SSC CHSL Tier-1 2023: Official Paper (Held On: 09 Aug, 2023 Shift 4) (Previous Year Paper)

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

Take this paper as a timed mock test

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

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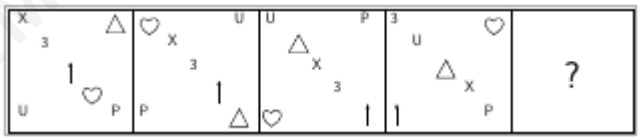
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ENGLISH LANGUAGE

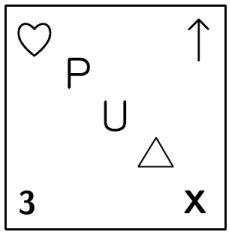
Q1. Each of the letters in the word DONATE are arranged in alphabetical order. How many letters are there in the English alphabetical series between the letter which is third from the left and the one which is second from the right?

(a) Seven
(b) Eight
(c) Six
(d) Nine

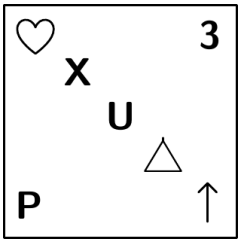
Q2. Identify the figure given in the options that when put in place of the question mark (?) will logically complete the series.



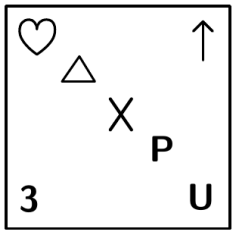
(a)



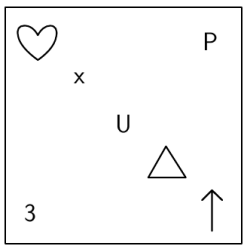
(b)



(c)



(d)



Q3. In a certain code language,

G + T means 'G is the father of T',

G - T means 'G is the sister of T',

G × T means 'G is the brother of T',

G ÷ T means 'G is the daughter of T',

Based on the above, If P ÷ Q - L + N × M, then how is N related to Q?

(a) Son

(b) Brother

(c) Father

(d) Brother's son

Q4. Which term from among the given options can replace the question mark (?) in the following series to make it logically complete?

AN 37, ?, EH 50, GE 58, IB 67

(a) DL 42

(b) DI 45

(c) CK 43

(d) CL 44

Q5. Which of the following interchanges in two mathematical operators will balance the equation given below?

85 - 28 × 3 + 114 ÷ 6 = 150

(a) • and ×

(b) • and ÷

(c) ÷ and ×

(d) • and -

Q6. 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.

(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.)

9 : 720

5 : 134

7 : 334

11 : 1322

(a) 7 : 334

(b) 5 : 134

(c) 9 : 720

(d) 11 : 1322

Q7. EFHD is related to LMOK in a certain way based on the English alphabetical order. In the same way, OPRN is related to VWYU. To which of the following is JKMI related, following the same logic?

(a) QSPT

(b) TUWS

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(c) QRTP
(d) RSTP

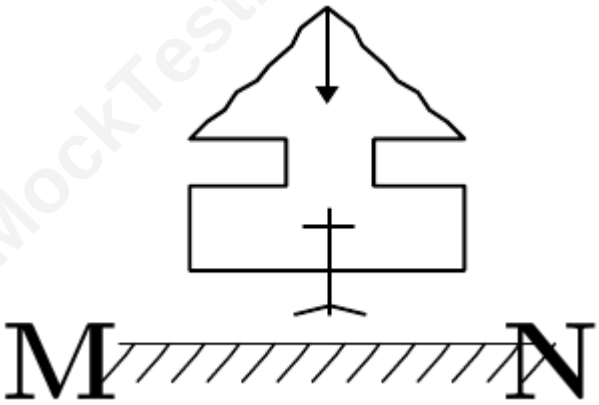
Q8. If 13 December 1969 is Saturday, then what will be the day of the week on 9 July 1978?

(a) Saturday
(b) Friday
(c) Sunday
(d) Monday

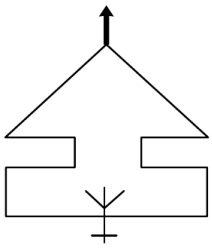
Q9. Select the letter-cluster from among the given options that can replace the question mark (?) in the following series.
AKRW, DNUZ, GQXC, ?

(a) CZWR
(b) ISZE
(c) TJAA
(d) JTAF

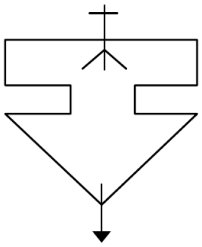
Q10. Select the correct mirror image of the given figure when the mirror is placed at MN as shown.



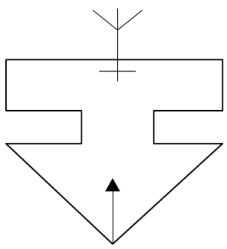
(a)



(b)

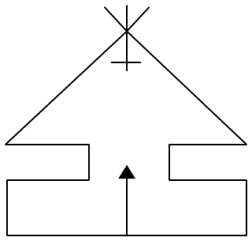


(c)



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(d)



Q11. If 'A' stands for '÷', 'B' stands for '×' 'C' stands for '+' and 'D' stands for '-', what will come in place of the question mark (?) in the following equation?

42 A 7 B 11 C 57 D 10 = ?

(a) 109
(b) 113
(c) 118
(d) 111

Q12. In a certain code language, 'REPLACE' is coded as '67' and 'PETRIFY' is coded as '106'. How will 'CRACKED' be coded in that language?

(a) 52
(b) 50
(c) 47
(d) 45

Q13. Which number will replace the question mark (?) to complete the given series?

15, 16, 20, 29, 45, ?

(a) 70
(b) 65
(c) 75
(d) 60

Q14. In the following number-pairs, the second number is obtained by applying certain mathematical operations to the first number. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

(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.)

(45, 80)

(37, 64)

(a) (41, 73)
(b) (52, 114)
(c) (65, 120)
(d) (39, 69)

Q15. Which number from among the given options can replace the question mark (?) in the following series?

6, 12, ?, 32, 36, 72

(a) 24
(b) 21
(c) 16
(d) 18

Q16. Three of the following number pairs are alike in some manner and one is different. Select the odd number pair.

(NOTE. The second number in the given number pairs is formed by performing a certain operation on the first number. The same operation is followed in all the number pairs except one. Find that odd number pair.)

(a) 297 : 33

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(b) 189 : 21
(c) 100 : 12
(d) 63 : 7

Q17. Select the term from among the given options that can replace the question mark (?) in the following series based on the English alphabetical order.

BRG, DOI, FLK, HIM, ?

(a) IEM
(b) JFO
(c) JGN
(d) IGN

Q18. Read the given statements and conclusions carefully Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements :

All blue are dogs.

No dog is silver

All pink are dogs.

Conclusions :

(I) Some pink are silver.

(II) No blue is pink is a possibility.

(III) Some blue are silver

(a) Both conclusions II and III follow
(b) Only conclusion III follows
(c) Only conclusion II follows
(d) Both conclusions I and II follow

Q19. In a certain code language,

A + B means 'A is the mother of B'

A - B means 'A is the brother of B'

A × B means 'A is the wife of B'

A ÷ B means 'A is the father of B'

Based on the above, how is S related to U if 'Q × R - S ÷ T + U'?

(a) Daughter
(b) Brother's wife
(c) Mother's father
(d) Mother's husband

Q20. Based on the alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which of the following does NOT belong to that group?

(a) PSR
(b) TUX
(c) MPO
(d) YBA

Q21. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

(NOTE : Operations should be performed on whole numbers, without breaking down the numbers into their 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.)

(22, 44, 8)

(32, 48, 6)

(a) (36, 64, 7)

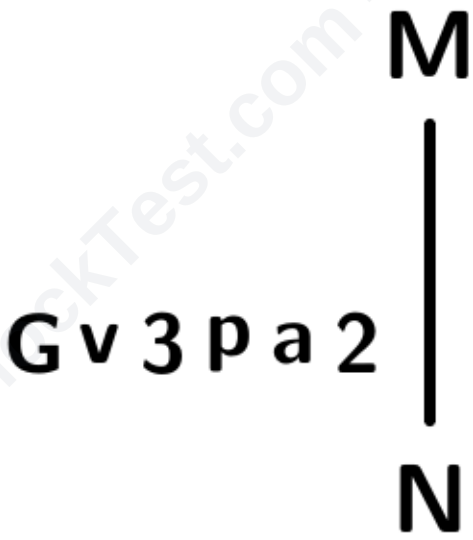
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(b) (42, 63, 6)
(c) (56, 128, 9)
(d) (48, 98, 8)

Q22. DGEC is related to KNLJ in a certain way based on the English alphabetical order. In the same way, NQOM is related to UXVT. To which of the following is ILJH related to, following the same logic?

(a) ORPN
(b) PSQO
(c) QTRP
(d) PTRQ

Q23. Select the correct mirror image of the given figure when the mirror is placed at MN as shown below.



