the largest ports in India and plays a significant role in the country's maritime trade.

Additional Information

• Kandla Port

• Kandla Port was constructed in the 1950s as the chief seaport serving western India.

• It is situated on the Gulf of Kutch and serves as a crucial link in international trade for India.

• The port handles a variety of cargo including petroleum, chemicals, iron, steel, and agricultural products.

• Over the years, Kandla Port has emerged as a prominent port known for its efficiency and capacity in handling bulk and container cargo.

• Pandit Deendayal Upadhyaya

• Pandit Deendayal Upadhyaya was a prominent Indian politician, philosopher, and leader of the Bharatiya Jana Sangh, the forerunner of the Bharatiya Janata Party (BJP).

• He is remembered for his concept of 'Integral Humanism' which aimed at the holistic development of individuals and society.

• The Government of India has named several institutions and infrastructure projects after him to honor his contributions and ideologies.

• Port Naming and Renaming

• Renaming ports and other significant infrastructure is often done to honor notable personalities or reflect historical, cultural, or political changes.

• Such decisions are typically made by the government and involve official announcements and administrative processes.

• Renaming can also help in branding and repositioning the port on the global map, attracting more business and investments.

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Q85. Answer: (a) Saprophytic nutrition

The correct answer is Saprophytic nutrition.

Key Points

• Saprophytic nutrition involves the intake of nutrients in solution form from dead and decaying organic matter.

• Organisms that exhibit saprophytic nutrition are called saprophytes.

• Common examples of saprophytes include fungi and some bacteria.

• Saprophytes play a crucial role in the ecosystem by breaking down complex organic materials into simpler substances, thus recycling nutrients.

Additional Information

• Heterotrophic nutrition:

• This type of nutrition involves organisms obtaining their food from other living organisms.

• All animals, fungi, and most bacteria are heterotrophs.

• Heterotrophs depend on autotrophs directly or indirectly for their food.

• Insectivorous nutrition:

• Some plants exhibit insectivorous nutrition, where they trap and digest insects to fulfill their nutrient requirements.

• Examples include the Venus flytrap and pitcher plants.

• This adaptation is usually found in nutrient-poor environments.

• Autotrophic nutrition:

• This type of nutrition involves organisms producing their own food from inorganic substances using light (photosynthesis) or chemical energy (chemosynthesis).

• Plants, algae, and some bacteria are autotrophs.

• Autotrophs are the primary producers in the ecosystem, forming the base of the food chain.

Q86. Answer: (c) B

Given:

Marks obtained by each student in different subjects (out of 50):

Student	Physics	Chemistry	Maths	English	Sanskrit
A	48	47	49	46	44
B	29	33	22	15	30
C	35	36	42	40	29
D	46	49	48	48	40
E	32	30	25	21	22

Formula used:

Total marks = Sum of marks in Physics, Chemistry, Maths, English, and Sanskrit

Percentage = (Total marks / Maximum marks) × 100

Calculation:

Maximum marks = 50 × 5 = 250

For each student:

A: (234 / 250) × 100 = 93.6%

B: (129 / 250) × 100 = 51.6%

C: (182 / 250) × 100 = 72.8%

D: (231 / 250) × 100 = 92.4%

E: (130 / 250) × 100 = 52%

Conclusion:

Student B got the lowest overall percentage of marks: 51.6%

Q87. Answer: (a) 93.60 %

Given:

Marks obtained by each student in different subjects (out of 50):

Student	Physics	Chemistry	Maths	English	Sanskrit

A	48	47	49	46	44
B	29	33	22	15	30
C	35	36	42	40	29
D	46	49	48	48	40
E	32	30	25	21	22

Formula used:

Percentage = (Total marks obtained in all subjects / Maximum possible marks) × 100

Calculation:

Maximum possible marks = 50 × 5 = 250

For each student:

