# SSC CHSL Tier-1 2023: Official Paper (Held On: 02 Aug, 2023 Shift 4) (Previous Year Paper)

SSC Combined Higher Secondary Level (CHSL) • 2023 • 100 questions • 60 minutes • Answer key and solutions

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## ENGLISH LANGUAGE

**Q1.** Select the triad in which the numbers are related in the same way as are the numbers of the following triads.

6 - 7 - 42

8 - 13 - 104

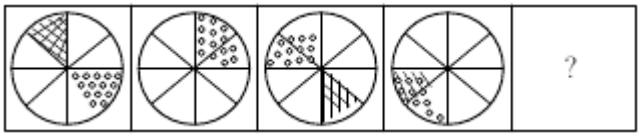
(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g. 13-Operations on 13 such as adding/ subtracting /multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed)

**(a)** 5 - 15 - 125
**(b)** 6 - 4 - 72
**(c)** 12 - 11 - 132
**(d)** 9 - 5 - 24

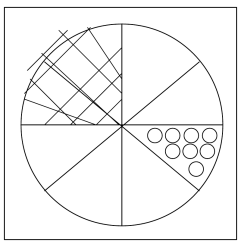
**Q2.** Four number pairs have been given, out of which three are alike in some manner and one is different. Select the one that is different.

**(a)** 17 - 54
**(b)** 19 - 60
**(c)** 15 - 48
**(d)** 14 - 42

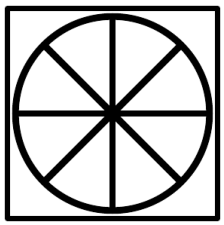
**Q3.** Identify the figure given in the options which when put in place of the question mark (?) will logically complete the series.



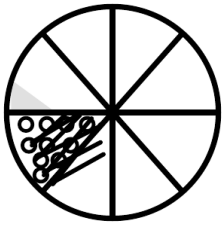

**(a)**



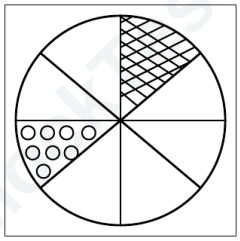
**(b)**



**(c)**



**(d)**



**Q4.** Based on the alphabetical order, three of the following four are alike in a certain way and thus form a group. Which is the one that does NOT belong to that group?

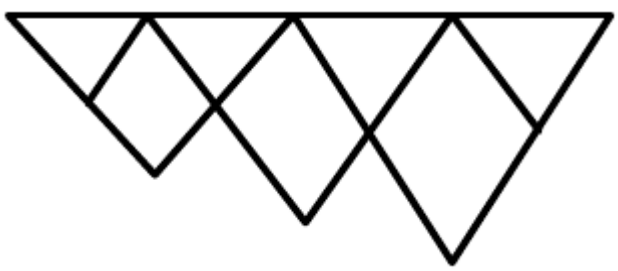
**(a)** JQN
**(b)** ELI
**(c)** ZGD
**(d)** NXR

**Q5.** Three of the following four are alike in a certain way and thus form a group. Which the one that does NOT belong to that group?

(1) 16-256
(2) 19-371
(3) 14-196
(4) 17-289

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

**Q6.** How many triangles are there in the given figure?



**(a)** 9

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**(b)** 6
**(c)** 7
**(d)** 8

**Q7.** In a certain code language, 'LEVITATE' is coded as 'IVELETAT' and 'INACTIVE' is coded as 'CANIEVIT'. What will be the code for 'HIGHNESS' in the given code language?

**(a)** SSENHGIH
**(b)** NHGIHSSE
**(c)** HGIHSSEN
**(d)** NEHIGSSE

**Q8.** 'IKLN' is related to 'FHIK' in a certain way based on the English alphabetical order. In the same way, 'GIJL' is related to 'DFGI'. To which of the following is 'MOPR' related, following the same logic?

**(a)** JMOP
**(b)** JKMO
**(c)** JLMO
**(d)** JLNO

**Q9.** What will come in the place of the question mark (?) in the following equation if '+' and '-' are interchanged and '×' and '÷' are interchanged?

36 ÷ 7 - 240 × 6 + 11 = ?

**(a)** 281
**(b)** 291
**(c)** 279
**(d)** 284

**Q10.** LQTU is related to JORS in a certain way based on the English alphabetical order. In the same way, CHKL is related to AFIJ. Which of the following is OTWX related to, following the same logic?

**(a)** MRTU
**(b)** NSVW
**(c)** MRUV
**(d)** MQTU

**Q11.** In a certain code language,

'M × N' means 'M is the father of N',

'M + N' means 'M is the wife of N',

'M ÷ N' means 'M is the daughter of N',

'M - N' means 'M is the son of N'.

Based on the above, how is P related to T, if P - Q × R + S × T?

**(a)** Mother's brother
**(b)** Sister's son
**(c)** Brother
**(d)** Mother's father

**Q12.** Find the correct alternative that when filled in the blanks in the same sequence will make the series logically complete.

_ _ VZ _ V _ V _ ZV _ _ V _

**(a)** VZVVZZZZ
**(b)** VZZVVZZZ
**(c)** ZVVZVVZV
**(d)** ZVZZVZZZ

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**Q13.** The position of how many letters will remain unchanged if each of the letter in the word 'FLOWERY' is arranged in alphabetical order?

**(a)** One
**(b)** Four
**(c)** Three
**(d)** Two

**Q14.** Which term from among the given options can replace the question mark (?) in the following series to make it logically complete?

WG 12, UE 15, ?, QA 21, OY 24

**(a)** QC 19
**(b)** QD 17
**(c)** SC 18
**(d)** RD 19

**Q15.** What will come in the place of the question mark (?) in the following equation if '+' and '-' are interchanged and '×' and '÷' are interchanged?

12 ÷ 182 × 14 - 67 + 19 = ?

**(a)** 204
**(b)** 216
**(c)** 187
**(d)** 199

**Q16.** If it is Wednesday on 13 September 2023, then what will be the day of the week on 30 August 2030?

**(a)** Friday
**(b)** Thursday
**(c)** Wednesday
**(d)** Saturday

**Q17.** In a certain code language. 'CHARISMA' is coded as '80' and 'PERFECTION' is coded as '121'. How will 'CREATION' be coded in that language?

**(a)** 93
**(b)** 91
**(c)** 87
**(d)** 85

**Q18.** Read the given statements and conclusions carefully. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. You have to decide which conclusion's logically definitely follow's from the given statements.

Statements:

Some Ducks are Chickens.

Some Chickens are Eggs.

All Eggs are Omelettes.

Conclusions:

(I) Some Ducks are Eggs.

(II) Some Chickens are Omelettes.

**(a)** Both conclusions (I) and (II) definitely follow.
**(b)** Only conclusion (I) definitely follows.
**(c)** Both conclusions (I) and (II) definitely do not follow.
**(d)** Only conclusion (II) definitely follows.

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**Q19.** Select the correct mirror image of the given figure when the mirror is placed at MN as shown below.




**(a)**



**(b)**



**(c)**



**(d)**



**Q20.** Which of the following letter-clusters will replace the question mark (?) in the given series to make it logically complete?

PSU, GBL, ?, OTT, FCK

**(a)** ATC
**(b)** UBH
**(c)** XKC
**(d)** ZKG

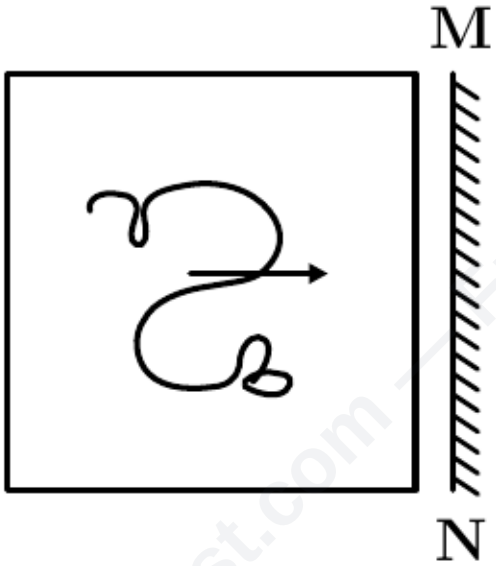
**Q21.** which number from among the given options can replace the question mark (?) in the following series?

4, 16, 13, ?, 49, 196

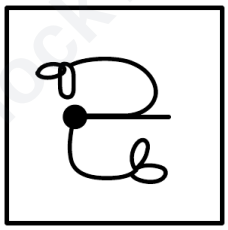
**(a)** 38
**(b)** 31
**(c)** 44
**(d)** 52

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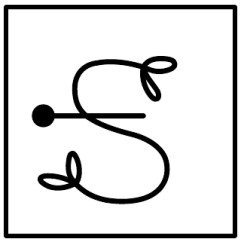
**Q22.** Select the correct mirror image of the given figure when the mirror is placed at MN as shown.



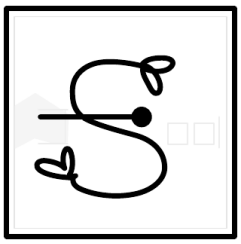

**(a)**



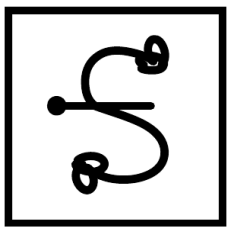
**(b)**



**(c)**



**(d)**



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**Q23.** Which number will replace the question mark (?) to complete the given series?

5, 7, 11, ?, 35, 67

**(a)** 19
**(b)** 15
**(c)** 13
**(d)** 17

**Q24.** P is the wife of Q. P is the mother of S. S and T are sisters. I is the brother of T. T is the wife of M. D is the mother of Q. How is D related to I?

**(a)** Father's mother
**(b)** Mother
**(c)** Sister
**(d)** Mother's father

**Q25.** 20 is related to 30 following a certain logic. Following the same logic, 42 is related to 56. To which of the following is 72 related, following the same logic?

**(a)** 94
**(b)** 92
**(c)** 88
**(d)** 90

## GENERAL INTELLIGENCE

**Q26.** Which river basin originates from the Western Ghats range of Karnataka state and has many tributaries such as the Noyyal, Kabini, Arkavathi and Amaravati?

**(a)** Sabarmati
**(b)** Brahmani
**(c)** Kaveri
**(d)** Periyar

**Q27.** Which s-block element is a silvery- metal that is used in an alloy with copper or nickel to make gyroscopes, springs, electrical contacts, spot-welding electrodes, and non-sparking equipment?

**(a)** Beryllium
**(b)** Rubidium
**(c)** Francium
**(d)** Caesium

**Q28.** Who among the following personalities was appointed as the legal advisor of the Constituent Assembly that drafted the document of the Constitution?

**(a)** HVR Iyengar
**(b)** S.N. Mukherjee
**(c)** B.R. Ambedkar
**(d)** BN Rau

**Q29.** India won their first women's under-19 T20 Cricket World Cup 2023 by defeating:

**(a)** Australia
**(b)** South Africa
**(c)** Sri Lanka
**(d)** England

**Q30.** Which gas is the major component of biogas?

**(a)** CNG
**(b)** Methane
**(c)** Hydrogen
**(d)** LPG

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**Q31.** What is the total route length of the Indian Railways (as of March 2020)?

**(a)** 67,956 km
**(b)** 63,950 km
**(c)** 91,604 km
**(d)** 82,402 km

**Q32.** Mohiniyattam is a dance form of which state?

**(a)** West Bengal
**(b)** Tamil Nadu
**(c)** Maharashtra
**(d)** Kerala

**Q33.** Which music director is popularly known as 'Pancham'?

**(a)** Khayyam
**(b)** SD Burman
**(c)** RD Burman
**(d)** Anu Malik

**Q34.** Based on the recommendations of which Committee was the creation of a separate category for NBFCS operating in the microfinance sector (NBFC-MFI) done?

