RRB NTPC CBT-I Official Paper (Held On: 17 Feb 2021 Shift 1) (Previous Year Paper)

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

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Scan the QR code or click the link to open it.

Q1. If the side of an equilateral triangle is 2 cm, then find the area and the altitude of the triangle.

(a) Area = 3/2 cm² and altitude = √3 cm
(b) Area = 2/3 cm² and altitude = √3 cm
(c) Area = √3 cm² and altitude = 2/3 cm
(d) Area = √3 cm² and altitude = √3 cm

Q2. Which place in India has been chosen as a UNESCO world heritage site in 2018?

(a) Konark Sun Temple, Konark, Odisha
(b) Dachigam National park, Srinagar
(c) Lalbagh botanical Garden, Bangalore
(d) Victorian Gothic and Art Deco Ensembles of Mumbai

Q3. A dealer offers a discount of 10% on the marked price of an article and still makes a profit of 20%. If the marked price is Rs. 1,200, then the cost price is:

(a) Rs. 800
(b) Rs. 950
(c) Rs. 900
(d) Rs. 850

Q4. Which is India's longest six-laned controlled-access expressway?

(a) Western Peripheral expressway
(b) Agra-Lucknow expressway
(c) PV Narasimha Rao expressway
(d) Mumbai Pune expressway

Q5. Which is the heaviest and most powerful communication satellite of India?

(a) GSAT- 11
(b) Kalpana- 1
(c) IRNSS- 1D
(d) GSAT- 6

Q6. The value of the largest four-digit perfect square number divided by the smallest four- digit perfect square number will be:

(a) less than 10
(b) equal to 10
(c) more than 10
(d) equal to 9

Q7. If a : b = 3 : 7, then (4a + 5b) : (9a + 2b) = ?

(a) 41 : 47
(b) 37 : 31
(c) 47 : 41

(d) 31 : 37

Q8. What does Article 243C deal with?

(a) Composition of the Panchayats
(b) Provision for early childhood care and education to children below the age of 6 years
(c) Protection of life and personal liberty
(d) Name and territory of the union

Q9. The LCM of two prime numbers, a and b (a > b > 1), is 697. The value of a - 2b is:

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

Q10. The mean of three numbers is 32. The range of this data set is 28 while the difference between the two smallest numbers is 8. The greatest of the three numbers is:

(a) 48
(b) 50
(c) 52
(d) 51

Q11. Recently, which Indian institute has edited the banana genome for the first time using the CRISPR / Cas9 technique?

(a) Indian Agriculture statistics Research Institute, New Delhi
(b) National Agri-food biotechnology Institute, Mohali
(c) Indian Institute of vegetable research, Varanasi
(d) Indian Agriculture Research Institute (IARI), New Delhi

Q12. Whose famous quote is this?

"If you cry because the sun has gone out of your life, your tears will prevent you from seeing the stars."

(a) Amrita Pritam
(b) Sri Aurobindo
(c) Sumitranandan Pant
(d) Rabindranath Tagore

Q13. Read the given statement and conclusion 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.

Statement:

I. All hens are pens.

II. No pen is a ship.

Conclusion:

I. No hen is a ship.

II. All pens are hens.

(a) Neither conclusion I nor II follows.
(b) Either conclusion I or II follows.
(c) Only conclusion I follows.
(d) Only conclusion II follows.

Q14. Which of the following is a dormant volcano?

(a) Mt. Erebus in Antarctica
(b) Sakurajima in Japan
(c) Mauna Kea in Hawaii
(d) Etna in Italy

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Q15. Solve the following.

$8 \div 8 \times (8 + 8)/(8 \div 8 \times 8 + 8) = ?$

(a) 1/128
(b) 128
(c) 1
(d) 64

Q16. Who was the first Muslim lady to sing Vande Mataram at a congress session?

(a) Begum Hazrat Mahal
(b) Raihana Tyabji
(c) Razia Khatun
(d) Asghari Begum

Q17. If 9 students are standing on a circular path, then the probability that 2 of them are always standing together is:

(a) (1)/(4)
(b) (7)/(8)
(c) (2)/(7)
(d) (1)/(3)

Q18. For which disease /disorder is a tranquilizer normally administered?

(a) Anxiety
(b) Diarrhoea
(c) Diabetes
(d) Cancer

Q19. When 25^(25) is divided by 26, then the remainder is:

(a) 25
(b) 2
(c) 24
(d) 1

Q20. Which one of the following is an example of a major tectonic plate?

(a) Pacific plate
(b) Nazca plate
(c) Cocos plate
(d) Arabian plate

Q21. Which was the first Act passed by the British government to control and regulate the affairs of the East India Company in India?

(a) Charter Act of 1853
(b) India Council Act of 1909
(c) Regulating Act of 1773
(d) Government of India Act of 1858

Q22. For which purpose is India's fastest and first multi-PetaFlops (OF) supercomputer 'Pratyush' used?

(a) Seismic data analysis
(b) Scientific data processing
(c) Pharmaceutical development
(d) Weather forecasting

Q23. If the difference between the compound interest and the simple interest on a certain sum of money at 8% p.a. for 2 years is Rs. 240, then the sum of money is:

(a) Rs. 38,000
(b) Rs. 37,000
(c) Rs. 37,500

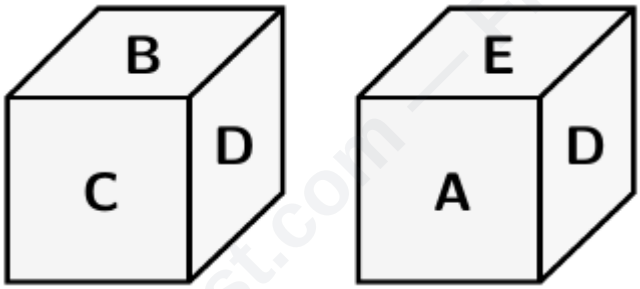
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(d) Rs. 38,500

Q24. Who built the Lingaraj Temple?

(a) Rulers of the Rajput Chandela Dynasty
(b) Mughal Emperor Shah Jahan
(c) King Anantavarman Chodaganga Deva
(d) King Yayati Keshari of Somavamshi

Q25. Two positions of a cubical block with faces A, B, C, D, E and F are shown below. When F is at the top which face will be at the bottom?



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

Q26. Which of the following sermons of Gautama Buddha known as Fire Sermon?

(a) Brahmajala Sutra
(b) Anatta-lakkhana sutta
(c) Adittapariyaya Sutta
(d) Dhammacakkappavattana Sutta

Q27. If 60% of a number is added to 36, gives the number itself then the number is:

(a) 75
(b) 90
(c) 80
(d) 100

Q28. Spicejet recently operated India's first ever biojet fuel flight. Which of the following institutes prepared the fuel?

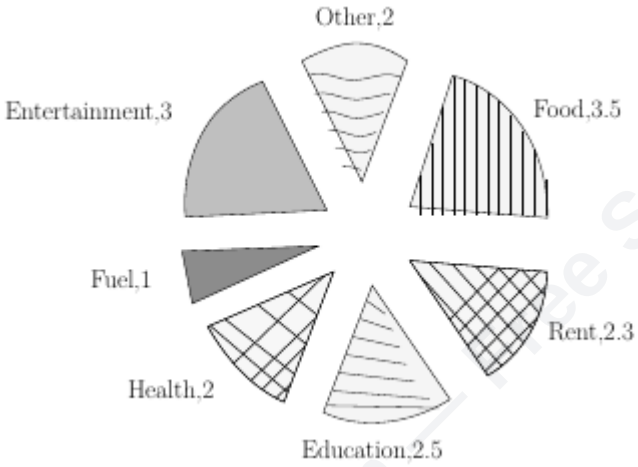
(a) Indian Space research Organization, Bengaluru
(b) Defence Research and Development Organization, New delhi
(c) CSIR-Indian Institute of Petroleum (IIP), Dehradun.
(d) Bhabha Atomic Research Center, Mumbai

Q29. Who is the world's youngest international chess grandmaster as of 31^(st) December 2020?

(a) Wesley Barbasa So
(b) Sergey Karjakin
(c) Baskaran Adhiban
(d) Humpy Koneru

Q30. The pie chart depicted below shows the monthly budget of a middle class family. Study the chart carefully and answer the question that follows.

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If the amount spent on food and education during a month was Rs. 18,000, then what was the total approximate amount spent in that month?

(a) Rs. 29500
(b) Rs. 45700
(c) Rs. 50300
(d) Rs. 48900

Q31. Study the table carefully and answer the question given below:

In the following table, the number of vacancies (in thousand numbers) for the post of clerk in three different states Delhi, Haryana and Panjab are shown over the years 2015 to 2018.

Years → States ↓	2015	2016	2017	2018
Delhi	7.2	7.8	6.2	7
Haryana	5.6	6.2	5	5.2
Panjab	6.2	6	5.8	5.6

What is the average number of vacancies for the post of clerk in the state of Delhi for all the years together?

(a) 7005
(b) 7200
(c) 7050
(d) 5000

Q32. A dealer marks his goods 20% above the cost price. He then allows a discount on it and makes a profit of 8%. Find the rate of discount offered by the dealer.

(a) 4%
(b) 10%
(c) 12%
(d) 6%

Q33. What is the electronic configuration of rhodium?

(a) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{(10)}\ 4s^2\ 4p^6\ 4d^8\ 5s^1$
(b) $1s^2\ 2s^2\ 2p^6\ 3s^1$
(c) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{(10)}\ 4p^5$
(d) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^1\ 3d^5$

Q34. Name the indigenously built patrol vessel commissioned by the Indian Coast Guard in September 2018.

(a) ICGS Samrat
(b) ICGS Samarth
(c) ICGS Vikram
(d) ICGS Vijaya

Q35. Read the given statement and conclusions carefully and decide which of the conclusions logically follow(s) from the statement.

Statement: Of all mobile phones manufactured in Korea, the 'Maxto' brand has the highest sale.

Conclusions: I. The quality of no other mobile phones in Korea is as high as that of 'Maxto'.

II. The number of sales of all the brands of mobile phones manufactured in Korea is known.

(a) Only conclusion I follows.
(b) Either Conclusion I or II follows.
(c) Only Conclusion II follows.
(d) Neither Conclusion I nor II follows.

Q36. If the product of two co-primes is 104, then their LCM:

(a) is 104
(b) is 1
(c) can't be determined
(d) is equal to their HCF

Q37. Three positive numbers are in the ratio of 1 : 2 : 5 and their LCM is 120. The HCF of the same numbers is:

(a) 12
(b) 16
(c) 10
(d) 14

Q38. In a triangle ABC, points D and E are on the sides AB and AC such that DE is parallel to BC and AD/BD=3/5. If AC = 4 cm, then AE = ?

(a) 2 cm
(b) 2.4 cm
(c) 1.8 cm
(d) 1.5 cm

Q39. Who was the president of the first meeting of the constituent assembly which was held on December 9, 1946?

(a) Manabendra Nath Roy
(b) Jawaharlal Nehru
(c) Dr. Sachchidananda Sinha
(d) Dr. Rajendra Prasad

Q40. AICC (All India Congress Committee) passed the Quit India Resolution on:

(a) 8^(th) January, 1942
(b) 18^(th)July, 1942
(c) 8^(th) August,1942
(d) 15^(th) August, 1942

Q41. Since 2011 the supreme court banned the manufacture, sale and use of which pesticide that cause hazardous effects to human life as well as the environment?

(a) Malathion
(b) Endosulfan
(c) Clothianidin
(d) Chlorpyrifos

Q42. What is the official name of JavaScript?

(a) JavaScript
(b) ECMAScript
(c) WireScript
(d) LiveScript

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Q43. 'waiting for a visa' is whose autobiography?

(a) Jawaharlal Nehru
(b) BR Ambedkar
(c) Indira Gandhi
(d) Satyajit Ray

Q44. In a certain code language, 'she is fine' is written as 'li qi si' is 'is Sam healthy' is written as 'oi ti li'. Find the code for 'is'.

(a) li
(b) si
(c) qi
(d) oi

Q45. When was the National Food for Work Programme launched?

(a) 14^(th)October 2004
(b) 14^(th) November 2004
(c) 14^(th)December 2004
(d) 14^(th) November 2005

Q46. The 'Borlaug Award' is given for outstanding work in the field of:

(a) sports
(b) films
(c) medicine
(d) agriculture and environment

Q47. According to the United Nations which year is considered as the International Year of Indigenous Languages?

(a) 2009
(b) 2007
(c) 2018
(d) 2019

Q48. Name the Indian scientist who shared the Nobel Prize for Medicine and Physiology in 1968 for cracking the genetic code.

(a) Visvesvaraya
(b) Meghnad Saha
(c) Har Gobind Khorana
(d) Venkatraman Radhakrishna

Q49. Two sides of a triangles are of lengths 4 cm and 10 cm. If the length of the third side is a cm, then:

(a) $6 < a < 14$
(b) $a < 6$
(c) $a > 5$
(d) $6 < a < 12$

Q50. Steel Authority of Indian Limited is an example of:

(a) Public sector industry
(b) Joint sector industry
(c) co-operative sector industry
(d) Private sector industry

Q51. Which pathogen cause 'bakane' (foolish seeding) disease in rice seedings?

(a) Rhizoctonia oryzae
(b) Curvularia lunata
(c) Drechslera gigante
(d) Gibberella fujikuroi

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Q52. Who has been selected as the 193^(rd) member of the UN?

