# RRB NTPC Tier I Official Paper (Held On: 28 Apr 2016 Shift 1) (Previous Year Paper)

RRB NTPC • 2016 • 100 questions • 90 minutes • Answer key and solutions

**Take this paper as a timed mock test**

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

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

**Q1.** If FRUIT is coded as WKHTI, what will be the code for MUSKMELON?

A. PHJRPXQNO
B. PJHRXMNQO
C. HPJRYNMQO
D. PHRJMQXON

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

**Q2.** Where is the Simlipal Bio-Reserve located?

A. Assam
B. Meghalaya
C. Odisha
D. West Bengal

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

**Q3.** What is Sin θ tan θ - sec θ ?

A. -cos θ
B. 1
C. -sec θ
D. cosec θ

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

**Q4.** Who represented India in the World's Parliament of Religion in 1893?

A. Swami Vivekananda
B. Lekhraj Khubchand Kripalani
C. Bhakti Vinod Thakur
D. Upasani Maharaj

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

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**Q5.** 7, 14, 21, 28 ..... the sum of the number series is 952, then the numbers in the series are

A. 16

B. 17

C. 18

D. 19

**(a)** D

**(b)** B

**(c)** A

**(d)** C

**Q6.** The train runs for 2 ½ hours at a speed of 62 km/hr and at a speed of 68 km/hr for 1 ¼ hour. Find the average speed of a train

A. 55 km/hr

B. 64 km/hr

C. 62 km/hr

D. 70 km/hr

**(a)** A

**(b)** D

**(c)** C

**(d)** B

**Q7.** Below are the statements and some of their conclusions. You have to follow the given statements to be true even if they seem to be at variance from commonly known facts.

Statement: Some monuments are watches. No time is watch.

Conclusion:

I. No monument is time.

II. All watches are monuments.

Decide which of the following conclusions logically follows from the given statements.

A. Only conclusion I follows.

B. Only conclusion II follows.

C. Neither I nor II follows.

D. Both I and II follow

**(a)** A

**(b)** B

**(c)** C

**(d)** D

**Q8.** If a circle is divided into 6 equal parts made of what would be the measurement of each angle?

A. 45

B. 60

C. 30

D. 90

**(a)** A

**(b)** C

**(c)** B

**(d)** D

**Q9.** Ramon Magsaysay Award winner Anshu Gupta is associated with which of the following NGOs?

A. Prayatna

B. Akshaya Patra

C. Goonj

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D. Udaan

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

**Q10.** If FOCUS is coded IRFXV, what will be the code for CAPTURE?

A. FDWSUAH
B. FDSWXUH
C. FSDUXWH
D. SDHXWUF

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

**Q11.** RABAT is from MOROCCO then _____ is from NAMIBIA.

A. WINDHOEK
B. NIAMEY
C. WELLINGTON
D. OSLO

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

**Q12.** What is the word used to refer to the study of soil?

A. Pedology
B. Geology
C. Doxology
D. Ecology

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

**Q13.** What is the example of vector quantity?

A. Mass
B. Temperature
C. Velocity
D. Length

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

**Q14.** Charlie buys a bed after a discount of 22% for Rs.16,725. He later finds that the same store was selling that bed online for 15% off at Rs.15,685. What is the difference between the marked price of store-bought beds and the marked price of online beds? (Rounded off to the nearest rupee)

A. 2989
B. 2785
C. 2897

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D. 2888

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

**Directions**

Directions: The following table shows the percentage distribution of population on the basis of poverty line and gender in five states M, N, O, P and Q.

| State | Below Poverty Line Population % | Ratio of males (M) and females (F) | |
|---|---|---|---|
| Below the poverty line | Above poverty line | | |
| M : F | M : F | | |
| M | 40 | 7 : 6 | 8 : 7 |
| N | 30 | 3 : 2 | 6 : 5 |
| O | 26 | 1 : 1 | 4 : 3 |
| P | 17 | 1 : 2 | 4 : 5 |
| Q | 20 | 2 : 3 | 3 : 4 |

**Q15.** If the male population above the poverty line of state O is 1.7 million, then what will be the total population of state O?

A. 4.02 million
B. 5.36 million
C. 5.63 million
D. 4.92 million

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

**Q16.** If the male population below the poverty line of state N is 2.6 million and for state Q it is 6 million then what will be the ratio of below poverty line population of state N and Q?

A. 4.33 : 15
B. 2.33 : 10
C. 3 : 5.5
D. 1 : 1

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

**Q17.** What will be the female population above the poverty line of state P if it is known that the total population of state P is 9 million?

A. 4.15 million
B. 5.32 million
C. 3.32 million
D. 6.32 million

**(a)** C
**(b)** D

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**(c)** B
**(d)** A

**Q18.** Why can't fish survive in distilled water?

A. Can't breathe in it
B. Osmosis dilutes fish body fluids
C. It does not contain oxygen
D. It does not contain food

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

**Q19.** The game of snooker is played with how many balls?

A. 16
B. 18
C. 22
D. 24

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

**Q20.** A sari is sold at Rs. 5,871 after the 5% discount. Find its marked Price.

A. 5577
B. 6880
C. 6180
D. 5734

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

**Q21.** The sum of the ages of a father and his son is 49 years. Their age ratio is 5 : 2. So what will be the age of the son after 5 years?

A. 12
B. 19
C. 14
D. 21

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

**Q22.** What form can be used when Mucilage is mixed with water.

A. Toothpaste
B. Insect repellants
C. Glue
D. Chewing gum

**(a)** C
**(b)** D
**(c)** B

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**(d)** A

**Q23.** What is the branch of biology related to the classification of organisms?

A. Taxonomy

B. Nothology

C. Anatomy

D. Limnology

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

**Q24.** What will you get if you subtract $– x^2 – x + 8$ from $5x^2 – 6x + 5$?

A. -6x2 - 5x + 3

B. 4x2 - 7x + 13

C. -6x2 - 7x - 13

D. 6x2 - 5x - 3

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

**Q25.** What is the fragrance of soil generated immediately after the rains?

A. Petrichor

B. Tempus vemum

C. Vrochi

D. Irida

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

**Q26.** Below are the statements and some of their conclusions. You have to assume the given statements to be true even if they seem to be at variance from commonly known facts.

Statements: Some elephants are lions. Some lions are camels.

Conclusion:

I. Some cows are camels.

II. All lions are cows.

Decide which of the following conclusions logically follows from the given statements.

A. Only conclusion I follows.

B. Only conclusion II follows.

C. Neither I nor II follows

D. Both I and II follow.

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

**Q27.** Which of the following is used as the video compression format?

A. WMV

B. MP3

C. JPEG

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D. WMA

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

**Q28.** Which is the most suitable cash crop for black soil?

A. Cotton
B. Tea
C. Jute
D. Oilseeds

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

**Q29.** The circumference of the four wheels is 16 cm, 24 cm, 32 cm, and 40 cm. They start rotating together. If each wheel covers the same distance, then the distance is

A. 480 cm
B. 40 cm
C. 520 cm
D. 560 cm

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

**Directions**

Instructions: Read the following information and answer the questions based on it.

i. Amy, Bella, Serra, Diya, Emma and Phila are 6 students in a class.

ii. Emma and Diya are shorter than Amy but heavier than Phila.

iii. Sera is heavier than Emma and taller than Diya.

iv. Bella is shorter than Sera but taller than Amy.

v. Amy is heavier than Sera.

vi. phila is shorter than Bella but taller than Amy.

**Q30.** Who is the shortest of these?

A. Bella
B. Sera
C. Diya
D. Phila

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

**Q31.** Which of the following group of friends is smaller than Phila?

A. Serra, Bella, Amy
B. Amy, Emma, Diya
C. Bella, Amy, Emma
D. Serra, Bella, Emma

**(a)** D

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**(b)** C
**(c)** A
**(d)** B

**Q32.** Who will be in the fourth place from the top if they are placed in descending order of their length?

A. Serra
B. Amy
C. Diya
D. Emma

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

**Q33.** At what temperature will the water density be maximum?

A. 0°C
B. 4°C
C. 39°C
D. 100°C

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

**Q34.** What is the ancient style of articles containing Egyptian symbols called?

A. Hieroglyphics
B. Cuneiform
C. Hitite
D. Zapotec

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

**Q35.** What force acts in a rollercoaster ride?

A. Centrifugal
B. Centripetal
C. Gravitational
D. Normal

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

**Q36.** If N's sister is M, then how is N related to O?

Which of the following statements is/are necessary to answer this question?

i. M's daughter is the granddaughter of O.
ii. M's brother is N.

A. Only i
B. Only ii
C. Either i or ii
D. Both statements are required

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

**Q37.** Rearrange the 4 disorganized sentences P, Q, R and S to form a meaningful paragraph.

P : cricket is a religion in India and

Q : most of the other sports suffer

R : due to the extra importance given to cricket as a game

S : it is known to all

Proper order is

A. PQSR

B. PSQR

C. QSPR

D. SPRQ

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

**Q38.** Simplify: {13 + [25 ÷ (3 + 7)] - (2 × 6)}

A. 3.5

B. 0.5

C. 2.8

D. 4

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

**Q39.** 'A' can do a work in 20 days and 'B' can do the same work in 15 days. 'B' works for 6 days and leaves work. In how many days can 'A' alone complete the remaining work?

A. 12 days

B. 4 days

C. 6 days

D. 5 days

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

**Q40.** If GARDEN is coded as 562701 and FOREST is coded as 342098, then what will be the code for ARREST?

A. 357909

B. 262908

C. 622098

D. 620289

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

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**Q41.** What is the surface area of a cube with sides 4 cm?

A. 16 cm square

B. 96 cm square

C. 64 cm square

D. 32 cm square

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

**Q42.** In which all nodes (workplace and other devices) are directly connected to a common central computer, what is that local area network (LAN) called?

A. Ring

B. Bus

C. Star

D. Vertical

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

**Q43.** Where is Taklimakan Desert found?

A. Saudi Arabia

B. Namibia

C. China

D. USA

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

**Q44.** Find the compound interest of that amount at the rate of 7% for 3 years? Whose simple interest will be Rs.18,900 at the rate of 7% in 3 years. (Rounded off to the nearest rupee)

A. 19,746

B. 18,390

C. 20,254

D. 21,053

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

**Q45.** What is the eye irritating compound when cutting onions?

A. Carbon

B. Nitrogen

C. Sulphur

D. Hydrogen

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

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**Q46.** When was New Delhi made the capital of the country?

A. 1908
B. 1910
C. 1911
D. 1914

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

**Q47.** Rearrange the 4 disorganized sentences P, Q, R and S to form a meaningful paragraph.

P : is mostly produced in rural farms
Q : India is a leading producer of
R : milk is the most important of them and
S : dairy products by volume
Proper order is

A. SRPQ
B. QSPR
C. QPSR
D. QSRP

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

**Q48.** Which of the following means 'tyrant lizard king'?

A. Protoceratops
B. Tyrannosaurus rex
C. Diplodocus
D. Compsognathus

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

**Q49.** If $\tan A + \cot A = 2$, then find the value of $\tan^2 A + \cot^2 A$.

A. 4
B. 2
C. 1
D. 1/2

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

**Q50.** Jeeva gets 492 marks in his examination. If he had got 12 marks more, then his percentage of marks would have been 84. What was the maximum number of marks he could score in his examination?

A. 504
B. 540
C. 580
D. 600

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

**Q51.** A garden is built in the shape of a circle of 22 meters in diameter. There is a circular section of 4 m radius for the playground in the center of the garden. This circular ring made is said to be covered by grass. Find the area of this circular ring in square meters.

A. 1470.8
B. 572.6
C. 330
D. 707.14

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

**Q52.** Convert 13/55 to decimal.

A. 0.20
B. 0.236
C. 0.245
D. 0.257

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

**Q53.** Below are the statements and some of their conclusions. You have to follow the given statements correctly even if they seem to be at variance from commonly known facts.

Statement: All chairs are windows. No window is a door.