**(a)** Narasimhan Committee
**(b)** Malegam Committee
**(c)** Deepak Parekh Committee
**(d)** PK Mohanty Committee

**Q35.** Which force causes the trade winds of the southern hemisphere to start blowing from southwest to northeast in India after crossing the equator?

**(a)** Gravitational force
**(b)** Magnetic force
**(c)** Centrifugal force
**(d)** Coriolis force

**Q36.** Which of the following Indian states was NOT the host of FIFA Under-17 Women's World Cup Football 2022?

**(a)** Maharashtra
**(b)** Goa
**(c)** Punjab
**(d)** Odisha

**Q37.** What was the HDI value of China in 2021?

**(a)** 0.768
**(b)** 0.645
**(c)** 0.557
**(d)** 0.750

**Q38.** Which of these is NOT a characteristic of a free-enterprise economy?

**(a)** Decisions are based on the forces of demand and supply.
**(b)** Factor rewards are based on the productivity of factors of production.
**(c)** All economic decisions are taken by the economic planners.
**(d)** Economic decisions are regulated by the market.

**Q39.** Which regulatory body oversees microfinance institutions in India?

**(a)** Reserve Bank of India (RBI)
**(b)** Ministry of Finance
**(c)** Insurance Regulatory and Development Authority of India (IRDAI)
**(d)** Securities and Exchange Board of India (SEBI)

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**Q40.** In which State of India is Sher Shah's Tomb located?

**(a)** Bihar
**(b)** Uttar Pradesh
**(c)** Punjab
**(d)** Bengal

**Q41.** Which of the following associations was formed in Maharashtra to get social justice for the weaker sections of society?

**(a)** Theosophical Society
**(b)** Arya Samaj
**(c)** Satya Shodhak Samaj
**(d)** Dharma Paripalana Yogam

**Q42.** Identify the FALSE statement.

**(a)** RBI decides the bank rate for the economy
**(b)** SEBI conducts open market operations to regulate money supply in the economy
**(c)** RBI prints the Rs. 100 currency notes
**(d)** Ministry of Finance issues Rs. 1 coins

**Q43.** Which of the following words was NOT a part of the original Preamble of the Indian Constitution?

**(a)** Democratic
**(b)** Republic
**(c)** Secular
**(d)** Sovereign

**Q44.** Which of the following article says that 'It shall be the duty of every citizen of India who is a parent or guardian to provide opportunities for education to his child or, as the case may be, ward between the age of six and fourteen years'?

**(a)** 51A(k)
**(b)** 51A(j)
**(c)** 51A(i)
**(d)** 51A(h)

**Q45.** How much wage compensation per trainee is provided under the PM DAKSH Yojana?

**(a)** Rs. 3000
**(b)** Rs. 6000
**(c)** Rs. 8000
**(d)** Rs. 2000

**Q46.** Which of the following teams won the Cricket's Inaugural Women's Premier League 2023?

**(a)** Kolkata Knight Riders
**(b)** Delhi Capitals
**(c)** Mumbai Indians
**(d)** Royal Challengers Bangalore

**Q47.** Which of the following statements is/are true regarding the Green Revolution?

i. The term 'green revolution' was coined by Sir William Gaud.
ii. Norman Borlaug is hailed as the Father of Green Revolution.
iii. MS Randhawa is called the Father of Green Revolution in India.

**(a)** Only i and iii
**(b)** Only i and ii
**(c)** Only ii
**(d)** Only iii

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**Q48.** Balkar Sidhu was awarded the Sangeet Natak Akdemi Award 2020 for his contribution to _____.

**(a)** folk dance of Punjab
**(b)** Manipuri
**(c)** Chhau
**(d)** folk dance of Maharashtra

**Q49.** In 1834, who proposed a law that states that the current induced by a change in flow opposes the effect producing the change?

**(a)** David Brewster
**(b)** Henry Moseley
**(c)** Christian Johann Doppler
**(d)** Heinrich Friedrich Lenz

**Q50.** Match the columns.

| States | Cultural festivals | | |
|---|---|---|---|
| A) | Jharkhand | I) | Karma |
| B) | Himachal Pradesh | II) | Chaitraul |
| C) | Telangana | III) | Lohri |
| D) | Punjab | IV) | Bathukamma |

**(a)** A-IV, B-II, C-I, D-III
**(b)** A-III, B-I, C-IV, D-II
**(c)** A-II, B-IV, C-III, D-I
**(d)** A-I, B-II, C-IV, D-III

## QUANTITATIVE APTITUDE

**Q51.** Simplify the given expression.

$(0.09\times0.09+0.04\times0.04+0.16\times0.16+2\times0.09\times0.04+2\times0.04\times0.16+2\times0.09\times0.16)/(0.3\times0.3+0.2\times0.2+0.4\times0.4)$

**(a)** 0.38
**(b)** 0.24
**(c)** 0.32
**(d)** 0.29

**Q52.** Find the value of the expression $(x^2-1)/(x-1) - (x^2-9)/(x-3)$.

**(a)** 1
**(b)** -2
**(c)** -1
**(d)** 2

**Q53.** Two years ago, the population of a small town was 60,000. It increased by 5% in the first year, but due to the pandemic, it decreased by 10% in the second year. What is its present population (after the end of 2 years)?

**(a)** 56,700
**(b)** 56,900
**(c)** 3300
**(d)** 55,700

**Q54.** If a man purchases kismis at Rs. 320 per kg and sells it at Rs. 6 per 25 grams, then his profit/loss percentage is:

**(a)** 20% loss
**(b)** 25% loss
**(c)** 25% profit
**(d)** 20% profit

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**Q55.** Kapil initiated a business with an investment of Rs. 30,00,000 in April 2022. After six months, his friend Kunal joined him with an investment of Rs. 25,00,000. In February 2023, Kapil's Ex-Class fellow Saloni also invested an amount equal to the total investment made by the earlier two partners. In what ratio the profit earned after 3 years from the date on which Kapil initiated the business, will be distributed?

**(a)** 332 : 200 : 50
**(b)** 108 : 75 : 143
**(c)** 432 : 300 : 55
**(d)** 432 : 400 : 55

**Q56.** A can do a piece of work in 12 days and B can do the same work in 15 days. If both do the work together, then in how many days will the work be completed?

**(a)** 7 2/3
**(b)** 6 2/3
**(c)** 5 2/3
**(d)** 8 2/3

**Q57.** In a triangle ABC, side BC is produced to D such that angle ACD = 127°. If angle ABC = 35°, then find angle BAC.

**(a)** 82°
**(b)** 92°
**(c)** 95°
**(d)** 75°

**Q58.** The following table gives the marks scored by 4 students in 4 unit tests of English. Read the table carefully and answer the question that follows.

| Name | Unit test 1 | Unit test 2 | Unit test 3 | Unit test 4 |
|---|---|---|---|---|
| Rani | 20 | 22 | 24 | 23 |
| Ravi | 22 | 18 | 24 | 20 |
| Raju | 24 | 22 | 20 | 24 |
| Rekha | 20 | 21 | 22 | 23 |

Whose average marks are the highest among the 4 students?

**(a)** Rani
**(b)** Ravi
**(c)** Raju
**(d)** Rekha

**Q59.** A boy covers a certain distance between his house and school on a cycle. Riding on an average speed of 15 km/h, he is late by 10 min. However, with an average speed of 20 km/h, he reaches the school 5 min earlier. Find the distance between his house and school.

**(a)** 25 km
**(b)** 20 km
**(c)** 15 km
**(d)** 30 km

**Q60.** The value of the expression 4 (sin^6A + cos^6A) - 6(sin^4A + cos^4A) + 8 is:

**(a)** 4
**(b)** 8
**(c)** 7
**(d)** 6

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**Q61.** The sum of the radius of the base and the height of a cylinder is 42 m. If the total surface area of the cylinder is 6336 $m^2$, find the curved surface area of the cylinder correct to two places of decimals (use π = 22/7 ).

**(a)** 2157.43 $m^2$
**(b)** 2571.43 m2
**(c)** 2715.43 m2
**(d)** 2517.43 m2

**Q62.** If cos A = 63/65, then find the value of tan A + cot A (up to two places of decimal).

**(a)** 4.19
**(b)** 2.76
**(c)** 3.19
**(d)** 5.23

**Q63.** The ratio of cost price (CP) and marked price (MP) of an article is 4 : 7. A discount of 20% is given on MP and the shopkeeper made a profit of Rs. 80. Find the CP of the article.

**(a)** Rs. 190
**(b)** Rs. 170
**(c)** Rs. 200
**(d)** Rs. 180

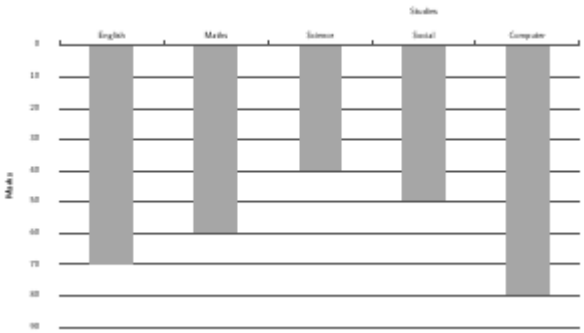
**Q64.** Simplify the given expression. $(4[(17)^3-(7)^3])/((17)^2+(7)^2+119)$

**(a)** 40
**(b)** 50
**(c)** 60
**(d)** 30

**Q65.** AB = 8 cm and CD = 6 cm are two parallel chords on the same side of the center of a circle. If the distance between them is 2 cm, then the radius (in cm) of the circle is:

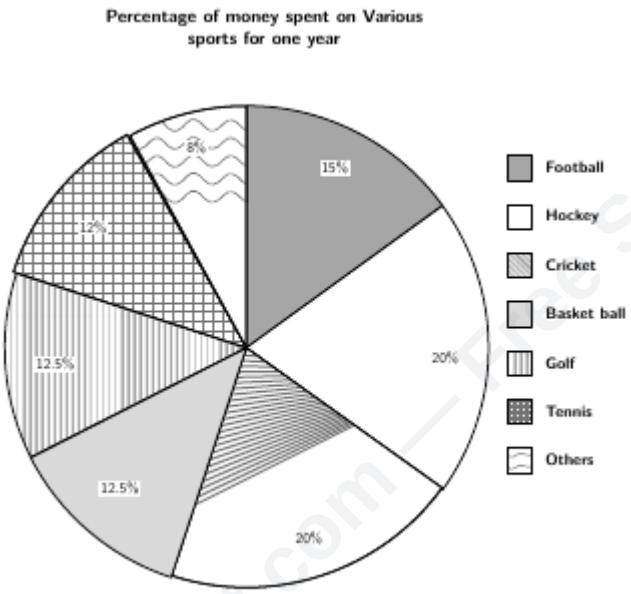
**(a)** √265/4
**(b)** √256/4
**(c)** √156/4
**(d)** √198/4

**Q66.** The below bar graph shows the marks obtained by a student in an examination. What is the average mark obtained by the student?



**(a)** 50
**(b)** 60
**(c)** 80
**(d)** 30

**Q67.** The pie-chart given here shows the spending of a country on various sports during a year. Study the graph carefully to answer these questions.