(a) France
(b) South Sudan
(c) Colombia
(d) Brazil

Q53. For treatment of which of the following is the bark of the Arjuna tree primarily used?

(a) Skin disease
(b) Heart Disease
(c) Inflammation
(d) Tuberculosis

Q54. The product of the LMS and the HCF of two positive numbers is 32 and the difference of the numbers is 4. The sum of the same numbers is:

(a) 16
(b) 10
(c) 12
(d) 14

Q55. Arrange the following words in the order in which they appear in an English dictionary?

1. Prophet
2. Prong
3. Propensity
4. Propose

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

Q56. If SHAME is coded as 20-9-2-14-6, then what is the code for FORT?

(a) 8-17-20-22
(b) 6-15-18-20
(c) 7-15-19-20
(d) 7-16-19-21

Q57. How many heritage cities have been selected for rejuvenation and development under National Heritage City Development and Augmentation Yojana (HRIDAY)?

(a) 25
(b) 12
(c) 20
(d) 10

Q58. If $3a + 4b = 2$ and $ab = 1/36$, then $27a^3 + 64b^3$ is:

(a) 2
(b) 8
(c) 4
(d) 6

Q59. Sundari, Kasu and Jyothi took two tests each. The ratio of marks obtained to total marks for each of their two tests is given below Sundari - 24/60 and 32/40, Kasu - 35/70 and 54/60, Jyothi 27/90 and 45/50 Who among them registered the maximum progress?

(a) Only Kasu
(b) Both Sundari and Kasu
(c) Only Jyothi
(d) Only Sundari

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Q60. If a/b = 0.25, then the value of ((2a - b)/(2a + b)) + 2/9 is:

(a) • 1/9
(b) 5/9
(c) 4/9
(d) • 2/9

Q61. A large cube is formed by melting of three smaller cubes of sides 3 cm, 4 cm and 5 cm each. The ratio of the surface areas of the three smaller cubes together to the larger cube is:

(a) 27 : 64
(b) 25 : 18
(c) 9 : 4
(d) 18 : 25

Q62. 8 men working 9 hours a day can complete a task in 20 days. How long will 7 men working 10 hours a day take to complete the same task?

(a) (21)/(2) days
(b) 21 days
(c) (103)/(5) days
(d) (144)/(7) days

Q63. The compound interest on a sum of Rs. 7,500 for 2 years at 4% p.a. is

(a) Rs. 515
(b) Rs. 612
(c) Rs. 750
(d) Rs. 850

Q64. What is the feature of ISRO Propulsion Complex (IPRC) organisation?

(a) It deals with the practical use of space technology such as geodesy, satellite based telecommunications, etc.
(b) It handles testing, assembly and integration of liquid propulsion control packages.
(c) It applies remote sensing technology to manage natural resources.
(d) It is used to launch sounding rockets.

Q65. In a triangles ABC, tanA + tanB + tanC = ?

(a) -tanA.tanB.tanC
(b) tanA.tanB + tanB.tanC + tanC.tanA
(c) 1
(d) tanA.tanB.tanC

Q66. A, B, and C completed a job for 1,800 rupees. A worked for 6 days, B worked for 4 days, and C worked for 9 days. Their daily wages were in the ratio of 5:6:4. How much money will A receive?

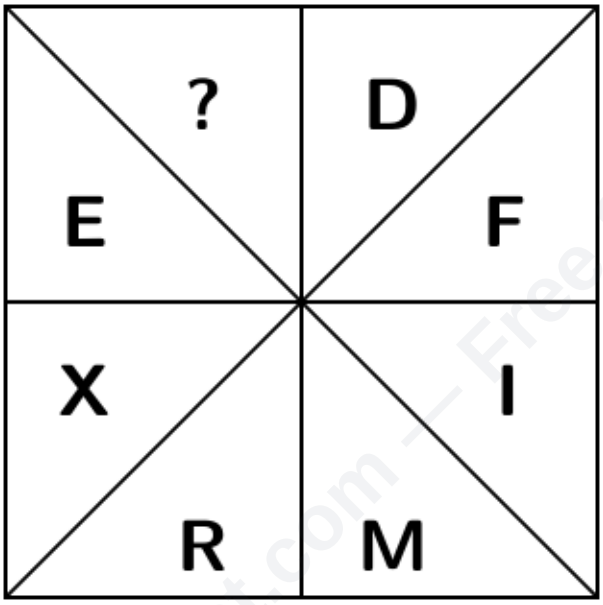
(a) Rs. 600
(b) Rs. 1,000
(c) Rs. 400
(d) Rs. 800

Q67. If $a^2 + b^2 + c^2 + 3 = 2(a + b + c)$, then the value of (a + b + c) is:

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

Q68. Select the letter that can replace the question mark (?) in the figure below.

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(a) W
(b) P
(c) M
(d) X

Q69. From a group of five boys, P, Q, R, S, T and three girls X, Y, Z, a team five have to be selected on the basis of the following criteria.

S and T cannot be together.

R and S have to be together.

S and Z cannot be together.

Q cannot be put with P.

If S is one of the members, which one of the following teams will be formed?

(a) PSXQY
(b) SRYZQ
(c) TXRYS
(d) RQSYX

Q70. What is the theme of the World Economic Forum Annual Meeting, 2019?

(a) Globalization 4.0: Shaping a Global Architecture in the Age of the Fourth Industrial Revolution
(b) New Global context
(c) New beginnings: making a difference
(d) Creating a shared future in a fractured world

Q71. Which freedom fighter is remembered for his efforts in achieving the official language of India as Hindi?

(a) Munishwar Dutt Upadhyay
(b) Mahavir Tyagi
(c) Purushottam Das Tandon
(d) Ram Manohar Lohia

Q72. Which era is called golden age of ancient India?

(a) The Chola Empire, 3^(rd) century
(b) The Mauryan Empire, 3^(rd)century
(c) The Gupta Empire, 4^(th) century
(d) The Kushan Empire, 1^(st) century

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Q73. An express train travelled at an average speed of 100 km/h, stopping for 3 min after every 75 km. How much time it took the express train to travel 600 km?

(a) 308 min
(b) 384 min
(c) 381 min
(d) 370 min

Q74. What does FQDN stand for?

(a) Frequency Query Domain Name
(b) Fully Qualified Disk Name
(c) File Qualified Division Name
(d) Fully Qualified Domain Name

Q75. If the sum of two numbers is r and their quotient is s/t, what are the two numbers?

(a) sr/(s+t) and tr/(s+t)
(b) (r-s)/t and (r-t)/s
(c) r/s and r/t
(d) rs/t and ts/r

Q76. Which of the following is used as a fissionable fuel in a nuclear reactor?

(a) Pu^(229)
(b) U^(235)
(c) U^(208)
(d) Pu^(115)

Q77. Read the given statement and assumptions and decide which of the assumptions is/are logically implicit from the statement.

Statement: Romila got elected as the president of the student's committee of her school, so she must be senior.

Assumptions:

I. Only members of the student's committee can be seniors.

II. Only seniors can be the president of the student's committee.

III. Only girls can be the members of the student's committee.

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

Q78. If L + M means 'L is the son of M', L - M means 'L is the husband of M', L × M means 'L is the brother of M' and L ÷ M means 'L is the mother of M', what does A × B ÷ C mean?

(a) A is the maternal uncle of C.
(b) A is the father of C.
(c) A is the mother of C.
(d) A is the nephew of C.

Q79. Select the set that can replace the question marks (?) in the following series.

D/23 20/G J/17 14/M P/11 (?)/(?)

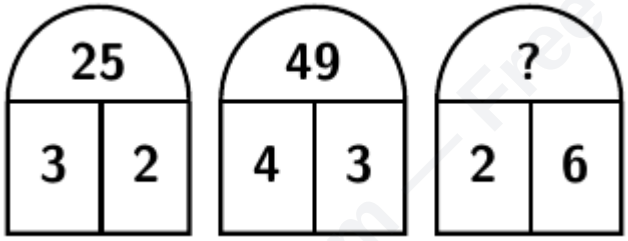
(a) 8/T
(b) R/8
(c) 9/S
(d) 8/S

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Q80. 40% of a number is 46 less than (4)/(5) of that number. Find the number.

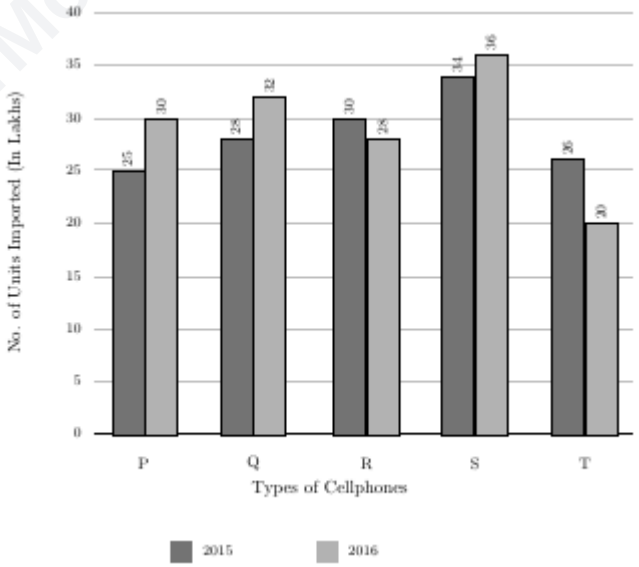
(a) 105
(b) 85
(c) 110
(d) 115

Q81. Select the number that can replace the question mark (?) in the third figure.



(a) 64
(b) 81
(c) 16
(d) 36

Q82. The bar graph provided below shows the revenue earned by a company in 2015 and 2016 from different types, such as P, Q, R, S, and T, represented by the number of cell phones (in lakhs). Please read the graph carefully and then answer the questions given



Note: Types of cellphones - Types of cell phones; Number of units imported (in lakhs) - Number of units imported (in lakhs). Which type of cellphone has experienced the lowest percentage change (increase or decrease) in the number of units imported from 2015 to 2016?

(a) Q
(b) P
(c) S
(d) R

Q83. A tank, 4 m long, 2 m wide and 1.5 m deep, is dug in field 22 m long and 14 m wide. If the earth dug out is evenly spread out over the remaining field, then the level of the field will rise by:

(a) 5 cm
(b) 4 cm
(c) 4.75 cm
(d) 3.5 cm

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Q84. According to the Department of Industrial Policy and Promotion (DIPP) which state ranked as the best performer in start-up ranking 2019?

(a) Chhattisgarh
(b) Panjab
(c) Delhi
(d) Gujarat

Q85. Which among the following is the process of covering the soil/ground to create more favourable conditions for plant growth, development and efficient crop production?

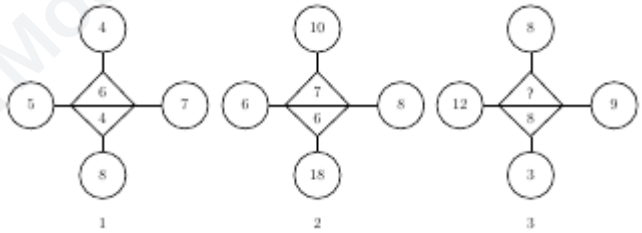
(a) Shelter belts
(b) Contour farming
(c) Mulching
(d) Terrace farming

Q86. Select the number that can replace the question mark (?) in the following series.

2, 5, 11, 20, 32, 47, ?

(a) 52
(b) 54
(c) 64
(d) 65

Q87. Understand the pattern and select the number that can replace the question mark (?) in the third figure.



(a) 4
(b) 10
(c) 12
(d) 6

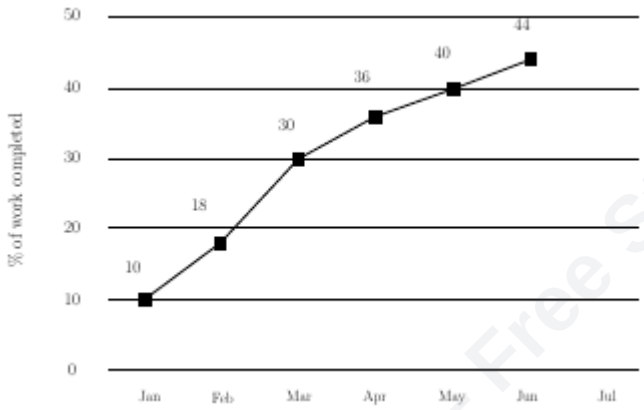
Q88. Select the number that can replace the question mark (?) in the following series.

2, 7, 23, 72, 220, ?

(a) 500
(b) 600
(c) 472
(d) 665

Q89. The following graph shows the month-wise cumulative progress in the construction of a dam. If the progress in July is equal to that of the highest progress recorded in any month in the given period, how much work will be completed by the end of July?

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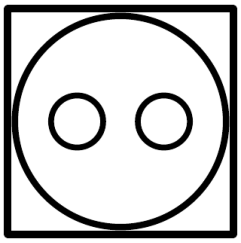
(a) 50%
(b) 54%
(c) 56%
(d) 52%

Q90. Three of the following four number pair are alike in a certain way and one is different. Pick the odd one out.

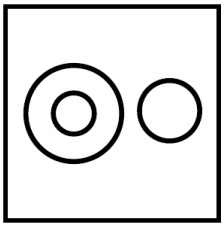
(a) 3 - 10
(b) 10 - 101
(c) 5 - 31
(d) 7 - 50

Q91. Choose the Venn diagram that best represents the relationship among the given categories:
summer, season, cloudy.