(a)



(b)



(c)



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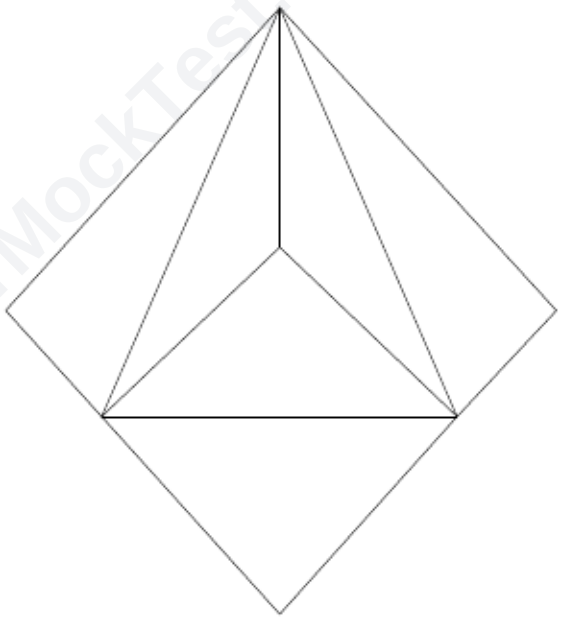
(d)



Q24. In a certain code language 'LEASE' is coded as '14936' and 'PLEASE' is coded as '941360'. What is the code for 'P' in the given code language?

(a) 4
(b) 9
(c) 1
(d) 0

Q25. How many triangles are there in the given figure?



(a) 8
(b) 10
(c) 9
(d) 7

GENERAL INTELLIGENCE

Q26. In 1851, who founded the science of hydrodynamics with his law of viscosity describing the velocity of a small sphere through a viscous fluid?

(a) Daniel Bernoulli
(b) George Gabriel Stokes
(c) Evangelista Torricelli
(d) Heinrich Gustav Magnus

Q27. The rate at which the Reserve Bank of India lends to other commercial banks for short term has been reduced. What is this rate called?

(a) Cash Reserve Rate
(b) Reverse Repo Rate
(c) Bank Rate
(d) Repo Rate

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Q28. What was the percentage of India's population that belonged to the Muslim religion in 2011?

(a) 14.2%
(b) 11.9%
(c) 16.4%
(d) 18.5%

Q29. Kerala is famous for which of the following festivals?

(a) Pongal
(b) Ugadi
(c) Bihu
(d) Onam

Q30. Guru Gopinath National Award 2021 was honoured to whom among the following Kathak dancers?

(a) Durga Lal
(b) Roshan Kumari
(c) Kumudini Lakhia
(d) Shambhu Maharaj

Q31. Which of these statements is true?

(a) Under competitive asset market conditions, the price of a bond must always be equal to its present value in equilibrium.
(b) Under competitive asset market conditions, the price of a bond must be less than its present value to benefit the seller.
(c) Under competitive asset market conditions, the price of a bond must exceed its present value to benefit the buyer.
(d) Under competitive asset market conditions, the present value must exceed the price of a bond to benefit the seller.

Q32. Which of these is NOT one of the negative effects of the green revolution?

(a) Primarily medium and large farmers were able to benefit from the new technology of the green revolution.
(b) The green revolution benefited farmers who had access to land, capital, technology and know-how.
(c) The green revolution led to the displacement of tenant cultivators in many cases.
(d) The green revolution caused increased migration from urban to rural areas.

Q33. Which of the following is included in the M1 measure of money supply?

A) Currency with Public
B) Time Deposit with Post Office
C) Demand Deposits with Commercial Banks/RBI of Public Financial Institutions

(a) Both B and C
(b) Both A and C
(c) Only B
(d) Only A

Q34. Indian Academy of Sciences, founded in 1934 by CV Raman, is situated in _____.

(a) Mumbai
(b) Hyderabad
(c) Bangalore
(d) New Delhi

Q35. Who amongst the following raised the banner of revolt against Nasiruddin Khusrau?

(a) Nasiruddin Tughlaq
(b) Muhammad bin Tughlaq
(c) Feroz Shah Tughlaq
(d) Ghiyasuddin Tughlaq

Q36. When milk is converted into curd, which type of change is it?

(a) Reversible change
(b) Physical change
(c) Isothermal change

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(d) Chemical change

Q37. Which of the following persons' tenure was extended for one year as Chief of the Enforcement Directorate in November 2021?

(a) Pradyumna Sinha
(b) Sanjay Kumar Mishra
(c) Prateek Rai
(d) Vijay Verma

Q38. Which of the following physical divisions of India is densely populated?

(a) The North Indian Plains
(b) The islands
(c) The Himalayan Range
(d) The Thar Desert

Q39. Which of the following is a liberal principle of the Directive Principles of State Policy of the Indian Constitution?

(a) To secure right to work
(b) To secure uniform civil code
(c) To promote social welfare
(d) To promote equal justice

Q40. Gurucharan Singh received the Padma Shri from the Government of India in 2023 for his contributions to the sport of _____.

(a) football
(b) basketball
(c) kabaddi
(d) cricket

Q41. Which of the following is NOT a capital expenditure for the central government?

(a) Loan to state government
(b) Improvement of fixed assets
(c) Salaries and old-age pensions
(d) Construction of roads and bridges

Q42. Which of the following is a yellowish green to green coloured gemstone often found in mafic and ultramafic igneous rocks such as basalt, gabbro, dunite, diabase and periodotite?

(a) Bornite
(b) Olivine
(c) Tremolite
(d) Garnet

Q43. Which of the following is a public sector industry?

(a) BHEL
(b) Dabur Industry
(c) Bajaj Auto
(d) TISCO

Q44. Who was the author of the famous book 'The Economic History of India'?

(a) Dadabhai Naoroji
(b) PC Dutta
(c) RG Bhandarkar
(d) RC Dutt

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Q45. Jagoi and Thabal Chongba are the famous dances of which Indian state?

(a) Uttar Pradesh
(b) Odisha
(c) Manipur
(d) Nagaland

Q46. In 2023, which Indian Tennis player became the oldest to win the ATP Masters 1000 title?

(a) Rohan Bopanna
(b) Mahesh Bhupathi
(c) Vijay Amritraj
(d) Ramanathan Krishnan

Q47. In 1830, which American scientist created the world's most powerful electromagnet, the Alnany magnet, which could lift up to 750 pounds of metal at a time?

(a) John Cockcroft
(b) William Gilbert
(c) Joseph Henry
(d) Edward Purcell

Q48. Who was the first American male athlete to win the Marathon gold medal in the Olympic Games?

(a) Abebe Bikila
(b) Thomas Hicks
(c) Frank Shorter
(d) John Hayes

Q49. Which of the following Articles about fundamental duties is related to the respect of the National Anthem?

(a) Article 51A (b)
(b) Article 51A (c)
(c) Article 51A (a)
(d) Article 51A (d)

Q50. Begum Akhtar is associated with which of the following fields?

(a) Writing
(b) Politics
(c) Painting
(d) Ghazal

QUANTITATIVE APTITUDE

Q51. Which of the following expressions is equal to the expression $(x^2-3x+2)/(x^2-4)$?

(a) $(x+1)/(x-2)$
(b) $(x-1)/(x+2)$
(c) $(x+1)/(x+2)$
(d) $(x-1)/(x-2)$

Q52. What is the fourth proportional of $3\sqrt{5}$, $5\sqrt{8}$ and $3\sqrt{10}$?

(a) $10\sqrt{5}$
(b) $40\sqrt{2}$
(c) 30
(d) 20

Q53. If $\tan\theta = 8/15$, then the value of $\sqrt{(1-\sin\theta)/(1+\sin\theta)}$ is :

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

(d) 4/5

Q54. Study the given table and answer the question that follows.

The table represents the mathematics marks of five students.

Name	Ajay	Pronoy	Mahendra	Jharna	Dipti
Marks	85	72	70	84	94

What is the average marks?

(a) 77
(b) 80
(c) 81
(d) 78

Q55. A man buys an article for Rs. 80 and marks it at Rs. 125. He then allows a discount of 40%. What is his percentage of loss or gain?

(a) 12% gain
(b) 10% gain
(c) 6.25% loss
(d) 12% loss

Q56. Subhas, a 3.15 m tall tree, and an 11.25 m tall building are positioned such that their feet on the ground are collinear and the tree is located between Subhas and the building. The tree is located at a distance of 7.5 m from Subhas and at a distance of 45 m from the building. Further, the eyes of Subhas, the top of the tree, and the top of the building fall in one line. Find the height (in m) from the ground at which Subhas eyes are situated.

(a) 1.75
(b) 1.8
(c) 1.6
(d) 1.5

Q57. The lengths of two parallel chords of a circle are 10 cm and 24 cm lie on the opposite sides of the centre. If the smaller chord is 12 cm from the centre, what is the distance (in cm) between the two chords?