If the total amount spent on sports during the year was Rs. 1,50,00,000, then the amount spent on Cricket and hockey together was:

**(a)** Rs. 60,00,000
**(b)** Rs. 75,00,000
**(c)** Rs. 50,00,000
**(d)** Rs. 37,50,000

**Q68.** If $\sin\theta - \cos\theta = 1/5$, then find the value of $\sin\theta + \cos\theta$.

**(a)** 5/7
**(b)** 7/5
**(c)** 5/3
**(d)** 3/5

**Q69.** A number when divided by 78 gives the quotient 280 and the remainder 0. If the same number is divided by 65, what will be the value of the remainder?

**(a)** 1
**(b)** 3
**(c)** 0
**(d)** 2

**Q70.** A man deposited Rs. 10,000 at simple interest in a fund. The interest rate on the fund increases by 4% every year. If the interest rate at the time of the amount deposit was 8%, what is the interest earned (in Rs. ) by him after 5 years?

**(a)** 6,000
**(b)** 8,400
**(c)** 5,800
**(d)** 8,000

**Q71.** Find the average of the prime numbers lying between 51 and 77.

**(a)** 65
**(b)** 64
**(c)** 67
**(d)** 66

**Q72.** A shopkeeper marked a product, 5% above the cost price and sold the product for Rs. 1890 by giving a discount of 10%. The cost price of the product is:

**(a)** Rs. 1,701
**(b)** Rs. 2,100
**(c)** Rs. 2,000

**(d)** Rs. 2,205

**Q73.** AB is a chord of the circle and AOC is its diameter such that angle ACB = 65°. If AT is the tangent to the circle at the point A, then angle BAT is equal to:

**(a)** 65°
**(b)** 75°
**(c)** 55°
**(d)** 40°

**Q74.** The population of a village was 12,000 two years ago. If it increased by 2.5% and 3%, respectively, in the last two years, then what is the present population of the village?

**(a)** 12,669
**(b)** 12,607
**(c)** 12,652
**(d)** 12,731

**Q75.** The length of each side of an equilateral triangle is 22 cm. Find the area (in $cm^2$) of this triangle.

**(a)** 121
**(b)** 242 √3
**(c)** 121 √3
**(d)** 242

## GENERAL AWARENESS

**Q76.** Select the most appropriate option that can substitute the underlined segment in the given sentence.

Despite being his competitor, John was generous and forgiving in defeat and congratulated his opponent on his well-deserved victory.

**(a)** altruistic
**(b)** magnanimous
**(c)** fainthearted
**(d)** venomous

**Q77.** Select the option that can be used as a one-word substitute for the given group of words/phrase.

A person who has features of extrovert and introvert

**(a)** Stoic
**(b)** Ambivert
**(c)** Ambiguous
**(d)** Dual

**Q78.** Select the option that can be used as a one-word substitute for the given group of words.

Something which cannot be easily conquered

**(a)** Frightening
**(b)** Invincible
**(c)** Reciprocal
**(d)** Stable

**Q79.** Select the most appropriate ANTONYM of the underlined word in the following sentence.

Bhagat Singh was a young firebrand, whose militant activism and revolutionary fervour made him a symbol of resistance against the British Raj.

**(a)** Violent
**(b)** Radical
**(c)** Moderate
**(d)** Ultra

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**Q80.** Select the most appropriate synonym of the bracketed word in the following sentence to fill in the blank.

The security cameras can automatically _____ (rotate) to monitor the entire hallway.

**(a)** evolve
**(b)** resolve
**(c)** revolve
**(d)** devolve

**Q81.** Parts of a sentence are given below in jumbled order. Select the option that arranges the parts in the correct order to form a meaningful sentence.

A. as some 71 per cent of Earth's surface is covered by saltwater oceans, and

B. notwithstanding that Europa and Enceladus (moons of Jupiter and Saturn, respectively)

C. the continents themselves possess lakes, rivers, and, in some cases, seas

D. are both covered in ice, Earth is the true water world of the solar system

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

**Q82.** Parts of the following sentence have been given as options. Select the option that contains an error.

He lives in 45 Church Street with his family.

**(a)** in 45 Church Street
**(b)** with his family
**(c)** lives
**(d)** He

**Q83.** Select the most appropriate synonym of the word 'Scrutiny' from the given sentence.

The company's strategic plan included a comprehensive analysis of market trends and consumer behaviour.

**(a)** Behaviour
**(b)** Comprehensive
**(c)** Trends
**(d)** Analysis

**Q84.** Select the most appropriate synonym of the word 'Capable' from the given sentence.

Jayesh was competent and the best candidate for the post of clerk in the interview, whereas others were inefficient and irritating.

**(a)** best
**(b)** irritating
**(c)** competent
**(d)** inefficient

**Q85.** Select the option that expresses the following sentence in passive voice.

Your mother teaches us English literature.

**(a)** English literature is taught to us by your mother.
**(b)** English literature has been taught to us by your mother.
**(c)** Your mother is taught to us English literature.
**(d)** English literature taught to us by your mother.

**Q86.** The following sentence has been split into four segments. Identify the segment that contains a grammatical error.

He sang / beautifully but / the judges were / unimpress at the end.

**(a)** the judges were
**(b)** unimpress at the end
**(c)** He sang
**(d)** beautifully but

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**Q87.** Select the most appropriate ANTONYM of the given word.

Stationary

**(a)** Moving
**(b)** Immobile
**(c)** Permanent
**(d)** Stable

**Q88.** Select the correct spelling from the given options to fill in the blank.

The civil engineers are trying to _____ the bridge using the new technology.

**(a)** elevate
**(b)** ilivate
**(c)** alivate
**(d)** elivait

**Q89.** Select the most appropriate homonym in the context of the following sentence to fill in the blank.

My birthday will _____on a Friday this year.

**(a)** fall: to go down onto the ground suddenly
**(b)** fall: to come at a particular time or happen in a particular place
**(c)** fall: to change to a particular condition
**(d)** fall: to be beaten or defeated

**Q90.** Select the most appropriate meaning of the given idiom.

Play it by ear

**(a)** Obey the rules blindly
**(b)** Act as suggested
**(c)** Discontinue impulsively
**(d)** Perform without any rehearsals

**Q91.** Parts of a sentence are given below in jumbled order. Select the option that arranges the parts in the correct order to form a meaningful sentence.

A. with the occult and the satanic which in turn, owes much also to

B. Poe’s work owes much to the concern of Romanticism

C. shaping plausible fabrics out of impalpable materials

D. his own feverish dreams, to which he applied a rare faculty of

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

**Q92.** Select the most appropriate idiom to fill in the blank.

Ashu is a dedicated guy, always ready to _____ for the betterment of his company.

**(a)** snug as a bug in a rug
**(b)** lose his marbles
**(c)** rain on his parade
**(d)** go the extra mile

**Q93.** Select the option that can be used as a one-word substitute for the given group of words/phrase.

The doctor who treats bone problems

**(a)** Obstetrician
**(b)** Gynaecologist
**(c)** Orthopaedist
**(d)** Physiotherapist

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**Q94.** Identify the INCORRECTLY spelt word in the following sentence.

Your lack of knowledge of recent advances in technology will be a sitback for your business.

**(a)** advances
**(b)** knowledge
**(c)** business
**(d)** sitback

**Q95.** Select the option that expresses the given sentence in passive voice.

The Governor of the state inaugurated the exhibition in a grand way.

**(a)** The exhibition had been inaugurated by the Governor of the state in a grand way.
**(b)** The exhibition inaugurated by the Governor of the state in a grand way.
**(c)** The exhibition has been inaugurated by the Governor of the state in a grand way.
**(d)** The exhibition was inaugurated by the Governor of the state in a grand way.

**Directions**

In the following passage, some words have been deleted. Read the passage carefully and select the most appropriate option to fill in each blank.

Our school organised a graduation day to award certificates to the students. The graduation day highlights the overall achievements of students. All the students who are being graduated are invited formally with their parents. Students wore their attire according to the dress code given to them by the school administration. High school graduation _____(1) is one of the most awaited and last event of any school. The function began with ____ (2) the lamp, followed by the distribution of certificates in a very systematic way. Our principal made a long and ____ (3) speech and blessed us for the future ____ (4). On behalf of our graduating class, our class representative extended a vote of thanks to show _____ (5) to all staff members. One of the parents expressed their experiences and views. At last, all the students, parents and staff members had lunch together.

**Q96.** Select the most appropriate option to fill in blank number 1.

**(a)** episode
**(b)** festival
**(c)** incident
**(d)** ceremony

**Q97.** Select the most appropriate option to fill in blank number 2.

**(a)** lighting
**(b)** lightening
**(c)** sparking
**(d)** glittering

**Q98.** Select the most appropriate option to fill in blank number 3.

**(a)** self-praising
**(b)** encouraging
**(c)** boring
**(d)** depressing

**Q99.** Select the most appropriate option to fill in blank number 4.

**(a)** endeavours
**(b)** neglects
**(c)** entertainments
**(d)** ruins

**Q100.** Select the most appropriate option to fill in blank number 5.

**(a)** gracious
**(b)** gratitude
**(c)** courteous
**(d)** greet

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## ANSWER KEY

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

## SOLUTIONS

**Q1. Answer: (c) 12 - 11 - 132**

The logic followed here is:

Logic: 1st number × 2nd number = 3rd number.

Now,

For, 6 - 7 - 42

=> 6 × 7 = 42.

For, 8 - 13 - 104

=> 8 × 13 = 104.

Similarly, for Option 3) 12 - 11 - 132

=> 12 × 11 = 132.

Hence, the correct answer is "Option 3".

**Q2. Answer: (d) 14 - 42**

The logic followed here is:

Logic: (1st number × 3) + 3 = 2nd number.

Now, checking the options:

Option 1) 17 - 54 → (17 × 3) + 3 → 51 + 3 = 54.

Option 2) 19 - 60 → (19 × 3) + 3 → 57 + 3 = 60.

Option 3) 15 - 48 → (15 × 3) + 3 → 45 + 3 = 48.

Option 4) 14 - 42 → (14 × 3) + 3 → 42 + 3 = 45 ≠ 42.

So, '14 - 42' odd among the given options.

Hence, the correct answer is "Option 4".

**Q3. Answer: (a) [figure]**

The logic followed here is:

Logic:

Step I: The 'Dotted circle' is getting shifting two places in anticlockwise direction.

Step II: The 'Lines' are getting shifting two places in the clockwise direction.

Hence, the correct answer is "Option 1".

**Q4. Answer: (d) NXR**

The logic followed here is:

Option 1) JQN

Option 2) ELI

Option 3) ZGD

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Option 4) NXR

Here, 'NXR' is odd among the given options.

Hence, the correct answer is "Option 4".

**Q5. Answer: (d) 2**

The logic followed here is:

Logic: (1st number)2 = 2nd number.

Now, checking the pairs:

1) 16 - 256 → $(16)^2 = 256$

2) 19 - 371 → (19)2 = 361 ≠ 371.

3) 14 - 196 → (14)2 = 196.

4) 17 - 289 → $(17)^2 = 289$.

So, '19 - 371' is odd among the given options.

Hence, the correct answer is "Option 4".

**Q6. Answer: (c) 7**

The triangles are:

So, there are '7' triangles in the given figure.

Hence, the correct answer is "Option 3".

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

The logic followed here is:

For, 'LEVITATE' is coded as 'IVELETAT',

For, 'INACTIVE' is coded as 'CANIEVIT',

Similarly, for 'HIGHNESS'

So, 'HIGHNESS' will be coded as 'HGIHSSEN'.

Hence, the correct answer is "Option 3".

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

The logic followed here is:

For, 'IKLN' is related to 'FHIK'

For, 'GIJL' is related to 'DFGI'

Similarly, for 'MOPR'

So, 'MOPR' will be related to 'JLMO'

Hence, the correct answer is "Option 3".