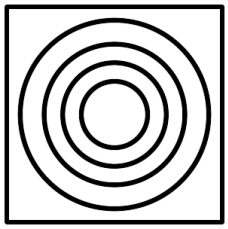
(a)



(b)

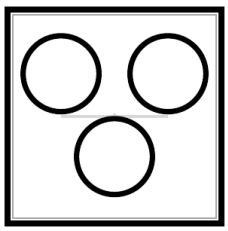


(c)



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(d)



Q92. Identify the number that DOES NOT belong to the following series.

3, 5, 9, 15, 26, 33, 45, 59

(a) 26
(b) 59
(c) 15
(d) 45

Q93. If 'Urdu', 'Sanskrit', 'History', 'Physics' and 'Economics' are known as 'Physics', 'History', 'Urdu', 'Economics' and 'Sanskrit', respectively, then in which subject did we study about Newton?

(a) Physics
(b) Economics
(c) Urdu
(d) History

Q94. 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 sisters are brothers.

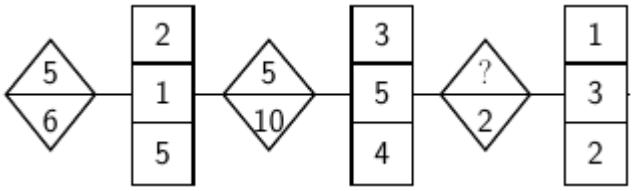
Very few balloons are sisters.

Conclusions: I. Some brothers are balloons.

II. Some brothers are not balloons.

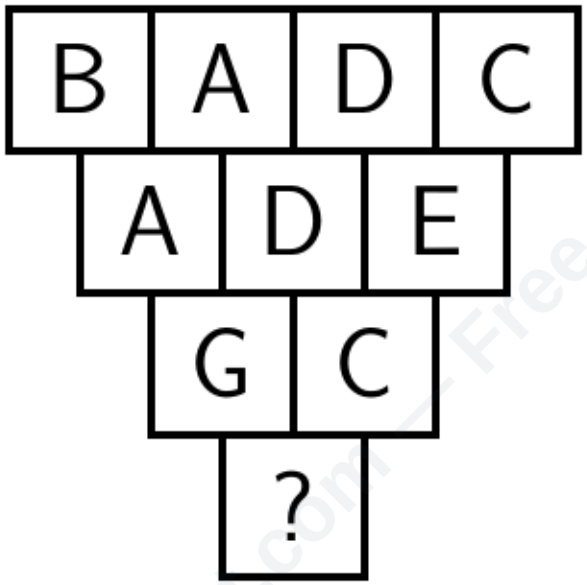
(a) Only conclusion II follows.
(b) Either conclusion I or II follows.
(c) Both the conclusions I and II follows.
(d) Only conclusion I follows.

Q95. understand the pattern and select the number that can replace the question mark (?) in the third figure.



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

Q96. Select the letter that can replace the question mark (?) in the figure below.



(a) H
(b) F
(c) I
(d) J

Q97. Study the following information and answer the question given below it.

Lee, Bruce and Chan are caring.
Min, Chan and Ho are sensitive.
Bruce, Ho and Min are honest.
Lee, Min and Ho are creative.
Which one of the following persons is neither honest nor creative?

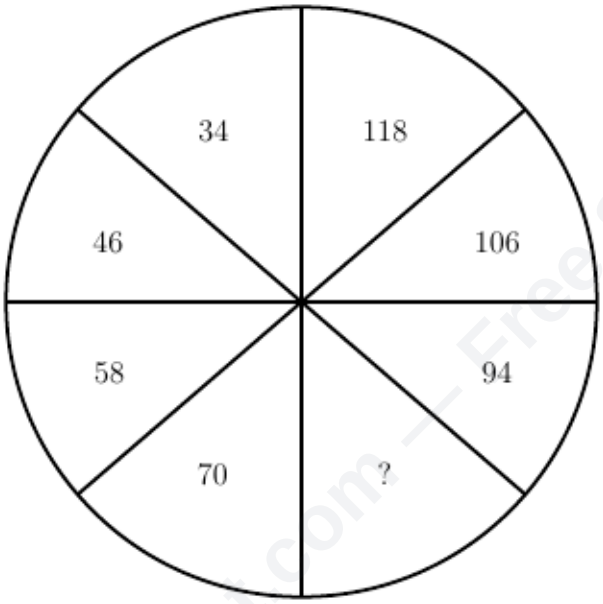
(a) Bruce
(b) Chan
(c) Lee
(d) Min

Q98. A and B are brothers. P and Q are a married couple. Q is the sister of A. How is B related to P?

(a) Father
(b) Wife's brother
(c) maternal uncle
(d) Wife's father

Q99. Understand the pattern and select the number that can replace the question mark (?) in the following figure.

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(a) 78
(b) 80
(c) 86
(d) 82

Q100. Three of the following four letter-clusters are alike in a certain way and one is different. Pick the odd one out.
(a) GQU
(b) REI
(c) SLO
(d) DOS

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) Area = √3 cm² and altitude = √3 cm

Shortcut Trick

For an equilateral triangle with side a = 2 cm:

Area = (√3 ÷ 4) × a² = (√3 ÷ 4) × 2² = √3 cm²

Altitude = (√3 ÷ 2) × a = (√3 ÷ 2) × 2 = √3 cm

Therefore The correct answer is Area = √3 cm² and altitude = √3 cm.

Alternate Method

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Given: Side (a) of the equilateral triangle = 2 cm.

Formula Used:

1. Area of equilateral triangle = (√3 ÷ 4) × a²

2. Altitude (h) of equilateral triangle = (√3 ÷ 2) × a

Calculations:

=> Area = (√3 ÷ 4) × (2)²

=> Area = (√3 ÷ 4) × 4

=> Area = √3 cm²

=> Altitude (h) = (√3 ÷ 2) × 2

=> Altitude (h) = √3 cm

Therefore The correct answer is Area = √3 cm² and altitude = √3 cm.

Additional Information

Perimeter of Equilateral Triangle

The total boundary length is given by P = 3 × a, where a is the side length.

Inradius and Circumradius

For an equilateral triangle, Inradius (r) = a ÷ (2√3) and Circumradius (R) = a ÷ √3. Note that R = 2r.

Area in terms of Altitude

The Area can also be calculated if altitude h is known using the formula: Area = h² ÷ √3.

Q2. Answer: (d) Victorian Gothic and Art Deco Ensembles of Mumbai

The correct answer is Victorian Gothic and Art Deco Ensembles of Mumbai

Key Points

• The Victorian Gothic and Art Deco Ensembles of Mumbai were inscribed as a UNESCO World Heritage Site in 2018.

• This site includes a collection of 19th-century Victorian Neo-Gothic public buildings and 20th-century Art Deco buildings in the Fort area of Mumbai.

• The Victorian Gothic buildings include the Chhatrapati Shivaji Maharaj Terminus (formerly Victoria Terminus) and the University of Mumbai.

• The Art Deco buildings include the Eros Cinema and the Marine Drive area.

• This ensemble represents the transformation of Mumbai from a fortified city of the 19th century to a modern commercial city.

Additional Information

• The UNESCO World Heritage Sites are landmarks or areas with legal protection by an international convention administered by the United Nations Educational, Scientific and Cultural Organization (UNESCO).

• The aim is to preserve these sites for their cultural, historical, scientific, or other forms of significance.

• India has a rich cultural heritage with 40 UNESCO World Heritage Sites as of 2023, including the Taj Mahal, Qutub Minar, and the Red Fort Complex.

• The inclusion of sites in the UNESCO list helps in their preservation and also boosts tourism and international recognition.

Q3. Answer: (c) Rs. 900

Given:

Marked Price (MP) = Rs. 1,200

Discount = 10%

Profit = 20%

Formula Used:

Selling Price (SP) = Marked Price × (1 - Discount %)

Cost Price (CP) = Selling Price / (1 + Profit %)

Calculation:

Discounted Price = Rs. 1,200 × (1 - 0.10)

=> Discounted Price = Rs. 1,200 × 0.90

=> Discounted Price = Rs. 1,080

Selling Price (SP) = Rs. 1,080

Cost Price (CP) = Rs. 1,080 / (1 + 0.20)

=> Cost Price (CP) = Rs. 1,080 / 1.20

=> Cost Price (CP) = Rs. 900

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The cost price is Rs. 900.

Q4. Answer: (b) Agra-Lucknow expressway

The correct answer is Agra-Lucknow expressway

Key Points

• The Agra-Lucknow expressway is India's longest six-laned controlled-access expressway.

• This expressway spans approximately 302 kilometers, connecting the cities of Agra and Lucknow in the state of Uttar Pradesh.

• It significantly reduces travel time between these two cities, boosting economic activities and connectivity in the region.

• The expressway is equipped with modern amenities and safety features, making it one of the most advanced highways in the country.

Additional Information

• The Agra-Lucknow expressway was inaugurated in November 2016 and is an important infrastructure project in Uttar Pradesh.

• It is part of the state's efforts to enhance road connectivity and support regional development.

• The expressway also serves as a crucial link to the Yamuna Expressway, further connecting it to the national capital, New Delhi.

• It features advanced traffic management systems, rest areas, and service lanes to ensure a smooth and safe journey for commuters.

Q5. Answer: (a) GSAT- 11

The correct answer is GSAT-11

Key Points

• GSAT-11 is the heaviest and most powerful communication satellite of India.

• It was launched by the Indian Space Research Organisation (ISRO) on December 5, 2018.

• GSAT-11 is part of the GSAT series of geostationary satellites and is designed to provide high data rate connectivity.

• The satellite weighs about 5,854 kg and is equipped with 40 transponders in the Ku-band and Ka-band frequencies.

• GSAT-11 aims to provide high-speed internet connectivity in remote areas and support the Digital India initiative.

Additional Information

• ISRO is the space agency of the Government of India, headquartered in Bengaluru.

• ISRO's vision is to "harness space technology for national development while pursuing space science research & planetary exploration."

• ISRO has successfully launched a variety of satellites for different applications, including communication, earth observation, navigation, and scientific exploration.

• GSAT-11 is a significant milestone in ISRO's efforts to enhance India's satellite communication capabilities.

• Other notable satellites in the GSAT series include GSAT-19 and GSAT-29, which also aim to improve communication infrastructure in the country.

Q6. Answer: (a) less than 10

Given:

Largest four-digit perfect square number = 9801

Smallest four-digit perfect square number = 1024

Formula Used:

Value = Largest four-digit perfect square number / Smallest four-digit perfect square number

Calculation:

Largest four-digit perfect square number = 99^2 = 9801

Smallest four-digit perfect square number = 32^2 = 1024

Value = 9801 / 1024

=> Value = 9.57

The value of the largest four-digit perfect square number divided by the smallest four-digit perfect square number is less than 10.

Q7. Answer: (c) 47 : 41

Given:

If a : b = 3 : 7

Formula Used:

(4a + 5b) : (9a + 2b)

Calculation:

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Let a = 3k and b = 7k for some constant k.

4a + 5b = 4 × 3k + 5 × 7k

=> 4a + 5b = 12k + 35k

=> 4a + 5b = 47k

9a + 2b = 9 × 3k + 2 × 7k

=> 9a + 2b = 27k + 14k

=> 9a + 2b = 41k

(4a + 5b) : (9a + 2b) = 47k : 41k

=> (4a + 5b) : (9a + 2b) = 47 : 41

The correct answer is option 3.

Q8. Answer: (a) Composition of the Panchayats

The correct answer is Composition of the panchayats

Key Points

• Article 243C of the Indian Constitution deals with the composition of Panchayats.

• It provides the framework for the structure and composition of Panchayats at different levels, including the number of members and their qualifications.

• The article also outlines the manner of election of the members and the chairpersons of Panchayats.

• This article is a part of the 73rd Amendment Act which was enacted to strengthen the Panchayati Raj system in India.

• The objective of this provision is to ensure democratic decentralization and local self-governance.

Additional Information

• The 73rd Amendment Act of 1992 added Part IX to the Constitution, which is titled "The Panchayats".

• This part contains Articles 243 to 243O, covering various provisions related to Panchayats.

• The amendment also introduced the Eleventh Schedule to the Constitution, which lists 29 subjects over which Panchayats have administrative control.

• The aim of these provisions is to empower rural local governments and ensure greater participation of the people in the decision-making process at the grassroots level.

• The Panchayati Raj system is a three-tier system consisting of the Gram Panchayat at the village level, the Panchayat Samiti at the block level, and the Zila Parishad at the district level.

• The system is intended to promote self-governance and bring about social and economic development in rural areas.

Q9. Answer: (d) 7

Given:

The LCM of two prime numbers, a and b (a > b > 1), is 697.

Formula Used:

LCM of two prime numbers a and b = a × b

Calculation:

Since a and b are prime numbers:

LCM (a, b) = a × b

Given LCM (a, b) = 697

=> a × b = 697

Since 697 is a product of two primes, we need to find those primes:

Prime factorization of 697:

697 = 17 × 41

Therefore, a = 41 and b = 17 (since a > b)

Now, we need to find the value of a - 2b:

=> a - 2b = 41 - 2 × 17

=> a - 2b = 41 - 34

=> a - 2b = 7

The value of a - 2b is 7.