Conclusion:

I. Some chairs are doors.

II. No door is window.

Decide which of the following conclusions logically follows from the given statements.

A. Only conclusion I follows.
B. Only conclusion II follows.
C. Neither I nor II follows.
D. Both I and II follow.

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

**Q54.** What will be the product of any two prime numbers except the smallest prime number?

A. Always zero
B. Always one
C. Always an even number
D. Always an odd number

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

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**Q55.** If PAINT is coded as 21563 and SHOT is coded as 8503 then what will be the code for TOAST?

A. 31852
B. 30183
C. 30138
D. 31038

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

**Q56.** A train covers a distance of 435 km in 2 hours 30 minutes. Find its speed in meters per second.

A. 47.4
B. 45.8
C. 43.5
D. 48.3

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

**Q57.** XYZ Company distributes its profit or loss to its partners X, Y and Z in the ratio of 1/3, 1/2, 1/6 respectively. If Z gets Rs.1,76,802 as his share then find the amount received by Y.

A. Rs. 5,30,406
B. Rs. 88,401
C. Rs. 3,53,604
D. Rs. 2,65,203

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

**Q58.** Rearrange the 4 disorganized sentences P, Q, R and S to form a meaningful paragraph.

P: mostly decided by the market conditions
Q: Sometimes, a United States dollar is worth only 12 pesos in Mexico
R: the rates of exchange between them vary from time to time
S: and some other time it can be 100 pesos
Proper order is -

A. PRSQ
B. QPRS
C. QSRP
D. QSPR

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

**Q59.** The Cabinet Mission, which prepared a Cabinet Mission Plan in 1946, included which of the following dignitaries?

A. Mohammad Ali Jinnah
B. Sir Pethick Lawrence
C. Clement Attlee
D. Lord Mountbatten

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

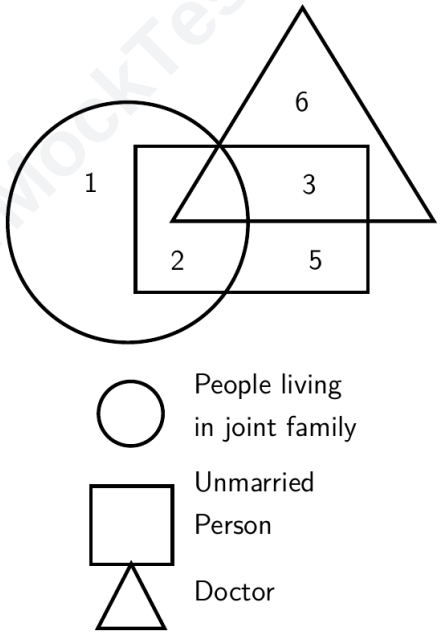
**Q60.** Introducing a girl, the boy says, "She is the daughter of my uncle's father's son". How is the girl related to the boy.

A. Niece
B. Daughter-in-law
C. Sister
D. Aunt

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

**Directions**

Direction: Study the following picture and answer the questions given below.




**Q61.** What number represents those people who live in a joint family but are neither unmarried nor doctors?

A. 4
B. 5
C. 2
D. 1

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

**Q62.** What number represents unmarried doctors living in joint family?

A. 2
B. 3
C. 4
D. 6

**(a)** B

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**(b)** D
**(c)** A
**(d)** C

**Q63.** What number shows unmarried persons living in joint families who are not doctors?

A. 2
B. 4
C. 1
D. 5

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

**Q64.** Who is the President of South Asian Wrestling Federation?

A. Brij Bhushan Sharan Singh
B. Tabiur Rahman
C. Raj Mohammad Ansari
D. Chaudhry Mohammad Ajgar

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

**Q65.** Simplify: (√32 - √18)/(√50 + √8)

A. 7
B. 1/7
C. (√2)/7
D. 2√2

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

**Q66.** If Ram is from Kushalya, then Karna is from _____

A. Draupadi
B. Ganga
C. Vrushali
D. Kunti

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

**Q67.** If page is from book, then what is from window?

A. Forest
B. Wood
C. Window glass
D. Room

**(a)** A
**(b)** D
**(c)** B

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**(d)** C

**Q68.** What is the purity of the minimum thousandth of sterling silver?

A. 916

B. 925

C. 935

D. 950

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

**Q69.** What Tata Motors renamed the car originally named 'Zika'?

A. Cooga

B. Nexon

C. Tiago

D. Hexa

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

**Q70.** If A%B means A is daughter of B, A-B means B's brother is A and A×B means B's father is A, then which of the following options indicates the relation of "M is grandson of N"?

A. M%CXFXN

B. DXFXN%M

C. M-C%F%N

D. N%DXFXC

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

**Q71.** A tea merchant has 3 varieties of tea to sell. Brand A was sold at Rs. 252 per kg, Brand B was sold at Rs. 280 per kg, and Brand C was sold at Rs. 316 per kg. At the end of the year, he finds that he has left 274 kg of brand A tea, 197 kg of brand B and 54 kg of brand C tea. He mixes the three and sells the mixture at the rate of Rs. 283.50 per kg. What was his profit or loss on the sale?

A. Rs. 7565.50 profit

B. Rs. 7565.50 loss

C. Rs. 8232.40 profit

D. Rs. 8125.30 loss

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

**Q72.** What are the brief bursts of energy arising from the sun's photosphere?

A. Solar energy

B. Soar flares

C. Sunspots

D. Solar wind

**(a)** A

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**(b)** D
**(c)** B
**(d)** C

**Q73.** Which of the following is not a consumer right as defined in the UN Consumer Bill?

A. The right to choose
B. Right to safety
C. Right to contest
D. Right of redress

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

**Q74.** Who is the current Leader of Opposition in Rajya Sabha?(According to 2016)

A. Mallikarjun Kharge
B. Ghulam Nabi Azad
C. Rahul Gandhi
D. Derek O'Brien

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

**Q75.** The median of a set of ascending order observation 11, 12, 14, 15, x + 1, x + 3, 20, 23, 25, 27 is 17. Then find the value of x.

A. 16
B. 15
C. 18
D. 17

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

**Q76.** The ratio of girls to boys in a class is 5 : 3. If the total capacity of the class was 48 and 16.67% girls were absent, find the number of girls present.

A. 15
B. 18
C. 5
D. 25

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

**Q77.** Cheerful is from Sad, then tolerant is from

A. Gloomy
B. Dire
C. Patient
D. Protesting

**(a)** A

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**(b)** C
**(c)** B
**(d)** D

**Q78.** Which of the following cities was called 'Designnadu' in ancient times?

A. Kollam
B. Mysore
C. Madurai
D. Chittor

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

**Q79.** Find the difference between simple interest and compound interest received at the rate of 7.5% in the second year of Rs. 23,465.

A. Rs. 132
B. Rs. 66
C. Rs. 147
D. Rs. 73.5

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

**Q80.** When working on an MS Excel sheet, to enter a formula in a cell, what should come before the formula?

A. @
B. =
C. *
D. &

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

**Q81.** If $a - b = 5$ and $a^2 + b^2 = 31$ then find the value of ab?

A. 4
B. 5
C. 2
D. 3

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

**Q82.** The residence of the Prime Minister of which country is called 'Temple trees'?

A. Nepal
B. Myanmar
C. Sri Lanka
D. Bangladesh

**(a)** B
**(b)** C

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**(c)** A
**(d)** D

**Q83.** Who is the compiler of the famous book 'Tirukkural'?

A. Kalidas
B. Tiruvalluvar
C. Kabir
D. Mirabai

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

**Q84.** A school canteen buys 3200 kg of lentils which will be sufficient to provide nutrition to 1200 children for 20 days. 6 days later 180 children went on a month-long journey. How many more days of lentils will be sufficient for the remaining children?

A. 14
B. 16.5
C. 12.6
D. 17.2

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

**Q85.** Choose one of the following options that is different or odd.

A. RPNL
B. ZXVT
C. CAWV
D. JHFD

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

**Q86.** Which of the following is an intangible asset?

A. Goodwill
B. Receivables
C. Stock
D. Cash

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

**Q87.** What day is World Wildlife Day celebrated?

A. 3 June
B. 3 March
C. 12 April
D. 8 September

**(a)** C
**(b)** B

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**(c)** D
**(d)** A

**Q88.** A cleaning company employs 42 sweepers to clean a building in 25 days. 10 days later, 12 sweepers left the job. If the cleaning work is to be finished in 10 days, how many more cleaning workers need to be hired?

A. 30
B. 32
C. 33
D. 21

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

**Q89.** Find the largest number which divides 1250 and 1615, leaves the remainder 4 and 5 respectively.

A. 13
B. 14
C. 16
D. 18

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

**Q90.** Which Pakistani cricket umpire has been banned for 5 years in February 2016?

A. Akram Raza
B. Asad Rauf
C. Sajid Afridi
D. Qaiser Waheed

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

**Q91.** When was the first Indian satellite Aryabhata launched?

A. 1970
B. 1973
C. 1975
D. 1976

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

**Q92.** What happens when methane burns?

A. Carbon monoxide emits
B. Carbon ash remains
C. Carbonate is formed
D. Carbon dioxide and water come

**(a)** D
**(b)** C
**(c)** A

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**(d)** B

**Q93.** John won a lottery, in which the government deducted 35% tax and paid the 7/8 part to John and the remaining to the ticket seller. If the ticket seller received Rs. 22,343.75, what was the lottery amount?

A. 2,23,437

B. 275,000

C. 264,384

D. 178,750

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

**Q94.** Who has been appointed the chairman of NHRC (National Human Rights Commission)?

A. J. S. Verma

B. K. Ramaswamy

C. Govinda Sharma

D. H.L. Dattu

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

**Q95.** According to the Indian constitution, how many languages have been given the status of official language?

A. 15

B. 18

C. 22

D. 25

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

**Q96.** What was the name of the spacecraft by which Rakesh Sharma traveled to space?

A. Soyuz T-11

B. Rockwell X-30

C. Spiral-EPOS

D. Mercury-Atlas 9

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

**Q97.** Simplify: {[(x^4)^(3 - 2a)] [(x^(2a + 1))^a]} ÷ {[(x³a - 5)2] [(xa + 1)²a - 1]}

**(a)** x4a
**(b)** x23 - 14a
**(c)** x22 - 7a
**(d)** x23

**Q98.** Where was the first Commonwealth Games, also known as the British Empire Games, played in 1930?

A. Hamilton

B. London

C. Sydney

D. Manchester

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

**Q99.** N is a whole number which when divided by 6, the remainder 4 is left. If 2N is divided by 6, what will be the remainder?

A. 4
B. 8
C. 2
D. 0

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

**Q100.** Look at this series: G2, J8 _____ P32, S50 So what would be appropriate to fill in the blanks?

A. M12
B. H12
C. N10
D. Q10

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

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## ANSWER KEY

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

## SOLUTIONS

**Q1. Answer: (c) A**

The logic followed here is :

Hence, option 3 is the correct answer.

**Q2. Answer: (d) C**

The correct answer is Odisha.