**Q9. Answer: (a) 281**

BODMAS Table:

Given equation: 36 ÷ 7 - 240 × 6 + 11 = ?

Now, if '+' and '-' and '×' and '÷' are interchanged, then:

=> 36 × 7 + 240 ÷ 6 - 11 = ?

=> 36 × 7 + 40 - 11 = ?

=> 252 + 40 - 11 = ?

=> 292 - 11 = 281.

Hence, the correct answer is "Option 1".

**Q10. Answer: (c) MRUV**

The logic followed here is:

For, 'LQTU' is related to 'JORS'

For, 'CHKL' is related to 'AFIJ'

Similarly, for 'OTWX'

So, 'OTWX' will be related to 'MRUV'

Hence, the correct answer is "Option 3".

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**Q11. Answer: (a) Mother's brother**

Family Chart:

Decoding the Symbols:

| Symbol | × | • | ÷ | • |
|---|---|---|---|---|
| Meaning | Father | Wife | Daughter | Son |

Given: P - Q × R + S × T

It means: P is the Son of Q, Q is the Father of R, R is the Wife of S, S is the Father of T.

So, P is the 'Mother's brother' of T.

Hence, the correct answer is "Option 1".

**Q12. Answer: (c) ZVVZVVZV**

The logic followed here is:

Given Sequence: _ _ VZ _ V _ V _ ZV _ _ V _

Now, putting the letters in the blank spaces given in the option one by one:

Option 1) VZVVZZZZ → V Z V / Z V V / V V Z / Z V Z / Z V Z

Option 2) VZZVVZZZ → V Z V / Z Z V / V V V / Z V Z / Z V Z

Option 3) ZVVZVVZV → Z V V / Z V V / Z V V / Z V V / Z V V

Here, 'ZVV' followed a pattern.

Option 4) ZVZZVZZZ → Z V V / Z Z V / Z V V / Z V Z / Z V Z

Hence, the correct answer is "Option 3".

**Q13. Answer: (a) One**

Given word: FLOWERY

Now, each letter of the word 'FLOWERY' is arranged in English alphabetical order:

| Letter | F | L | O | W | E | R | Y |
|---|---|---|---|---|---|---|---|
| Alphabetical order | E | F | L | O | R | W | Y |

Here, only 'One' letter(Y) will remain unchanged after arrange the words in Alphabetical order.

Hence, the correct answer is "Option 1".

**Q14. Answer: (c) SC 18**

The logic followed here is:

So, 'SC 18' will replace the question mark in the given series.

Hence, the correct answer is "Option 3".

**Q15. Answer: (a) 204**

BODMAS Table:

Given equation: 12 ÷ 182 × 14 - 67 + 19 = ?

Now, if '+' and '-' and '×' and '÷' are interchanged, then:

=> 12 × 182 ÷ 14 + 67 - 19 = ?

=> 12 × 13 + 67 - 19 = ?

=> 156 + 67 - 19 = ?

=> 223 - 19 = 204.

Hence, the correct answer is "Option 1".

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

Given: 13 September 2023 is Wednesday.

Now, 2023 to 2030 = 7 Years, In 7 years 2 Leap Year(2024, 2028), and 5 Ordinary Year.

Total odd days from 13 September 2023 to 13 September 2030 = (2 × 2) + (5 × 1) = 4 + 5 = 9 days.

And, 9 days = 1 week and 2 odd days.

So, 13 September 2030 will be Wednesday + 2 = Friday.

Now,

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We need to subtract 14 days from 13 September 2030 to find the day on 30 August 2030.

And, 14 days = 2 week and 0 odd days.

Therefore, 30 August 2030 = Friday - 0 = Friday.

Hence, the correct answer is "Option 1".

**Q17. Answer: (a) 93**

The logic followed here is:

Logic: (Sum of the place value of all numbers) + Number of letter in that word = Code of the word.

'CHARISMA' is coded as '80'

=> (3 + 8 + 1 + 18 + 9 + 19 + 13 + 1) + 8

=> 72 + 8 = 80.

'PERFECTION' is coded as '121'

=> (16 + 5 + 18 + 6 + 5 + 3 + 20 + 9 + 15 + 14) + 10

=> 111 + 10 = 121.

Similarly, for 'CREATION'

=> (3 + 18 + 5 + 1 + 20 + 9 + 15 + 14) + 8

=> 85 + 8 = 93.

So, 'CREATION' will be coded as '93'.

Hence, the correct answer is "Option 1".

**Q18. Answer: (d) Only conclusion (II) definitely follows.**

Given Statements:

Some Ducks are Chickens.

Some Chickens are Eggs.

All Eggs are Omelettes.

The least possible Venn diagram for the given statement is:

Conclusions:

I. Some Ducks are Eggs - False (Because, No definite relation given between Ducks and Eggs, so Some Ducks are Eggs is possible only).

II. Some Chickens are Omelettes - True (Because, Some Chickens are Eggs and All Eggs are Omelettes, so those part of Chickens which is Eggs will Omelettes also).

So, Only conclusion (II) definitely follows.

Hence, the correct answer is "Option 4".

**Q19. Answer: (d) [figure]**

The correct mirror image of the given figure is:

Hence, the correct answer is "Option 4".

**Q20. Answer: (c) XKC**

The logic followed here is:

So, 'XKC' will replace the question mark in the given series.

Hence, the correct answer is "Option 3".

**Q21. Answer: (d) 52**

The logic followed here is:

So, '52' is the missing term in the given series.

Hence, the correct answer is "Option 4".

**Q22. Answer: (b) [figure]**

The correct mirror image of the given figure is:

Hence, the correct answer is "Option 2".

**Q23. Answer: (a) 19**

The logic followed here is:

So, '19' is the missing term in the given series.

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Hence, the correct answer is "Option 1".

**Q24. Answer: (a) Father's mother**

Family Chart:

Given:

P is the wife of Q.

P is the mother of S.

S and T are sisters.

I is the brother of T.

T is the wife of M.

D is the mother of Q.

So, D is 'Father's mother' of I.

Hence, the correct answer is "Option 1".

**Q25. Answer: (d) 90**

The logic followed here is:

For, 20 is related to 30

=> 4 × 5 = 20.

=> 5 × 6 = 30.

For, 42 is related to 56

=> 6 × 7 = 42.

=> 7 × 8 = 56.

Similarly, for 72 is related to:

=> 8 × 9 = 72.

=> 9 × 10 = 90.

Here, 72 is related to 90.

Hence, the correct answer is "Option 4".

Alternate method :-

For, 20 is related to 30

=> 20 × (3 / 2) = 30

For, 42 is related to 56

=> 42 × (4 / 3) = 56

Similarly, for 72 is related to:

=> 72 × (5 / 4) = 90

The logic used here is the numerator and denominator both increased by 1 for next numbers.

**Q26. Answer: (c) Kaveri**

The correct answer is Kaveri.

Key Points

• The river basin that originates from the Western Ghats range of Karnataka state is the Kaveri River Basin.

• The Kaveri River Basin is one of the major river basins in India and covers parts of Karnataka, Tamil Nadu, and Kerala.

• The Noyyal, Kabini, Arkavathi, and Amaravati are some of the important tributaries of the Kaveri River.

Additional Information

• Sabarmati flows westward in India.

• It starts in the Aravalli Range in the Udaipur District of Rajasthan and travels 371 km in a south-westerly direction throughout Rajasthan and Gujarat before meeting the Gulf of Khambhat of the Arabian Sea.

• In eastern India's state of Odisha, there is a significant seasonal river called the Brahmani.

• The Brahmani river travels through the districts of Sundargarh, Deogarh, Angul, Dhenkanal, Cuttack, Jajapur, and Kendrapara.

• It is produced by the confluence of the Sankh and South Koel rivers.

• Periyar is a longest river in Kerala having large discharge potential.

• It is one of the few rivers that flows year-round in the area and supplies drinking water to a number of sizable communities.

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**Q27. Answer: (a) Beryllium**

The correct answer is Beryllium.

Key Points

• The s-block element that is a silvery- metal and is used in an alloy with copper or nickel to make various equipment is Beryllium.

• Beryllium is a lightweight and strong metal that is widely used in aerospace, defense, and nuclear industries.

• It has a high melting point, good thermal conductivity, and is also a good electrical conductor.

• Atomic number of Beryllium is - 4.

Additional Information

• Rubidium is a soft, silvery- metal that is highly reactive.

• It is used in atomic clocks and as a catalyst in certain chemical reactions.

• Francium is a highly radioactive and unstable element.

• It is extremely rare and has no practical applications.

• Caesium is a soft, silvery-golden metal that is also highly reactive.

• It is used in atomic clocks, drilling fluids, and in the treatment of cancer.

**Q28. Answer: (d) BN Rau**

The correct answer is BN Rau.

Key Points

• BN Rau was appointed as the legal advisor of the Constituent Assembly that drafted the document of the Constitution.

• He was a renowned Indian civil servant and jurist.

• Rau played a crucial role in the drafting of the Indian Constitution and provided valuable inputs to the Constituent Assembly.

• From 1950 to 1952, Rau served as India's delegate to the UN Security Council.

Additional Information

• H.V.R Iyengar was a prominent lawyer and freedom fighter.

• He served as a member of the Constituent Assembly.

• S.N. Mukherjee was a lawyer and politician.

• The Principal Constitutional Draftsman in the Constituent Assembly was S. N. Mukherjee.

• B.R. Ambedkar was the chairman of the Drafting Committee of the Constituent Assembly.

• He was a political activist, social reformer, economist, and jurist from India.

**Q29. Answer: (d) England**

The correct answer is England.

Key Points

• India won their first women's under-19 T20 Cricket World Cup in 2023.

• The victory was against England, making them the runners-up in the tournament.

• The tournament was specifically for under-19 women's teams.

• T20 cricket is a shorter format of the game, with each team playing for 20 overs.

Additional Information

• The inaugural tournament of the ICC Women's Cricket World Cup took place in England in 1973, making it the oldest global championship in cricket.

• The International Cricket Council is currently in charge of organizing the World Cup (ICC).

• Australia is a strong contender in women's cricket and has won multiple World Cups, including the 2018 T20 World Cup.

• England is a strong contender in women's cricket and has won multiple World Cups, including the 2009 and 2017 T20 World Cup.

• Five nations have hosted the twelve World Cups that have been played so far, with India and England serving as the event's hosts three times each.

**Q30. Answer: (b) Methane**

The correct answer is Methane.

Key Points

• Biogas is primarily composed of methane gas, which is the major component of biogas.

• Methane gas makes up about 50-75% of biogas, while the remaining 25-50% is made up of carbon dioxide, water vapor, and trace amounts of other gases.

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• Biogas is a gaseous renewable energy source.

• Anaerobic digestion using methanogens or anaerobic organisms in a bioreactor, biodigester, or anaerobic digester produces biogas.

• The main components of the gas are methane (CH4) and carbon dioxide (CO2), with trace amounts of moisture, siloxanes, and hydrogen sulfide (H2S).

Additional Information

• Compressed natural gas:

• CNG is a fossil fuel that is primarily composed of methane gas.

• CNG is commonly used as a fuel for vehicles and is produced from natural gas reserves.

• Hydrogen gas:

• It is a colorless, odorless, tasteless, and highly flammable gas.

• It is commonly used in fuel cells to generate electricity.

• Liquefied petroleum gas:

• It is a mixture of propane and butane gases.

• It is commonly used as a fuel for heating and cooking.

**Q31. Answer: (a) 67,956 km**

The correct answer is 67,956 km.

Key Points

• Indian Railways is one of the largest railway networks in the world and connects almost all parts of India through its extensive network of tracks.