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Q10. Answer: (a) 48

Given:

The mean of three numbers = 32

The range of this data set = 28

The difference between the two smallest numbers = 8

Formula Used:

Mean = (Sum of numbers) / (Number of items)

Range = Maximum number - Minimum number

Calculation:

Let the three numbers be a, b, and c where $a \leq b \leq c$.

Mean = (a + b + c) / 3 = 32

=> a + b + c = 32 × 3

=> a + b + c = 96

Range = c - a = 28

=> c = a + 28

The difference between the two smallest numbers = 8

=> b - a = 8

We have three equations:

1) a + b + c = 96

2) c = a + 28

3) b = a + 8

Substitute equation (2) and (3) into equation (1):

=> a + (a + 8) + (a + 28) = 96

=> 3a + 36 = 96

=> 3a = 96 - 36

=> 3a = 60

=> a = 20

Now, substitute a = 20 into equation (3):

=> b = 20 + 8 = 28

Substitute a = 20 into equation (2):

=> c = 20 + 28 = 48

The greatest of the three numbers is 48.

Q11. Answer: (b) National Agri-food biotechnology Institute, Mohali

The correct answer is National Agri-food biotechnology Institute, Mohali

Key Points

• The National Agri-food biotechnology Institute, Mohali has successfully edited the banana genome for the first time using the CRISPR / Cas9 technique.

• This is a significant breakthrough in agricultural biotechnology in India.

• The use of CRISPR / Cas9 technique allows for precise modifications in the genome, which can lead to the development of improved banana varieties.

• This achievement can contribute to better crop yields, disease resistance, and overall agricultural productivity.

Additional Information

• CRISPR / Cas9 is a revolutionary gene-editing technology that allows scientists to make precise changes to the DNA of plants, animals, and microorganisms.

• It has a wide range of applications in medicine, agriculture, and biological research.

• The technology works by using a protein called Cas9 to cut DNA at a specific location, allowing for the addition, removal, or alteration of genetic material.

• This advancement can lead to the development of crops with enhanced traits such as increased yield, improved nutritional value, and resistance to pests and diseases.

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Q12. Answer: (d) Rabindranath Tagore

The correct answer is Rabindranath Tagore

Key Points

• Rabindranath Tagore is the author of the famous quote: "If you cry because the sun has gone out of your life, your tears will prevent you from seeing the stars."

• Rabindranath Tagore was a renowned Indian poet, writer, composer, and painter.

• He became the first non-European to win the Nobel Prize in Literature in 1913.

• Tagore's works reshaped Bengali literature and music, as well as Indian art with Contextual Modernism in the late 19th and early 20th centuries.

• He is also the author of the Indian national anthem, "Jana Gana Mana."

Additional Information

• Rabindranath Tagore was born on 7th May 1861 in Calcutta, India.

• He was a key figure in the Bengali Renaissance and made significant contributions to the cultural and intellectual life of India.

• Tagore founded the Visva-Bharati University in Santiniketan, West Bengal, which aimed to bridge the gap between the East and the West through education and culture.

• He is also known for his profound influence on the Indian independence movement and his close association with Mahatma Gandhi.

• Tagore's literary works include novels, short stories, songs, dance-dramas, and essays covering topics ranging from political issues to personal reflection.

Q13. Answer: (c) Only conclusion I follows.

The least possible venn diagram is shown below,

Conclusion:

I. No hen is a ship → True (All hens are pens and no pen is a ship implies that no hen is a ship)

II. All pens are hens → False (All hens are pens implies that it is possible that all pens are hens but not definite).

Hence, the correct answer is "Option 3".

Q14. Answer: (c) Mauna Kea in Hawaii

The correct answer is Mauna Kea in Hawaii

Key Points

• Mauna Kea in Hawaii is classified as a dormant volcano.

• Dormant volcanoes are those that have not erupted in a long time but have the potential to erupt in the future.

• Mauna Kea last erupted around 4,500 years ago.

• It is the highest point in Hawaii and is considered sacred by native Hawaiians.

• Unlike active volcanoes, dormant volcanoes do not show signs of imminent eruption.

Additional Information

• Mt. Erebus in Antarctica is an active volcano and is known for its persistent lava lake.

• Sakurajima in Japan is one of the most active volcanoes in the world.

• Etna in Italy is also an active volcano and is one of the most active in Europe.

• Understanding the status of volcanoes is important for disaster preparedness and risk mitigation.

Q15. Answer: (c) 1

Given:

$8 \div 8 \times (8 + 8)/(8 \div 8 \times 8 + 8)$

Concept used:

BODMAS rule, follow the order Bracket off, Division, Multiplication, Addition and Subtraction.

Calculations:

$8 \div 8 \times (8 + 8)/(8 \div 8 \times 8 + 8)$

$\Rightarrow 1 \times 16/(1 \times 8 + 8)$

$\Rightarrow 1 \times 16/16$

$\Rightarrow 1$

Therefore The correct answer is 1.

Q16. Answer: (b) Raihana Tyabji

The correct answer is Raihana Tyabji

Key Points

• Raihana Tyabji was the first Muslim lady to sing Vande Mataram at a Congress session.

• She was a prominent figure in the Indian National Congress and was known for her contributions to the freedom struggle.

• Her rendition of Vande Mataram was a significant moment in the history of the Indian independence movement, symbolizing unity and patriotism across religious lines.

• Raihana Tyabji's participation highlighted the inclusive nature of the freedom movement, bringing together people from diverse backgrounds.

Additional Information

• Vande Mataram is a poem written by Bankim Chandra Chattopadhyay in the 1870s, which later became a source of inspiration for the Indian independence movement.

• The song was first sung in a political context by Rabindranath Tagore at the 1896 session of the Indian National Congress.

• The song's message of patriotism and national unity resonated deeply with the Indian populace, making it a rallying cry for freedom fighters.

• While "Vande Mataram" is not the national anthem of India (which is "Jana Gana Mana"), it holds an esteemed place in the country's cultural and historical heritage.

Q17. Answer: (a) (1)/(4)

Given:

Number of students = 9

Formula Used:

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

Calculation:

Total number of ways to arrange 9 students in a circle = (9 - 1)! = 8!

Number of favorable outcomes:

Consider the 2 students who need to stand together as 1 unit. Therefore, we now have 8 units to arrange in a circle.

Total number of ways to arrange 8 units in a circle = (8 - 1)! = 7!

Within this 1 unit, the 2 students can be arranged in 2! ways.

So, number of favorable outcomes = 7! × 2!

Probability that 2 students are always standing together:

=> Probability = (7! × 2!) / 8!

=> Probability = (7! × 2!) / (8 × 7!)

=> Probability = 2 / 8

=> Probability = 1 / 4

The correct answer is option 1.

Q18. Answer: (a) Anxiety

The correct answer is Anxiety

Key Points

• Tranquilizers are typically prescribed to manage conditions such as anxiety and related disorders.

• They work by calming the central nervous system, helping to reduce tension and anxiety.

• Tranquilizers are not used to treat diarrhoea, diabetes, or cancer.

• There are two main types of tranquilizers: major tranquilizers (antipsychotics) and minor tranquilizers (anxiolytics).

• Common examples of minor tranquilizers include benzodiazepines like diazepam and alprazolam.

Additional Information

• Tranquilizers should be used under strict medical supervision due to the risk of dependence and side effects.

• They are generally prescribed for short-term relief and not intended for long-term use.

• Patients should follow their healthcare provider's instructions carefully to avoid potential complications.

• Non-pharmacological therapies such as cognitive-behavioral therapy (CBT) are also effective in managing anxiety and are often recommended in conjunction with medication.

Q19. Answer: (a) 25

Given:

Number to be divided = 25^(25)

Divisor = 26

Formula Used:

Remainder = Dividend - (Divisor × Quotient)

Calculation:

Calculation:

=> Remainder = (2525)/26 = (2520 × 255)/26

=> Remainder = ((254)5 × 255)/26

=> Remainder = 25

Therefore The remainder when (25)25 is divided by 26 is 25.

Q20. Answer: (a) Pacific plate

The correct answer is Pacific plate

Key Points

• The Pacific plate is one of the largest tectonic plates on Earth.

• Tectonic plates are massive slabs of solid rock, composed of both continental and oceanic lithosphere, which move and interact at their boundaries.

• The movement of these plates is responsible for many geological events such as earthquakes, volcanic activity, and the creation of mountain ranges.

• The Pacific plate covers more than 103 million square kilometers and is primarily an oceanic plate.

Additional Information

• The Earth's lithosphere is divided into several major and minor tectonic plates.

• Other major tectonic plates include the North American plate, Eurasian plate, African plate, Antarctic plate, Indo-Australian plate, and South American plate.

• Tectonic plate theory is a fundamental principle in geology, explaining the dynamics of Earth's surface.

• The interactions at the plate boundaries can be divergent (moving apart), convergent (coming together), or transform (sliding past each other).

Q21. Answer: (c) Regulating Act of 1773

The correct answer is Regulating Act of 1773

Key Points

• The Regulating Act of 1773 was the first Act passed by the British government to control and regulate the affairs of the East India Company in India.

• The Act aimed to address the administrative and financial disorders of the Company in India and marked the beginning of British parliamentary control over the Company.

• It established the position of Governor-General of Bengal and created an executive council of four members to assist him.

• The Act also laid the foundation for a centralized administration in India.

• It mandated the Supreme Court of Judicature at Fort William in Calcutta to administer justice.

Additional Information

• The Regulating Act was a significant step towards the establishment of British rule in India, leading to subsequent reforms and control measures by the British Parliament.

• Other notable Acts that followed include the Pitt's India Act of 1784, which further increased the British government's control over the East India Company.

• The Act of 1858 marked the end of Company rule and the beginning of direct control of India by the British Crown, following the Indian Rebellion of 1857.

• The Charter Acts and Government of India Acts were subsequent legislative measures that shaped the administrative structure of British India.

Q22. Answer: (d) Weather forecasting

The correct answer is Weather forecasting

Key Points

• Pratyush is India's fastest and first multi-PetaFlops (PF) supercomputer.

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• It is primarily used for weather forecasting.

• The supercomputer helps in improving the accuracy of weather predictions, which is crucial for agriculture, disaster management, and other sectors.

• Pratyush enhances the capabilities of the Indian Meteorological Department (IMD) in forecasting monsoons, cyclones, and other weather phenomena.

Additional Information

• The name Pratyush means 'sun' in Sanskrit, symbolizing the supercomputer's role in illuminating weather patterns.

• India's investment in supercomputing aims to place the country among the top nations in weather and climate modeling.

• Pratyush's computational power supports various research and operational activities in atmospheric and oceanic sciences.

• Such advancements contribute to better preparedness and mitigation strategies for natural disasters.

Q23. Answer: (c) Rs. 37,500

Given:

Compound Interest (CI) - Simple Interest (SI) = Rs. 240

Rate (R) = 8% p.a.

Time (T) = 2 years

Formula Used:

CI = P (1 + R/100)^T - P

SI = P × R × T / 100

CI - SI = P [(1 + R/100)^T - 1] - P × R × T / 100

Calculation:

Given CI - SI = Rs. 240

Let the principal amount be P.

CI = P (1 + 0.08)² - P

CI = P (1.08)² - P

CI = P (1.1664) - P

CI = 1.1664P - P

CI = 0.1664P

SI = P × 0.08 × 2

SI = 0.16P

Difference (CI - SI) = 0.1664P - 0.16P

0.0064P = Rs. 240

=> P = Rs. 240 / 0.0064

=> P = Rs. 37,500

The sum of money is Rs. 37,500.

Q24. Answer: (d) King Yayati Keshari of Somavamshi

The correct answer is King Yayati Keshari of Somavamshi

Key Points

• The Lingaraj Temple was built by King Yayati Keshari of the Somavamshi dynasty.

• It is one of the oldest temples in Bhubaneswar, Odisha, and is dedicated to Lord Shiva.

• The temple represents the quintessence of the Kalinga style of architecture and is a significant landmark in the history of Indian temple architecture.

• Construction of the temple is believed to have begun in the 7th century and was completed in the 11th century.

Additional Information

• The Lingaraj Temple is a major tourist attraction and a pilgrimage site for Hindus.

• The temple complex covers an area of over 250,000 square feet and includes a large number of smaller shrines and deities.

• It is renowned for its majestic spire, which rises to a height of about 180 feet.

• During the festival of Shivaratri, the temple attracts thousands of devotees from all over India.

Q25. Answer: (d) D

In first and second dice,

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

opposite numbers in dice.

In the first dice and second dice. The letter 'D' is common.

The left letters will be opposite each other writing them clockwise starting from D.

Letter	Opposite
C	A
B	E

Here, we can see that the letter opposite to F is D.

Hence, the correct answer is "Option 4".

Q26. Answer: (c) Adittapariyaya Sutta

The correct answer is Adittapariyaya Sutta

Key Points

• Adittapariyaya Sutta is known as the Fire Sermon given by Gautama Buddha.

• The Fire Sermon is one of the most famous discourses of Buddha, delivered to a group of thousand bhikkhus.

• In this sermon, Buddha uses the metaphor of fire to explain the nature of human suffering and the path to liberation.

• The sermon emphasizes detachment from the senses and the impermanent nature of all things.

Additional Information

• The Brahmajala Sutra is a discourse on ethical precepts and moral conduct.

• The Anatta-lakkhana Sutta is the discourse on the characteristic of non-self.