(a) 13
(b) 5
(c) 17
(d) 12

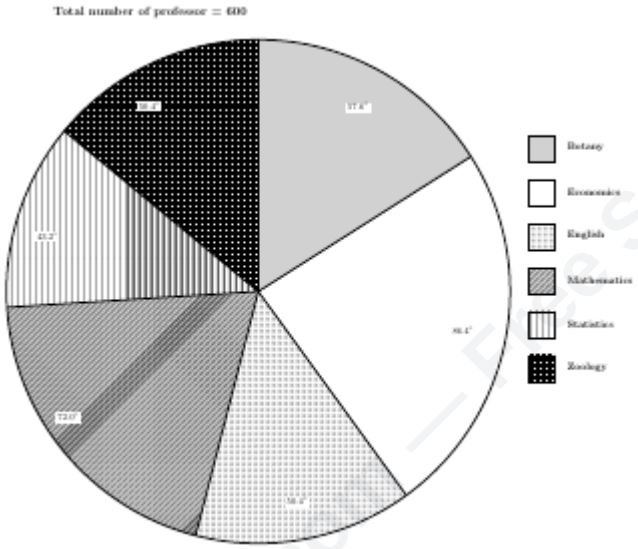
Q58. If θ is an acute angle and cos θ = 39/89, what is the value of sin θ?

(a) 49/89
(b) 79/89
(c) 80/89
(d) 50/89

Q59. Study the given pie chart and answer the question that follows.

The pie chart shows the distribution (in terms of central angles) of the number of professors in six different departments of a college.

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The number of professors in Economics and Mathematics is approximately (correct up to two decimal places) what per cent more than the number of professors in English and Statistics?

(a) 69.23%
(b) 59.09%
(c) 40.91%
(d) 70.91%

Q60. The marked price of a sunglass is Rs. 1,350. It is sold at Rs. 1,188 after allowing a certain discount. Find the rate of discount.

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

Q61. If a + 1/a = 5, then determine the value of $a^3 + 1/(a^3)$ ^.

(a) 90
(b) 125
(c) 105
(d) 110

Q62. If tan θ. tan 2θ = 1, then the value of cot 5θ is :

(a) -1
(b) 1
(c) • √3
(d) √3

Q63. A man sells rice at 8% profit and uses weight 25% less than the actual measure. What is his percentage profit?

(a) 44%
(b) 41%
(c) 23%
(d) 36%

Q64. The simple interest (in Rs. rounded off to the tens place) on Rs. 12,300 from 22 May 1993 to 2 August 1993 (both days are included) at the rate of 12% per annum is :

(a) 300
(b) 200
(c) 250
(d) 350

Q65. Two points P and Q are 3 cm apart. These two points lie on the circumference of a circle having radius 1.7 cm. What is the distance (in cm) of the line segment PQ from the centre of the circle?

(a) 0.8
(b) 1.0
(c) 0.4
(d) 0.6

Q66. Two people A and B started running from the same point on a circular track of length 400 m in opposite directions with initial speeds of 10 m/s and 40 m/s, respectively. Whenever they meet, A's speed doubles and B's speed halves. After what time from the start will they meet for the third time?

(a) 30 sec
(b) 24 sec
(c) 26 sec
(d) 28 sec

Q67. Two years ago, the population of the city was 5,00,000. If the annual birth rate and the annual death rate are 6% and 3%, respectively, what is the present population of the city?

(a) 536440
(b) 580440
(c) 530450
(d) 540550

Q68. Find the value of the given expression.

(21/2÷17/8) ÷ (93/8÷112/3 of 1/8)

(a) 33/135
(b) 11/135
(c) 28/135
(d) 57/135

Q69. Find the average of prime numbers lying between 69 and 92.

(a) 76
(b) 77
(c) 78
(d) 79

Q70. In ΔABC, P and Q are the middle points of the sides AB and AC, respectively, R is point on the segment PQ such that PR : RQ = 1 : 3. If PR = 6 cm, then BC :

(a) 46 cm
(b) 48 cm
(c) 44 cm
(d) 50 cm

Q71. The diameter of a sphere is 14 cm, then the volume of this sphere is (use π = 22/7) :

(a) 1437 1/3 cm^3
(b) 1683 1/3 cm3
(c) 1521 2/3 cm3
(d) 2125 1/3 cm^3

Q72. If x = (7 + 3 √5), then find the value of $x^2 + 1/(x^2)$ ^.

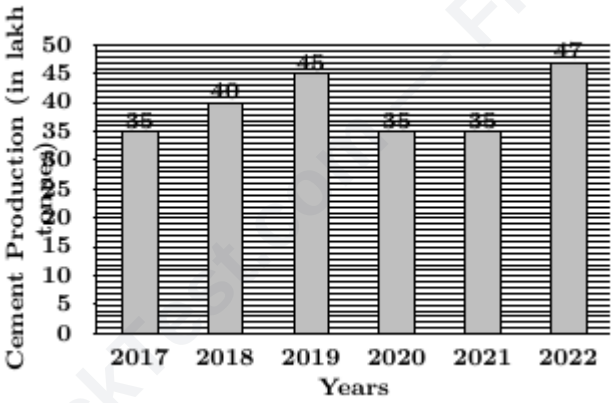
(a) (580+315√5)/8
(b) (799+328√5)/8
(c) (799+315√5)/12
(d) (799+315√5)/8

Q73. A person spent 12% of his salary on groceries, 8% on medicines, 20% on children's school fee and he had a balance of Rs. 36,000. Find his salary.

(a) Rs. 56,000
(b) Rs. 54,000
(c) Rs. 60,000
(d) Rs. 66,000

Q74. Study the given bar graph and answer the question that follows.

The production of cement (in lakh tonnes) by a company during the last six years is presented by the bar graph.



What is the average cement production (in lakh tonnes) during the given six years?

(a) 40.0
(b) 39.0
(c) 39.5
(d) 40.5

Q75. Three people A, B and C worked together and finished a work in 9 days. If A alone can finish the same work in 18 days, B alone in 30 days, then the number of days C alone will take is :

(a) 36 days
(b) 45 days
(c) 40 days
(d) 54 days

GENERAL AWARENESS

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

Sheela tried for argue with him though she knew it was of no use.

(a) to argue with him
(b) of argue with him
(c) in argue with him
(d) on argue with him

Q77. Select the most appropriate idiom for the given situation.

Don't annoy or irritate Raghav, otherwise he will oppose our proposal in the meeting.

(a) Pass the buck
(b) Pour oil in troubled water
(c) Rub in the wrong way
(d) Loose the ground

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Q78. Select the ANTONYM of the word 'repel' to fill in the blank.

Her bright blue eyes _____ everyone in the party.

(a) disgust
(b) vacillate
(c) attract
(d) amenable

Q79. Select the most appropriate ANTONYM of the given word.

Ludicrous

(a) Ridiculous
(b) Insane
(c) Wise
(d) Pathetic

Q80. Select the most appropriate option that expresses the given sentence in active voice.

The car was manufactured by the company in a factory overseas.

(a) The factory overseas was used by the company to manufacture the car.
(b) The company manufactured the car in a factory overseas.
(c) The car was being manufactured by the company in a factory overseas.
(d) The car was manufactured in a factory overseas by the company.

Q81. Select the most appropriate idiom for the given statement.

Doing things in a hurry does not give fruitful results.

(a) Nothing succeeds like success.
(b) Still waters run deep.
(c) Haste is waste.
(d) Wisdom is too high for a fool.

Q82. Select the option that expresses the given sentence in passive voice.

The garment business has made Archie rich.

(a) Archie has been made rich by the garment business.
(b) Archie have been made rich by the garment business.
(c) Archie had been made rich by the garment business.
(d) Archie is made rich by the garment business.

Q83. Select the most appropriate ANTONYM of the word given in brackets to fill in the blank.

The _____ (chill) of the sun on his face was a welcome respite from the chilly morning air.

(a) glow
(b) blush
(c) warmth
(d) brightness

Q84. Select the INCORRECTLY spelt word.

(a) Infer
(b) Neutral
(c) Apprehensive
(d) Maintanence

Q85. Parts of the following sentence have been given as options. One of them may contain an error. Select the option that contains the error. If you don't find any error, mark 'No error' as your answer.

By virtue off the power given to the leader, the followers accepted his decision.

(a) No error
(b) By virtue off
(c) the power given to the leader

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(d) the followers accepted his decision

Q86. Directions: Each item in this section consists of a sentence with an underlined word followed by four words/group of words. Select the option that is nearest in meaning to the underlined word and mark your response on the answer sheet accordingly.

Education gives people the knowledge and skills they need to stay healthy, get jobs and foster tolerance.

(a) entrench
(b) distrust
(c) lethargy
(d) endurance

Q87. Select the most appropriate ANTONYM of the underlined word.

The doctor reassured Raman that the lump was benign, which brought immense relief to both him and his family.

(a) Harsh
(b) Rugged
(c) Malignant
(d) Healthy

Q88. Parts of a sentence are given below in jumbled order. Arrange the parts in the correct order to form a meaningful sentence.