• The representative parts of natural and cultural landscapes extending over large areas of terrestrial or coastal/ marine ecosystems or a combination of both designated by the United Nations Educational, Scientific and Cultural Organisation

(UNESCO) is called a Biosphere Reserve.

| Name of Biosphere Reserve | Location |
|---|---|
| Nilgiri | Tamil Nadu, Kerala, and Karnataka |
| Nokrek | Meghalaya |
| Gulf of Mannar | Tamil Nadu |
| Sunderbans | West Bengal |
| Dibru-Saikhowa | Assam |
| Pachmarhi | Madhya Pradesh |
| Khangchenzonga | Sikkim |
| Agasthyamalai | Kerala |
| Great Rann of Kutch | Gujarat |
| Seshachalam Hills | Andhra Pradesh |

Additional Information

| Name of Biosphere Reserve | Location |
|---|---|
| Panna | Madhya Pradesh |
| Cold Desert | Himachal Pradesh |
| Achanakamar Amarkantak | Chhattisgarh |
| Dehang-Dibang | Arunachal Pradesh |
| Simlipal | Odisha |
| Manas | Assam |
| Great Nicobar | Andaman and Nicobar Island |
| Nanda Devi | Uttarakhand |

Image of Simlipal Biosphere Reserve:

**Q3. Answer: (a) A**

Given:

Sin θ tan θ - sec θ

Concept used:

$\sin^2 \theta + \cos^2 \theta = 1$

Calculation:

$\tan \theta = \sin \theta / \cos \theta$

$\sec \theta = 1/\cos \theta$

$\sin \theta \tan \theta - \sec \theta = \sin \theta \times (\sin \theta / \cos \theta) - (1/\cos \theta)$

$\sin \theta \tan \theta - \sec \theta = \sin^2 \theta / \cos \theta - 1/\cos \theta = (\sin^2 \theta - 1)/\cos \theta$

$\sin \theta \tan \theta - \sec \theta = -(1 - \sin^2 \theta)/\cos \theta = -\cos^2 \theta/\cos \theta$

$\sin \theta \tan \theta - \sec \theta = -\cos \theta$

Therefore The value of the expression is -cos θ.

**Q4. Answer: (c) A**

The correct answer is Swami Vivekananda.

- The Swami Vivekananda represented India in the World's Parliament of Religion in 1893.
- Swami Vivekananda was born on 12th January 1863 in Kolkata.
- Every year on 12th January is celebrated as National Youth Day to pay tribute to the great legend of India Swami Vivekananda.
- The full name of Swami Vivekananda was Narendra Nath Datta.
- Ramakrishna Mission and Ramakrishna Math was founded by him and he died on 4th July 1902 at the age of 39 years in Belur

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Math Howrah.

• The World's Parliament of Religion was inaugurated on 11-16th September 1893 in Chicago in the United States of America (USA).

• The World's Parliament of Religions was created with the goal of trying to create a global dialogue of faiths.

Image of Swami Vivekananda:

**Q5. Answer: (c) A**

Given:

7, 14, 21, 28,...

Sum is 952

Formula Used:

$S_n = n/2 \{2a + (n – 1)d\}$,

Where,

a is a first term of a series,

n total number of series,

d difference between two consecutive terms,

$S_n$ is sum of series

Calculation:

According to the question,

=> a = 7,

=> d = 14 – 7 = 7,

Using the formula for summation,

=> $952 = n/2 \{2(7) + (n – 1) 7\}$

=> $952 = n/2 (14 + 7n – 7)$

=> $952 = n/2\ 7(n + 1)$

=> $1,904 = 7n^2 + 7n$

=> $7n^2 + 7n – 1,904 = 0$

=> $n^2 + n – 272 = 0$

=> $n^2 + 17n – 16n – 272 = 0$

=> $n (n + 17) – 16(n + 17) = 0$

=> n + 17 = 0 or n – 16 = 0

=> n = – 17 or n = 16

n can not be negative,

=> n = 16

Therefore Total numbers in a series are 16.

**Q6. Answer: (d) B**

Given:

Ran for 5/2 hours at 62km/hr, and for 5/4 hours at 68 km/hr

Formula Used:

Speed = Distance/Time

Average speed = Total distance traveled/Total time taken

Calculation:

In the first case,

=> 62 = Distance/(5/2)

=> Distance = (62 × 5)/2

=> Distance = 155 km

In the second case,

=> 68 = Distance/(5/4)

=> Distance = (68 × 5)/4

=> Distance = 85 km

Using the formula for average speed,

Average speed = (155 + 85)/(5/2 + 5/4)

=> Average speed = 16 × 4

Therefore The average speed of a train is 64 km/hr

**Q7. Answer: (c) C**

The least possible Venn diagram for the given statement is as follows:

Conclusions:

I. No monument is time → does not follow (It is possible but not definite)

II. All watches are monuments → does not follow (It is possible but not definite)

Hence, option 3 is the correct answer.

**Q8. Answer: (c) B**

Given:

Measure of angle of total circle 360°

Calculation:

A circle is divided into 6 equal to parts,

=> 360/6

=> 60°

Therefore The measurement of each angle is 60°

**Q9. Answer: (a) C**

The correct answer is Goonj.

• The Ramon Magsaysay Award is awarded for outstanding contributions in Emergent Leadership, Government Service, Public Service, Community Leadership, Journalism, Literature and Creative Communication Arts and Peace and International Understanding.

• The award was established to perpetuate former Philippines President Ramon Magsaysay.

• The award is presented by the Ramon Magsaysay Award Foundation.

• It was first awarded in 1958.

• Ramon Magsaysay Award winner Anshu Gupta is associated with Goonj Non-Governmental Organisation (NGO).

• Goonj is a Non-Governmental Organisation headquartered in New Delhi.

• Goonj was founded by Anshu Gupta in 1999.

• In 2012 Anshu Gupta was named India's social entrepreneur of the year 2012 by Schwab Foundation, a sister organization of the World Economic Forum.

• Goonj undertakes disaster relief, humanitarian aid, and community development in parts of 23 states across India and also focuses on clothing as a basic but unaddressed need.

Image of Anshu Gupta:

**Q10. Answer: (d) B**

The pattern followed here is,

Similarly,

Hence, the code for the word CAPTURE is 'FDSWXUH'

**Q11. Answer: (d) A**

Here the logic is as follows:

| Option | City | Description |
|---|---|---|
| A. | WINDHOEK | WINDHOEK is the capital city of NAMIBIA. |
| B. | NIAMEY | NIAMEY is the capital city of NIGER. |
| C. | WELLINGTON | WELLINGTON is the capital city of NEW ZEALAND. |
| D. | OSLO | OSLO is the capital city of NORWAY. |

RABAT is the capital city of MOROCCO.

Similarly,

WINDHOEK is the capital city of NAMIBIA.

Hence, WINDHOEK is the correct answer.

**Q12. Answer: (b) A**

The correct answer is Pedology.

• Pedology is a field within soil science that focuses on characterizing and understanding soil formation, evolution, and theoretical frameworks in the context of the natural environment.

| Study of Soil | Pedology |
|---|---|
| Study of Grasses | Agrostology |
| Study of food | Bromatology |
| Study of Cells | Cytology |
| Study of Skin | Dermatology |
| Study of Insects | Entomology |
| Study of Blood | Haematology |
| Study of nerves | Neurology |
| Study of eggs | Oology |
| Study of mental illness or disorders | Psychopathology |

Additional Information

| Study of waves or wave motions | Kymatology |
|---|---|
| Study of rocks | Lithology |
| Study of earthquakes | Seismology |
| Study of Poisons | Toxicology |
| Study of Viruses | Virology |
| Study of fermentation | Zymology |
| Study of plant nutrition and growth in relation to soil | Agrobiology |
| Study of Bacteria | Bacteriology |
| Study of heart | Cardiology |
| Study of the age of trees and the records in their rings | Dendrochronology |

**Q13. Answer: (d) C**

The correct answer is Velocity.

• A physical quantity is a measurable and quantifiable physical property that carries unique information with it.

• There are two types of quantity

• Scalar Quantity

• Vector Quantity.

• Both these quantities are used to represent the motion of an object.

• The difference between Scalar Quantity and Vector Quantity is as follows:

| Scalar Quantity | Vector Quantity |
|---|---|
| It has the only magnitude. | It has both magnitude and direction. |
| One scalar quantity can divide another scalar quantity. | One vector quantity cannot divide another vector quantity. |
| It is one-dimensional. | It is multidimensional. |
| The normal rules of algebra are applicable. | Vector algebra which is a different set of rules is applicable. |
| The scalar quantity changes with the change in magnitude only. | The vector quantity changes with the change in magnitude and direction both. |

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| | |
|---|---|
| The distance between the points is a scalar quantity and not the direction. | It is a measurement of the rate of change of an object's position. |
| Speed, time, etc is an example of Scalar Quantity. | Velocity is an example of Vector Quantity. |

**Q14. Answer: (d) A**

Given:

SP1 = Rs.16,725

D1 = 22%

SP2 = Rs.15,685

D2 = 15%

Formula used:

Marked Price = Sale Price × 100/(100- Discount %)

Calculation:

MP1 = 16725 × 100/78 = 21,442.30

MP2 = 15685 × 100/85 = 18452.94

Difference = MP1 - MP2 = 21442.30 - 18452.94 = 2989.36

Therefore The difference between Marked Prices is 2989.

**Q15. Answer: (d) A**

Calculation:

From the table

Male population of above poverty line in state O = 1.7

=> 4x = 1.7

=> x = 1.7/4

So, Population above poverty line in state O

=> 7x = 7 × 1.7/4 = 2.975

Total population in state O

=> (2.975/74) × 100 = 4.02 millions

Therefore Total population in state O is 4.02 million

**Q16. Answer: (a) A**

Calculation:

From the table

Below poverty line population ratio of male and female in state N = 3 : 2

Below poverty line population ratio of male and female in state Q = 2 : 3

Below poverty line male in N = 2.6 million

=> 3x = 2.6 million

=> x = 2.6/3

So, Below poverty line population in state N = 5x = 5 × 2.6/3 = 4.33 million

Below poverty line male in Q = 6 million

=> 2y = 6 million

=> y = 3

So, Below poverty line population in state Q = 5y = 15 million

Therefore The ratio of below poverty line population in State N and Q is 4.33 : 15

**Q17. Answer: (d) A**

Calculation:

From the table

Above the poverty line population in state P = 83% of total population

=> (83/100) × 9 million = 7.47 million

In state P above poverty line ratio of male = 4 : 5

So, female population above poverty line in state P = (7.47/9) × 5

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=> 4.15 million

Therefore Female Population above poverty line in state is 4.15 million

**Q18. Answer: (a) B**

The correct answer is Osmosis dilutes fish body fluids.

• The fish can't survive in distilled water because osmosis dilutes fish body fluids.

• Distilled water is a type of purified water.

• The water that has been boiled into vapor and condensed back into liquid in a separate container is called distilled water.

• Distilled water doesn't have enough oxygen for the fish to breathe.

• Micronutrients like salts and minerals are very essential for the fish to survive but distilled water lacks these micronutrients.

**Q19. Answer: (b) C**

The correct answer is 22.

• The snooker is a cue sport first played by British Army officers stationed in India in the fourth quarter of the 19th Century.

• The highest governing body of the sport is World Professional Billiards and Snooker Association (WPBSA) founded in 1968.

• The game was first played in 1895 in India.

• The game requires a snooker table, snooker balls, cue stick, triangle, chalk, rests.

• The game of snooker is played with 22 balls.

Image of Snooker:

**Q20. Answer: (a) C**

Given:

Selling price is Rs. 5,871

Discount is 5%

Formula Used:

Selling price = (100 – D)/100 × Marked price

Where, D is percent discount

Calculation:

Using the formula,

=> 5,871 = (100 – 5)/100 × Marked price

=> 5,871 = (95/100) × Marked price

=> 5,871 = (19/20) × Marked price

=> 309 × 20 = Marked price

=> Marked price = 6,180

Therefore The marked price of a Sari is Rs. 6,180.

**Q21. Answer: (d) B**

Given:

The sum of the ages of a father and his son is 49 years.

Their age ratio is 5 : 2

Calculations:

Let the ages of a father and son be 5x and 2x

According to the question, we have

=> 5x + 2x = 49

=> 7x = 49

=> x = 7

So, The age of son is 2x + 5

=> 2x + 5 = 2(7) + 5

=> 2x + 5 = 19 years

Therefore The age of son after 5 years is 19 years.

**Q22. Answer: (a) C**

The correct answer is Glue.

• Mucilage is a thick, gluey substance produced by some microorganisms and nearly all plants.

• These microorganisms include protists which use it for their locomotion.
• It is a polar glycoprotein and an exopolysaccharide.
• The mucilage in plants plays a role in seed germination, storage of water and food, and thickening membranes.
• The rich sources of mucilage are cacti, aloe vera, okra, flax seeds, and other succulents.
• Mucilage is edible and is used in various medicines as it relieves irritation of mucous membranes by forming a protective film.
• When Mucilage is mixed with water it can be used in the form of glue.