• The Dhammacakkappavattana Sutta is the first sermon of the Buddha, setting in motion the Wheel of Dharma.

• Gautama Buddha's teachings revolve around the Four Noble Truths and the Eightfold Path as a means to attain Nirvana.

• Buddha's discourses are compiled in the Sutta Pitaka, one of the three main divisions of the Pali Canon.

Q27. Answer: (b) 90

Given:

Let the number be x.

60% of the number = 0.60x

Formula Used:

0.60x + 36 = x

Calculation:

=> 0.60x + 36 = x

=> x - 0.60x = 36

=> 0.40x = 36

=> x = (36) / (0.40)

=> x = 90

The number is 90.

Q28. Answer: (c) CSIR-Indian Institute of Petroleum (IIP), Dehradun.

The correct answer is CSIR-Indian Institute of Petroleum (IIP), Dehradun

Key Points

• Spicejet recently operated India's first ever biojet fuel flight.

• The fuel for this flight was prepared by CSIR-Indian Institute of Petroleum (IIP), Dehradun.

• This initiative marks a significant step forward in the use of sustainable aviation fuel in India.

• Biojet fuel can help reduce the carbon footprint of aviation and contribute to environmental sustainability.

Additional Information

• CSIR-Indian Institute of Petroleum (IIP), Dehradun is a premier research institute in India focusing on energy and hydrocarbon research.

• The development of biojet fuel is part of the institute's efforts to promote sustainable and cleaner energy sources.

• Biojet fuel is derived from renewable biomass and can significantly reduce greenhouse gas emissions compared to conventional jet fuel.

• Successful implementation of biojet fuel in aviation can set a precedent for other industries to adopt cleaner fuel alternatives.

• India aims to increase the use of biofuels in various sectors to achieve its environmental and energy goals.

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Q29. Answer: (b) Sergey Karjakin

The correct answer is Sergey Karjakin

Key Points

• Sergey Karjakin is recognized as the world's youngest international chess grandmaster as of 31st December 2020.

• He achieved the grandmaster title at the age of 12 years and 7 months, a record that still stands.

• Sergey Karjakin was born in Ukraine but later became a Russian citizen.

• He has competed in numerous international chess tournaments and has been a prominent figure in the world of chess.

Additional Information

• Sergey Karjakin was born on January 12, 1990.

• He became a grandmaster in 2002, breaking the previous record for the youngest grandmaster.

• Karjakin has been a contender in several World Chess Championships and has won numerous titles throughout his career.

• He is known for his strong defensive playing style and has earned the nickname "Minister of Defense" in the chess community.

Q30. Answer: (d) Rs. 48900

Given:

The pie chart depicting the monthly budget of a middle-class family.

The amount spent on food and education during a month was Rs. 18,000

Concept used:

Find equivalent to 1 unit, then multiple that equivalent by total amount.

Calculation:

Food + Education = 18000

3.5 + 2.5 units = 18000

6 units = 18000

1 unit = 3000

Total amount spent = 2.5 + 2 + 1+ 3 + 2 +3.5 + 2.3 units

=> 16.3 units

=> 16.3 × 3000

=> 48900

Therefore The correct option is Rs. 48900

Q31. Answer: (c) 7050

Given:

The number of vacancies (in thousand numbers) for the post of clerk in three different states Delhi, Haryana and Panjab are shown over the years 2015 to 2018.

Formula used:

Average = Total/number of entries

Calculation:

The average number of vacancies for the post of clerk in the state of Delhi for all the years together is,

=> (7.2 + 7.8 + 6.2 + 7) × 1000 / 4

=> 28.2 × 1000 / 4

=> 7050

Therefore The correct answer is 7050.

Q32. Answer: (b) 10%

Given:

A dealer marks his goods 20% above the cost price.

The dealer then allows a discount on it and makes a profit of 8%.

Formula Used:

Marked Price (MP) = Cost Price (CP) × (1 + Mark-up Percentage)

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

Discount = Marked Price (MP) - Selling Price (SP)

Discount Percentage = (Discount / Marked Price (MP)) × 100

Calculation:

Let the Cost Price (CP) be 100 units.

Marked Price (MP) = 100 × (1 + 0.20)

=> Marked Price (MP) = 100 × 1.20

=> Marked Price (MP) = 120 units

Selling Price (SP) = 100 × (1 + 0.08)

=> Selling Price (SP) = 100 × 1.08

=> Selling Price (SP) = 108 units

Discount = Marked Price (MP) - Selling Price (SP)

=> Discount = 120 - 108

=> Discount = 12 units

Discount Percentage = (12 / 120) × 100

=> Discount Percentage = 0.10 × 100

=> Discount Percentage = 10%

The rate of discount offered by the dealer is 10%.

Q33. Answer: (a) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}\ 4s^2\ 4p^6\ 4d^8\ 5s^1$

The correct answer is $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}\ 4s^2\ 4p^6\ 4d^8\ 5s^1$

Key Points

• Option 1 correctly represents the electronic configuration of rhodium.

• Rhodium (Rh) has an atomic number of 45, meaning it has 45 electrons.

• The correct electronic configuration is $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}\ 4s^2\ 4p^6\ 4d^8\ 5s^1$.

• This configuration reflects the distribution of electrons across various energy levels and sublevels in a rhodium atom.

Additional Information

• Rhodium is a transition metal and is part of the d-block elements in the periodic table.

• It is commonly used in catalytic converters, jewelry, and electrical contacts due to its reflective properties and resistance to corrosion.

• Rhodium has a high melting point and is chemically inert, making it valuable in various industrial applications.

Q34. Answer: (d) ICGS Vijaya

The correct answer is ICGS Vijaya

Key Points

• ICGS Vijaya is the indigenously built patrol vessel commissioned by the Indian Coast Guard in September 2018.

• It is designed and constructed by Garden Reach Shipbuilders and Engineers (GRSE), Kolkata.

• The vessel is equipped with advanced navigation and communication equipment, sensors, and machinery.

• ICGS Vijaya enhances the operational capabilities of the Indian Coast Guard in terms of surveillance, interdiction, search and rescue, and medical evacuation.

Additional Information

• The Indian Coast Guard is the maritime law enforcement and search and rescue agency of India, established on 18th August 1978.

• The organization operates under the Ministry of Defence and has a wide array of vessels, aircraft, and coastal stations to ensure maritime safety and security.

• ICGS Vijaya is part of the expansion and modernization plan of the Indian Coast Guard to strengthen maritime security.

• The vessel is named 'Vijaya' which means 'Victory' in Sanskrit, symbolizing the strength and commitment of the Indian Coast Guard.

• ICGS Vijaya is the second in the series of 98-meter offshore patrol vessels (OPVs) built by GRSE.

Q35. Answer: (c) Only Conclusion II follows.

Given:

Statement - "Of all mobile phones manufactured in Korea, the 'Maxto' brand has the highest sale."

Conclusions:

I: The quality of no other mobile phones in Korea is as high as that of 'Maxto' - Does not follows (Because, the statement mentions only sales numbers, not the quality of the mobile phones. High sales could be due to various factors (e.g., pricing, marketing, etc.) unrelated to quality.

II: The number of sales of all the brands of mobile phones manufactured in Korea is known - Follows (Because, knowing that

"Maxto" has the highest sale implies that the sales data of other brands were considered to make this comparison.s of all other brands are known.)

So, Only Conclusion II follows.

Hence, the correct answer is "Option 3".

Q36. Answer: (a) is 104

Shortcut Trick

For any set of co-prime numbers, the Highest Common Factor (HCF) is always 1.

The relationship between the product, HCF, and LCM is: Product = HCF × LCM.

Since the numbers are co-prime, Product = 1 × LCM, which means LCM = Product.

Given the product is 104, the LCM must be 104.

Therefore The correct answer is 104.

Alternate Method

Given:

Product of two co-prime numbers = 104

Formula Used:

Product of two numbers = HCF × LCM

Calculations:

=> By definition, the HCF of co-prime numbers is 1.

=> 104 = 1 × LCM

=> LCM = 104 ÷ 1

=> LCM = 104

Therefore The correct answer is 104.

Additional Information

Co-prime Numbers

Two numbers are said to be co-prime if their only common divisor is 1. Example: (8, 13), (15, 16).

Fundamental HCF-LCM Relation

For any two numbers 'a' and 'b', the formula is: a × b = HCF(a, b) × LCM(a, b).

Consecutive Integers

Any two consecutive integers are always co-prime, meaning their HCF is always 1.

LCM of Prime Numbers

The LCM of any set of prime numbers is simply the product of those numbers since they have no common factors.

Q37. Answer: (a) 12

Given:

Three positive numbers are in the ratio of 1:2:5.

Their LCM is 120.

Formula Used:

LCM × HCF = Product of the numbers

Calculation:

Let the three numbers be x, 2x, and 5x.

LCM of x, 2x, and 5x = 10x

Given LCM = 120

=> 10x = 120

=> x = 12

The numbers are 12, 24, and 60.

HCF of 12, 24, and 60 = 12

The HCF of the numbers is 12.

Q38. Answer: (d) 1.5 cm

Given:

In triangle ABC, points D and E are on sides AB and AC, and DE is parallel to BC. It is given that:

AD/BD = 3/5

AC = 4 cm

Formula used:

Since DE is parallel to BC, by the basic proportionality theorem (Thales theorem), we know:

AD/BD = AE/EC

Calculations:

AD/BD = 3/5, so AE/EC = 3/5

Let AE = 3x and EC = 5x, since AE/EC = 3/5.

Now, AC = AE + EC, so:

4 = 3x + 5x

4 = 8x

x = 4/8 = 0.5

AE = 3x = 3 × 0.5 = 1.5 cm

Therefore AE = 1.5 cm.

Q39. Answer: (c) Dr. Sachchidananda Sinha

The correct answer is Dr. Sachchidananda Sinha

Key Points

• Dr. Sachchidananda Sinha was the president of the first meeting of the Constituent Assembly held on December 9, 1946.

• He was appointed as the temporary president of the assembly, a role that was later taken over by Dr. Rajendra Prasad.

• The Constituent Assembly was formed to draft the Constitution of India and included members from different regions and communities.

• The assembly had its first meeting in the Central Hall of Parliament House, New Delhi.

• The formation of the Constituent Assembly was a significant step towards India's independence and democratic governance.

Additional Information

• The Constituent Assembly was composed of members who were elected by the provincial assemblies by a single, transferable-vote system of proportional representation.

• The assembly held its sessions over a period of nearly three years, with the final session ending on January 24, 1950.

• Dr. Rajendra Prasad was elected as the permanent chairman of the Constituent Assembly on December 11, 1946.

• The Constitution of India was adopted on November 26, 1949, and came into effect on January 26, 1950, a date now celebrated as Republic Day in India.

• The assembly included prominent leaders such as Jawaharlal Nehru, Sardar Patel, Dr. B.R. Ambedkar, and others who played crucial roles in framing the Constitution.

• The drafting committee, chaired by Dr. B.R. Ambedkar, was responsible for drafting the text of the Constitution.

Q40. Answer: (c) 8^(th) August,1942

The correct answer is 8th August, 1942

Key Points

• The Quit India Resolution was passed by the All India Congress Committee (AICC) on 8th August, 1942.

• This movement was a significant part of the Indian independence struggle, calling for an end to British rule in India.

• The Quit India Movement was launched under the leadership of Mahatma Gandhi, who gave the famous call to "Do or Die" in his speech delivered at the Gowalia Tank Maidan in Mumbai.

• The British government responded with mass arrests and severe repression, but the movement continued to gain momentum and widespread support across the country.

• The Quit India Movement marked a crucial turning point in India's fight for independence, eventually leading to the country's freedom in 1947.

Additional Information

• The Quit India Movement is also known as the August Kranti Movement.

• It was one of the largest and most widespread movements against British rule in India.

• The movement saw participation from people across different sections of society, including students, workers, and peasants.

• Despite the harsh measures taken by the British to suppress the movement, it played a significant role in uniting Indians in their struggle for freedom.

• The movement also highlighted the leadership of Mahatma Gandhi and his philosophy of non-violent resistance.

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Q41. Answer: (b) Endosulfan

The correct answer is Endosulfan

Key Points

• The Supreme Court of India banned the manufacture, sale, and use of Endosulfan in 2011.

• Endosulfan is a pesticide that has been found to have hazardous effects on human health and the environment.

• The ban was implemented due to concerns over its toxicity and the long-term health impacts observed in communities exposed to the chemical.

• Endosulfan exposure has been linked to various health issues such as neurotoxicity, endocrine disruption, and developmental abnormalities.

• The decision to ban Endosulfan was part of India's commitment to protecting public health and the environment from harmful substances.

Additional Information

• Endosulfan is an organochlorine insecticide and acaricide that has been used worldwide but has been banned or restricted in many countries due to its adverse effects.

• The Stockholm Convention on Persistent Organic Pollutants, to which India is a signatory, also lists Endosulfan for elimination.

• The ban on Endosulfan in India was a significant step towards aligning with global standards for pesticide use and environmental protection.

• Alternatives to Endosulfan have been promoted to ensure that agricultural productivity is not adversely affected while safeguarding health and environmental standards.

Q42. Answer: (b) ECMAScript

The correct answer is ECMAScript

Key Points

• The official name of JavaScript is ECMAScript.

• ECMAScript is a standardized scripting language specification, created to ensure the interoperability of web pages across different web browsers.