A. disrupted, posing major threats to progress
B. global health systems have been
C. health services have been
D. overwhelmed and many essential
E. in fighting other deadly diseases

(a) BECDA
(b) EADCB
(c) BDCAE
(d) DEABC

Q89. Select the most appropriate option that can substitute the underlined segment in the following sentence.

As the orchestra began to play, the audience was transported to another world, enthralled by the psychological effects of the music and the skill of the musicians, who performed each note with precision and passion.

(a) influenced by the overall scenario
(b) impacted by feelings
(c) swept away by the emotive power
(d) taken in by the effect on emotions

Q90. Select the option that can be used as a one-word substitute for the given group of words.

A person who is against the use of violence and war to settle disputes

(a) Fatalist
(b) Hedonist
(c) Pacifist
(d) Misogynist

Q91. Identify the correct spelling of the underlined word.

Alcohol causes intocsication.

(a) intoxication
(b) intaxication
(c) entoxkation
(d) intakcication

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Q92. Parts of a sentence are given below in jumbled order. Arrange the parts in the correct order to form a meaningful sentence.

P. so they design the advertisement of products in such a way

Q. the main target consumers of food companies

R. that consumers are stimulated to buy them repeatedly

S. are children and youth of the country

(a) QRSP
(b) RPQS
(c) PRQS
(d) QSPR

Q93. Parts of the following sentence have been given as options. Select the option that contains an error.

The team of scientists were conducting experiments to test its hypothesis.

(a) experiments to test
(b) The team of scientists
(c) its hypothesis
(d) were conducting

Q94. Parts of a sentence are given below in jumbled order. Arrange the parts in the correct order to form a meaningful sentence.

P. due to the lofty hilly terrain, curves and cliffs

Q. the route to Badrinath

R. is one of the most arduous one

S. amidst the most scenically beautiful place on the earth

(a) QRPS
(b) QSPR
(c) PRSQ
(d) PQRS

Q95. Select the most appropriate ANTONYM of the given word.

Fixation

(a) Formulation
(b) Indifference
(c) Inclination
(d) Reformation

Directions

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

The solar system is made up of the sun, planets, moons, asteroids, and comets that 1. _____ around it. Its mysteries and wonders have captured the imagination of people from all walks of life, and it continues to be an area of active research and exploration. The sun is at the centre of the solar system and is the largest object in it. The eight planets in the solar system, 2. _____ Earth, orbit around the sun in nearly circular paths. While the sun is at the centre of the solar system and dominates its gravitational pull, each planet has its own unique set of characteristics that makes it a fascinating object to study. Each planet in the solar system has unique characteristics and features. 3. _____ planets, such as Mercury and Venus, are small and rocky, while others, like Jupiter and Saturn, are much larger and made up mostly of gas. The outer planets, Uranus and Neptune, are 4. _____ as 'ice giants' because they contain more water, ammonia, and methane than the gas giants. In addition to the planets, the solar system also has numerous moons, asteroids, and comets. These objects provide important 5. _____ about the formation and evolution of the solar system.

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

(a) form
(b) orbit
(c) stick

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(d) fly

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

(a) excluding
(b) diluting
(c) dissolving
(d) including

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

(a) Few
(b) Some
(c) Many
(d) A lot

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

(a) classified
(b) magnified
(c) restricted
(d) indulged

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

(a) sets
(b) derivations
(c) clues
(d) blases

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) Nine

Word: DONATE

After arranging the letters in the alphabetical order: A D E N O T

Letters between third from the left(E) and second from the right(O) in the alphabetical order is "9".

E F G H I J K L M N O.

Hence, the correct answer is "Option "4".

Q2. Answer: (a) [figure]

The figure that will replace the question mark (?) in the following figure series is shown below:

1) For '

' element → Shifting diagonally in downward direction subsequently.
2) For '
' element → → Shifting diagonally in downward direction and then in the opposite direction subsequently.
3) For '
' element → Shifting diagonally in downward direction and then in the opposite direction subsequently.
4) For '
' element → Shifting diagonally subsequently.
5) For '
' element → Shifting diagonally subsequently.
6) For '
' element → Shifting diagonally and then diagonally in downward direction subsequently.
7) For '
' element → Shifting diagonally and then diagonally in downward direction subsequently.
Final series is
Hence, ‘option - (1)’ is the correct answer.

Q3. Answer: (d) Brother's son

Given :

G is				
Symbol	•	•	×	÷
Meaning	Father	Sister	Brother	Daughter
to T				

Statement given : P ÷ Q - L + N × M
So,
• P ÷ Q → P is the daughter of Q.
• Q - L → Q is the sister of L.
• L + N → L is the father of N.
• N × M → N is the brother of M.

Thus, according to the final family tree N is the nephew i.e brother's son of Q.
Hence, "Brother's son" is the correct answer.

Q4. Answer: (c) CK 43

Logic :
• First letter → (2) is added to the position value according to English alphabetic series
• Second letter → (3) is subtracted from the position value according to English alphabetic series.
• Number → Consecutive number series is added to each number starting with (6).
So,
Hence, "CK 43" is the correct answer.

Q5. Answer: (d) • and -

Given statement : 85 - 28 × 3 + 114 ÷ 6 = 150
According to the question, after interchanging the signs :
So,
• Option - (1) : + and ×
85 - 28 × 3 + 114 ÷ 6 = 150 => 85 - 28 + 3 × 114 ÷ 6 = 150
85 - 28 + 3 × 19 = 150
85 + 57 - 28 = 150
142 - 28 = 150
114 ≠ 150 (LHS ≠ RHS)
• Option - (2) : - and ÷

85 - 28 × 3 + 114 ÷ 6 = 150 => 85 ÷ 28 × 3 + 114 - 6 = 150
3.03 × 3 + 114 - 6 = 150
27 + 114 - 6 = 150
141 - 6 = 150
135 ≠ 150 (LHS ≠ RHS)
• Option - (3) : ÷ and ×
85 - 28 × 3 + 114 ÷ 6 = 150 => 85 - 28 ÷ 3 + 114 × 6 = 150
85 - 9 + 114 × 6 = 150
85 + 684 - 9 = 150
769 - 9 = 150
760 ≠ 150 (LHS ≠ RHS)
• Option - (4) : + and -
85 - 28 × 3 + 114 ÷ 6 = 150 => 85 + 28 × 3 - 114 ÷ 6 = 150
85 + 28 × 3 - 19 = 150
85 + 84 - 19 = 150
169 - 19 = 150
150 = 150 (LHS = RHS)
Hence, "Option - (4)" is the correct answer.

Q6. Answer: (b) 5 : 134

Logic : (Cube of 1st number) - 9 = 2nd number
So,
• Option - (1) : 7 : 334
$(7)^3$ - 9 = 334
343 - 9 = 334
334 = 334 (LHS = RHS)
• Option - (2) : 5 : 134
$(5)^3$ - 9 = 134
125 - 9 = 134
116 ≠ 134 (LHS ≠ RHS)
• Option - (3) : 9 : 720
$(9)^3$ - 9 = 720
729 - 9 = 720
720 = 720 (LHS = RHS)
• Option - (4) : 11 : 1322
$(11)^3$ - 9 = 1322
1331 - 9 = 1322
1322 = 1322 (LHS = RHS)
Hence, "Option - (2)" is the correct answer.

Q7. Answer: (c) QRTP

The logic followed here is :- (7) is added to the position value according to English alphabetic series.
So,
• 'EFHD' is written as 'LMOK'

And,
• 'OPRN' is written as 'VWYU'

Similarly,
• 'JKMI' is written as

Hence, "QRTP" is the correct answer.

Q8. Answer: (c) Sunday

Given : 13 December 1969 was Saturday

Explanation :

The number of odd days from 13 December 1969 to 9 July 1978 :

Year	Period	Calculation	Odd days
1969	13 December 1969 - 31 December 1969	18 days	18 ÷ 7 = 4
1970 - 2077	Full years (6 Ordinary years + 2 Leap years)	(1 odd day × 6 Ordinary years) + (2 odd days × 2 Leap years) = 10 odd days	10 ÷ 7 = 3
1978	1st January 1978 - 9 July 1978	31 January + 28 February + 31 March + 30 April + 31 May + 30 June + 9 July = 190 days	190 ÷ 7 = 1
Total odd days	(8 ÷ 7) = 1		

Therefore The number of odd days from 13 December 1969 to 9 July 1978 => 1

=>So, One odd day get added to Saturday because day asked in future.

Therefore Sunday was the day of the week on the 9 July 1978.

Hence, "Sunday" is the correct answer.

Additional Information

• Number of odd days for the days of week.

Days	Odd days
Sunday	0
Monday	1
Tuesday	2
Wednesday	3
Thursday	4
Friday	5
Saturday	6

• Number of odd days for the days of months.

Months having number of days	Odd days
28 days	0
29 days	1
30 days	2
31 days	3

• Number of odd days for the years.

Years	Odd days
Ordinary year	1
Leap year	2

Q9. Answer: (d) JTAF

Logic : (3) is added to the position value according to English alphabetic series.