A: Total marks = 48 + 47 + 49 + 46 + 44 = 234

Percentage = (234 / 250) × 100 = 93.60%

B: Total marks = 29 + 33 + 22 + 15 + 30 = 129

Percentage = (129 / 250) × 100 = 51.6%

C: Total marks = 35 + 36 + 42 + 40 + 29 = 182

Percentage = (182 / 250) × 100 = 72.8%

D: Total marks = 46 + 49 + 48 + 48 + 40 = 231

Percentage = (231 / 250) × 100 = 92.4%

E: Total marks = 32 + 30 + 25 + 21 + 22 = 130

Percentage = (130 / 250) × 100 = 52%

Conclusion:

The maximum overall percentage of marks is 93.60% obtained by student A.

Q88. Answer: (a) B and E

Given:

The marks obtained by students in various subjects (out of 50) are presented in the following table:

Marks (out of 50)					
Name of Students	Physics	Chemistry	Maths	English	Sanskrit
A	48	47	49	46	44
B	29	33	22	15	30
C	35	36	42	40	29
D	46	49	48	48	40
E	32	30	25	21	22

Step-by-step calculation:

First, calculate the total marks for each student:

A: Total marks = 48 + 47 + 49 + 46 + 44 = 234

B: Total marks = 29 + 33 + 22 + 15 + 30 = 129

C: Total marks = 35 + 36 + 42 + 40 + 29 = 182

D: Total marks = 46 + 49 + 48 + 48 + 40 = 231

E: Total marks = 32 + 30 + 25 + 21 + 22 = 130

Now, calculate the difference between the total marks of each pair of students:

Difference between A and B: |234 - 129| = 105

Difference between A and C: |234 - 182| = 52

Difference between A and D: |234 - 231| = 3

Difference between A and E: |234 - 130| = 104

Difference between B and C: |129 - 182| = 53

Difference between B and D: |129 - 231| = 102

Difference between B and E: |129 - 130| = 1
Difference between C and D: |182 - 231| = 49
Difference between C and E: |182 - 130| = 52
Difference between D and E: |231 - 130| = 101
Conclusion:
The two students with the least difference in marks are B and E, with a difference of 1 mark.

Q89. Answer: (a) The ranks will remain the same in both cases.

Given:

Name	Physics	Chemistry	Maths	English	Sanskrit
A	48	47	49	46	44
B	29	33	22	15	30
C	35	36	42	40	29
D	46	49	48	48	40
E	32	30	25	21	22

Approach:
Step 1: Rank students based on total marks in all five subjects.
Sum of marks for each student:
• A's total = 48 + 47 + 49 + 46 + 44 = 234
• B's total = 29 + 33 + 22 + 15 + 30 = 129
• C's total = 35 + 36 + 42 + 40 + 29 = 182
• D's total = 46 + 49 + 48 + 48 + 40 = 231
• E's total = 32 + 30 + 25 + 21 + 22 = 130
Rank based on total marks in all subjects:
1. A: 234 points (Rank 1)
2. D: 231 points (Rank 2)
3. C: 182 points (Rank 3)
4. B: 129 points (Rank 4)
5. E: 130 points (Rank 5)
Step 2: Rank students based on marks in Physics, Chemistry, and Maths only.
Sum of marks for each student in Physics, Chemistry, and Maths:
• A's total = 48 + 47 + 49 = 144
• B's total = 29 + 33 + 22 = 84
• C's total = 35 + 36 + 42 = 113
• D's total = 46 + 49 + 48 = 143
• E's total = 32 + 30 + 25 = 87
Rank based on marks in Physics, Chemistry, and Maths only:
1. A: 144 points (Rank 1)
2. D: 143 points (Rank 2)
3. C: 113 points (Rank 3)
4. B: 84 points (Rank 4)
5. E: 87 points (Rank 5)
Step 3: Compare the rankings.
Ranking based on all subjects:
1. A: Rank 1
2. D: Rank 2
3. C: Rank 3
4. B: Rank 4
5. E: Rank 5

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Ranking based on Physics, Chemistry, and Maths only:

1. A: Rank 1
2. D: Rank 2
3. C: Rank 3
4. B: Rank 4
5. E: Rank 5

Conclusion:

The ranking of students based on all five subjects and the ranking based only on Physics, Chemistry, and Maths are the same.