• As of March 2020, the total route length of the Indian Railways is 67,956 km, which includes both broad gauge and meter gauge tracks.

• The Indian Railways has 18 zones and more than 7,000 stations, making it an integral part of the country's transportation infrastructure.

• The Indian Railways also operates several luxury and tourist trains, such as the Palace on Wheels and the Maharaja Express, which offer a unique and memorable travel experience to passengers.

Additional Information

• The first opulent tourist train in India is called The Palace on Wheels.

• In an effort to boost tourism in Rajasthan, the Indian Railways and the Rajasthan Tourism Development Corporation jointly launched it.

• In 1982, the train was introduced.

• Heritage Palace on Wheels is the new name for the train.

• Indian Railway Catering and Tourism Corporation is the owner and operator of the opulent tourist train known as the Maharajas' Express.

• Between October and April, it operates four routes through North-West and Central India, with a primary focus on Rajasthan.

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

The correct answer is Kerala.

Key Points

• Mohiniyattam is a classical dance form of Kerala, India.

• Mohiniyattam is primarily a solo dance performed by women and is known for its graceful movements and expressions.

• The dance form originated in the temples of Kerala and was performed by devadasis (temple dancers) to entertain the deities.

• The word Mohiniyattam is derived from two words, "Mohini" (meaning enchantress) and "attam" (meaning dance). The dance form is said to have been named after Mohini, the female avatar of Lord Vishnu.

• Mohiniyattam is characterized by subtle movements, intricate footwork, and expressive facial expressions.

• The costumes worn by the dancers are usually white or off-white with gold borders and are adorned with jewelry and flowers.

Additional Information

• West Bengal is known for its rich culture and tradition of folk dances like Baul, Chhau, and Santhal.

• Tamil Nadu is known for its classical dance forms like Bharatanatyam.

• Maharashtra is known for its folk dances like Lavani, Koli, and Tamasha.

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**Q33. Answer: (c) RD Burman**

The correct answer is RD Burman.

Key Points

• RD Burman is popularly known as "Pancham" in the Indian music industry.

• He was the son of famous music director SD Burman.

• RD Burman was known for his innovative music compositions and experimentation with different genres of music.

• He composed music for over 300 films in his career and won several awards for his work.

• Some of his popular compositions include "Chura Liya Hai Tumne Jo Dil Ko", "Yeh Dosti", "Tere Bina Zindagi Se", and "Mehbooba Mehbooba".

Additional Information

• Khayyam:

• He was a renowned music director who composed music for films like "Kabhi Kabhie" and "Umrao Jaan".

• The Sangeet Natak Akademi Award in Creative Music for 2007 went to him.

• SD Burman

• He was a legendary music director who composed music for films like "Guide" and "Pyaasa".

• Burman performed playback vocals on 13 Bengali and 14 Hindi movie songs.

• Anu Malik

• He is a popular music director who has composed music for several Bollywood films and is known for his hit songs like "Oonchi Hai Building" and "Tumse Milke Dil Ka Hai Jo Haal".

• He is a musician who has won both the Filmfare and National Awards in India.

**Q34. Answer: (b) Malegam Committee**

The correct answer is Malegam Committee.

Key Points

• The creation of a separate category for NBFCs operating in the microfinance sector (NBFC-MFI) was done based on the recommendations of the Malegam Committee.

• The Malegam Committee was appointed by the Reserve Bank of India (RBI) in 2010 to review the microfinance sector in India and provide recommendations for its growth and development.

• The committee recommended the creation of a separate category of NBFCs for microfinance to regulate and supervise them effectively, and to ensure that they comply with the prescribed norms and standards.

• The NBFC-MFIs are required to obtain a certificate of registration from the RBI and comply with the regulations on interest rates, lending practices, borrower protection, and reporting requirements.

Additional Information

• Narasimhan Committee:

• It was appointed by the RBI in 1991 to review the financial system in India and provide recommendations for its reforms.

• It recommended the creation of a four-tier banking system, the establishment of asset reconstruction companies, and the liberalization of the banking sector.

• Deepak Parekh Committee:

• It was appointed by the RBI in 2018 to review the existing framework for the MSME sector and suggest measures to strengthen it.

• It recommended the creation of a distressed asset fund, the simplification of the loan application process, and the enhancement of credit guarantee schemes.

• PK Mohanty Committee:

• It was appointed by the RBI in 2013 to review the regulatory framework for the NBFC sector and suggest measures to enhance its stability and development.

• It recommended the creation of a new category of NBFCs for infrastructure finance, the enhancement of risk management practices, and the strengthening of the supervisory framework.

**Q35. Answer: (d) Coriolis force**

The correct answer is Coriolis force.

Key Points

• Coriolis force is an apparent force that is observed due to the rotation of the Earth.

• It deflects the path of moving objects, such as winds and ocean currents, to the right in the Northern Hemisphere and to the left in the Southern Hemisphere.

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• In the southern hemisphere, the trade winds start blowing from the southeast towards the equator due to the Coriolis force.

• As the winds cross the equator, they are deflected to the right by the Coriolis force, causing them to blow towards the northeast in India.

Additional Information

• Gravitational force

• It is the force of attraction between two masses, such as the Earth and objects on its surface.

• It is responsible for keeping objects, such as the Moon, in orbit around the Earth and for causing tides.

• Magnetic force

• It is the force exerted by magnets and magnetic fields.

• It is responsible for the behavior of compass needles and the Earth's magnetic field, which protects the planet from harmful solar radiation.

• Centrifugal force

• It is the apparent force that is observed due to the rotation of a rotating frame of reference.

• It is often used to explain the behavior of objects in circular motion, but it is not a real force as it is not caused by an interaction between two objects.

**Q36. Answer: (c) Punjab**

The correct answer is Punjab.

Key Points

• Punjab was not chosen as a host state for the FIFA Under-17 Women's World Cup Football 2022.

• Maharashtra, Goa, and Odisha were chosen as the host states for the tournament.

• The FIFA Under-17 Women's World Cup Football 2022 was originally scheduled to be held in India from 17 February to 7 March 2021, but was postponed due to the COVID-19 pandemic.

• This will be the seventh edition of the FIFA U-17 Women's World Cup, and the first time it will be held in India.

• The tournament will feature 16 teams from around the world and will be played across four cities in the host states of Maharashtra, Goa, and Odisha.

Additional Information

• Every two years, female players under the age of seventeen compete in an international women's association football competition called the FIFA U-17 Women's World Cup.

• Since 2008, FIFA (Fédération Internationale de Football Association) has been in charge of organizing FIFA U-17 women's world cup.

• Spain is currently the champion, having won the 2022 edition in India for the second time.

**Q37. Answer: (a) 0.768**

The correct answer is 0.768.

Key Points

• The HDI is a composite index that measures the average achievements of a country in three basic dimensions of human development, namely, a long and healthy life, access to knowledge, and a decent standard of living.

• HDI value of China in 2021 is 0.768, which is considered to be a high human development score and China 's rank was 79^(th).

• The HDI establishes "goalposts"—minimum and maximum values—for each dimension and then displays the position of each nation in respect to these values. A number between 0 and 1 is used to represent this.

• The higher a nation's HDI value, the higher its level of human development.

Additional Information

• The HDI is a composite summary indicator that evaluates a nation's average performance in three fundamental areas of human development: standard of living, knowledge, and health.

• The HDI is calculated by the United Nations Development Programme (UNDP) and is used as a standard measure of human development across the world.

• With the exception of 2012 and 2020–21, the HDI has been published yearly since its initial release in 1990.

• The Human Development Index (HDI) has four categories: low human development (below 0.55), medium human development (0.55-.70), high human development (0.7-0.79), and very high human development (0.8-1.0).

**Q38. Answer: (c) All economic decisions are taken by the economic planners.**

The correct answer is "All economic decisions are taken by the economic planners".

Key Points

• A free-enterprise economy is also known as a capitalist economy, where the means of production are privately owned, and

economic decisions are based on the forces of demand and supply.

• The government does not interfere in the market unless it is necessary to ensure fair competition or protect consumers.

• Economic decisions are regulated by the market in a free-enterprise economy.

• The market mechanism determines the prices of goods and services, which, in turn, determine the production and consumption decisions of firms and consumers.

• Factor rewards are based on the productivity of factors of production in a free-enterprise economy. The factors of production, such as land, labor, capital, and entrepreneurship, are owned by private individuals or firms who receive income in the form of rent, wages, interest, and profit, respectively.

• The forces of demand and supply determine the allocation of resources in a free-enterprise economy.

• The prices of goods and services reflect the relative scarcity of resources and the preferences of consumers.

• Firms produce goods and services that are in demand and profitable, while consumers buy goods and services that satisfy their needs and wants.

Additional Information

• "Decisions are based on the forces of demand and supply" is a characteristic of a free-enterprise economy.

• It means that the prices of goods and services are determined by the interaction of buyers and sellers in the market.

• The higher the demand for a good or service, the higher its price, and the lower its supply, the higher its price.

• "Factor rewards are based on the productivity of factors of production" is a characteristic of a free-enterprise economy.

• It means that the income earned by the factors of production, such as land, labor, capital, and entrepreneurship, is determined by their contribution to the production process.

• The more productive a factor is, the higher its income.

• "Economic decisions are regulated by the market" is a characteristic of a free-enterprise economy.

• It means that the market mechanism determines the allocation of resources, the prices of goods and services, and the production and consumption decisions of firms and consumers.

• The government intervenes only to ensure competition and protect consumers from market failures.

**Q39. Answer: (a) Reserve Bank of India (RBI)**

The correct answer is Reserve Bank of India (RBI).

Key Points

• The RBI is the central bank of India and has the authority to regulate and supervise all financial institutions operating in the country.

• Microfinance institutions (MFIs) are considered Non-Banking Financial Companies (NBFCs) and are regulated by the RBI under the regulatory framework for NBFCs.

• The RBI sets guidelines and regulations for MFIs to ensure they operate in a transparent and responsible manner, and to protect the interests of customers.

• The RBI also conducts regular inspections and audits of MFIs to ensure they comply with the regulations and maintain financial stability.

Additional Information

• Ministry of Finance:

• Ministry of Finance plays a key role in setting policies and regulations for the financial sector in India.

• It specifically addresses taxation, financial regulations, capital markets, financial institutions, federal and state finances, and the Union Budget.

• Insurance Regulatory and Development Authority of India (IRDAI):

• As the name suggests, IRDAI is responsible for regulating and developing the insurance sector in India.

• The Ministry of Finance, Government of India, has control over the Insurance Regulatory and Development Authority of India, which is an established body.

• Securities and Exchange Board of India (SEBI):

• SEBI is the regulatory body for securities markets in India.

• The Securities and Exchange Board of India was constituted as a non-statutory body on April 12, 1988 through a resolution of the Government of India.

• The Securities and Exchange Board of India was established as a statutory body in the year 1992 and the provisions of the Securities and Exchange Board of India Act, 1992 (15 of 1992) came into force on January 30, 1992.

**Q40. Answer: (a) Bihar**

The correct answer is Bihar.

Key Points

• Sher Shah's Tomb is located in the state of Bihar in India.
• Sher Shah was a prominent ruler of medieval India who ruled over the region from 1540 to 1545.
• He is known for his administrative and military reforms, which laid the foundation for the Mughal Empire.
• Sher Shah's Tomb is located in the town of Sasaram in Bihar.
• It was built by his son Islam shah suri in 1545, after Sher Shah's death, and is considered to be a fine example of Indo-Islamic architecture.