So,

Hence, "JTAF" is the correct answer.

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Q10. Answer: (c) [figure]

The correct mirror image of the given combination when mirror is placed at MN is as shown below:

Hence, the correct answer is "Option - (3)".

Q11. Answer: (b) 113

According to the question,

Symbol	A	B	C	D
Meaning	÷	×	•	•

Given that: 42 A 7 B 11 C 57 D 10 = ?

After replacing the symbols with their meanings, we get :-

42 ÷ 7 × 11 + 57 - 10 = ?

6 × 11 + 57 - 10 = ?

66 + 57 - 10 = ?

123 - 10 = ?

113 = ?

Hence, the correct answer is "113".

Q12. Answer: (a) 52

Logic : Number of letters within the words are added to the sum of the position values according to English alphabetic series.

So,

• 'REPLACE' is coded as '67'

And,

• 'PETRIFY' is coded as '106'

Similarly,

• 'CRACKED' will be coded as :

Hence, "52" is the correct answer.

Q13. Answer: (a) 70

Logic : Squares of a consecutive series is added to each number subsequently.

Hence, "70" is the correct answer.

Q14. Answer: (c) (65, 120)

Logic : (1st number × 2) - 10 = 2nd number

Given :

• (45, 80)

(45 × 2) - 10 = 80

90 - 10 = 80

80 = 80 (LHS = RHS)

• (37, 64)

(37 × 2) - 10 = 64

74 - 10 = 64

64 = 64 (LHS = RHS)

So,

• Option - (1) : (41, 73)

(41 × 2) - 10 = 73

82 - 10 = 73

72 ≠ 73 (LHS ≠ RHS)

• Option - (2) : (52, 114)

(52 × 2) - 10 = 114

104 - 10 = 114

94 ≠ 114 (LHS ≠ RHS)

• Option - (3) : (65, 120)

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(65 × 2) - 10 = 120

130 - 10 = 120

120 = 120 (LHS = RHS)

• Option - (4) : (39, 69)

(39 × 2) - 10 = 69

78 - 10 = 69

68 ≠ 69 (LHS ≠ RHS)

Hence, "Option - (3)" is the correct answer.

Q15. Answer: (c) 16

Logic : Alternately (2) is multiplied and (4) is added to each number subsequently.

Hence, "16" is the correct answer.

Q16. Answer: (c) 100 : 12

Logic : (1st number ÷ 9) = 2nd number

So,

• Option - (1) : 297 : 33

297 ÷ 9 = 33

33 = 33 (LHS = RHS)

• Option - (2) : 189 : 21

189 ÷ 9 = 21

21 = 21 (LHS = RHS)

• Option - (3) : 100 : 12

100 ÷ 9 = 12

11.11 ≠ 12 (LHS ≠ RHS)

• Option - (4) : 63 : 7

63 ÷ 9 = 7

7 = 7 (LHS = RHS)

Hence, "Option - (3)" is the correct answer.

Q17. Answer: (b) JFO

Logic :

• First and third letters → (2) is added to the position values according to English alphabetic series.

• Second letter → (3) is subtracted from the position values according to English alphabetic series.

So,

Hence, "JFO" is the correct answer.

Q18. Answer: (c) Only conclusion II follows

The least possible Venn diagram for the given statement is:

Conclusions:

I. Some pink are silver → Does not Follow (As, all pink are dogs and no dog is silver, So, no pink will be silver, therefore Some pink are silver will be definitely false)

II. No blue is pink is a possibility → Follow (As, all blue are dogs and all pink are dogs. and, no definite relation is given between blue and pink, so No blue is pink can be possible therefore it is definitely true)

III. Some blue are silver → Does not Follow (As, all blue are dogs and no dog is silver. So, no blue will be silver, therefore Some blue are silver is definitely false)

Here, Only conclusion II follows.

Hence, the correct answer is "Only conclusion II follows".

Q19. Answer: (c) Mother's father

Given :

A is				

Symbol	•	•	×	÷
Meaning	Mother	Brother	Wife	Father
to B				

Given statement : Q × R - S ÷ T + U

So,

• Q × R → Q is the wife of R.

• R - S → R is the brother of S.

• S ÷ T → S is the father of T.

• T + U → T is the mother of U.

Thus, according to the given statement,

S is the maternal grandfather i.e mother's father of U.

Hence, "Mother's father" is the correct answer.

Q20. Answer: (b) TUX

The logic followed here is :-

• First and second letter => Difference between the position values according to English alphabetic series is (3).

• Second and third letter => Difference between the position values according to English alphabetic series is (1).

So,

• Option - (1) : PSR

• Option - (2) : TUX

• Option - (3) : MPO

• Option - (4) : YBA

Hence, "TUX" is the correct answer.

Q21. Answer: (b) (42, 63, 6)

Logic : (1st number × 3rd number) ÷ 4 = 2nd number

Given :

• (22, 44, 8)

(22 × 8) ÷ 4 = 44

176 ÷ 4 = 44

44 = 44 (LHS = RHS)

• (32, 48, 6)

(32 × 6) ÷ 4 = 48

192 ÷ 4 = 48

48 = 48 (LHS = RHS)

So,

• Option - (1) : (36, 64, 7)

(36 × 7) ÷ 4 = 64

252 ÷ 4 = 64

63 ≠ 64 (LHS ≠ RHS)

• Option - (2) : (42, 63, 6)

(42 × 6) ÷ 4 = 63

252 ÷ 4 = 63

63 = 63 (LHS = RHS)

• Option - (3) : (56, 128, 9)

(56 × 9) ÷ 4 = 128

504 ÷ 4 = 128

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126 ≠ 128 (LHS ≠ RHS)
• Option - (4) : (48, 98, 8)
(48 × 8) ÷ 4 = 98
384 ÷ 4 = 98
96 ≠ 98 (LHS ≠ RHS)
Hence, "Option - (2)" is the correct answer.

Q22. Answer: (b) PSQO

Logic : (7) is added to the position value according to the English alphabetic series.
So,
• 'DGEC' is written as 'KNLJ'

And,
• 'NQOM' is written as 'UXVT'

Similarly,
• 'ILJH' is written as:

Hence, "PSQO" is the correct answer.

Q23. Answer: (b) [figure]

The correct mirror image of the given combination when mirror is placed at MN is as shown below:
Detailed Explanation:
• The line MN is the mirror
• The word "Gv3pa2" the third digit is "3". So, the mirror image should be "
" => Option 1 is eliminated.
• The word "Gv3pa2" the fourth letter is "p". So, the mirror image should be "
" => Option 3 is eliminated..
• The word "Gv3pa2" the second letter is "v". So, the mirror image should be "
" => Option 4 is eliminated.
Hence, the correct answer is "Option - (2)".

Q24. Answer: (d) 0

Logic : No specific pattern is followed here, random codes are assigned to each letter.
So,
• 'LEASE' is coded as '14936'
• 'PLEASE' is coded as '941360'
As some letters are common, so the codes will be :

Letters	L / E / A / S	P
Codes	1 / 4 / 9 / 3 / 6	0

Therefore,
• 'P' will be coded as:
'P' will be coded as '0'.
Hence, "0" is the correct answer.

Q25. Answer: (c) 9

The number of triangles in the given figure is shown below :
So, there are 9 triangles in the given figure.
Hence, "9" is the correct answer.

Q26. Answer: (b) George Gabriel Stokes

The correct answer is George Gabriel Stokes.

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Key Points

• Hydrodynamics:-

• It is the study of fluids in motion, including liquids and gases.

• George Gabriel Stokes:-

• He was an Irish mathematician and physicist who made significant contributions to fluid dynamics and optics.

• George Gabriel Stokes founded the science of hydrodynamics with his law of viscosity, which describes the relationship between the velocity of a small sphere and the viscosity of a fluid.

Additional Information

• Daniel Bernoulli:-

• He was a Swiss mathematician who is known for his work on fluid dynamics, including Bernoulli's principle.

• Evangelista Torricelli:-

• He was an Italian physicist and mathematician who is best known for inventing the barometer.

• Heinrich Gustav Magnus:-

• He was a German physicist who made important contributions to the study of magnetism and thermodynamics.

Q27. Answer: (d) Repo Rate

The correct answer is Repo Rate.

Key Points

• Repo Rate:-

• It is the rate at which the Reserve Bank of India (RBI) lends money to commercial banks for short term.

• The reduction in Repo Rate indicates that the RBI is trying to encourage borrowing and spending in the economy.

Additional Information

• Cash Reserve Rate:-

• CRR is the amount of funds that banks have to keep with the RBI as a reserve. It is not related to lending rates.

• Reverse Repo Rate:-

• It is the rate at which the RBI borrows money from commercial banks. It is also not related to lending rates.

• Bank Rate:-

• It is the rate at which the RBI lends money to commercial banks for long term. It is also not related to short-term lending rates.

Q28. Answer: (a) 14.2%

The correct answer is 14.2%

Key Points

• Muslims as per 2011 Census:-

• It indicates that only 0.142% of India's population identified themselves as Muslims in 2011.