Therefore, the arrangement of ranks remains the same in both cases.

Q90. Answer: (c) Father's Brother

Family Chart:

Given: A man said to a woman. "Your husband's daughter is the daughter of my brother".

So, the man is the "Father's Brother" of the woman's daughter.

Hence, the correct answer is "Father's Brother".

Q91. Answer: (d) TOSNVS

The logic followed here is:

CRACKS is written as DQBBLR,

Similarly, SPROUT will be written as:

Hence, the correct answer is "TOSNVS".

Q92. Answer: (d) Mile

The logic followed here is:

Centimeter	Metric system.
Kilometer	Metric system.
Meter	Metric system.
Mile	Imperial system

Centimeter, Kilometer, Meter are all units of length in the metric system.

Whereas, Mile is a unit of length in the imperial system.

Hence, the correct answer is Option 4 - Mile.

Q93. Answer: (b) 499

The logic followed here is:

Hence, the correct answer is "499".

Q94. Answer: (d) Length

The logic followed here is:

Logic: Units of Measurement

Here,

Kilogram : Mass → Kilogram is a unit of Mass.

Similarly,

Kilometre : Length → Kilometre is a unit of Length.

Hence, the correct answer is "Option 4".

Q95. Answer: (a) CDEF

The logic followed here is:

Hence, the correct answer is "CDEF".

Q96. Answer: (b) Peninsula

The logic followed here is:

Logic: Geographical feature classification.

Here,

Srilanka : Island → Srilanka is classified as an Island.
Similarly,
India : Peninsula → India is classified as a Peninsula.
Hence, the correct answer is "Option 2".

Q97. Answer: (d) Iron

The logic followed here is:

Fluorine	Non-metal
Nitrogen	Non-metal
Oxygen	Non-metal
Iron	Metal

Fluorine, Nitrogen, Oxygen all are Non-metals,
Whereas, Iron is a Metal.
Hence, the correct answer is "Iron".

Q98. Answer: (b) W1 —P

Given: No two women live in same hotel. One woman live in only one hotel.
1) W4 does not live in hotel P or R.
2) W3 and W6 live in S and W respectively.

Women	Hotel
W1	
W2	
W3	S
W4	P or R
W5	
W6	W

3) W1 does not live in T or R.

Women	Hotel
W1	T or R
W2	
W3	S
W4	P or R
W5	
W6	W

4) W5 does not live in R or P.

Women	Hotel
W1	T or R
W2	
W3	S
W4	P or R
W5	R or P
W6	W

Thus final arrangement:

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Women	Hotel
W1	P
W2	R
W3	S
W4	T/Q
W5	T/Q
W6	W

Option 1) W2 — P - Definitely False
Option 2) W1 —P - Definitely true
Option 3) W5 — T - False
Option 4) W4 — T - False
So, combination of woman and hotel "W1 —P" is definitely true.
Hence, the correct answer is "W1 —P".

Q99. Answer: (c) 4 hours, 8 minutes, 24 seconds

The logic followed here is:
For changing 4.14 hours in hours, minutes and seconds = 4 hours + .14 hours
= 4 hours + (.14 × 3600) seconds
= 4 hours + 504 seconds
= 4 hours + 8 minutes + 24 seconds.
So, 4 hours, 8 minutes, 24 seconds.
Hence, the correct answer is "4 hours, 8 minutes, 24 seconds".

Q100. Answer: (d) M6 and M4

According to the given information:
1) M3 sits to the immediate right of M5 and second to the left of M1.
2) M4 is second to the right of M2.
3) M5 is not sitting at the ends of the row.
Only M6 is remaining. Then final arrangement:
So, M6 and M4 are sitting at the ends of the row.
Hence, the correct answer is "M6 and M4".

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