• JavaScript was originally developed by Netscape as Mocha, later renamed to LiveScript, and then to JavaScript. However, due to trademark issues, the standardized version was named ECMAScript.

• ECMAScript is maintained by the ECMA International standards organization in the ECMA-262 and ISO/IEC 16262 specifications.

• There are several editions of ECMAScript, with ECMAScript 6 (ES6) being one of the most significant updates, introducing many new features and improvements to the language.

Additional Information

• ECMA International is an industry association founded in 1961 dedicated to the standardization of information and communication systems.

• The first edition of ECMAScript was released in June 1997.

• Subsequent versions of ECMAScript have introduced significant features such as classes, modules, and async programming capabilities.

• JavaScript engines in web browsers, such as V8 in Google Chrome and SpiderMonkey in Mozilla Firefox, are implementations of the ECMAScript standard.

• ES6, also known as ECMAScript 2015, was a major update that included features like arrow functions, template literals, and destructuring assignments.

Q43. Answer: (b) BR Ambedkar

The correct answer is BR Ambedkar

Key Points

• Waiting for a Visa is an autobiography written by BR Ambedkar.

• BR Ambedkar was an Indian jurist, economist, politician, and social reformer who inspired the Dalit Buddhist movement and campaigned against social discrimination towards the untouchables (Dalits).

• He was the principal architect of the Constitution of India.

• The autobiography "Waiting for a Visa" recounts his experiences with untouchability and caste discrimination in India.

• Ambedkar's life and work have been a source of inspiration for many social movements and reforms in India.

Additional Information

• BR Ambedkar was born on 14 April 1891 and died on 6 December 1956.

• He was posthumously awarded the Bharat Ratna, India's highest civilian honor, in 1990.

• Ambedkar's efforts to eradicate social evils like untouchability and his contributions to the Indian Constitution are widely recognized and celebrated.

• He also played a key role in the establishment of the Reserve Bank of India in 1935.

• Ambedkar's work and legacy continue to influence social justice movements in India and around the world.

Q44. Answer: (a) li

According to the given information,

Here, we can see that the code for 'is' is 'li'.

Hence, the correct answer is "Option 1".

Q45. Answer: (b) 14^(th) November 2004

The correct answer is 14th November 2004

Key Points

• The National Food for Work Programme was launched on 14th November 2004.

• The program was aimed at ensuring food security through employment generation for the rural poor.

• It was implemented in 150 of the most backward districts of India.

• Under this program, laborers were provided with food grains as part of their wages.

• The scheme was subsumed under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in 2006.

Additional Information

• The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) was enacted on 7th September 2005 and came into effect on 2nd February 2006.

• MGNREGA aims to enhance the livelihood security of people in rural areas by guaranteeing 100 days of wage employment in a financial year to a rural household whose adult members volunteer to do unskilled manual work.

• The Act provides a legal guarantee for wage employment and also focuses on the sustainability of natural resources.

Q46. Answer: (d) agriculture and environment

The correct answer is agriculture and environment

Key Points

• The 'Borlaug Award' is given for outstanding work in the field of agriculture and environment.

• This award recognizes contributions to increasing food production and ensuring food security, which are crucial for sustainable development.

• The award is named after Dr. Norman E. Borlaug, who is known as the father of the Green Revolution and made significant advances in agricultural science.

• Recipients of this award are often individuals or organizations that have made significant contributions to agricultural research, development, and policy implementation.

Additional Information

• The Green Revolution, led by Dr. Borlaug, introduced high-yielding varieties of crops and modern agricultural techniques, which significantly increased food production in developing countries.

• The Borlaug Award aims to inspire others to continue the legacy of improving agricultural practices and ensuring food security for future generations.

• Dr. Borlaug's work has had a lasting impact on global agriculture, contributing to the alleviation of hunger and poverty.

• Recipients of the Borlaug Award often work on innovative solutions to challenges such as climate change, resource management, and sustainable farming practices.

Q47. Answer: (d) 2019

The correct answer is 2019

Key Points

• The United Nations declared 2019 as the International Year of Indigenous Languages.

• The aim was to raise awareness of the consequences of the endangerment of indigenous languages across the world.

• It sought to establish a link between language, development, peace, and reconciliation.

• Indigenous languages are essential to the identity of indigenous peoples, their cultural heritage, and the transfer of traditional knowledge.

• The year-long observance emphasized the need for preservation, revitalization, and promotion of indigenous languages.

Additional Information

• According to UNESCO, at least 40% of the 6,700 languages spoken around the world are in danger of disappearing.

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• The loss of indigenous languages means the loss of valuable cultural heritage and traditional knowledge systems.

• Efforts to preserve and promote these languages involve documentation, community education programs, and policy support at national and international levels.

• The United Nations General Assembly adopted a resolution on 19 December 2016 to proclaim 2019 as the International Year of Indigenous Languages.

Q48. Answer: (c) Har Gobind Khorana

The correct answer is Har Gobind Khorana

Key Points

• Har Gobind Khorana was awarded the Nobel Prize for Medicine and Physiology in 1968, not 1986, along with Robert W. Holley and Marshall W. Nirenberg for their research on the interpretation of the genetic code and its function in protein synthesis.

• Har Gobind Khorana was an Indian-American biochemist renowned for his work in the field of genetics.

• He was born on January 9, 1922, in Raipur, Punjab, India (now in Pakistan).

• Khorana's work laid the foundation for much of modern genetic research and biotechnology.

• His achievements have had a lasting impact on the scientific community and have paved the way for advancements in genetic engineering and biotechnology.

Additional Information

• The Nobel Prize in Physiology or Medicine is awarded annually by the Nobel Assembly at the Karolinska Institute to scientists and physicians in various fields of medicine.

• The Nobel Prizes were established by the will of Alfred Nobel, the inventor of dynamite, who left his fortune to fund annual prizes in the fields of Physics, Chemistry, Medicine, Literature, and Peace.

• Har Gobind Khorana's contributions to science are celebrated worldwide, and he has received numerous awards and honors in recognition of his groundbreaking research.

• In addition to the Nobel Prize, Khorana was also awarded the Louisa Gross Horwitz Prize from Columbia University and the Lasker Award for Basic Medical Research.

Q49. Answer: (a) 6 < a < 14

Shortcut Trick

The third side a of a triangle with sides x and y must satisfy: $|x - y| < a < x + y$.

Given sides: 4 cm and 10 cm.

Range: $|10 - 4| < a < 10 + 4$

=> $6 < a < 14$

Therefore The correct answer is $6 < a < 14$.

Alternate Method

Given: Side 1 = 4 cm, Side 2 = 10 cm, Side 3 = a cm.

Formula Used: Triangle Inequality Theorem states that the sum of any two sides of a triangle must be greater than the third side.

=> 4 + 10 > a => 14 > a

=> 4 + a > 10 => a > 6

=> 10 + a > 4 => a > −6 (Length must be positive)

=> Combining the valid conditions: $6 < a < 14$

Therefore The correct answer is $6 < a < 14$.

Additional Information

Triangle Inequality Theorem

The sum of any two sides of a triangle is strictly greater than the third side: x + y > z.

Q50. Answer: (a) Public sector industry

The correct answer is Public sector industry

Key Points

• Steel Authority of India Limited (SAIL) is an example of a public sector industry.

• SAIL is one of the largest steel-making companies in India and one of the Maharatnas of the country's Central Public Sector Enterprises.

• It operates and owns five integrated steel plants, three special steel plants, and one subsidiary in different parts of India.

• The Government of India owns about 75% of SAIL's equity, making it a public sector undertaking.

• Public sector industries are those that are owned, managed, and controlled by the government.

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Additional Information

• Public sector enterprises play a crucial role in the economic development of a country.

• They are established to achieve various socio-economic objectives like providing employment, reducing income inequalities, and ensuring balanced regional development.

• Some other examples of public sector industries in India include Bharat Heavy Electricals Limited (BHEL), Oil and Natural Gas Corporation (ONGC), and Indian Oil Corporation Limited (IOCL).

Q51. Answer: (d) Gibberella fujikuroi

The correct answer is Gibberella fujikuroi

Key Points

• Gibberella fujikuroi is the pathogen responsible for causing 'bakane' or 'foolish seeding' disease in rice seedlings.

• This disease is characterized by the abnormal elongation of rice seedlings, making them appear taller and thinner than healthy plants.

• Gibberella fujikuroi produces gibberellins, which are plant hormones that stimulate excessive growth, leading to the 'foolish seeding' effect.

• The affected seedlings often become weak and may eventually die, leading to significant yield losses in rice cultivation.

• Effective management of this disease includes the use of resistant varieties, seed treatment with fungicides, and proper field sanitation practices.

Additional Information

• Gibberella fujikuroi is a fungal pathogen that can survive in soil and plant debris, making crop rotation and field hygiene crucial for its control.

• Bakane disease was first reported in Japan in the early 19th century and has since spread to other rice-growing regions worldwide.

• Research is ongoing to develop more effective control measures and resistant rice varieties to combat this disease.

• Farmers are advised to monitor their fields regularly for early detection and management of bakane disease to minimize crop losses.

• Integrated disease management approaches, combining cultural, chemical, and biological control methods, are recommended for sustainable rice production.

Q52. Answer: (b) South Sudan

The correct answer is South Sudan

Key Points

• South Sudan became the 193rd member of the United Nations.

• South Sudan gained independence from Sudan on 9th July 2011 after a referendum.

• The country was admitted to the United Nations on 14th July 2011.

• South Sudan's admission marked the first addition to the UN membership since Montenegro in 2006.

• The admission of South Sudan was approved by the UN General Assembly through a resolution.

Additional Information

• The United Nations was established on 24th October 1945, after World War II, to promote peace and cooperation among countries.

• The UN initially had 51 member states and has grown to include almost all sovereign states in the world.

• The UN works on a wide range of global issues, including peace and security, climate change, sustainable development, human rights, disarmament, terrorism, humanitarian and health emergencies, gender equality, governance, and food production.

• The General Assembly is one of the six main organs of the UN, where all member states have equal representation.

• Membership in the UN is open to all peace-loving states that accept the obligations contained in the UN Charter and, in the judgment of the Organization, are able and willing to carry out these obligations.

Q53. Answer: (b) Heart Disease

The correct answer is Heart Disease

Key Points

• The bark of the Arjuna tree is primarily used for the treatment of heart disease.

• It has been used in Ayurvedic medicine for centuries to support cardiovascular health.

• The bark contains compounds that help in strengthening the heart muscles, improving blood circulation, and reducing blood pressure.

• Arjuna bark is often used in the form of powder, capsules, or decoction for its heart-protective benefits.

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Additional Information

• The Arjuna tree (Terminalia arjuna) is native to India and grows along riverbanks and in the Himalayas.

• Besides heart disease, Arjuna bark is also used for treating high cholesterol, high blood pressure, and chest pain (angina).

• The tree is named after the legendary hero Arjuna from the Indian epic Mahabharata, symbolizing its strength and resilience.

• Modern research supports many of the traditional uses of Arjuna bark, validating its role in cardiovascular health.

Q54. Answer: (c) 12

Given:

The product of the LCM and the HCF of two positive numbers is 32.

The difference of the numbers is 4.

Formula Used:

LCM × HCF = Product of the numbers

Calculation:

Let the numbers be a and b.

We are given that:

LCM (a, b) × HCF (a, b) = a × b

Also, a - b = 4

Let a = x + 2 and b = x - 2.

Then:

LCM (a, b) × HCF (a, b) = (x + 2) × (x - 2) = 32

=> (x + 2) (x - 2) = 32

=> x^2 - 4 = 32

=> x^2 = 36

=> x = 6

Then,

a = x + 2 = 6 + 2 = 8

b = x - 2 = 6 - 2 = 4

Sum of the numbers a and b is:

a + b = 8 + 4 = 12

The sum of the numbers is 12.

Q55. Answer: (b) 2, 3, 1, 4

The correct Dictionary order is:

2. Prong

3. Propensity

1. Prophet

4. Propose

So, the correct order are: '2, 3, 1, 4'.

Hence, the correct answer is "Option 2".

Q56. Answer: (d) 7-16-19-21

The logic followed here is,

SHAME is coded as 20-9-2-14-6

Similarly,

FORT can be coded as,

Hence, the correct answer is "Option 4".

Q57. Answer: (b) 12

The correct answer is 12 heritage cities

Key Points

• 12 heritage cities have been selected for rejuvenation and development under the National Heritage City Development and Augmentation Yojana (HRIDAY).

• The HRIDAY scheme aims to preserve and revitalize the unique character of each heritage city.

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• The selected cities under HRIDAY include Ajmer, Amaravati, Amritsar, Badami, Dwarka, Gaya, Kanchipuram, Mathura, Puri, Varanasi, Velankanni, and Warangal.

• The scheme focuses on holistic development, with an emphasis on accessibility, security, and infrastructure improvement in these heritage cities.

Additional Information

• The HRIDAY scheme was launched by the Ministry of Housing and Urban Affairs on 21st January 2015.

• The scheme's objective is to bring together urban planning, economic growth, and heritage conservation in an inclusive manner.

• It also seeks to enhance the quality of life of the residents in the heritage cities.

• HRIDAY is a central sector scheme with 100% funding coming from the Government of India.

• The scheme aims to promote an integrated, inclusive, and sustainable development of heritage cities.