**Q23. Answer: (c) A**

The correct answer is Taxonomy.

• The term taxonomy refers to the science of naming, describing, and classifying organisms and includes all types of animals, plants, and microorganisms of the world.

| Branch of Biology | Related to |
|---|---|
| Anatomy | Study of the internal structure of an organism as revealed by dissection |
| Dendrology | Study of Shrubs and trees |
| Eugenics | Study of science dealing with factors which improve successive generations of the human race |
| Forensic Biology | Application of Biology to law enforcement |
| Katology | Study of Human Beauty |
| Limnology | Study of snails |
| Mycology | Study of fungi |
| Nosology | Classification of diseases |
| Taxonomy | study of the classification, nomenclature, and identification of the organism |
| Zymology | Study of the fermentation process |

Additional Information

| Branch of Biology | Related to |
|---|---|
| Biophysics | Study of physical aspects of living systems |
| Craniology | Study of skulls |
| Gerontology | Study of the social, psychological, cognitive, and biological aspects of ageing |
| Helminthology | Study of parasitic worms |
| Ichthyology | Study of fish and its culture |
| Ontogeny | Study of various life cycles |
| Phenomics | Study of the physical and biochemical traits of organisms |
| Radiology | Study of effects of radiation on the living beings |
| Saurology | Study of lizards |
| Urology | Study of urine and its diseases |

**Q24. Answer: (d) D**

Given:

$5x^2 – 6x + 5 – (– x^2 – x + 8)$

Calcualtion:

$\Rightarrow 5x^2 – 6x + 5 – (– x^2 – x + 8)$

$\Rightarrow 5x^2 – 6x + 5 + x^2 + x – 8$

$\Rightarrow 6x^2 – 5x – 3$

Therefore You will get 6x2 – 5x – 3.

**Q25. Answer: (c) A**

The correct answer is Petrichor.

• Petrichor is the fragrance of soil generated immediately after the rains.

• The word petrichor is derived from the Greek language.

• In March 1964 paper by Australian researchers, Isabel Bear and Dick Thomas described the phenomena petrichor scientifically for the first time in the journal Nature.

• Formerly the term Petrichor was known as argillaceous odour.

• The pleasant smell that is frequently accompanied by the first rain after a long period of warm, dry weather is called petrichor.

**Q26. Answer: (d) C**

The least possible Venn diagram for the given statements is as follows:

Conclusions:

I. some cows are camels → False (There is no such element named cow here, so no relationship can be established between camel and cow)

II. All lions are cows → False (There is no such element named cow here, so no relationship can be established between lion and cow)

Hence, neither conclusion I nor II follows.

**Q27. Answer: (d) A**

The correct answer is WMV.

• WMV is used as the video compression format.

• The full form of WMV is Windows Media Video.

• The WMV video format was designed by Microsoft.

• It is widely used in Windows media players.

• It provides small file sizes with better compression than MP4.

• It is not compatible with Apple devices.

• Windows Media Player can be downloaded by users for iPhone or Mac.

**Q28. Answer: (d) A**

The correct answer is Cotton.

• Cotton is the most suitable cash crop for black soil.

• The largest producer of cotton in India is Maharashtra followed by Gujarat and Telangana.

• The largest producer of cotton in the world is India followed by China and the United States of America (USA).

• The cash crop is also known as profit crop is an agricultural crop that is grown to sell for profit.

• Some examples of cash crops are tea, coffee, rubber, coconut, and spices.

• Black soil which is found in India is rich in metals such as Aluminium, Magnesium, Lime, Calcium, and Iron.

• It is deficient in Phosphorous, Potassium, Nitrogen, and organic matter.

• The black soil is also called regur and black cotton soils because cotton is the most important crop grown on these soils.

• This soil is mainly found in Tamil Nadu, Maharashtra, Gujarat, Madya Pradesh, Andhra Pradesh, and parts of Karnataka.

• It has the highest water-retaining capacity.

• The texture of the black soil is Clayey.

Image of Cotton:

**Q29. Answer: (a) A**

Given:

Circumference of 4 wheels, 16cm, 24cm, 32cm, and 40cm

Concept Used:

Distance covered is same as the LCM of a Circumference.

Calculation:

LCM of 16, 24, 32, and 40

=> 4 × 2 × 2 × 1 × 3 × 2 × 5

=> 480

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Therefore The distance covered is 480 cm.

**Q30. Answer: (d) C**

Given, Amy, Bella, Serra, Diya, Emma and Phila are 6 students in a class. We have to arrange them in order of their height as well as their weight.

From the given information, Emma and Diya are shorter than Amy but heavier than Phila. We conclude the following:

Case 1: Amy > Emma, also Amy > Diya

Case 2: Emma > Phila also, Diya > Phila.

Here, Case 1 is used for height and Case 2 is used for weight.

Sera is heavier than Emma and taller than Diya.

Case 1: Sera > Diya

Case 2: Sera > Emma

Bella is shorter than Sera but taller than Amy.

Case 1: Sera > Bella > Amy

Amy is heavier than Sera.

Case 2: Amy > Sera

phila is shorter than Bella but taller than Amy.

Case 1: Bella > Phila > Amy

Now, on combining all Case 1 and Case 2 from the above statements we conclude:

Case 1: Sera > Bella > phila > Amy > Emma/Diya

Case 2: Amy > Sera > Emma/Diya > Phila

No information was given about the weight of Bella so Case 2 can't be formed properly, only case 1 is shown completely with the given information.

Here, the shortest person is either Emma or Diya but in the available options we have only Diya.

Hence, Diya is the shortest amongst the given options.

**Q31. Answer: (d) B**

Given, Amy, Bella, Serra, Diya, Emma and Phila are 6 students in a class. We have to arrange them in order of their height as well as their weight.

From the given information, Emma and Diya are shorter than Amy but heavier than Phila. We conclude the following:

Case 1: Amy > Emma, also Amy > Diya

Case 2: Emma > Phila also, Diya > Phila.

Here, Case 1 is used for height and Case 2 is used for weight.

Sera is heavier than Emma and taller than Diya.

Case 1: Sera > Diya

Case 2: Sera > Emma

Bella is shorter than Sera but taller than Amy.

Case 1: Sera > Bella > Amy

Amy is heavier than Sera.

Case 2: Amy > Sera

phila is shorter than Bella but taller than Amy.

Case 1: Bella > Phila > Amy

Now, on combining all Case 1 and Case 2 from the above statements we conclude:

Case 1: Sera > Bella > Phila > Amy > Emma/Diya

Case 2: Amy > Sera > Emma/Diya > Phila

No information was given about the weight of Bella so Case 2 can't be formed properly, only case 1 is shown completely with the given information.

Hence, Amy, Emma and Diya are shorter than Phila.

**Q32. Answer: (d) B**

Given, Amy, Bella, Serra, Diya, Emma and Phila are 6 students in a class. We have to arrange them in order of their height as well as their weight.

From the given information, Emma and Diya are shorter than Amy but heavier than Phila. We conclude the following:

Case 1: Amy > Emma, also Amy > Diya

Case 2: Emma > Phila also, Diya > Phila.

Here, Case 1 is used for height and Case 2 is used for weight.

Sera is heavier than Emma and taller than Diya.

Case 1: Sera > Diya

Case 2: Sera > Emma

Bella is shorter than Sera but taller than Amy.

Case 1: Sera > Bella > Amy

Amy is heavier than Sera.

Case 2: Amy > Sera

phila is shorter than Bella but taller than Amy.

Case 1: Bella > Phila > Amy

Now, on combining all Case 1 and Case 2 from the above statements we conclude:

Case 1: Sera > Bella > Phila > Amy > Emma/Diya

Case 2: Amy > Sera > Emma/Diya > Phila

No information was given about the weight of Bella so Case 2 can't be formed properly, only case 1 is shown completely with the given information.

Descending order of their length:

Sera > Bella > phila > Amy > Emma/Diya

Hence, Amy will be in fourth place from the top if they are placed in descending order of their length.

**Q33. Answer: (b) B**

The correct answer is 4°C.

• At 4°C temperature, the water density will be maximum.

• At 0°C temperature, the water density will be the minimum.

• The boiling point of water is 100°C.

• The cluster starts forming at 4-degree Celcius.

• The molecules are still slowing down and coming closer together but the formation of clusters makes the molecules be further apart.

• The density starts to decrease because the cluster formation is a bigger effect.

**Q34. Answer: (a) A**

The correct answer is Hieroglyphics.

• Hieroglyphics is the ancient style of articles containing Egyptian symbols.

• A hieroglyph is a Greek word that means sacred carvings.

• The pictorial script was invented by the Egyptians.

• Logographic scripts that are pictographic in the form are also sometimes called hieroglyphs.

• cuneiform is a system of writing first developed in 3500-3000 BCE by the ancient Sumerians of Mesopotamia.

• The script type is Logographic and the syllabary.

• To write the Hittite language sometime around the 17th century BC Akkadian cuneiform was itself adapted.

• Eblaite, Elamite, Hurrian, Luwian, and Urartian are other languages with significant cuneiform corpora.

• Hittite language belongs to the Indo-European language family and was mostly spoken in the Anatolia region.

• The era in which the language was spoken was from the 17th to 12th centuries BCE.

• By the Late Bronze Age, the Hittite was replaced by the Luwian language.

• In the 13th Century, BCE Luwian appeared to be the most widely spoken language in the Hittite capital Hattusa.

• In 1902 the first substantive claim as to the affiliation of Hittite was made by Jorgen Alexander Knudtzon.

• The Zapotec language has 4,90,000 native speakers in the state of Mexico according to the census conducted in the year 2020.

• It is a group of around fifty closely related indigenous mesoamerican languages which constitutes the main branch of the Oto-Manguean language family.

• Image of Hieroglyphics:

**Q35. Answer: (a) B**

The correct answer is Centripetal.

Key Points

• Centrifugal force refers to moving away from the center point.

• The centrifugal force is an inertial force also known as fictitious force or pseudo force which acts on all objects when viewed in a rotating frame of reference.

• Some examples of Centrifugal force are a Vehicle driving around a curve, the Weight of an object at the poles and on the equator, the rotation of the earth, a stone on a string, etc.

• Centripetal force refers to the net force that acts on an object to keep it moving along a circular path.

• The unit of centripetal force is Newton.

• Some examples of Centripetal force are spinning a ball on a string or twirling a lasso, Planets orbiting around the sun, Going through a loop on a roller coaster, and turning a car.

• Gravitational Force is always attractive in nature and the gravitational force of the Earth is equal to the force the Earth exerts on individuals.

• The gravitational force at rest, on or near the surface of the Earth is equal to the weight of the Individual.

• The normal force is the support force exerted upon an object that is in contact with another stable object.

• Example: If a toy is resting upon a surface, then the surface is exerting an upward force upon the toy to support its weight of the toy.

**Q36. Answer: (d) D**

Given, N's sister is M and M's daughter is the granddaughter of O.

Till statement i we can draw the following diagram:

Also, it is given from statement ii that, M's brother is N. Then, a the diagram which can be drawn from the second statement is:

Hence, N is O's son and in order to know the relationship between N and O we need both the statements.

**Q37. Answer: (c) B**

To make a meaningful paragraph the correct order is 'PSQR'.

Hence, 'PSQR' is the correct answer.

**Q38. Answer: (a) A**

Given:

We have to find the simplified value of {13 + [25 ÷ (3 + 7)] - (2 × 6)}

Concept Used:

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

Calculation:

{13 + [25 ÷ (3 + 7)] - (2 × 6)}

=> {13 + [25 ÷ 10] - 12}

=> {13 + 2.5 - 12}

=> 3.5

Therefore The required simplified value is 3.5.

**Q39. Answer: (d) A**

Given:

A can complete a work in 20 days.