• This figure is notably lower than some of the other large Muslim-majority countries in the world, such as Indonesia, Pakistan, and Bangladesh.

• The Muslim population in India has increased since 2011, but it is still a minority religion in the country.

• It is important to note that religion is a sensitive topic in India, and there have been instances of communal tensions and violence between different religious groups.

Q29. Answer: (d) Onam

The correct answer is Onam.

Key Points

• Onam:-

• It is the most popular festival celebrated in the state of Kerala, India.

• It is a 10-day harvest festival that usually falls in the month of August or September.

• The festival is marked by various cultural events and traditional activities such as boat races, flower decorations, and feasting.

• Onam is celebrated to honor the legendary king Mahabali and to welcome his annual visit to Kerala.

Additional Information

• Pongal:-

• It is a harvest festival celebrated in Tamil Nadu, Andhra Pradesh, and Telangana.

• Ugadi:-

• It is a New Year festival celebrated in the states of Andhra Pradesh, Telangana, and Karnataka.

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• Bihu:-

• It is a harvest festival celebrated in the state of Assam.

Q30. Answer: (c) Kumudini Lakhia

The correct answer is Kumudini Lakhia

Key Points

• Kumudini Lakhia:-

• She is a renowned Kathak dancer and choreographer from India who has been awarded several other prestigious awards in the past.

• She was honored with the Guru Gopinath National Award 2021 for her contribution to the field of Kathak dance.

Additional Information

• Durga Lal:-

• He was a famous Kathak dancer and choreographer from Rajasthan who passed away in 1990.

• He is known for his contribution to the Jaipur Gharana of Kathak dance.

• Roshan Kumari:-

• She is a Kathak dancer from Jammu and Kashmir who has been trained in the Lucknow Gharana of Kathak dance.

• Shambhu Maharaj:-

• He was a legendary Kathak dancer from Lucknow who passed away in 1970. He was a part of the Maharaj family of Kathak dancers and is known for his contribution to the Lucknow Gharana of Kathak dance.

Q31. Answer: (a) Under competitive asset market conditions, the price of a bond must always be equal to its present value in...

The correct answer is Under competitive asset market conditions, the price of a bond must always be equal to its present value in equilibrium.

Key Points

• Under competitive asset market conditions:-

• The price of a bond must always be equal to its present value in equilibrium.

• This is because in a competitive market, buyers and sellers have access to the same information and are able to make transactions at the market price, which reflects the present value of the bond.

Q32. Answer: (d) The green revolution caused increased migration from urban to rural areas.

The correct answer is the green revolution caused increased migration from urban to rural areas.

Key Points

• Green revolution:-

• The green revolution was a period of technological advancement in agriculture that began in the 1940s and continued until the 1970s.

• The green revolution was mainly focused on increasing the productivity of high-yielding crops such as wheat, rice, and maize.

• The green revolution was successful in increasing crop yields and reducing food insecurity in many parts of the world, particularly in Asia and Latin America.

• Primarily medium and large farmers were able to benefit from the new technology of the green revolution. This statement is true as the green revolution was mainly focused on increasing the productivity of high-yielding crops, which required a certain level of investment and resources that small farmers could not afford.

• The green revolution benefited farmers who had access to land, capital, technology, and know-how. This statement is also true as the green revolution required a certain level of resources and infrastructure to be successful, and farmers who had access to these resources were able to benefit from it.

• The green revolution led to the displacement of tenant cultivators in many cases. This statement is also true as the green revolution led to the consolidation of landholdings and the displacement of small farmers and tenant cultivators who could not compete with the larger farmers.

Q33. Answer: (b) Both A and C

The correct answer is Both A and C

Key Points

• M1:-

• It measure of money supply includes the most liquid components of the money supply, such as physical currency and demand deposits.

• Time deposits, also known as term deposits, are not included in the M1 measure as they are less liquid and cannot be accessed

immediately.

• Demand deposits are funds held in a checking account that can be withdrawn at any time without prior notice.

• Commercial banks and RBI (Reserve Bank of India) are examples of financial institutions that offer demand deposit accounts to the public.

• Both currency with public and demand deposits with commercial banks/RBI of public financial institutions are included in the M1 measure of money supply.

• Currency with public refers to physical cash held by individuals and businesses.

• Time deposit with post office is not included in the M1 measure as it is a less liquid component of the money supply.

Q34. Answer: (c) Bangalore

The correct answer is Bangalore.

Key Points

• Indian Academy of Sciences:-

• It is located in the city of Bangalore in Karnataka state of India.

• The academy was founded in 1934 by the Nobel laureate physicist CV Raman.

• Indian Academy of Sciences is one of the three academies of the Indian National Science Academy (INSA), along with the National Academy of Sciences and the Indian National Academy of Engineering.

• The academy's mission is to promote science and its applications for the benefit of humanity, and to provide a platform for scientists to exchange ideas and collaborate on research.

Q35. Answer: (d) Ghiyasuddin Tughlaq

The correct answer is Ghiyasuddin Tughlaq.

Key Points

• Nasiruddin Khusrau:-

• Following the death of Alauddin, the Delhi Sultanate was plunged into confusion.

• Malik Kafur sat on the throne for a few days but was disposed by Qutubuddin Mubarak Shah who ruled from 1316-1320 CE.

• He was murdered by Nasiruddin Khusrau Shah in1320CE who ascended the throne after him.

• Ghiyasuddin Tughlaq:-

• He was the first sultan of the Tughluq dynasty of the Delhi Sultanate.

• During his reign, Ghiyasuddin Tughluq founded the city of Tughluqabad

Additional Information

• Muhammad bin Tughlaq:-

• Muhammad bin Tughluq, also named Jauna Khan

• He reigned from February 1325 until his death in 1351

• Feroz Shah Tughlaq:-

• He was the grandson of Muhammad bin Tughlaq and ruled from 1351 to 1388.

Q36. Answer: (d) Chemical change

The correct answer is Chemical Change.

Key Points

• Chemical change:-

• This type of change alters the composition of the substance and results in the formation of a new substance. Examples include combustion, rusting, and digestion. When milk is converted into curd, it undergoes a chemical change.

• This change is irreversible, meaning it cannot be undone.

• The process of converting milk into curd is called fermentation, which is a chemical reaction that occurs due to the presence of bacteria.

• During fermentation, the lactose in the milk is converted into lactic acid, which causes the milk to thicken and form curd.

Additional Information

• Reversible change:

• This type of change can be undone, meaning the original substance can be restored. Examples include melting and freezing of ice.

• Physical change:

• This type of change does not alter the composition of the substance. Examples include changes in state (solid, liquid, gas) and changes in shape or size.

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• Isothermal change:

• This type of change occurs at a constant temperature and does not involve any change in energy.

Q37. Answer: (b) Sanjay Kumar Mishra

The correct answer Sanjay Kumar Mishra.

Key Points

• Sanjay Kumar Mishra:-

• His tenure as Chief of the Enforcement Directorate was extended for one year in November 2021.

• Enforcement Directorate:-

• It is a law enforcement agency in India responsible for enforcing economic laws and fighting economic crime.

Additional Information

• Pradyumna Sinha:-

• He is a retired IAS officer who was appointed as the first Lieutenant Governor of Jammu and Kashmir after the state's special status was revoked in 2019.

Q38. Answer: (a) The North Indian Plains

The correct answer is The North Indian Plains.

Key Points

• North Indian Plains:-

• The North Indian Plains are densely populated due to their fertile soil, abundant water resources, and favorable climate for agriculture.

• This region includes the states of Punjab, Haryana, Uttar Pradesh, Bihar, and parts of Rajasthan, Madhya Pradesh, and West Bengal.

• The islands such as Andaman and Nicobar and Lakshadweep have a relatively low population density due to their remote location and limited resources.

Additional Information

• Himalayan Range:-

• The Himalayan Range is sparsely populated due to its rugged terrain, harsh weather conditions, and limited accessibility.

• The Thar Desert:-

• It is also sparsely populated due to its arid climate and limited water resources.

Q39. Answer: (b) To secure uniform civil code

The correct answer is To secure uniform civil code.

Key Points

• Liberal principle:-

• The liberal principle of the Directive Principles of State Policy of the Indian Constitution is to secure uniform civil code.

• This means that the state should strive to have a common set of laws governing personal matters such as marriage, divorce, inheritance, and adoption, regardless of the religion or community of the individuals involved. This is seen as a way to promote gender equality and social harmony.

Additional Information

• Directive Principles of State Policy:-

• The Directive Principles of State Policy are not enforceable by the courts, but are considered to be fundamental in the governance of the country. They are guidelines for the government to follow in making policies and laws.

• The issue of uniform civil code is a controversial one in India, with some arguing that it would infringe on the rights of religious minorities and others advocating for its implementation as a way to promote secularism and gender equality.

Q40. Answer: (d) cricket

The correct answer is cricket.

Key Points

• Gurucharan Singh:-

• Gurucharan Singh is a former Indian cricketer who played as a left-arm spinner. He represented the Indian cricket team in 5 test matches and 1 ODI between 1982 and 1984.