Q58. Answer: (d) 6

Given:

3a + 4b = 2

ab = 1/36

Formula Used:

Identity: $a^3 + b^3 = (a+b)(a^2 - ab + b^2)$

Calculation:

3a + 4b = 2

Take cube on both sides,

$(3a + 4b)^3 = 2^3$

27a3 + 64b3 + 3 ×3a × 4b × (3a + 4b) = 8

27a3 + 64b3 + 36ab × 2 = 8

27a3 + 64b3 + 36 × 1/36 × 2 = 8

27a3 + 64b3 = 8 -2

27a3 + 64b3 = 6.

Therefore The correct answer is option 4.

Q59. Answer: (c) Only Jyothi

Given:

Sundari's marks ratios: 24/60 and 32/40

Kasu's marks ratios: 35/70 and 54/60

Jyothi's marks ratios: 27/90 and 45/50

Formula Used:

Progress = (Marks in second test - Marks in first test) / Marks in first test × 100%

Calculation:

For Sundari:

First test ratio = 24/60 = 0.4

Second test ratio = 32/40 = 0.8

Progress:

=> Progress = (0.8 - 0.4) / 0.4 × 100%

=> Progress = 0.4 / 0.4 × 100% = 100%

For Kasu:

First test ratio = 35/70 = 0.5

Second test ratio = 54/60 = 0.9

Progress:

=> Progress = (0.9 - 0.5) / 0.5 × 100%

=> Progress = 0.4 / 0.5 × 100% = 80%

For Jyothi:

First test ratio = 27/90 = 0.3

Second test ratio = 45/50 = 0.9

Progress:

=> Progress = (0.9 - 0.3) / 0.3 × 100%

=> Progress = 0.6 / 0.3 × 100% = 200%

Solution Statement:

Jyothi registered the maximum progress with 200%.

Q60. Answer: (a) • 1/9

Given:

a/b = 0.25, then the value of ((2a - b)/(2a + b)) + 2/9.

Concept used:

Divide by b bot numerator and denominator.

Calculation:

((2a - b)/(2a + b)) + 2/9

=> ((2a/b - 1)/(2a/b + 1)) + 2/9

=> ((2× 0.25 - 1)/(2× 0.25 + 1)) + 2/9

=> (-0.5)/1.5 + 2/9

=> (-1)/3 + 2/9

=> (-3+2)/9

=> (-1)/9

Therefore The correct answer is (-1)/9

Q61. Answer: (b) 25 : 18

Given:

Side of the first cube = 3 cm

Side of the second cube = 4 cm

Side of the third cube = 5 cm

Formula Used:

Volume of a cube = side^3

Surface area of a cube = 6 × side^2

Calculation:

Volume of the first cube = 3^3 = 27 cm^3

Volume of the second cube = 4^3 = 64 cm^3

Volume of the third cube = 5^3 = 125 cm^3

Total Volume of the three smaller cubes = 27 + 64 + 125 = 216 cm^3

Volume of the larger cube = 216 cm^3

Side of the larger cube = cbrt(216) = 6 cm

Surface area of the first cube = 6 × 3^2 = 54 cm^2

Surface area of the second cube = 6 × 4^2 = 96 cm^2

Surface area of the third cube = 6 × 5^2 = 150 cm^2

Total surface area of the three smaller cubes = 54 + 96 + 150 = 300 cm^2

Surface area of the larger cube = 6 × 6^2 = 216 cm^2

Ratio of the surface areas of the three smaller cubes together to the larger cube = 300 / 216

Simplifying the ratio:

300 / 216 = 25 / 18

The ratio of the surface areas of the three smaller cubes together to the larger cube is 25 : 18.

Q62. Answer: (d) (144)/(7) days

Given:

8 men working 9 hours a day can complete a task in 20 days.

7 men working 10 hours a day need to complete the same task.

Formula Used:

Total Work = Number of men × Number of hours per day × Number of days

Calculation:

Total work done by 8 men in 20 days:

Total Work = 8 × 9 × 20

Total Work = 1440 hours

Let the number of days required for 7 men working 10 hours a day be D.

Total work done by 7 men in D days:

Total Work = 7 × 10 × D

=> 1440 = 7 × 10 × D

=> 1440 = 70D

=> D = 1440 / 70

=> D = 144 / 7

=> D = (144)/(7) days

7 men working 10 hours a day will take (144)/(7) days to complete the task.

Q63. Answer: (b) Rs. 612

Given:

Principal (P) = Rs. 7,500

Rate (R) = 4% p.a.

Time (T) = 2 years

Formula Used:

Compound Interest (CI) = P × (1 + (R)/(100))^T - P

Calculation:

CI = Rs. 7,500 × (1 + (4)/(100))² - Rs. 7,500

=> CI = Rs. 7,500 × (1 + 0.04)² - Rs. 7,500

=> CI = Rs. 7,500 × (1.04)² - Rs. 7,500

=> CI = Rs. 7,500 × 1.0816 - Rs. 7,500

=> CI = Rs. 8,112 - Rs. 7,500

=> CI = Rs. 612

The compound interest on a sum of Rs. 7,500 for 2 years at 4% p.a. is Rs. 612.

Q64. Answer: (b) It handles testing, assembly and integration of liquid propulsion control packages.

The correct answer is It handles testing, assembly and integration of liquid propulsion control packages.

Key Points

• The ISRO Propulsion Complex (IPRC) is an integral part of the Indian Space Research Organisation (ISRO).

• IPRC is primarily responsible for testing, assembly, and integration of liquid propulsion control packages.

• This facility plays a crucial role in ensuring the reliability and efficiency of liquid propulsion systems used in various Indian space missions.

• IPRC is located at Mahendragiri in the state of Tamil Nadu, India.

• The complex is equipped with state-of-the-art infrastructure for testing different types of liquid engines and stages, which are vital components of ISRO's launch vehicles.

Additional Information

• ISRO, the space agency of the Government of India, is responsible for the nation's space research and exploration activities.

• Established in 1969, ISRO has made significant strides in space technology, launching numerous satellites for various applications such as communication, earth observation, and navigation.

• ISRO's achievements include the Chandrayaan and Mangalyaan missions, which explored the Moon and Mars, respectively.

• The organization is also working on future missions such as Gaganyaan, which aims to send Indian astronauts to space.

• ISRO's efforts contribute significantly to national development and technological advancement.

Q65. Answer: (d) tanA.tanB.tanC

Given:

In a triangle ABC, we need to find the value of tanA + tanB + tanC.

Formula Used:

For any triangle ABC, the sum of the tangents of the angles is given by:

tanA + tanB + tanC = tanA × tanB × tanC

Calculation:

We know that:

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tanA + tanB + tanC = tanA × tanB × tanC

In a triangle, the sum of the angles is 180°, hence:

A + B + C = 180°

We also know that the tangent of an angle is the ratio of the opposite side to the adjacent side. Using the identity for the sum of angles in a triangle:

tan(A + B + C) = tan(180°)

tan(180°) = 0

Using the identity for tangent of sum of angles:

tan(A + B + C) = (tanA + tanB + tanC - tanA × tanB × tanC)/(1 - tanA × tanB - tanB × tanC - tanC × tanA)

Since tan(180°) = 0:

=> tanA + tanB + tanC - tanA × tanB × tanC = 0

=> tanA + tanB + tanC = tanA × tanB × tanC

The correct answer is option 4.

Q66. Answer: (a) Rs. 600

Given:

A worked for 6 days, B worked for 4 days, and C worked for 9 days.

Their daily wages ratio is 5:6:4.

Total earnings = Rs. 1,800

Formula used:

Earnings = Number of days × Daily wage

Total earnings of A, B, and C = A's earnings + B's earnings + C's earnings

Calculation:

Let the daily wages of A, B, and C be 5x, 6x, and 4x respectively.

A's earnings = 6 × 5x = 30x

B's earnings = 4 × 6x = 24x

C's earnings = 9 × 4x = 36x

Total earnings => 30x + 24x + 36x = 90x

Total earnings => 90x = 1,800

=> x = 1,800 ÷ 90 = 20

A's earnings => 30x = 30 × 20 = 600

Therefore A will receive Rs. 600.

Q67. Answer: (c) 3

Given:

$a^2 + b^2 + c^2 + 3 = 2(a + b + c)$

Formula used:

Rearranging the given equation:

$a^2 + b^2 + c^2 - 2(a + b + c) + 3 = 0$

Calculations:

We can try values of a, b, and c that satisfy this equation.

Let a = 1, b = 1, and c = 1.

Substitute these values into the equation:

$(1)^2 + (1)^2 + (1)^2 + 3 = 2(1 + 1 + 1)$

1 + 1 + 1 + 3 = 2 × 3

6 = 6 (True)

So, a + b + c = 1 + 1 + 1 = 3.

Therefore The value of (a + b + c) is 3.

Q68. Answer: (c) M

The logic followed here is:

Logic: The letters form a pattern when considered in clockwise direction.

Hence, the correct answer is "Option 3".

Q69. Answer: (d) RQSYX

According to the given information,

The given conditions to form the team are →

i) S and T cannot be together.

ii) R and S have to be together.

iii) S and Z cannot be together.

iv) Q cannot be put with P.

Let's check each option on the basis of the given conditions,

1) PSXQY → Can't be formed (Because, R and S have to be together).

2) SRYZQ → Can't be formed (Because, S and Z cannot be together).

3) TXRYS → Can't be formed (Because, S and T cannot be together).

4) RQSYX → Can be formed (It fulfills all the criteria).

Hence, the correct answer is "Option 4".

Q70. Answer: (a) Globalization 4.0: Shaping a Global Architecture in the Age of the Fourth Industrial Revolution

The correct answer is Globalization 4.0: Shaping a Global Architecture in the Age of the Fourth Industrial Revolution

Key Points

• The theme of the World Economic Forum Annual Meeting, 2019, was Globalization 4.0: Shaping a Global Architecture in the Age of the Fourth Industrial Revolution.

• This theme focused on how the global architecture can be reshaped to address the challenges and opportunities presented by the Fourth Industrial Revolution.

• The Fourth Industrial Revolution is characterized by a range of new technologies that are fusing the physical, digital, and biological worlds, impacting all disciplines, economies, and industries.

• The meeting aimed to promote dialogue and collaboration among world leaders, policymakers, and business executives to harness these technological advancements for the benefit of society.

Additional Information

• The World Economic Forum (WEF) is an international organization for public-private cooperation.

• Founded in 1971 by Professor Klaus Schwab, the WEF engages political, business, cultural, and other leaders of society to shape global, regional, and industry agendas.

• The Annual Meeting is held in Davos, Switzerland, and brings together around 3,000 participants from around the world.

• The WEF's mission is to improve the state of the world by fostering cooperation between the public and private sectors.

Q71. Answer: (c) Purushottam Das Tandon

The correct answer is Purushottam Das Tandon

Key Points

• Purushottam Das Tandon is remembered for his significant efforts in advocating for Hindi as the official language of India.

• He was an Indian freedom fighter and a staunch supporter of the Hindi language.

• His efforts were instrumental in the adoption of Hindi as the official language in the Indian Constitution.

• He served as the President of the Indian National Congress and was awarded the Bharat Ratna, India's highest civilian award, in 1961.

Additional Information

• Purushottam Das Tandon was born on 1 August 1882 in Allahabad, Uttar Pradesh.

• He was actively involved in the Indian independence movement and worked closely with Mahatma Gandhi.

• Tandon played a crucial role in promoting Hindi and was a key figure in the Hindi Sahitya Sammelan, an organization dedicated to the promotion of Hindi literature.

• He was also a member of the Constituent Assembly of India, where he strongly advocated for Hindi to be the national language.

• His dedication to the cause earned him the title "Rajarshi," meaning "Royal Saint."

Q72. Answer: (c) The Gupta Empire, 4^(th) century

The correct answer is The Gupta Empire, 4th century

Key Points

• The Gupta Empire, which ruled during the 4th century, is often referred to as the Golden Age of ancient India.

• During this period, India witnessed significant achievements in various fields including science, mathematics, astronomy, religion, and philosophy.

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• Prominent scholars such as Aryabhata and Kalidasa emerged during this era, contributing immensely to their respective fields.

• The era was marked by extensive cultural development, including the creation of notable literary and artistic works.

• The Gupta period is also known for its advancements in architecture, with the construction of numerous temples and universities.

Additional Information

• The Gupta Empire was founded by Sri Gupta, but it reached its zenith under the reign of Chandragupta I, Samudragupta, and Chandragupta II.

• The period saw the codification of laws and the establishment of a centralized administrative system.

• Trade and commerce flourished during this time, with the Gupta Empire maintaining robust trade relations with regions such as the Roman Empire and Southeast Asia.

• The era also saw the revival and spread of Hinduism, alongside the continued patronage of Buddhism and Jainism.

• The Gupta period's contributions to culture, science, and politics have had a lasting impact on Indian civilization.

Q73. Answer: (c) 381 min

Shortcut Trick

Running Time = (600 ÷ 100) × 60 = 360 min.

Number of Stoppages = (600 ÷ 75) − 1 = 8 − 1 = 7 (excluding the destination).

Total Stoppage Time = 7 × 3 = 21 min.

Total Time = 360 + 21 = 381 min.

Therefore The correct answer is 381 min.

Alternate Method

Given: Average speed = 100 km/h, Distance = 600 km, Stoppage interval = 75 km, Stoppage duration = 3 min.

Formula Used: Time = Distance ÷ Speed; Total Time = Running Time + Stoppage Time.