Additional Information

• Uttar Pradesh, is a neighboring state of Bihar.
• It is also home to many historical sites and monuments, such as the Taj Mahal and the Agra Fort.
• Punjab, is located in the northwestern part of India, bordering Pakistan.
• It is known for its rich cultural heritage and history, including the ancient Indus Valley Civilization.
• Bengal, refers to the historical region of Bengal, which is now divided between India and Bangladesh.
• It is known for its unique culture, literature, and cuisine.

**Q41. Answer: (c) Satya Shodhak Samaj**

The correct answer is Satya Shodhak Samaj.

Key Points

• The association formed in Maharashtra to get social justice for the weaker sections of society is the Satya Shodhak Samaj.
• Satya Shodhak Samaj was founded by Jyotirao Phule in 1873 with the aim to uplift the lower castes and women.
• The movement challenged the Brahminical domination of the Indian society and advocated for social equality, education, and women's rights.
• The movement was instrumental in the formation of the Indian National Congress and the Dalit movement.

Additional Information

• Theosophical Society
• Theosophical Society is a worldwide organization that aims to promote unity and understanding among different religions and cultures.
• It was founded in the United States in 1875 by Helena Petrovna Blavatsky, Henry Steel Olcott, and William Quan Judge.
• The society's main objective is to study and promote theosophy, which is a set of spiritual and philosophical teachings that are believed to be universal and timeless.
• Arya Samaj
• Arya Samaj is a Hindu reform movement founded by Swami Dayananda Saraswati in 1875 with the aim to promote Vedic knowledge and remove superstitions from Hinduism.
• The movement emphasizes the authority of the Vedas and rejects idol worship, caste system, and animal sacrifices.
• Arya Samaj played an important role in the Indian independence movement and was a major influence on the Hindu nationalist movement.
• Dharma Paripalana Yogam
• Dharma Paripalana Yogam is a religious organization based in Kerala that aims to promote the teachings of Sree Narayana Guru, a social reformer and spiritual leader.
• The organization is known for its work in the fields of education, healthcare, and social welfare.
• Sree Narayana Guru is considered to be one of the most influential figures in the social reform movements of Kerala.

**Q42. Answer: (b) SEBI conducts open market operations to regulate money supply in the economy**

The correct answer is SEBI conducts open market operations to regulate money supply in the economy.

Key Points

• RBI decides the bank rate for the economy which is the rate at which RBI lends money to commercial banks.
• SEBI is the Securities and Exchange Board of India which regulates the securities market and does not conduct open market operations.
• RBI is responsible for printing currency notes in India.
• Ministry of Finance issues coins in India.

Additional Information

• Open market operations are conducted by the RBI to regulate the money supply in the economy.
• In this process, RBI buys or sells government securities in the open market to increase or decrease the money supply respectively.
• SEBI is responsible for regulating the securities market in India.

• It was established in 1988 and is headquartered in Mumbai.
• Ministry of Finance is responsible for managing the finances of the Government of India.
• It is headed by the finance minister and is responsible for formulating and implementing the financial policies of the government.
• Bank rate is the rate at which RBI lends money to commercial banks.
• It is an important tool used by RBI to control the money supply in the economy.

**Q43. Answer: (c) Secular**

The correct answer is secular.

Key Points

• The original Preamble had the following words: "We, the people of India, having solemnly resolved to constitute India into a Sovereign Democratic Republic..."
• "Democratic", "Republic", and "Sovereign" were all a part of the original Preamble and continue to be integral to the Indian Constitution.
• "Democratic" refers to the principle of government by the people and for the people.
• "Republic" signifies that the head of the state is elected, not hereditary.
• "Sovereign" means that India is a free and independent country that is not subject to external control.

Additional Information

• The Preamble of the Indian Constitution was adopted on 26th November 1949.
• It is an introductory statement that sets out the fundamental principles and values of the Constitution.
• The Preamble originally had 22 words, but it was amended by the 42nd Constitutional Amendment Act of 1976 to include the words "socialist" and "secular".
• "Secular" was added to the Preamble in 1976 to signify that India is a country that does not have an official religion and that all religions are treated equally by the state.

**Q44. Answer: (a) 51A(k)**

The correct answer is Article 51A(k).

Key Points

• Article 51A(k) of the Constitution of India states that it is the duty of every citizen who is a parent or guardian to provide opportunities for education to their child or ward between the age of six and fourteen years.
• This article falls under Part IV-A of the Constitution which deals with fundamental duties of citizens.
• This article specifically addresses the duty of parents and guardians to provide education to their children.

Additional Information

• 51A(j), states that it is the duty of every citizen to strive towards excellence in all spheres of individual and collective activity.
• 51A(i), states that it is the duty of every citizen to safeguard public property and to abjure violence.
• 51A(h), states that it is the duty of every citizen to develop the scientific temper, humanism, and the spirit of inquiry and reform.

**Q45. Answer: (a) Rs. 3000**

The correct answer is Rs. 3000.

Key Points

• PM DAKSH Yojana is an initiative launched by the Government of India to provide training and employment opportunities to the youth of the country.
• Rs 3000 is the wage compensation per trainee is provided under the PM DAKSH Yojana
• The scheme aims to provide training and apprenticeship opportunities to over 1 crore youth by 2025.
• The scheme provides wage compensation to the trainees during the training period to support them financially.

Additional Information

• Rs 6000 is the wage compensation provided under the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) 3.0 scheme.
• It aims to provide skill development training to the youth and improve their employability.
• Rs 8000 is the wage compensation provided under the National Apprenticeship Promotion Scheme (NAPS).
• It aims to promote apprenticeship training and increase the participation of employers and apprentices in the scheme.

**Q46. Answer: (c) Mumbai Indians**

• The correct answer is Mumbai Indians.

Key Points

• Mumbai Indians won the Cricket's Inaugural Women's Premier League in 2023.

• The team is owned by Indiawin sports.

• Harmanpreet Kaur is the team captain, and Charlotte Edwards is the team coach.

• The team defeated Delhi Capitals in the championship game to win the inaugural WPL season.

Additional Information

• The Women's Premier League started in 2023, and Mumbai Indians were the champions in the inaugural season.

• Mumbai Indians is a men's team in the Indian Premier League (IPL) and is owned by India's biggest conglomerate, Reliance Industries.

• The Women's Premier League is a new initiative to promote women's cricket in India and provide a platform for talented players to showcase their skills.

**Q47. Answer: (b) Only i and ii**

The correct answer is option i and ii.

Key Points

• Sir William Gaud, a British economist, first used the term "Green Revolution" in a 1968 speech to describe the rapid increase in agricultural productivity in Asia and Latin America.

• Norman Borlaug, an American plant scientist, is widely regarded as the Father of Green Revolution for his pioneering work in developing new wheat varieties that were resistant to disease and had higher yields.

Additional Information

• The Green Revolution refers to a period of significant agricultural productivity growth that occurred in the 1960s and 1970s, mainly in developing countries.

• It involved the introduction of high-yielding crop varieties, modern farming techniques, and improved irrigation and fertilization practices.

• MS Randhawa was a prominent Indian botanist and agricultural scientist, but he is not considered the Father of Green Revolution in India.

• M.S. Swaminathan, is known as the Father of Green Revolution in India, who played a key role in introducing high-yielding varieties of rice and wheat in the country.

**Q48. Answer: (a) folk dance of Punjab**

The correct answer is folk dance of Punjab.

Key Points

• Balkar Sidhu was awarded the Sangeet Natak Akdemi Award 2020 for his contribution to the folk dance of Punjab.

• Balkar Sidhu is a renowned Punjabi folk singer and songwriter who has contributed significantly to the promotion and preservation of Punjabi folk music and culture.

• Sidhu has released several albums and performed at various national and international platforms to showcase the rich heritage of Punjabi folk music and dance.

• Some of his popular songs include "Maavan", "Jija Akhian Na Maar", "Jhanjaran" and "Tera Yaar Bolda".

Additional Information

• Manipuri Dance is a jagoi that originated in the state of Manipur.

• It is one of the eight main Indian classical dance styles.

• Chhau dance is a combination of martial and folk traditions, which is a semi - classical dance.

• There are three varieties of it, namely the Purulia Chhau of West Bengal, the Seraikella Chhau of Jharkhand, and the Mayurbhanj Chhau of Odisha, after the regions in which they are performed.

• Lavani, koli and Dhangari are among a few folk dances of Maharashtra.

**Q49. Answer: (d) Heinrich Friedrich Lenz**

The correct answer is Heinrich Friedrich Lenz.

Key Points

• Heinrich Friedrich Lenz proposed the law known as Lenz's law in 1834.

• Lenz's law states that the direction of the induced current in a conductor will be such that it opposes the change that produced it.

• This law is a consequence of the law of conservation of energy and is widely used in the study of electromagnetism.

Additional Information

• David Brewster was a Scottish physicist.

• He made significant contributions to the study of optics, including the polarization of light.

• Henry Moseley was an English physicist.

• He made important discoveries about atomic structure and is known for his work on X-ray spectra.

• Christian Johann Doppler was an Austrian mathematician and physicist.

• He discovered the Doppler effect, which describes the change in frequency of a wave as the source and observer move relative to each other.

**Q50. Answer: (d) A-I, B-II, C-IV, D-III**

The correct answer is A-I, B-II, C-IV, D-III.

Key Points

• Jharkhand is known for Karma festival, which is celebrated in the month of August or September.

• Himachal Pradesh celebrates Chaitraul festival, which is also known as the Spring Festival and is celebrated in the month of April.

• Telangana celebrates Bathukamma festival, which is celebrated during Navaratri and is dedicated to Goddess Gauri.

• Punjab celebrates Lohri festival, which is a winter harvest festival and is celebrated on 13th January.

Additional Information

• Karma festival:

• It is related to the harvest and a tribute to the Karam tree.

• Karam-Devta, the god of strength, vigor, and youthfulness, is worshipped there.

• Chaitraul festival:

• it is considered as the festival of pictures and celebrated in the month of chaitra.

• A well-known celebration in the Sirmaur region is Chaitrual.

• Telangana festival:

• Nine days are dedicated to celebrating Bathukamma.

• It falls between the Durga Puja and Sharad Navratri festivals.

• Lohri festival:

• People in the northern part of the Indian subcontinent celebrate Lohri.

• It signals the end of winter and signifies the arrival of longer days and the sun's journey to the Northern Hemisphere.

**Q51. Answer: (d) 0.29**

Formula used:

$(a + b + c)^2 = (a^2 + b2 + c2) + (2ab +2bc+ 2 ca)$

Calculation:

$(0.09\times0.09+0.04\times0.04+0.16\times0.16+2\times0.09\times0.04+2\times0.04\times0.16+2\times0.09\times0.16)/(0.3\times0.3+0.2\times0.2+0.4\times0.4)$

$\Rightarrow \{(.09^2 + .04^2 + .16^2) + (2\times 0.09 \times 0.04 +2 \times 0.04\times0.16+ 2 \times 0.09 \times 0.16)\} / (0.09 +0 .04 +0.16)$

$\Rightarrow (.09 + .04 + .16)^2 / (0.09 +0 .04 +0.16)$

$\Rightarrow (.09 + .04 + .16)$

$= 0.29$

Therefore The correct option is 4

**Q52. Answer: (b) -2**

Calculation:

$(x^2-1)/(x-1) - (x^2-9)/(x-3)$

$\Rightarrow (x-1)(x+1)/(x-1) - (x-3)(x+3)/(x-3)$

$\Rightarrow x + 1 - x - 3 = -2$

Therefore The correct option is 2

**Q53. Answer: (a) 56,700**

Given:

Two years ago, the population of a small town was 60,000. It increased by 5% in the first year, but due to the pandemic, it decreased by 10% in the second year.