B can complete a work in 15 days

Concept Used:

Total units of work is equal to the LCM of number of days required to complete the work.

Efficiency = Total units of work/Number of days taken

Calculation:

Total units of work, LCM of 20 and 15

Total units of work,

=> 60 units

Efficiency of A,

=> 60/20

=> 3 units/day

Efficiency of B,

=> 60/15

=> 4 units/day

B worked for 6 days and left,

Total units of work completed by B in 6 days,

=> 6 × 4

=> 24 units

Remaining units of work completed by A,

=> Remaining units of work = 60 – 24

=> Remaining units of work = 36 units

Time taken to complete the work,

=> 36/3

=> 12 days

Therefore A can complete the remaining work in 12 days

**Q40. Answer: (c) C**

Here, GARDEN is coded as 562701. The code for each alphabet of the word GARDEN is as follows:

G - 5, A - 6, R - 2, D - 7, E - 0, N - 1

and, code for the word FOREST is 342098. The code for each alphabet of the word FOREST is as follows:

F - 3, O - 4, R - 2, E - 0, S - 9, T - 8

Hence, the code for the word ARREST is 622098.

**Q41. Answer: (b) B**

Given:

Side of a cube is 4cm

Formula Used:

Total surface area of a cube = $6a^2$,

Where a is side of a cube

Calculation:

Using the formula,

=> $6 \times (4)^2$

=> 6 × 16

=> 96 sq.cm

Therefore The total surface area of a cube is 96 sq. cm.

Additional Information

When we have asked to find the Surface Area, it means that we are asked to find the Total Surface Area

**Q42. Answer: (c) C**

The correct answer is Star.

• Ring topology is a network topology in which each node connects to exactly two other nodes and forms a single continuous pathway for signals through each node- a ring.

• It performs better than a bus topology even under the heavy network load.

• Communication delay is directly proportional to the number of nodes in the network.

• They can be used to carry circuits or packets or the combination of both circuits or packets.

• An example of ring topology is Token Ring.

• Bus topology is a communication system that transfers data between computers or components inside a computer.

• Buses can be parallel buses (which carry data words in parallel on multiple wires) or serial buses (which carry data in bit-serial form).

• An example of internal computer buses is MBus, Multibus, Conventional PCI, SS-50 Bus, STEbus, etc.

• An example of external computer buses is Camera Link, Universal Serial Bus (USB), eSATA, High-Performance Parallel Interface (HIPPI), etc.

• Futurebus, Thunderbolt, QuickRing, etc are examples of internal and external computer buses.

• Star topology is an implementation of the spoke-hub distribution paradigm in computer networks.

• Every host is connected to the central network.

• All nodes (workplace and other devices) are directly connected to a common central computer, local area network (LAN) called

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Star topology.

• It works well under heavy load.

• The single point of failure for the network is the central hub.

• Tree topology has a root node and all other nodes are connected to it and form a hierarchy and also known as hierarchical topology.

• It is mostly used in Wide Area Network (WAN).

• It is an extension of bus and star topologies.

• It is a very expensive and heavily cabled topology.

• This topology can be easily managed and maintained.

Image of Star Topology:

**Q43. Answer: (b) C**

The correct answer is China.

• The Taklimakan Desert is the desert in southwest Xinjiang in Northwest China.

| Name of the Desert | Located in |
|---|---|
| Taklimakan Desert | China |
| Dasht-e-Loot Desert | Iran |
| Mojave Desert | United States of America |
| Dasht-e Margo Desert | Afghanistan |
| Colorado Plateau Desert | United States of America |
| Antarctica Desert | Antarctica |
| Chihuahuan Desert | Mexico |
| Gobi Desert | China and Mongolia |
| Namib Desert | Africa |
| Sahara Desert | Africa |
| Sonoran Desert | USA/ Mexico |
| Rub'al Khali | Saudi Arabia |
| Atacama Desert | Chile and Peru |
| Great Victoria Desert | Australia |
| Great Basin Desert | United States of America |

Additional Information

| Name of the Dessert | Located in |
|---|---|
| Dasht-e Kavir | Iran |
| Columbia Basin Desert | United States of America |
| Registan Desert | Afghanistan |
| Karakum Desert | Turkmenistan |
| Patagonian Desert | Argentina |
| Kyzylkum Desert | Kazakhstan, Turkmenistan, and Uzbekistan |
| Puntland Desert | Africa |
| Ferlo Desert | Senegal, Africa |
| Thar Desert | India/ Pakistan |
| Tabernas Desert | Spain |

Image of Taklimakan Desert:

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**Q44. Answer: (d) C**

Given:
Simple interest is Rs.18,900
Rate is 7%
Time is 3 years
Formula used:
A = P{1 + (R/100)}^T
CI = A - P
SI = (PRT)/100
where,
A is Amount,
P is Principal,
R is Rate,
CI is Compound interest,
SI is Simple interest
And, T is Time
Calculations:
According to the questions, we have
SI = (PRT)/100
=> 18,900 = (P × 7 × 3)/100
=> P = (18,900 × 100)/21
=> P = Rs. 90,000
Thus, Compound interest will be
A = P{1 + (R/100)}T
=> A = 90,000{1 + (7/100)}3
=> A = 90,000 × (107/100) × (107/100) × (107/100)
=> A = 1,10,25,387/100
=> A = 1,10,253.87
So, Compound interest is
CI = A - P
=> CI = 1,10,253.87 - 90,000
=> CI = Rs. 20,253.87
=> CI = Rs. 20,254
Therefore The compound interest is Rs. 20,254.

**Q45. Answer: (b) C**

The correct answer is Sulphur.
• The sulphur is the eye irritating compound that is released when cutting onions.
• The syn-Propanethial-S-oxide is the chemical irritant produced by an onion.
• This chemical stimulates the eyes' lachrymal glands which release tears.
• Previously scientists used to blame enzyme alinase for the instability of substances in a cut onion.
• In 2002, a study in Japan proved that lachrymatory factor synthase is responsible for irritation of the eyes.

**Q46. Answer: (d) C**

The correct answer is 1911.
• In 1911, New Delhi was made the capital of India.
• During the Delhi Durbar of 1911, Emperor George V had laid the foundation stone of New Delhi.
• It was designed by the two British architects Sir Edwin Lutyens and Sir Herbert Baker.
• The Viceroy and Governor-General Lord Irwin inaugurated the new Capital on 13th February 1931.
• During the British raj till December 1911, Calcutta was the capital of India.

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**Q47. Answer: (a) D**

To make a meaningful paragraph the proper order is 'QSRP'.

Hence, the correct order is 'QSRP'.

**Q48. Answer: (a) B**

The correct answer is Tyrannosaurus rex.

• The Tyrant Lizard King belongs to the family tyrannosaurids and is a species of Dinosauria. They are extinct and were carnivorous and could grow up to 12 meters.

| Original Name | Scientific Name |
|---|---|
| Bison | Bos Gaurus |
| Wolf | Canis Lupus |
| Leopard | Panthera Pardus |
| Fox | Vulpes Vulpes |
| Crocodile | Crocodylus Palustris |
| Buffalo | Babalus Bubalis |
| House Wall Lizard | HEmidactylus Flaviviridis |
| Cat | Felis Domesticus |
| Rabbit | Oryctolagus cuniculus |
| Tyrant Lizard King | Tyrannosaurus Rex |

Additional Information

| Original Name | Scientific Name |
|---|---|
| Chinkara | Gazella Bennettii |
| Elephant | Elephas Maximus |
| Peacock | Pavo Cristatus |
| Rhinoceros | Rhinoceros Unicornis |
| Horse | Equus Quagga |
| Arabian Camel | Camelus Dromedaries |
| Rhesus Monkey | Macaca Mulatta |
| Black Rat | Rattus Rattus |
| House Sparrow | Passer Domesticus |
| Common Myna | Acridotheres Tristis |

Image of Tyrannosaurus Rex:

**Q49. Answer: (b) B**

Given:

tan A + cot A = 2

Calculations:

According to the question, we have

tan A + cot A = 2

Squaring both sides, we get

=> $(\tan A + \cot A)^2 = (2)^2$

=> $\tan^2 A + \cot^2 A + 2(\tan A)(\cot A) = 4$

=> tan2 A + cot2 A + 2(tan A)(1/tan A) = 4

=> tan2 A + cot2 A + 2 = 4

=> tan2 A + cot2 A = 2

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Therefore The value of tan2 A + cot2 A is 2.
Put the value of A = 45°, we get
=> tan 45° + cot 45°
=> 1 + 1
=> 2
Therefore The value of tan2 A + cot2 A is 2.

**Q50. Answer: (c) D**

Given:
Jeeva got 492
If she gets 12 marks more, her percentage will be 84%.
Calculation:
Her marks on 84%,
=> 492 + 12
=> 504
On 84% her marks will be 504.
=> 84% = 504
=> 1% = 504/84
Maximum marks i.e.100%
=> 100 × 504/84
=> 600
Therefore The maximum marks are 600.

**Q51. Answer: (c) C**

Given:
A garden diameter is 22 m
A playground having radius of 4 m
Formula used:
Area of circle = $\pi r^2$
where,
r is Radius of the circle
Calculations:
The radius of the garden is 22/2 = 11 m
According to the question, we have
The area of the garden is
=> Area = (22/7) × 11 × 11
=> Area = 380.28 $m^2$
And, Radius of the playground is 4 m
The area of the playground is
=> Area = (22/7) × 4 × 4
=> Area = 50.28 $m^2$
The remaining area is
=> Remaining area = 380.28 - 50.28
=> Remaining area = 330 $m^2$
Therefore The remaining area of a circular field is 330$m^2$.

**Q52. Answer: (d) B**

Given:
Given fraction is 13/55
Concept used:
Division method
Calculations:
According to the question, we have

Therefore The decimal form of 13/55 is 0.236.

**Q53. Answer: (c) B**

The least possible Venn diagram for the given statements is as follows:

Conclusions:

I. some chairs are doors → False (As no window is door)

II. No door is Window → True

Hence, option 3 is the correct answer.

**Q54. Answer: (d) D**

Given:

product of any two prime numbers except the smallest one

Calculation:

Prime numbers are 2, 3, 5, 7, ...

The smallest prime number is 2

So it can not be used in further calculation.

Product of any prime numbers,

Randomly picking from the above numbers,

=> 3 × 5 = 15

=> 11 × 9 = 99

and so on

Now we can say that the product will always be Odd number,

Therefore The product will always be Odd number.

**Q55. Answer: (b) B**

Here, PAINT is coded as follows:

P - 2, A - 1, I - 5, N - 6, T - 3

and, SHOT is coded as follows:

S - 8, H - 5, O - 0, T - 3

Hence, the code for the word TOAST will be 30183.

**Q56. Answer: (d) D**

Given:

A train covers a distance of 435 km

Time taken by train is 2 hours 30 minutes.

Concept used:

To convert the speed from km/hr into m/s

m/s = (5/18) × km/hr

Formula used:

Speed = Distance/Time

Calculations:

We can write 2 hours 30 minutes as 2.5 hours

According to the question, we have

Speed = Distance/Time

=> Speed = 435/2.5

=> Speed = 174 km/hr

To convert into m/s, multiply it by 5/18

=> Speed = 174 × (5/18)

=> Speed = 48.33 m/s

Therefore The speed of train is 48.33 m/s.

**Q57. Answer: (b) A**

Given:

Profit/loss sharing ratio of X, Y and Z = 1/3 : 1/2 : 1/6

Share of Z = Rs. 1,76,802

Calculation:

LCM of 3, 2 and 6 = 6

Then, Profit/loss sharing ratio of X, Y and Z = 2 : 3 : 1

Share of Y = (3/1) × Share of Z

=> 3 × Rs. 1,76,802

=> Rs. 5,30,406

Therefore Rs. 5,30,406 is received by Y.

**Q58. Answer: (c) C**

To form a meaningful paragraph the correct order is 'QSRP'.

Hence, QSRP is the correct answer.