• He received the Padma Shri award for his contributions to this sport.

Additional Information

• Football:-

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• It is a popular sport in India, but Gurucharan Singh did not receive the Padma Shri award for his contributions to this sport.

• Basketball:-

• It is also a popular sport in India, but Gurucharan Singh did not receive the Padma Shri award for his contributions to this sport.

• Kabaddi:-

• It is a traditional Indian sport that has gained popularity in recent years, but Gurucharan Singh did not receive the Padma Shri award for his contributions to this sport.

Q41. Answer: (c) Salaries and old-age pensions

The correct answer is Salaries and old-age pensions.

Key Points

• Capital expenditures:-

• It refer to investments made by the government in fixed assets such as infrastructure, buildings, and equipment.

• Salaries and old-age pensions are not capital expenditures as they are recurring expenses and do not involve investments in fixed assets.

• Loans to state governments and construction of roads and bridges:-

• These are examples of capital expenditures as they involve long-term investments in fixed assets.

• Loans to state governments can be an important tool for the central government to support state-level development projects, while improvement of fixed assets such as buildings and equipment can help to enhance the efficiency and effectiveness of government services.

Q42. Answer: (b) Olivine

The correct answer is Olivine.

Key Points

• Bornite:-

• It is a copper iron sulfide mineral that is commonly found in hydrothermal veins and contact metamorphic rocks.

Additional Information

• Tremolite:-

• It is a calcium magnesium silicate mineral that belongs to the amphibole group and is commonly found in metamorphic rocks such as schist and marble.

• Garnet:-

• It is a group of minerals that come in a variety of colors and are commonly found in metamorphic and igneous rocks.

• Olivine:-

• It is a magnesium iron silicate mineral that is typically yellowish-green to green in color.

• Olivine is also known as peridot when it occurs as a gemstone.

Q43. Answer: (a) BHEL

The correct answer is BHEL.

Key Points

• Public sector industries:-

• These are those that are owned and operated by the government.

• BHEL (Bharat Heavy Electricals Limited) is a public sector company that specializes in manufacturing electrical equipment.

• BHEL:-

• It is a public sector industry.

Additional Information

• Dabur Industry:-

• It is a private sector company that specializes in manufacturing Ayurvedic medicine and consumer goods.

• Bajaj Auto:-

• It is a private sector company that specializes in manufacturing two-wheelers and three-wheelers.

• TISCO:-

• It is a private sector company that specializes in manufacturing steel products.

Q44. Answer: (d) RC Dutt

The correct answer is RC Dutt.

Key Points

• Economic History of India:-

• The book provides a detailed account of India's economic history, starting from ancient times and covering the colonial period until the early 20th century.

• The author of the famous book "The Economic History of India" is RC Dutt.

• The book was first published in 1902 and is considered a classic in the field of Indian economic history.

• RC Dutt:-

• He was a prominent Indian economist, writer, and politician who played a significant role in India's struggle for independence from British rule

Additional Information

• Dadabhai Naoroji:-

• He was a prominent Indian nationalist, social reformer, and politician who is known for his work on Indian economy and his "Drain Theory" that argued that India's wealth was being drained by British colonial policies.

• PC Dutta:-

• He was an Indian economist and academic who wrote several books on Indian economy and economic policy.

• RG Bhandarkar:-

• He was an Indian historian and scholar who is known for his work on ancient Indian history and culture.

Q45. Answer: (c) Manipur

The correct answer is Manipur.

Key Points

• Jagoi and Thabal Chongba:-

• These are the famous dances of Manipur, a state in northeastern India.

• Jagoi is a traditional folk dance performed by the Meitei community of Manipur, which is also known as the Manipuri dance.

• Thabal Chongba is a Manipuri folk dance that is performed during the Yaoshang festival, which is celebrated in Manipur during spring.

• Both Jagoi and Thabal Chongba are characterized by graceful movements, intricate footwork, and colorful costumes.

• These dances are an integral part of Manipuri culture and are performed on various occasions like weddings, festivals, and social gatherings.

Additional Information

• Uttar Pradesh:-

• It is a state in northern India, known for its rich cultural heritage and diverse folk traditions. Some of the famous dances of Uttar Pradesh include Kathak, Charkula, and Raslila.

• Odisha:-

• It is a state on the east coast of India, is renowned for its classical dance form, Odissi. Apart from Odissi, the state is also known for its folk dances like Dalkhai, Ghumura, and Sambalpuri.

• Nagaland:-

• It a state in northeastern India, is home to several indigenous tribes, each with its unique dance forms. Some of the famous dances of Nagaland include the Naga warrior dance, the Chang Lo dance, and the Hornbill dance.

Q46. Answer: (a) Rohan Bopanna

The correct answer is Rohan Bopanna.

Key Points

• Rohan Bopanna:-

• He became the oldest Indian Tennis player to win the ATP Masters 1000 title in 2023.

• This achievement was a significant milestone in Bopanna's career and a proud moment for Indian tennis.

Additional Information

• Mahesh Bhupathi:-

• He is a former doubles world number one and has won numerous Grand Slam titles in doubles and mixed doubles.

• Vijay Amritraj and Ramanathan Krishnan are both former top-ranked Indian singles players who have represented India in multiple Davis Cup matches.

• ATP Masters 1000:-

• It is a series of nine men's tennis tournaments that form part of the elite ATP Tour. Winning a Masters 1000 title is a significant achievement for any tennis player.

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Q47. Answer: (c) Joseph Henry

The correct answer is Joseph Henry.

Key Points

• Joseph Henry:-

• He was an American scientist who is best known for his work in electromagnetism. He discovered the phenomenon of self-induction and mutual induction independently of Michael Faraday.

• In 1830, Joseph Henry created the world's most powerful electromagnet, the Albany magnet, which could lift up to 750 pounds of metal at a time. This was a significant achievement in the field of electromagnetism.

Additional Information

• John Cockcroft:-

• He was a British physicist who is known for his work on the splitting of the atom.

• He was awarded the Nobel Prize in Physics in 1951 for his contributions to nuclear physics.

• William Gilbert:-

• He was an English physician and natural philosopher who is known as the father of electrical studies.

• He is credited with the discovery of the Earth's magnetic field and the invention of the term "electricity."

• Edward Purcell:-

• He was an American physicist who is known for his work on nuclear magnetic resonance.

• He was awarded the Nobel Prize in Physics in 1952 for his contributions to the development of the nuclear magnetic resonance method.

Q48. Answer: (b) Thomas Hicks

The correct answer is Thomas Hicks.

Key Points

• Thomas Hicks:-

• He won the gold medal in the Marathon event at the 1904 Olympic Games held in St. Louis, Missouri.

• Hicks was an American athlete who was born in England and later migrated to the United States.

• He was a member of the New York Athletic Club and was coached by Charles Waldron.

• Hicks' victory in the Marathon event was controversial as he was given strychnine and brandy during the race by his trainers, which was a common practice at that time.

Additional Information

• Frank Shorter:-

• He was an American long-distance runner who won the Marathon gold medal at the 1972 Munich Olympics.

• John Hayes:-

• He was an American long-distance runner who won the Marathon gold medal at the 1908 London Olympics.

Q49. Answer: (c) Article 51A (a)

The correct answer is Article 51A (a).

Key Points

• Article 51A (a):-

• It outlines the fundamental duty of every citizen to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem.

• The National Anthem is a symbol of national unity and integrity and must be respected by all citizens.

Additional Information

• Article 51A (b) of the Indian Constitution outlines the fundamental duty of every citizen to cherish and follow the noble ideals that inspired the freedom struggle.

• Article 51A (c) of the Indian Constitution outlines the fundamental duty of every citizen to uphold and protect the sovereignty, unity, and integrity of India.

• Article 51A (d) of the Indian Constitution outlines the fundamental duty of every citizen to defend the country and render national service when called upon to do so.

Q50. Answer: (d) Ghazal

The correct answer is Ghazal.

Key Points

• Begum Akhtar:-

• She was a renowned Indian classical singer and ghazal artist.
• Begum Akhtar was primarily associated with the field of ghazal, a form of Urdu poetry that is often sung.
• She was known for her soulful renditions of ghazals and her unique style of singing.
• Begum Akhtar was considered one of the greatest ghazal singers of all time and her contributions to the genre are still celebrated today.
• She was also known for her mastery of other forms of Indian classical music, such as thumri and dadra.

Q51. Answer: (b) (x-1)/(x+2)

Calculation:
$(x^2-3x+2)/(x^2-4)$
$\Rightarrow (x^2 - 2x - x + 2)/\{(x - 2)(x + 2)\}$
$\Rightarrow x(x - 2) - 1(x - 2)/\{(x - 2)(x + 2)\}$
$\Rightarrow (x - 2)(x - 1)/\{(x - 2)(x + 2)\}$
$\Rightarrow (x - 1)/(x + 2)$
Therefore The correct answer is (x-1)/(x+2).