Calculation:

After the first year the population will be,

$\Rightarrow 60000 \times 105 /100 = 63000$

After the second year the population will be,

$\Rightarrow 63000 \times 90/100 = 56,700$

Therefore The correct option is 1

**Q54. Answer: (b) 25% loss**

Given:

Cost price = Rs. 320 per kg and selling price = Rs. 6 per 25 grams,

Concept used:

Selling price = cost price + profit

Calculation:

The selling price of 1 kg will be,

=> (6/25) × 1000 = Rs 240

The loss percentage will be,

=> (320 - 240 /320) × 100 = 25%

Therefore The correct option is 2

**Q55. Answer: (b) 108 : 75 : 143**

Given:

Kapil invested = Rs. 30,00,000. Kunal =Rs. 25,00,000.

Saloni also invested, 30,00,000 + 25,00,000=Rs. 55,00,000

Calculation:

Kapil's money was invested for 36 months

Kunal's money was invested for 30 months

Saloni's money (30,00,000 + 25,00,000) = 55,00,000 was invested for 26 months

The profit ratio will be,

30,00,000 × 36 : 25,00,000 × 30: 55,00,000 × 26

=> 108 : 75 : 143

Therefore The correct option is 2

**Q56. Answer: (b) 6 2/3**

Given:

A can do in 12 days and B can do in 15 days.

Concept used:

Efficiency = 1 / number of days

Calculation:

If they work together then do in 1 day

=> 1/12 + 1/15

=> (5+4)/60

=> 9/60

= 3/20 part

Total work will be done in, 20 / 3 days

Therefore The correct option is 2

**Q57. Answer: (b) 92°**

Given:

In a triangle ABC, side BC is produced to D such that angle ACD = 127°. If angle ABC = 35°

Concept used:

External angle = sum of the opposite internal angles

Calculation:

As we know,

angle ACD = angle ABC + angle BAC

=> 127° = 35° + angle BAC

=> angle BAC = 92°

Therefore The correct option is 2

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

Calculation:

The average marks of Rani is,

=> (20 + 22 + 24 + 23) / 4 = 89/4

=> 22.25

The average marks of Ravi is,

=> (22 + 18 + 24 + 20)

=> 84/4 = 21

In the same way average marks of Raju is 22.50

The average mark of Rekha is 21.50

Therefore The correct option is 3

**Q59. Answer: (c) 15 km**

Shortcut Trick

For problems involving Late and Early reaching times, the distance is calculated as:

Distance = [(S1 × S2) / (S2 − S1)] × [Total Time Difference / 60]

Total time difference = 10 min (late) + 5 min (early) = 15 min.

Distance = [(15 × 20) / (20 − 15)] × (15 / 60) = (300 / 5) × (1 / 4) = 60 / 4 = 15 km.

Therefore The correct answer is 15 km.

Alternate Method

Given:

Speed 1 (S1) = 15 km/h (Late by 10 min)

Speed 2 (S2) = 20 km/h (Early by 5 min)

Calculations:

Let the Distance be 'D' km.

Time taken at 15 km/h = D / 15

Time taken at 20 km/h = D / 20

The difference between being 10 min late and 5 min early is 15 minutes.

=> (D / 15) − (D / 20) = 15 / 60

=> (D / 15) − (D / 20) = 1 / 4

Taking LCM of 15 and 20, which is 60:

=> (4D − 3D) / 60 = 1 / 4

=> D / 60 = 1 / 4

=> D = 60 / 4

=> D = 15 km

Therefore The correct answer is 15 km.

Additional Information

Time Difference Rule

When one case is late and another is early, add the times. If both are late or both are early, subtract the times to find the net difference.

Speed-Time Relation

For a constant distance, speed is inversely proportional to time (S1 / S2 = T2 / T1).

Conversion Units

To convert km/h to m/s, multiply by 5/18. To convert minutes to hours, divide by 60.

**Q60. Answer: (d) 6**

Concept used:

Sin0° = 0 and cos 0° = 1

Calculation:

By putting A = 0° we get,

4 (sin6A + cos6A) - 6(sin4A + cos4A) + 8

=> 4 (1) - 6 (1) + 8

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=> 4 - 6 + 8 = 6

Therefore The correct option is 4

**Q61. Answer: (c) 2715.43 m2**

Given:

The radius + height = 42 m.

The total surface area = 6336 m2,

Concept used:

The total surface area of the cylinder = curved surface area of the cylinder + area of the base

Formula used:

The curved surface area = 2πrh (r= radius and h = height)

Calculation:

As per the question,

r + h = 42

Again,

2πr (r + h) = 6336

=> 2πr × 42 = 6336

=> r = 6336 / 264

=> r = 24

Then h = 42 - 24

=> 18m

The curved surface area will be, 2πrh

=> 2 × 22/7 × 18 × 24 = 2715.43 m2

Therefore The correct option is 3

**Q62. Answer: (a) 4.19**

Concept used:

Tan A = Sin A / Cos A

Calculation:

cos A = 63/65, Then sin A = 16/65

Then,

tan A + cot A = (sin A / cos A) + (cos A / sin A)

=> 16/65 × 65/63 + 63/65 × 65/16

=> 16/ 63 + 63 / 16 = 4.19

Therefore The correct option is 1

**Q63. Answer: (c) Rs. 200**

Shortcut Trick

Let CP and MP of the article be 400 and 700 units respectively.

Discount = 20% of 700 = 140 units, so SP = 700 − 140 = 560 units.

Profit = SP − CP = 560 − 400 = 160 units.

Given, 160 units = Rs. 80 => 1 unit = Rs. 0.5.

Cost price (CP) = 400 units × 0.5 = Rs. 200.

Therefore The correct answer is Rs. 200.

Alternate Method

Given:

Ratio of Cost Price (CP) to Marked Price (MP) = 4 : 7

Discount = 20%

Profit = Rs. 80

Formula Used:

Selling Price (SP) = MP − Discount

Profit = SP − CP

CP = 4xSP = 5.6xMP = 7xProfit1.6xDiscount20%Profit = 1.6x = Rs. 80, so x = 50

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Calculation:

=> Let CP = 4x and MP = 7x

=> Discount is given on the Marked Price

=> Discount = 20% of 7x = (20 ÷ 100) × 7x = 1.4x

=> SP = MP − Discount = 7x − 1.4x = 5.6x

=> Profit = SP − CP = 5.6x − 4x = 1.6x

=> We are given that Profit = Rs. 80

=> 1.6x = 80

=> x = 80 ÷ 1.6 = 50

=> Cost Price (CP) = 4x = 4 × 50 = 200

Therefore The correct answer is Rs. 200.

Additional Information

Marked Price & Discount

Discount is always calculated on the Marked Price (MP). Selling Price (SP) = MP × (100 − Discount%) ÷ 100.

Profit & Loss Base

Profit or Loss is always evaluated on the Cost Price (CP) unless stated otherwise. Profit% = (Profit ÷ CP) × 100.

Successive Discount

When two successive discounts d1% and d2% are given, the Equivalent Single Discount = (d1 + d2 − d1×d2 ÷ 100)%.

**Q64. Answer: (a) 40**

Formula used:

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

Calculation:

$(4[(17)^3-(7)^3])/((17)^2+(7)^2+119)$

=> $4 (17-7) \times (17^2 + 7^2 + 119) / (172 + 72 + 119)$

=> $4 \times (10) = 40$

Therefore The correct option is 1

**Q65. Answer: (a) √265/4**

Shortcut Trick

For two parallel chords of half-lengths a and b on the same side of the center with distance d between them:

Let the distance of the longer chord from the center be x.

=> $x = (a^2 − b^2 − d^2) ÷ (2 × d)$

Given: a = 8 ÷ 2 = 4 cm, b = 6 ÷ 2 = 3 cm, d = 2 cm.

=> $x = (4^2 − 3^2 − 2^2) ÷ (2 × 2) = (16 − 9 − 4) ÷ 4 = 3 ÷ 4 = 0.75$ cm.

=> $r^2 = a^2 + x^2 = 16 + (0.75)^2 = 16 + 9/16 = 265/16$.

=> r = √265 ÷ 4 cm.

Therefore The correct answer is √265/4 cm.

Alternate Method

Given:

Length of chord AB = 8 cm => half-length AM = 4 cm.

Length of chord CD = 6 cm => half-length CN = 3 cm.

Distance between chords MN = 2 cm.

Formula Used:

In a circle, the perpendicular from the center to a chord bisects the chord. Using Pythagoras Theorem: $r^2 = (\text{chord}/2)^2 + (\text{distance from center})^2$.

Calculations:

Let r be the radius and OM = x be the distance from the center to chord AB.

Then the distance of chord CD from the center is ON = (x + 2).

In ΔOMA: $r^2 = 4^2 + x^2 \Rightarrow r^2 = 16 + x^2$ −−− (1)

In ΔONC: $r^2 = 3^2 + (x + 2)^2 \Rightarrow r^2 = 9 + x^2 + 4x + 4 \Rightarrow r^2 = 13 + x^2 + 4x$ −−− (2)

Equating (1) and (2):

=> 16 + $x^2$ = 13 + $x^2$ + 4x

=> 16 − 13 = 4x

=> 3 = 4x => x = 3/4 = 0.75 cm.

Substitute x in equation (1):

=> $r^2$ = 16 + $(3/4)^2$ = 16 + 9/16

=> $r^2$ = (256 + 9) ÷ 16 = 265/16

=> r = √265 ÷ 4 cm.

Therefore The correct answer is √265/4 cm.

Additional Information

Perpendicular Bisector Theorem

The perpendicular drawn from the center of a circle to a chord always bisects the chord into two equal segments.

Parallel Chords on Opposite Sides

If chords are on opposite sides of the center, the distance between them is the sum of their individual distances from the center (d = x + y).

Chord Length and Distance

The longer the chord, the closer it is to the center of the circle (inverse relationship between chord length and perpendicular distance).

**Q66. Answer: (b) 60**

Calculation:

The total marks will be, 70 + 60 + 40 + 50 + 80 = 300

The average marks will be 300 / 5 = 60

Therefore The correct option is 2

**Q67. Answer: (a) Rs. 60,00,000**

Calculation:

Total percentage of cricket and hockey is 20 + 20 = 40%

The value of 40% will be 1,50,00,000 × 40/100 = Rs. 60,00,000

Therefore The correct option is 1

**Q68. Answer: (b) 7/5**

Formula Used:

(sin θ + cos θ)2 + (sin θ - cos θ)2 = 2

Calculation:

(sin θ + cos θ)2 + (sin θ - cos θ)2 = 2

=> (sin θ + cos θ)2 + (1/5)2 = 2

=> (sin θ + cos θ)2 + (1/25) = 2

=> (sin θ + cos θ)2 = 2 - (1/25)

=> (sin θ + cos θ)2 = 49/25

=> (sin θ + cos θ) = √(49/25)

Therefore sin θ + cos θ = 7/5

Alternate Method

sin θ - cos θ = 1/5

Assuming that, If base = 3 height is = 4 then hypotenuse = 5

sin θ + cos θ = 4/5 + 3/5

=> 7/5

Therefore The correct option is 2

**Q69. Answer: (c) 0**

Calculation:

Let the number is 280 × 78

Now divide the number by 65

=> 280 × 78 / 65 = 336

If we divide the quotient is 336

So if it is divisible by 65 the remainder will be 0

**Q70. Answer: (d) 8,000**

Shortcut Trick

Total Effective Interest Rate = 8% + 12% + 16% + 20% + 24% = 80%

Total Interest Earned = 80% of Rs. 10,000

=> Total Interest = (80 ÷ 100) × 10,000 = Rs. 8,000

Therefore The correct answer is Rs. 8,000.