**Q59. Answer: (a) B**

The Correct Answer is "B".

Important Points

• The Cabinet Mission Plan was a statement made by the Cabinet Mission and the Viceroy, Lord Wavell, on May 16, 1946, that contained proposals regarding the constitutional future of India in the wake of Indian political parties and representatives not coming to an agreement.

• The members of the Cabinet Mission were: Lord Pethick-Lawrence, Secretary of State for India, Sir Stafford Cripps, President of the Board of Trade, and A.V Alexander, First Lord of Admiralty.

• In September 1945, the newly elected Labour government in Britain expressed its intention of creating a Constituent Assembly for India that would frame India's Constitution; the Cabinet Mission was sent to India in March 1946 to make this happen.

• The Mission had to deal with a major obstacle: the two main political parties – the Indian National Congress and the Muslim League – had fundamental differences over India's future.

• The Muslim League wanted the Muslim majority provinces of India to constitute a separate sovereign state of Pakistan, the Congress wanted a united India.

• The Mission, at the Shimla Conference, attempted to facilitate an agreement between the Muslim League and the Congress.

• When this failed, the Mission came out with its own proposals known as the Cabinet Mission Plan.

Key Points

Objectives of Cabinet Mission were :

• To formulate a constitution-making body (the Constituent Assembly of India).

• To establish an Executive Council with the support of the major Indian parties.

• To obtain an agreement with the Indian leaders as to the framing of a constitution for India.

**Q60. Answer: (c) C**

The given information can be depicted through a family tree using following symobls:

Family tree-

Hence, the girl is boy's sister.

**Q61. Answer: (b) D**

The shaded portion represents those people who live in a joint family but are neither unmarried nor doctors

Hence, the number which represents those people who live in a joint family but are neither unmarried nor doctors is 1.

**Q62. Answer: (d) C**

The shaded portion represents unmarried doctors living in a joint family.

Hence, the number which represents unmarried doctors living in a joint family is '4'.

**Q63. Answer: (c) A**

The shaded portion represents unmarried persons living in joint families who are not doctors.

Hence, the number which represents unmarried persons living in joint families who are not doctors is '2'.

**Q64. Answer: (a) A**

The Correct Answer is "A".

Important Points

• Brij Bhushan Sharan Singh was elected to the 10th Lok Sabha from Gonda constituency in Uttar Pradesh state (India) as a Bharatiya Janata Party (BJP) candidate.

• He was re-elected to the 13th Lok Sabha in 1999 from the same constituency and in 2004, he was re-elected to the 14th Lok Sabha from the Balrampur constituency in Uttar Pradesh state on the BJP ticket.

• On 20 July 2008, he joined the Samajwadi Party.

• In 2009, he was re-elected to 15th Lok Sabha from Kaiserganj constituency in Uttar Pradesh state.

• He later joined the Bharatiya Janata Party months before the 16th general election and is currently a member of the 17th Lok Sabha from BJP.

• He is the President of the Wrestling Federation of India (WFI).

• During the General Body Meeting of the South Asian Wrestling Federation held on February 5 here during the 12th SAF Games, Brijbhushan was unanimously elected president.

• Tibur Rehman from Bangladesh was also unanimously elected secretary-general.

**Q65. Answer: (a) B**

Given:

We have to find the simplified value of (√ 32 - √ 18)/(√ 50 + √ 8)

Concept Used:

Concept of rationalisation: When an irrational number came in the denominator in a fraction then it becomes difficult in the calculation. To avoid this problem we multiply something with both numerator and denominator so that the denominator part become rational. This process is known as rationalisation.

In general, the process to make an irrational number to a rational number is called rationalisation.

Calculation:

(√ 32 - √ 18)/(√ 50 + √ 8)

=> (√ 32 - √ 18) × (√50 - √8)/(√ 50 + √ 8)× (√50 - √8)

=> √32 × 50 - √ 32 × 8 - √ 18 × 50 + √ 18 × 8 over (50 - 8)

=> 40 - 16 - 30 + 12 over 42

=> 6/42

=> 1/7

Therefore The required simplified value is 1/7.

Shortcut Trick

(√ 32 - √ 18)/(√ 50 + √ 8)

=> (√ 16 × 2 - √ 9 × 2)/(√ 25 × 2 + √4 × 2)

=> (4√2 - 3√2)/(5√2 + 2√2)

=> √2/7√2

=> 1/7

Therefore The required simplified value is 1/7

**Q66. Answer: (d) D**

The Correct Answer is "D".

Important Points

• Karna is one of the major characters of the Hindu epic Mahābhārata.

• He is the spiritual son of the Vedic deity- Surya ("sun god") and princess Kunti (mother of the Pandavas), and thus a demigod of royal birth.

• Kunti was granted the boon to bear a child with desired divine qualities from the gods without her knowledge, later upon learning about the boon, a surprised and worried Kunti invoked the sun god to confirm it if it was true indeed.

• Karna was secretly born to an unmarried Kunti in her teenage, fearing outrage and backlash from society over her premarital pregnancy, Kunti had no choice but to abandon the newly born Karna adrift in a basket on the Ganges, in the hope that he finds foster parents.

• The basket discovered and Karna is adopted and raised by foster Suta parents named Radha and Adhiratha Nandana of the charioteer and poet profession working for king Dhritarashtra.

• He is a tragic hero in the Mahabharata, in a manner similar to Aristotle's literary category of "flawed good man".

• Rama(son) Shanta(daughter) Kaushalya was the queen of the Kosala Kingdom and the mother of Rama.

• In the Hindu epic, Ramayana, Kaushalya was the wife of King Dasharatha, the mother of Lord Rama, and the eldest queen of Ayodhya.

• She was also the mother of Shanta.
• Her cowives were Sumitra and Kaikeyi.

**Q67. Answer: (d) C**

As book always has pages. Similarly Window should have Window glass.

Hence, "Window glass" is the correct answer.

**Q68. Answer: (b) B**

The Correct Answer is "B".

Important Points

• Karats are not used in silver.
• 999 silver pure silver is not used in jewelry in which minimal hardness is required.
• 925 silver also known as sterling silver is the most common alloy used in the manufacture of silver jewelry and other fine silver items.
• The silver purity levels generally accepted in Israel are:
• 99.9% purity – 999 thousandths.
• 92.5% purity – 925 thousandths.
• 83.5% purity – 835 thousandths.
• 80% purity – 800 thousandths.
• Sterling silver is an alloy of silver containing 92.5% by weight of silver and 7.5% by weight of other metals, usually copper.
• The sterling silver standard has a minimum millesimal fineness of 925.

**Q69. Answer: (a) C**

The Correct Answer is "C".

Important Points

• Tata Motors had renamed its hatchback Zica after the outbreak of the Zika virus.
• Automobile maker Tata Motors had renamed its new hatchback Zica as Tiago.
• The company had decided to rename the car, which was showcased at the Auto Expo 2016 in New Delhi in February 2016, following its resemblance to the Zika virus.
• Tiago became the chosen name from the final three entries – Tiago, Civet, and Adore - that was opened up for audience voting.
• Tata Motors Limited is an Indian multinational automotive manufacturing company headquartered in Mumbai, Maharashtra, India.
• It is a part of Tata Group, an Indian conglomerate.
• Its products include passenger cars, trucks, vans, coaches, buses, sports cars, construction equipment, and military vehicles.
• Formerly it was known as Tata Engineering and Locomotive Company (TELCO).

Additional Information

• Zika virus is a member of the virus family Flaviviridae.
• It is spread by daytime-active Aedes mosquitoes, such as A. aegypti and A. albopictus.
• Its name comes from the Ziika Forest of Uganda, where the virus was first isolated in 1947.

**Q70. Answer: (a) C**

Possible family tree diagram for option C is :

M-C%F%N → M is the grandson of N.

Hence, option 1 is correct.

**Q71. Answer: (a) A**

Given:

| Varieties | Quantity left | Selling Price/kg |
|---|---|---|
| Brand-A | 274 kg | Rs. 252 |
| Brand-B | 197 kg | Rs. 280 |
| Brand-C | 54 kg | Rs. 316 |

New Selling Price of mixture = Rs. 283.50 per kg

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Calculation:

Total selling price of Brand A = 274 × 252 = Rs. 69,048

Total selling price of Brand B = 197 × 280 = Rs. 55,160

and Total selling price of Brand C = 54 × 316 = Rs. 17,064

Sum of quantities = 274 + 197 + 54 = 525 kg

Total selling price of (A + B + C) = Rs. 69,048 + Rs. 55,160 + Rs. 17,064

=> Rs. 1,41,272

New selling price of (A + B + C) = Rs. 283.50 × 525 kg

=> Rs. 1,48,837.50

Now, Profit = Rs. 1,48,837.50 - Rs. 1,41,272

=> Rs. 7,565.50

Therefore Rs. 7,565.50 is the profit of the tea merchant on the sale.

**Q72. Answer: (c) B**

The Correct Answer is "B".

Important Points

• The photosphere is a star's outer shell from which light is radiated.

• The photo meaning "light", in reference to it being a spherical surface that is perceived to emit light.

• It extends into a star's surface until the plasma becomes opaque, equivalent to an optical depth of approximately 2⁄3, or equivalently, a depth from which 50% of the light will escape without being scattered.

• A photosphere is the deepest region of a luminous object, usually a star, that is transparent to photons of certain wavelengths.

Key Points

• Sunspot: A dark spot on the photosphere of the sun.

• Solar flare:A brief burst of energy from the sun's photosphere.

• Solar wind: A fast-moving stream of particles thrown into space by solar flares.

• Photosphere: The visible surface of the sun.

• Corona: The sun's atmosphere.

Additional Information

• The Sun is composed primarily of the chemical elements hydrogen and helium; they account for 74.9% and 23.8% of the mass of the Sun in the photosphere, respectively.

• All heavier elements, called metals in astronomy, account for less than 2% of the mass, with oxygen (roughly 1% of the Sun's mass), carbon (0.3%), neon (0.2%), and iron (0.2%) being the most abundant.

• The Sun's photosphere has a temperature between 4,500 and 6,000 K (4,230 and 5,730 °C).

**Q73. Answer: (d) C**

The Correct Answer is "C".

Important Points

• On March 15, 1962, President John F. Kennedy presented a speech to the United States Congress in which he extolled four basic consumer rights, later called the Consumer Bill of Rights.

• The United Nations through the United Nations Guidelines for Consumer Protection expanded these into eight rights, and Consumers International adopted these rights as a charter and started recognizing March 15 as World Consumer Rights Day.

Key Points

The Eight Rights are :

• The right to safety :

• The assertion of this right is aimed at the defense of consumers against injuries caused by products other than automobile vehicles and implies that products should cause no harm to their users if such use is executed as prescribed.

• The right to be informed

• This right states that businesses should always provide consumers with enough appropriate information to make intelligent and informed product choices. The product information provided by business should always be complete, truthful, and also appropriate.

• The right to choose :

• The right to free choice among product offerings states that consumers should have a variety of options provided by different companies from which to choose.

• The right to be heard :

• This right has the ability of consumers to voice complaints and concerns about a product in order to have the issue handled efficiently and responsively. While no federal agency is tasked with the specific duty of providing a forum for this interaction between consumer and producer, certain outlets exist to aid consumers if difficulty occurs in communication with an aggrieving party.

• The right to satisfaction of basic needs :

• This right demands that people have access to basic, essential goods and services: adequate food, clothing, shelter, health care, education, public utilities, water.

• The right to redress :

• The right to redress provides for consumers to receive a fair settlement of just claims, including compensation for misrepresentation, shoddy goods, or unsatisfactory services. For example, a consumer should be able to go to consumer court against mobile phone companies that put hidden charges on the bill that were not previously explained, or activate ringtones without the parent/legal guardian's permission.

• The right to consumer education :

• The right to consumer education states that consumers should be able to acquire knowledge and skills needed to make informed, confident choices about goods and services while being aware of basic consumer rights and responsibilities and how to act on them.