=> Running Time = 600 ÷ 100 = 6 hours

=> Running Time in minutes = 6 × 60 = 360 min

=> Number of intervals = 600 ÷ 75 = 8

=> Since the last stop is the destination, we subtract 1: 8 − 1 = 7 stoppages

=> Total Stoppage Time = 7 × 3 = 21 min

=> Total Time = 360 + 21 = 381 min

Therefore The correct answer is 381 min.

Additional Information

Effective Speed with Stoppages

When a vehicle stops, its effective speed decreases. Effective speed = Total Distance ÷ (Running time + Stoppage time).

Stoppage Logic

In problems where a journey ends exactly at a multiple of the stoppage interval, the last stop is ignored because it is the destination. Use (Total Distance ÷ Interval) − 1.

Average Speed Formula

Average Speed = Total Distance ÷ Total Time. In this case, 600 km ÷ (381/60) h ≈ 94.48 km/h.

Q74. Answer: (d) Fully Qualified Domain Name

The correct answer is Fully Qualified Domain Name

Key Points

• Fully Qualified Domain Name (FQDN) is the complete domain name for a specific computer, or host, on the internet.

• It consists of the host name and the domain name, including the top-level domain (TLD), and can be used to uniquely identify a device on the internet.

• An example of an FQDN is www.example.com, where "www" is the host name, "example" is the second-level domain, and "com" is the top-level domain.

• FQDNs are important for DNS (Domain Name System) resolutions, allowing users to access websites and services using human-readable addresses instead of IP addresses.

Additional Information

• The Domain Name System (DNS) is a hierarchical and decentralized naming system for computers, services, or other resources connected to the internet or a private network.

• It translates more readily memorized domain names to the numerical IP addresses needed for locating and identifying computer services and devices with the underlying network protocols.

• DNS is an essential component of the functionality of the internet, as it provides a way to match names (a website you are

seeking) to numbers (the address for the website).

• The DNS hierarchy consists of the root level, top-level domains (like .com, .org, .net), second-level domains, and subdomains.

Q75. Answer: (a) sr/(s+t) and tr/(s+t)

Given:

Sum of two numbers = r

Quotient of two numbers = s/t

Formula used:

Let the two numbers be x and y.

x + y = r

x/y = s/t => x = s/t × y

Calculation:

From x + y = r, substitute x = s/t × y

=> s/t × y + y = r

=> y (s/t + 1) = r

=> y = r/(s/t + 1)

=> y = (r × t)/(s + t)

Substitute y in x = s/t × y

=> x = (r × s)/(s + t)

Therefore The two numbers are:

x = (r × s)/(s + t), y = (r × t)/(s + t)

Q76. Answer: (b) U^(235)

The correct answer is U235

Key Points

• U235 is used as a fissionable fuel in nuclear reactors.

• Uranium-235 is one of the isotopes of uranium that can sustain a chain reaction of nuclear fission.

• It is a critical material for nuclear power generation and nuclear weapons.

• U235 undergoes fission when it absorbs a neutron, releasing a significant amount of energy in the form of heat and radiation.

Additional Information

• Plutonium-239 (Pu239) is another fissionable material used in nuclear reactors and weapons, although it is not mentioned in the given options.

• Uranium-238 (U238) is not fissionable by thermal neutrons but can be converted into plutonium-239 through neutron capture and subsequent beta decay.

• Uranium-235 makes up about 0.72% of natural uranium, with the remainder being mostly uranium-238.

• The enrichment process is used to increase the concentration of U235 in uranium to make it suitable for use in reactors or weapons.

Q77. Answer: (a) Only assumption II is implicit

Given Statement: Romila got elected as the president of the student's committee of her school, so she must be senior.

Now,

Assumptions:

1. Only members of the student's committee can be seniors - Not Implicit (The statement doesn't imply that only members of the student's committee can be seniors; it only suggests that Romila being a president implies she is a senior.)

2. Only seniors can be the president of the student's committee - Implicit (The statement suggests that being elected as president implies that Romila is a senior, indicating that only seniors can hold the position of president.)

3. Only girls can be the members of the student's committee - Not Implicit (The statement does not mention anything about the gender of the members of the student's committee.)

Here, Only assumption II is implicit.

Hence, the correct answer is "Option 1".

Q78. Answer: (a) A is the maternal uncle of C.

Preparing the family tree using the following symbols,

Given equation: A × B ÷ C

Code	•	•	×	÷
Relation	Son	Husband	Brother	Mother

The family tree can be drawn as per the given information,

Here, we can see that A is the maternal uncle of C.

Hence, the correct answer is "Option 1".

Q79. Answer: (d) 8/S

The logic followed here is:

Logic: The letters are increasing +3 diagonally. The numbers are decreasing -3 diagonally.

Hence, the correct answer is "Option 4".

Q80. Answer: (d) 115

Given:

40% of a number is 46 less than 4/5 of that number.

Formula Used:

0.4x = (4/5)x - 46

Calculation:

0.4x = (4/5)x - 46

=> 0.4x - (4/5)x = -46

=> (2/5)x - (4/5)x = -46

=> (-2/5)x = -46

=> x = -46 × (-5/2)

=> x = 115

The number is 115.

Q81. Answer: (a) 64

The logic followed here is,

Logic: The number at the top is the square of the sum of the two bottom numbers.

→ 25 = (3 + 2)² = (5)²

→ 49 = (4 + 3)2 = (7)2

Similarly,

→ ? = (2 + 6)2 = (8)2 = 64

Hence, the correct answer is "Option 1".

Q82. Answer: (c) S

Given:

Data from the bar graph for the number of cell phones (in lakhs) imported in 2015 and 2016:

P: 25 (2015), 30 (2016)

Q: 28 (2015), 32 (2016)

R: 30 (2015), 28 (2016)

S: 34 (2015), 36 (2016)

T: 26 (2015), 20 (2016)

Formula used:

Percentage change = (New Value - Old Value)/(Old Value) × 100

Calculation:

For P: (30 - 25)/25 × 100 = 20%

For Q: (32 - 28)/28 × 100 = 14.29%

For R: (28 - 30)/30 × 100 = -6.67%

For S: (36 - 34)/34 × 100 = 5.88%

For T: (20 - 26)/26 × 100 = -23.08%

Conclusion:

The lowest percentage change (smallest absolute value) is for S with 5.88%.

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Therefore The correct answer is S.

Q83. Answer: (b) 4 cm

Given:

Dimensions of the tank: 4 m (length) × 2 m (width) × 1.5 m (depth)

Dimensions of the field: 22 m (length) × 14 m (width)

Formula Used:

Volume of the tank = Length × Width × Depth

Area of the remaining field = Total Area of the field - Area of the tank

Height rise = Volume of the tank / Area of the remaining field

Calculation:

Volume of the tank = 4 m × 2 m × 1.5 m

=> Volume of the tank = 12 m^3

Area of the field = 22 m × 14 m

=> Area of the field = 308 m^2

Area of the tank = 4 m × 2 m

=> Area of the tank = 8 m^2

Area of the remaining field = 308 m^2 - 8 m^2

=> Area of the remaining field = 300 m^2

Height rise = Volume of the tank / Area of the remaining field

=> Height rise = 12 m^3 / 300 m^2

=> Height rise = 0.04 m

=> Height rise = 0.04 m × 100 cm/m

=> Height rise = 4 cm

The level of the field will rise by 4 cm.

Q84. Answer: (d) Gujarat

The correct answer is Gujarat

Key Points

• Gujarat was ranked as the best performer in start-up ranking 2019 by the Department of Industrial Policy and Promotion (DIPP).

• The ranking evaluates states based on their support for startup ecosystems and the implementation of various policies and initiatives to foster startup growth.

• Gujarat's top ranking reflects its strong infrastructure, favorable policies, and proactive measures in promoting startups and innovation.

• The state has implemented several schemes and initiatives to support budding entrepreneurs, including financial incentives, incubation centers, and mentorship programs.

Additional Information

• The Department of Industrial Policy and Promotion (DIPP) is responsible for formulating and implementing promotional and developmental measures for the growth of the industrial sector in India.

• In addition to startup rankings, DIPP also works on policies related to intellectual property rights, foreign direct investment, and industrial development.

• Gujarat has consistently performed well in various industrial and economic rankings, showcasing its robust economic environment and governance.

• The state government continues to focus on creating a conducive ecosystem for startups by simplifying regulatory processes, providing financial support, and encouraging innovation.

Q85. Answer: (c) Mulching

The correct answer is Mulching

Key Points

• Mulching is the process of covering the soil/ground to create more favourable conditions for plant growth, development, and efficient crop production.

• It involves the application of organic or inorganic materials over the soil surface.

• Common materials used for mulching include straw, leaves, grass clippings, wood chips, and plastic sheets.

• Mulching helps in conserving soil moisture, reducing weed growth, and improving soil fertility and structure.

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• It also helps in regulating soil temperature and preventing soil erosion.

Additional Information

• Shelter belts are rows of trees or shrubs planted to protect an area from strong winds and erosion.

• Contour farming involves plowing along the contour lines of a slope to reduce soil erosion.

• Terrace farming is the practice of creating stepped levels on hilly or mountainous terrain to reduce soil erosion and surface runoff.

• These practices, while beneficial for soil conservation, are different from mulching in their approach and application.

Q86. Answer: (d) 65

The logic followed here is,

Hence, the correct answer is "Option 4".

Q87. Answer: (a) 4

The logic followed here is:

Adding the digits of the outer circle = Multiplying the numbers of the triangle

For image 1:

4 + 7 + 8 + 5 = 24

6 x 4 = 24

For image 2:

10 + 8 + 6 + 18 = 42

7 x 6 = 42

Similarly for image 3:

12 + 8 + 9 + 3 = 32

8 x 4 = 32

Hence the correct answer is "Option 1".

Q88. Answer: (d) 665

The logic followed here is,

Hence, the correct answer is "Option 4".

Q89. Answer: (c) 56%

Given:

The graph shows the cumulative progress of dam construction over the months, with July's progress equal to the highest progress recorded in any previous month.

Formula used:

Total progress by the end of July = Cumulative progress by June + Highest monthly progress

Calculations:

From the graph:

Cumulative progress by June = 44%

Highest monthly progress = 12% (from March)

Total progress by the end of July = 44% + 12% = 56%

Therefore The total work completed by the end of July is 56%.

Q90. Answer: (c) 5 - 31

The logic followed here is:

Logic: number x same number + 1

Option1: (3 x 3 + 1) = 10

Option 2: (10 x 10 + 1) = 101

Option 3: (5 x 5 + 1) = 26 ≠ 31

Option 4: (7 x 7 +1) = 50

so, '5 - 31' is the odd one out

Hence the correct answer is "Option 3".

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Q91. Answer: (b) [figure]

The least possible Venn diagram:

Summer is a type of season.

Cloudy is a weather condition that can occur during any season, including summer.

Hence the correct answer is Option 2

Q92. Answer: (a) 26

The logic followed here is,

Hence, the correct answer is "Option 1".

Q93. Answer: (b) Economics

The logic followed here is:

Subject	is Called
Urdu	Physics
Sanskrit	History
History	Urdu
Physics	Economics
Economics	Sanskrit

So, we study about Newton in 'Physics',

But, 'Physics' is called 'Economics'.

Hence, the correct answer is "Option (2)".

Q94. Answer: (b) Either conclusion I or II follows.

The least possible venn diagram is shown below,

Conclusions:

I. Some brothers are balloons → False (Some sisters are brothers and very few balloons are sisters implies that it is possible but not definite).

II. Some brothers are not balloons → False (Some sisters are brothers and very few balloons are sisters implies that it is possible but not definite).

Here, we can see that both statements are complimentary to each other.

Hence, the correct answer is "Option 2".

Q95. Answer: (a) 7

The logic followed here is: Sum of the numbers in 1st diagram - Sum of numbers in 2nd diagram = 3

→ (5+6) - (2+1+ 5) = 11 -8 = 3

→ (5+10) - (3+5+ 4) = 15 -12 = 3

Similarly,

=> (x+2) - (1+3+ 2) = x+2 - 6 =3

=> x+2 = 3+ 6

=> x+2 = 9

=> x = 7

Hence the correct answer is Option 1:7

Q96. Answer: (d) J

The logic followed here is:

Logic: The sum of the positional values of the letters of each row is same.

Row 1,

=> B A D C → (2 + 1 + 4 + 3) = 10

Row 2,

=> A D E → (1 + 4 + 5) = 10

Row 3,

=> G C → (7 + 3) = 10

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In Row 4, there is only one letter,
=> J is the letter whose positional value is 10.
Hence, the correct answer is "Option 4".

Q97. Answer: (b) Chan

According to the given information,

Caring	Sensitive	Honest	Creative
Lee Bruce Chan	Min Chan Ho	Bruce Ho Min	Lee Min Ho

Here, we can see that Chan is neither honest nor creative.
Hence, the correct answer is "Option 2".

Q98. Answer: (b) Wife's brother

Preparing the family tree using the following symbols,
The family tree can be drawn as per the given information,
Here, we can see that B is wife's brother of P.
Hence, the correct answer is "Option 2".

Q99. Answer: (d) 82

The logic followed here is,
→ (94 - 12) = 82
Hence, the correct answer is "Option 4".

Q100. Answer: (c) SLO

The logic followed here is:
Difference in place values of last two letters of each word
So, 'SLO' is different from others from others.
Hence the correct answer is "Option 3".

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