Alternate Method

Given:

Principal (P) = Rs. 10,000

Initial Rate (R1) = 8%

Annual Increment = 4%

Time (T) = 5 years

Formula Used:

Simple Interest (SI) = (P × R × T) ÷ 100

Step-by-step Calculation:

=> Interest for 1st Year = (10,000 × 8 × 1) ÷ 100 = Rs. 800

=> Interest for 2nd Year = (10,000 × 12 × 1) ÷ 100 = Rs. 1,200

=> Interest for 3rd Year = (10,000 × 16 × 1) ÷ 100 = Rs. 1,600

=> Interest for 4th Year = (10,000 × 20 × 1) ÷ 100 = Rs. 2,000

=> Interest for 5th Year = (10,000 × 24 × 1) ÷ 100 = Rs. 2,400

=> Total Interest Earned = 800 + 1,200 + 1,600 + 2,000 + 2,400

=> Total Interest Earned = Rs. 8,000

Therefore, the total interest earned after 5 years is Rs. 8,000, which corresponds to Option 4.

Therefore The correct answer is Rs. 8,000.

Additional Information

Simple Interest vs. Compound Interest

In Simple Interest, the interest is calculated only on the initial principal. In Compound Interest, interest is calculated on the principal plus the accumulated interest of previous periods.

Arithmetic Progression of Rates

When rates increase by a constant amount, the total rate is the sum of an AP: $S_n = n/2 \times [2a + (n-1)d]$. Here, n=5, a=8, d=4, so $S_n = 5/2 \times [16 + 16] = 80\%$.

Effective Annual Rate

The effective average interest rate over the period is Total Rate ÷ Total Years. Here, 80% ÷ 5 = 16% per annum.

**Q71. Answer: (b) 64**

Shortcut Trick

Identify prime numbers between 51 and 77: 53, 59, 61, 67, 71, 73.

Sum of these 6 numbers = 53 + 59 + 61 + 67 + 71 + 73 = 384.

Average = Total Sum ÷ Number of terms = 384 ÷ 6 = 64.

Therefore The correct answer is 64.

Alternate Method

Given: Range for prime numbers is 51 to 77.

Formula: Average = (Sum of observations) ÷ (Total number of observations)

=> Prime numbers are 53, 59, 61, 67, 71, and 73.

=> Sum = 53 + 59 + 61 + 67 + 71 + 73 = 384.

=> Number of terms = 6.

=> Average = 384 ÷ 6

=> Average = 64.

Therefore The correct answer is 64.

Additional Information

Prime Numbers

A prime number is a natural number greater than 1 that has no positive divisors other than 1 and itself. The smallest prime number is 2.

Arithmetic Mean

The Average (Arithmetic Mean) is the ratio of the sum of all observations to the total number of observations.

Prime Checklist

To check if a number n is prime, test for divisibility by all prime numbers less than or equal to √n.

**Q72. Answer: (c) Rs. 2,000**

Given:

A shopkeeper marked a product, 5% above the cost price.

Sold the product for Rs. 1890.

Discount =10%.

Concept used:

The discount is calculated on market price while profit is calculated on cost price.

Calculation:

The market price will be 1890 × 100 / 90 = Rs 2100

The cost price will be 2100 × 100/105 = Rs. 2000

Therefore The correct option is 3.

**Q73. Answer: (a) 65°**

Given:

AB is a chord. angle ACB = 65°.

AT is the tangent to the circle at the point A.

Concept used:

Semi-circled angle is a right angle.

Calculation:

As per the question,

angle ACB = 65°, then angle angle ABC = 90°

So the angle CAB = 180 - (90+65)

=> 25°

Again angle CAT = 90°

angle BAT = angle CAT - angle CAB

=> 90° -25°

=> 65°

Therefore The correct option is 1

**Q74. Answer: (a) 12,669**

Given:

The population = 12,000.

It increased by 2.5% and 3%, respectively, in the last two years.

Calculation:

Population after two years will be,

=> 12,000 × 102.5/100 × 103/100 = 12669

Therefore The correct option is 1

**Q75. Answer: (c) 121 √3**

Given:

The length of each side of an equilateral triangle is 22 cm

Formula used:

The area of an equilateral triangle is (√3 / 4) × side²

Calculation:

The area of an equilateral triangle is

(√3 / 4) × 222

=> 121 √3 cm2

Therefore The correct option is 3

**Q76. Answer: (b) magnanimous**

The solution is in Hindi. Read it online.

**Q77. Answer: (b) Ambivert**

The solution is in Hindi. Read it online.

**Q78. Answer: (b) Invincible**

The solution is in Hindi. Read it online.

**Q79. Answer: (c) Moderate**

The solution is in Hindi. Read it online.

**Q80. Answer: (c) revolve**

The solution is in Hindi. Read it online.

**Q81. Answer: (a) B, D, A, C**

The correct answer is: B, D, A, C

Key Points

• Part B: This phrase introduces the idea that Europa and Enceladus are moons of Jupiter and Saturn and sets the stage for a comparison.

• Part D: This part completes the comparison by stating that despite Europa and Enceladus being covered in ice, Earth is considered the true water world of the solar system.

• Part A: This part adds a supporting detail, emphasizing that Earth's claim as the true water world is justified because 71 per cent of its surface is covered by saltwater oceans.

• Part C: This part further elaborates on Earth's water abundance by mentioning that the continents also contribute to this abundance with lakes, rivers, and seas.

• So, the correct order is B, D, A, C, forming a coherent and meaningful sentence.

Therefore, the correct answer is option 1.

**Q82. Answer: (a) in 45 Church Street**

The correct answer is: in 45 Church Street

Key Points

• "At" is generally preferred when we want to emphasize a specific point or location.

• In the case of an address, using "at" can convey a sense of precision, indicating a particular point on the street.

• Corrected sentence: "He lives at 45 Church Street with his family", suggests a precise location on Church Street.

• "In" is used for general locations, countries, cities, and regions.

• Example: He lives in New York.

• While 'At' is used for specific points or addresses.

• Example: The party is at 45 Main Street.

Therefore, the correct answer is option 1.

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

The solution is in Hindi. Read it online.

**Q84. Answer: (c) competent**

The solution is in Hindi. Read it online.

**Q85. Answer: (a) English literature is taught to us by your mother.**

The correct answer is: English literature is taught to us by your mother.

Key Points

• The passive voice is formed by rearranging the sentence structure to emphasize the recipient of the action rather than the doer.

• Active voice structure: Subject + verb + Object

• Example: The chef prepares a delicious meal.

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• Passive voice structure: Object + be verb + past participle + by + doer

• Example: A delicious meal is prepared by the chef.

• So, in the passive voice construction, the focus is on what is being taught (English literature) rather than who is doing the teaching (your mother).

• Passive voice constructions have the option to include or omit the doer of the action (by your mother).

• Including it provides additional information about who is performing the action.

Therefore, the correct answer is option 1.

**Q86. Answer: (b) unimpress at the end**

The correct answer is: unimpress at the end

Key Points

• The word "unimpress" is not a proper adjective in English.

• The correct adjective form to use in this context is "unimpressed."

• Adjectives modify or describe nouns, and in this case, we are describing the state or condition of the judges.

• "Unimpressed" is the adjective form, indicating a lack of a positive impact or a lack of being impressed.

• So, when describing the judges' reaction, we should use "unimpressed" to convey that they were not impressed by the singing.

• The corrected sentence reflects the appropriate adjective form: "He sang beautifully, but the judges were unimpressed at the end."

Therefore, the correct answer is option 2.

**Q87. Answer: (a) Moving**

The solution is in Hindi. Read it online.

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

The solution is in Hindi. Read it online.

**Q89. Answer: (b) fall: to come at a particular time or happen in a particular place**

The correct answer is: fall: to come at a particular time or happen in a particular place

Key Points

• A homonym is a linguistic term that refers to a pair (or group) of words that have the same spelling or pronunciation but different meanings.

• In this context, the word "fall" is used in the sense of an event occurring or taking place at a particular time.

• Fall: to come at a particular time or happen in a particular place: This is the correct meaning for the given context.

• It expresses when an event, in this case, the birthday, is scheduled to happen.

• So, in the sentence "My birthday will fall on a Friday this year," the word "fall" is used to convey the timing or occurrence of the birthday, making it the most appropriate choice.

Therefore, the correct answer is option 2.

Additional Information

• Fall: to go down onto the ground suddenly: Here, "fall" refers to the physical act of descending or dropping to the ground, typically in an unplanned or sudden manner.

• Fall: to change to a particular condition: Here, "fall" indicates a change, typically a decrease, in a particular condition or state. It is often used when describing a decline in value, quantity, or quality.

• Fall: to be beaten or defeated: Here, "fall" is used metaphorically to convey the team's defeat or loss in a competition. It implies a decline in performance or success.

**Q90. Answer: (d) Perform without any rehearsals**

The solution is in Hindi. Read it online.

**Q91. Answer: (d) B, A, D, C**

The correct answer is: B, A, D, C

Key Points

• Part B: This part introduces the main idea of the sentence, stating that Poe's work is influenced by the Romanticism movement.

• Part A: This connects with the first part, explaining that Poe's work owes much to the occult and the satanic, and this influence can be traced back to Romanticism.

• Part D: This provides additional information about how Poe's work was influenced – through his own feverish dreams and his unique ability to apply those dreams to his writing.

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• Part C: This concludes the sentence by describing how Poe applied his rare faculty – by shaping plausible fabrics out of impalpable materials. It adds a vivid description of Poe's creative process.

• So, the correct sequence forms a coherent and logically flowing sentence about the influence of Romanticism, the occult, the satanic, Poe's dreams, and his unique creative process.

Therefore, the correct answer is option 4.

**Q92. Answer: (d) go the extra mile**

The solution is in Hindi. Read it online.

**Q93. Answer: (c) Orthopaedist**

The solution is in Hindi. Read it online.

**Q94. Answer: (d) sitback**

The correct answer is Setback

Key Points

• The incorrectly spelled word in the sentence is "sitback." The correct spelling is "setback."

• A setback refers to a reversal or a check in progress, a delay, or an unexpected obstacle that hinders or delays one's plans or goals., which fits the context of the sentence.

• Example: The sudden resignation of the project manager was a setback for the team's timeline and overall progress.

• Corrected sentence: Your lack of knowledge of recent advances in technology will be a setback for your business.

Therefore, the correct answer is option 4.

**Q95. Answer: (d) The exhibition was inaugurated by the Governor of the state in a grand way.**

The correct answer is: The exhibition was inaugurated by the Governor of the state in a grand way.

Key Points

• In an active voice sentence, the subject performs the action.

• The basic structure is Subject + Verb + Object.

• Example: The cat chased the mouse.

• In a passive voice sentence, the subject receives the action, and the focus is on the action or the receiver.

• The basic structure is Object of the Active Voice Sentence + "to be" verb + Past Participle of the Main Verb + by + Subject

• Example: The mouse was chased by the cat.

• So, in the given sentence, the object of the Active Voice will be "the exhibition", "to be" verb will be "was", the past participle of the main verb will be "inaugurated" and the subject with 'by' will become "by the Governor of the state."

• The passive voice sentence retains the essential information from the active voice sentence but shifts the focus from the Governor to the exhibition.

Therefore, the correct answer is option 4.

**Q96. Answer: (d) ceremony**

The solution is in Hindi. Read it online.

**Q97. Answer: (a) lighting**

The solution is in Hindi. Read it online.

**Q98. Answer: (b) encouraging**

The solution is in Hindi. Read it online.

**Q99. Answer: (a) endeavours**

The solution is in Hindi. Read it online.

**Q100. Answer: (b) gratitude**

The solution is in Hindi. Read it online.

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