• The right to a healthy environment :

• This is the right to live and work in a workspace or home that is non-threatening to the well-being of present and future generations.

**Q74. Answer: (c) B**

The Correct Answer is "B".

Important Points

• Ghulam Nabi Azad is a politician of the Indian National Congress.

• He served as the Leader of Opposition in Rajya Sabha until 2021 February.

• He has served as the Parliamentary Affairs Minister of India in the government of former Prime Minister Manmohan Singh.

• On 27 October 2005, he was appointed as the Chief Minister of Jammu and Kashmir.

• Hee was nominated as the President of the Jammu and Kashmir Pradesh Youth Congress.

• In 1980, he was appointed as the President of the All-India Youth Congress.

Key Points

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

• It currently has a maximum membership of 245, of which 233 are elected by the legislatures of the states and union territories using single transferable votes through Open Ballot while the President can appoint 12 members for their contributions to art, literature, science, and social services.

• The potential seating capacity of the Rajya Sabha is 250 (238 elected, 12 appointed), according to article 80 of the Indian Constitution.

**Q75. Answer: (d) B**

Given:

The median of the set is 17.

Formula Used:

When number of observation (n) is even,

Median = (Value of (n/2)th observation + Value of (n/2 + 1)th observation)/2

Calculation:

Here, n = 10,

n/2 = 10/2 = 5

and (n/2) + 1 = (10/2) + 1 = 5 + 1 = 6

Value of (n/2)th observation = Value of 5th observation = (x + 1)

and Value of [(n/2) + 1]th observation = Value of 6th observation = (x + 3)

Then, Median = 17

=> [(x + 1) + (x + 3)]/2 = 17

=> 2x + 4 = 34

=> 2x = 30

=> x = 15

Therefore 15 is the value of x.

**Q76. Answer: (c) D**

Given:

Ratio of girls to boys = 5 : 3

Total capacity of class = 48

Percentage of girls absent = 16.67%

Calculation:

Number of girls in the class = [5/(5 + 3)] × 48

=> (5/8) × 48

=> 30

Now, number of girls present = [1 - (16.67/100)] × 30

=> [1 - (1/6)] × 30

=> (5/6) × 30

=> 25

Therefore 25 girls are present in the class.

Important Points

16.67% = 100/600 = 1/6

**Q77. Answer: (d) D**

The logic follows here is:

| Option | Word | Meaning |
|---|---|---|
| A. | Gloomy | Partially or totally dark or sad. |
| B. | Dire | Very bad or serious |
| C. | Patient | Able to stay calm and not get angry |
| D. | Protesting | To say or show that you do not approve of or agree with something, especially publicly. |

Cheerful (Happy) is the antonym of Sad.

Similarly,

Tolerant (the ability to allow or accept something that you do not like or agree with) is the antonym of Protesting.

Hence, the tolerant is from protesting.

**Q78. Answer: (a) A**

The Correct Answer is "A".

Important Points

• Kollam is one of the ancient civilizations in India.

• Kollam is the oldest port city on the Malabar Coast and was the capital city of the historic Venad Kingdom and the Travancore Kingdom.

• Quilon was one of the most important trading ports in India. It was also known as Desinganadu.

• Kollam is world-famous for its historic importance and business culture. It is now known as the “Cashew Capital of the World”.

Key Points

• the city of Kollam(Quilon) has played a vital role in the business, economical, cultural, religious, and political history of Asia and the Indian sub-continent.

• Even the Malayalam calendar(Kollavarsham) is also known so with the name of the city Kollam.

• The city of Quilon is mentioned in historical citations dating back to Biblical times and the reign of King Solomon, connecting with Red Sea ports of the Arabian Sea (supported by a find of ancient Roman coins).

• The teak wood used in building King Solomon’s throne was taken from Kollam.

• Desinganadu, the old name of Kollam, had a sustained commercial reputation from the days of the Phoenicians, Chinese, Arabs, Dutch, and the Romans.

• It is closely related to the ancient and modern life of Keralites through Kollavarsham, Tharisapalli plates, the arrival of Christianity in Kerala.

Additional Information

• The history of the district of Kollam as an administrative unit can be traced back to 1835 when the Travancore state consisted of

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two revenue divisions with headquarters at Kollam and Kottayam.

• During the integration of Travancore and Cochin states in Kerala in 1949, Kollam was one of the three revenue divisions in the state.

**Q79. Answer: (a) A**

Given:

Principal amount = Rs. 23,465

Rate of Interest = 7.5%

Formula used:

S.I = (P × R × T)/100

Amount = P(1 + R/100)^T

Where, S.I = Simple Interest,

P = Principal,

R = Rate of Interest,

T = Time,

C.I = Compound Interest

Calculation:

S.I for 2nd year = (P × R × T)/100

=> (Rs. 23,465 × 7.5 × 1)/100

=> Rs. 1,759.87

=> Rs. 1,760 (approx)

In 1st year, C.I is equal to S.I.

C.I for 1st year = (P × R × T)/100

=> (Rs. 23,465 × 7.5 × 1)/100

=> Rs. 1,759.87

=> Rs. 1,760 (approx)

Now, we do not need to take principal amount to find 2nd year C.I. Just take 1st year C.I amount as principal

C.I for 2nd year (Amount) = P(1 + R/100)T

=> Rs. 1,760 × $[1 + (7.5/100)]^1$

=> Rs. 1,760 × (1075/1000)

=> Rs. 1,892

So, Required difference = C.I for 2nd year - S.I for 2nd year

=> Rs. 1,892 - Rs. 1,760

=> Rs. 132

Therefore Rs. 132 is the difference between the simple interest and compound interest in the 2nd year.

Shortcut Trick

Formula used:

Second year difference of C.I and S.I

=> $P(R/100)^2$

=> $23465(7.5/100)^2$

=> 1319906.25/10000

=> 131.99

=> Rs. 132

Therefore Rs. 132 is the difference between the simple interest and compound interest in the 2nd year.

**Q80. Answer: (b) B**

The Correct Answer is "B".

Key Points:

• Typing a formula in a cell or the formula bar is the most straightforward method of inserting basic Excel formulas.

• The process usually starts by typing an equal sign, followed by the name of an Excel function.

Additional Information

• Select a cell.

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• Type the equal sign =.
• • select cell
• Enter an operator. For example, – for subtraction.
• Select the next cell, or type its address in the selected cell.
• next cell
• • Press Enter. The result of the calculation appears in the cell with the formula.

**Q81. Answer: (d) D**

Given:
a - b = 5
$a^2 + b^2 = 31$
Formula used:
$(a - b)^2 = a^2 + b^2 - 2ab$
Calculation:
(a - b)2 = a2 + b2 - 2ab
=> $5^2 = 31 - 2ab$
=> 25 = 31 - 2ab
=> 2ab = 31 - 25
=> 2ab = 6
=> ab = 3
Therefore The value of ab is 3.

**Q82. Answer: (b) C**

The Correct Answer is "C".
Important Points
• Temple Trees is the official residence of the Prime Minister of Sri Lanka.
• The prime minister of the Democratic Socialist Republic of Sri Lanka is the deputy head of government of Sri Lanka and the most senior member of parliament in the cabinet of ministers in Sri Lanka which is collectively accountable for their policies and actions to parliament.
• On 21 November 2019, Mahinda Rajapaksa was appointed as the prime minister for the 3rd time, following the resignation of Ranil Wickremesinghe, upon the election victory of his brother, Gotabaya as the president of Sri Lanka.
Additional Information
• Sri Lanka, officially the Democratic Socialist Republic of Sri Lanka, is an island country in South Asia, located in the Indian Ocean southwest of the Bay of Bengal and southeast of the Arabian Sea.
• Sri Lanka has been called “the pearl of the Indian ocean” because of its shape and location.
• As of May 2022:
• Gotabaya Rajapaksa is the present president of Srilanka.
• Ranil Wickremesinghe is the present PM of Srilanka.

**Q83. Answer: (d) B**

The Correct Answer is "B".
Important Points
• Thiruvalluvar was the author of the book ‘Tirukkural (also known as the Kural).
• It is a classic Tamil Sangam literature consisting of 1330 couplets or Kurals.
• The book is also called the fifth Veda or ‘Bible of the Tamil Land’.
• The Tirukkural, or shortly the Kural, is a classic Tamil language text consisting of 1,330 short couplets of seven words each, or kurals.
• The text is divided into three books with aphoristic teachings on virtue (Aram), wealth (porul), and love (inbam), respectively.
• Considered one of the greatest works on ethics and morality, it is known for its universality and secular nature.
• Its authorship is traditionally attributed to Valluvar, also known in full as Thiruvalluvar.
• The text has been dated variously from 300 BCE to 5th century CE.
• It emphasizes non-violence and moral vegetarianism as virtues for an individual.

Additional Information

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• The 12-foot-tall stone statue of renowned Tamil poet and philosopher-saint Thiruvalluvar was inaugurated at Mela Bhawan in Haridwar, Uttarakhand by Chief minister Harish Rawat.

• The process of introducing the Thiruvalluvar statue in Uttarakhand was initiated by the former Bharatiya Janata Party (BJP) MP from Uttarakhand Tarun Vijay.

**Q84. Answer: (d) B**

Given:

The initial number of students is 1200

School canteen buys 3200 kg lentils for 20 days

After 6 days later 180 children left.

Concept used:

Here we can use the unitary method

Calculation:

1200 students in 20 days can consume 3200 kg lentils

=> 1200 students in 1 day consume = (3200/1200) kg

=> 1 student in 1 day consumes = {3200/(1200 × 20)} kg = 2/15 kg

=> 1200 students in 6 days consume = {(2/15) × 1200 × 6} kg = 960 kg

Now, the remaining lentils = (3200 - 960) kg = 2240 kg

So, the remaining students = (1200 - 180) = 1020

Let the required day be D to consume the remaining lentils

So, according to the question, we can say

(2/15) × 1020 × D = 2240

=> D = (280/17) = 16.47 ≈ 16.5 days

Therefore In 16.5 more days will be sufficient for the remaining children to finish the remaining lentils.

**Q85. Answer: (d) C**

The following table has been used to show English Alphabets and their positional Values:

The pattern followed here is,

All other options except option 4 i.e. series C doesn't follow this pattern.

Hence, option 4 is different.

**Q86. Answer: (d) A**

The Correct Answer is "A".

Important Points

• An intangible asset is an asset that is not physical in nature. Goodwill, brand recognition and intellectual property, such as patents, trademarks, and copyrights, are all intangible assets. Intangible assets exist in opposition to tangible assets, which include land, vehicles, equipment, and inventory.

• Financial assets such as stocks and bonds, which derive their value from contractual claims, are considered tangible assets.

• Businesses can create or acquire intangible assets.

• An intangible asset can be considered indefinite (a brand name, for example) or definite, like a legal agreement or contract.

• Intangible assets created by a company do not appear on the balance sheet and have no recorded book value.

• While an intangible asset doesn't have the obvious physical value of a factory or equipment, it can prove valuable for a firm and be critical to its long-term success or failure.

• For example, a business such as Coca-Cola wouldn't be nearly as successful if it not for the money made through brand recognition.1 Although brand recognition is not a physical asset that can be seen or touched, it can have a meaningful impact on generating sales.

**Q87. Answer: (b) B**

The Correct Answer is "B".

Important Points

• World Wildlife Day is observed on 3rd March.

• World Wildlife Day is observed every year to celebrate and raise awareness about the world’s wild fauna and flora. It is celebrated to mark the signing of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) on this day in 1973.

• The 2020 observation is on the theme of ‘Sustaining all life on earth’.

**Q88. Answer: (a) C**

Given:

The initial number of sweepers is 42

The initial number of days is 25

After 10 days 12 sweepers left.

The remaining work has to be finished in 10 days.

Concept used:

Here, we can use the unitary method

Formula used:

W1/W2 = (M1D1)/(M2D2)

Where W1 is initial work, W2 is remaining work,

M1 is the initial number of men, M2 is the final number of men

D1 is the initial number of days, D2 final number of days

Calculation:

42 sweepers in 25 days can complete 1 unit of work

42 sweeper in 10 days can complete = (10/25) unit of work = 2/5 unit of work

So, the remaining work is = (1 - 2/5) = 3/5 unit of work

So, the remaining sweepers = (42 - 12) = 30

Now, according to the question, M1 = 42, D1 = 10, D2 = 10

Let the required number of sweepers be X

So, the total number of sweeper M2 = (30 + X)

Now, we can say

(2/5)/(3/5) = (42 × 10)/{(30 + X) × 10}

=> 2/3 = 42/(30 + X)

=> 30 + X = 63

=> X = 33

Therefore 33 more cleaning workers need to be hired.

**Q89. Answer: (c) B**

Given:

The largest number when divides 1250 leaves the remainder 4

The same number when divides 1615 leaves the remainder 5

Formula used:

Dividend = (Divisor × Quotient) + Remainder

Calculation:

The largest number divided by 1250 leaves the remainder 4

So, after subtracting the remainder we will get = 1250 - 4 = 1246

The largest number divided by 1615 leaves the remainder 5

So, after subtracting the remainder we will get = 1615 - 5 = 1610

Now, the HCF of 1246 and 1610 is = 14

Therefore The largest number is 14 which, when divided 1250 and 1615, leaves the remainder 4 and 5 respectively.

**Q90. Answer: (a) B**

The Correct Answer is "B".

Explanation :

Important Points

• Asad Rauf is a Pakistani former umpire and cricketer who is banned for his involvement in spot-fixing.

• He was a member of the ICC Elite Umpire Panel from 2006 to 2013, and is alleged to have been involved in match-fixing and spot-fixing of cricket matches.

• In February 2016, Rauf was found guilty of corruption by the BCCI and banned for five years.

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**Q91. Answer: (c) C**

The Correct Answer is "C".

Explanation :

Important Points

• Aryabhata was India's first satellite, named after the famous Indian astronomer.

• It was launched on 19 April 1975 from Kapustin Yar, a Russian rocket launch and development site in Astrakhan Oblast using a Kosmos-3M launch vehicle.

• It was built by the Indian Space Research Organisation.

• The launch came from an agreement between India and the Soviet Union directed by UR Rao and signed in 1972.

• It allowed the USSR to use Indian ports for tracking ships and launching vessels in return for launching various different Indian satellites.

• It was named after the 5th-century astronomer and mathematician from India by the same name.

• The satellite's image appeared on the reverse of Indian two rupee banknotes between 1976 and 1997.

Additional Information

• The Indian satellite program began to take shape in the early 1970s, although local scientists had long dreamed of an indigenous Indian program since the time of Sputnik.

• The Indian Space Research Organisation focuses on building indigenous satellites.

• Vikram Sarabhai, the ISRO founder and a renowned physicist who also had a role in the development of India’s nuclear industry, appointed a team of 25 engineers and researchers at the Physical Research Laboratory in Ahmedabad.

**Q92. Answer: (a) D**

The Correct Answer is "D".

Important Points

• When methane burns, $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$.

• When methane burns in presence of air or oxygen, it produces a large amount of heat, along with carbon dioxide and water vapour formation.

Additional Information

• Methane is a chemical compound with the chemical formula $CH_4$ (one atom of carbon and four atoms of hydrogen).

• It is a group-14 hydride and the simplest alkane and is the main constituent of natural gas.

• The largest reservoir of methane is under the seafloor in the form of methane clathrates.

• When methane reaches the surface and the atmosphere, it is known as atmospheric methane.

**Q93. Answer: (d) B**

Given:

The government deducted 35% tax on the lottery money

After that, John got 7/8 part and the ticket seller received the remaining

Calculation:

Let the total amount of money be 100x

So, after deducting 35% tax remaining money will be 65x

Now, John got 7/8 part of the money

So, remaining money = (1 - 7/8) = 1/8

1/8 part of the money received by the ticket seller.

So, according to the question, we can say

65x × 1/8 = 22343.75

=> x = 2750

=> 100x = 275,000

Therefore The total amount of lottery money is Rs. 275,000.

**Q94. Answer: (a) D**

The Correct Answer is "D".

Important Points

• H.L. Dattu the chairman of the National Human Rights Commission.

• The National Human Rights Commission (NHRC) of India is a Statutory public body constituted on 12 October 1993 under the Protection of Human Rights Ordinance of 28 September 1993.

• It was given a statutory basis by the Protection of Human Rights Act, 1993 (PHRA).

Functions of NHRC

• The Protection of Human Rights Act mandates the NHRC to perform the following:

• Proactively or reactively inquire into violations of human rights by the government of India or negligence of such violation by a public servant.

• The protection of human rights and recommend measures for their effective implementation.

• Review the factors, including acts of terrorism that inhibit the enjoyment of human rights, and recommend appropriate remedial measures.

• To study treaties and other international instruments on human rights and make recommendations for their effective implementation.

• Undertake and promote research in the field of human rights.

• To visit jails and study the condition of inmates.

• Encourage the efforts of NGOs and institutions congress to work in the field of human rights.

• It considers the necessity for the protection of human rights.

• Requisitioning any public record or copy thereof from any court or office.

Key Points

• The National Human Rights Commission (NHRC) is a statutory body that was constituted by the Act passed in the Parliament. it is comprised of a speaker and 4 members; hence this is a multilateral institution.

• The Chairman and Members of the National Human Rights Commission are not appointed by the President alone but by a 6-member committee which is headed by the Prime Minister.

• The tenure of the chairman of the National Human Rights Commission for five years or until he is 70 years old (whichever is earlier).

**Q95. Answer: (c) C**

The Correct Answer is "C".

Important Points

• The Eighth Schedule of the Indian Constitution lists 22 languages.

• These are 22 languages mentioned in the 8th Schedule.

• 1) Assamese, (2) Bengali, (3) Gujarati, (4) Hindi, (5) Kannada, (6) Kashmiri, (7) Konkani, (8) Malayalam, (9) Manipuri, (10) Marathi, (11) Nepali, (12) Oriya, (13) Punjabi, (14) Sanskrit, (15) Sindhi, (16) Tamil, (17) Telugu, (18) Urdu (19) Bodo, (20) Santhali, (21) Maithili and (22) Dogri.

Additional Information

• Article 343 of the Indian constitution stated that the official language of the Union is Hindi in Devanagari script instead of extant English.

• However, there is no national language in India.

• Article 343 of the Indian constitution specifically mentions that "The official language of the Union shall be Hindi in Devanagari script.

• English is allowed to be used for official purposes such as parliamentary proceedings, judiciary, communications between the Central Government and a State Government.

Key Points

• The Constitution of India is the supreme law of India.

• It was adopted by the Constituent Assembly of India on 26 November 1949 and became effective on 26 January 1950.

• The constitution replaced the Government of India Act 1935 as the country's fundamental governing document, and the Dominion of India became the Republic of India.

**Q96. Answer: (a) A**

The correct answer is "A".

Important Points

• Wing Commander Rakesh Sharma is a former Indian Air Force pilot who flew aboard Soyuz T-11 on 3 April 1984 with the Soviet Interkosmos program.

• He flew 21 combat missions in a MiG-21 in the Bangladesh war of 1971.

• On April 3, 1984, he flew onboard Soyuz T-11 with two Soviet cosmonauts, commander Yury Malyshev and flight engineer Gennady Strekalov, to the space station Salyut 7.

• In 1987 he joined the Indian company Hindustan Aeronautics as its chief test pilot.

• He left Hindustan Aeronautics in 2001 and became chairman of the board of Automated Workflow, a process-management

company based in Bangalore (Bengaluru).

Key Points

• Sharma has conferred the honor of the Hero of the Soviet Union upon his return from space.

• India also conferred its highest peacetime gallantry award, the Ashoka Chakra, on him and the two Soviet members of his mission, Malyshev, and Strekalov.

Additional Information

• The Rockwell X-30 was an advanced technology demonstrator project for the National Aero-Space Plane (NASP), part of a United States project to create a single-stage-to-orbit (SSTO) spacecraft and passenger spaceliner.

• Started in 1986, it was canceled in the early 1990s before a prototype was completed, although much development work in advanced materials and aerospace design was completed.

• The Spiral-EPOS program was also known as the Experimental Passenger Orbital Aircraft (EPOS).

• Work on this project began in 1965, with the project being halted in 1969, only to be restarted in 1974 in response to the U.S. Space Shuttle Program.

• Mercury-Atlas 9 was the final crewed space mission of the U.S. Mercury program, launched on May 15, 1963, from Launch Complex 14 at Cape Canaveral, Florida.

• The spacecraft, named Faith 7, completed 22 Earth orbits before splashing down in the Pacific Ocean, piloted by astronaut Gordon Cooper, then a United States Air Force major.

• The Atlas rocket was No. 130-D, and the Mercury spacecraft was No. 20. This mission marks the last time an American was launched alone to conduct an entirely solo orbital mission.

**Q97. Answer: (b) x23 - 14a**

Given:

{[(x4)3 - 2a] [(x2a + 1)a]} ÷ {[(x3a - 5)2] [(xa + 1)2a - 1]}

Formula used:

(x^a)^b = x^(ab)

(x^a) × (x^b) = x^(a + b)

(x^a) ÷ (x^b) = x^(a - b)

Calculation:

{[(x4)3 - 2a] [(x2a + 1)a]} ÷ {[(x3a - 5)2] [(xa + 1)2a - 1]}

= {[x^(12 - 8a)][x^(2a² + a)]} ÷ {[x^(6a - 10)][x^(2a² + a - 1)]}

= {x^(12 - 7a + 2a²)} ÷ {x^(6a - 10 + 2a² + a - 1)}

= {x^(2a² - 7a + 12)} ÷ {x^(2a² + 7a - 11)}

= x^(23 - 14a)

Therefore The value of this mathematical expression is x^(23 - 14a)

**Q98. Answer: (b) A**

The Correct Answer is "A".

Important Points

• The Commonwealth Games is an international multi-sport event involving athletes from the Commonwealth of Nations.

• The event was first held in Hamilton, in the province of Ontario in Canada from 16–23 August 1930.

• The exception of 1942 and 1946, has taken place every four years since then.

• The World Economic Forum called the event inspiring and significant.

• Melville Marks Robinson founded the games as the British Empire Games which were first hosted in Hamilton, Canada in 1930.

Additional Information

• Hamilton is a port city in the Canadian province of Ontario.

• An industrialized city in the Golden Horseshoe at the west end of Lake Ontario,

• The city is 58 kilometers southwest of Toronto in the Greater Toronto and Hamilton Area (GTHA).

**Q99. Answer: (b) C**

Given:

N is a whole number that is divided by 6 and left the remainder 4

2N is also a whole number that is divided by 6

Formula used:

Dividend = (Divisor × Quotient) + Remainder

Calculation:

Here, in the first case dividend = N, divisor = 6, remainder = 4

Let the quotient be Q

So, from the above formula, we can write

N = (6 × Q) + 4 ----(1)

Now, multiplying equation (1) with 2 we will get

2N = 2(6 × Q) + 8

=> 2N = 12Q + 8

Now, in the second case it says that 2N is divided by 6

=> 2N = 12Q + 6 + 2

=> 2N = 6(2Q + 1) + 2

Here, from the above form, we can say the remainder will be 2.

Therefore The remainder will be 2.

Alternate Method

N is a whole number which when divided by 6, the remainder 4 is left. If 2N is divided by 6 then the new remainder will obtain after dividing the old remainder by 2

R1 = 6

R2 = R1/2

4/2 = 2

New remainder = 2

Important Points

In these questions, we calculate the remainder

When the number is divide, multiply, add or subtract by any number then the remainder will also divide, multiply, add and subtract by the same number

**Q100. Answer: (a) A**

The following diagram shows English alphabets and their positional values

In the given series, there is an addition of +3 in the positional values of alphabets

Hence, M12 is the correct answer.

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