Q52. Answer: (d) 20

Shortcut Trick
Fourth Proportional (d) = (Second term × Third term) ÷ First term
$d = (5\sqrt{8} \times 3\sqrt{10}) \div 3\sqrt{5}$
$d = (5 \times 2\sqrt{2} \times 3 \times \sqrt{2} \times \sqrt{5}) \div (3\sqrt{5})$
$d = 5 \times 2 \times 2 = 20$
Therefore The correct answer is 20.
Alternate Method
Given:
First term (a) = $3\sqrt{5}$
Second term (b) = $5\sqrt{8} = 5 \times 2\sqrt{2} = 10\sqrt{2}$
Third term (c) = $3\sqrt{10}$
Formula Used:
If a, b, c, and d are in proportion, then a/b = c/d => d = (b × c) / a
Calculations:
=> Let the fourth proportional be d.
$\Rightarrow 3\sqrt{5} / 5\sqrt{8} = 3\sqrt{10} / d$
$\Rightarrow d = (5\sqrt{8} \times 3\sqrt{10}) / 3\sqrt{5}$
$\Rightarrow d = (10\sqrt{2} \times 3 \times \sqrt{2} \times \sqrt{5}) / 3\sqrt{5}$
$\Rightarrow d = (30 \times 2 \times \sqrt{5}) / 3\sqrt{5}$
$\Rightarrow d = 60 / 3$
$\Rightarrow d = 20$
Therefore The correct answer is 20.
Additional Information
Mean Proportional
The mean proportional between two numbers a and b is given by $x = \sqrt{(a \times b)}$.
Third Proportional
The third proportional to two numbers a and b is c, such that a:b = b:c, which gives $c = b^2/a$.
Invertendo Rule
If a:b = c:d, then b:a = d:c. This is used to rearrange proportional terms.
Compound Ratio
The compound ratio of (a:b) and (c:d) is (a × c) : (b × d).

Q53. Answer: (b) 3/5

Given:
Tan θ = 8/15
Formula used:

By Pythagoras theorem:

$H^2 = P^2 + B^2$

Tan θ = P/B

Sin θ = P/H

Where, H = hypotenuse

P = perpendicular ; B = base

Calculation:

Tan θ = 8/15 = P/B

By Pythagoras theorem:

=> H2 = P2 + B2

=> $H2 = 8^2 + 15^2$

=> H = √(64 + 225) = √289

=> H = 17

Now,

√(1-sin θ)/(1+sin θ)~

Putting the values in equation:

=> √[{1 - (8/17)}/{1 + (8/17)}]

=> √[{9/17}/{25/17}]

=> √[9/25] = 3/5

Therefore The correct answer is 3/5.

Q54. Answer: (c) 81

Calculation:

Total marks obtained by all 5 students = 85 + 72 + 70 + 84 + 94 = 405

Average marks obtain by students = total marks/total students

=> 405/5 = 81

Therefore The correct answer is 81.

Q55. Answer: (c) 6.25% loss

Given:

Cost price (C.P) = Rs.80

Marked price (M.P) = Rs.125

Discount (D)% = 40%

Concept used:

If discount is = D%

M.P : S.P = 100 : (100 - D)%

Calculation:

C.P : M.P = 80 : 125 = 16 : 25

Discount (D)% = 40%

M.P : S.P = 100 : 60 = 5 : 3

Marked price must be same.

M.P : S.P = (5 : 3) × 5 = 25 : 15

C.P : M.P : S.P = 16 : 25 : 15

Percentage loss = {(16 - 15) × 100}/16

=> 100/16 = 6.25%

Therefore The correct answer is 6.25%.

Shortcut TrickCalculation:

Selling price (S.P) = 125 × (100 - 40)%

=> 125 × 60% = Rs.75

Gain% = {(80 - 75) × 100}/80

=> 50/8 = 6.25%

Therefore The correct answer is 6.25%.

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Q56. Answer: (b) 1.8

Given:

The height of the tree = 3.15 m

The height of the building = 11.25 m

The distance between Subhas and the tree = 7.5 m

The distance between the tree and the building = 45 m

Calculation:

Let the height from the ground at which Subhas's eyes are situated be h.

XA = OB = PC = h

From the question:

YB = 3.15 m ; ZC = 11.25 m

AB = 7.5 m ; BC = 45 m

XO = AB = 7.5 m

OP = BC = 45 m

XP = XO + OP

=> XP = 7.5 m + 45 m

Therefore XP = 52.5 m

Now,

OY = BY - OB

=> OY = 3.15 - h

PZ = ZC - PC

=> PZ = 11.25 - h

In ΔXPZ,

=> tan θ = PZ/PX

=> tan θ = (11.25 - h)/52.5 ----------(1)

Similarly, in ΔXOY,

=> tan θ = OY/OX

=> tan θ = (3.15 - h)/7.5 ----------(2)

From eq. (1) & (2)

=> (11.25 - h)/52.5 = (3.15 - h)/7.5

=> 11.25 - h = 7(3.15 - h)

=> 11.25 - h = 22.05 - 7h

=> 7h - h = 22.05 - 11.25

=> 6h = 10.8

=> h = 10.8/6

=> h = 1.8 m

Therefore The correct answer is 1.8 m.

Q57. Answer: (c) 17

Shortcut Trick

For a circle with two parallel chords of lengths L1 and L2 at distances d1 and d2 from the center, the radius r satisfies: $r^2 = d1^2 + (L1/2)^2 = d2^2 + (L2/2)^2$.

Given L1 = 10 (half = 5), d1 = 12 => $r^2 = 12^2 + 5^2 = 169$ => r = 13 cm.

For L2 = 24 (half = 12) => $13^2 = d2^2 + 12^2$ => 169 = $d2^2$ + 144 => d2 = 5 cm.

Since chords are on opposite sides of the center, Distance = d1 + d2 = 12 + 5 = 17 cm.

Therefore The correct answer is 17 cm.

Alternate Method

Given:

Length of chord AB = 10 cm, Chord CD = 24 cm.

Distance of AB from center (OM) = 12 cm.

Formula Used:

The perpendicular from the center of a circle to a chord bisects the chord. In a right-angled triangle, Pythagoras theorem states:

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Hypotenuse² = Base² + Perpendicular².

In circle with center O, let AB and CD be the parallel chords.

OM perpendicular to AB and ON perpendicular to CD. Since they are on opposite sides, the distance between them is MN = OM + ON.

=> AM = AB ÷ 2 = 10 ÷ 2 = 5 cm.

=> In ΔOAM, $OA^2 = OM^2 + AM^2$

=> $r^2 = 12^2 + 5^2 = 144 + 25 = 169$

=> r = √169 = 13 cm.

=> In ΔOCN, $OC^2 = ON^2 + CN^2$, where CN = CD ÷ 2 = 24 ÷ 2 = 12 cm.

=> $13^2 = ON^2 + 12^2$

=> $169 = ON^2 + 144$

=> $ON^2 = 169 - 144 = 25$

=> ON = 5 cm.

=> Total distance MN = OM + ON = 12 + 5 = 17 cm.

Therefore The correct answer is 17 cm.

Additional Information

Distance Between Parallel Chords

If chords are on the same side of the center, distance = |d1 − d2|. If on opposite sides, distance = d1 + d2.

Perpendicular Bisector Property

The perpendicular from the center to a chord always bisects it, creating two right-angled triangles with the radius as the hypotenuse.

Pythagorean Triplets

Common triplets like (5, 12, 13) and (8, 15, 17) frequently appear in circle geometry problems involving chords and radii.

Q58. Answer: (c) 80/89

Given:

Cos θ = 39/89

Formula used:

By Pythagoras theorem:

$H^2 = P^2 + B^2$

Cos θ = B/H ; sin θ = P/H

Where, P = perpendicular ; B = Base

and H = Hypotenuse

Calculation:

Cos θ = 39/89 = B/H

By Pythagoras theorem:

H2 = P2 + B2

=> $(89)^2 = P^2 + (39)^2$

=> $P^2 = 89^2 - 39^2$

=> P = √{(89 - 39) × (89 + 39)}

=> P = √(50 × 128)

=> P = 80

Now, Sin θ = P/H = 80/89

Therefore The correct answer is 80/89.

Q59. Answer: (a) 69.23%

Calculation:

According to the question:

=> 360° = 600

=> 1° = 600/360 = 5/3

Total number of Professor in Economics = 86.4 × (5/3) = 144

Total number of Professor in Mathematics = 72 × (5/3) = 120

Sum of professor in Economics and mathematics = 144 + 120 = 264

Total number of Professor in English = 50.4 × (5/3) = 84
Total number of Professor in Statistics = 43.2 × (5/3) = 72
Sum of professor in English and Statistics = 84 + 72 = 156
Required percentage = {(264 - 156) × 100}/156
=> 10800/156 = 900/13 = 69.23%
Therefore The correct answer is 69.23%.

Q60. Answer: (b) 12%

Given:
Marked price (M.P) = Rs.1350
Selling price (S.P) = Rs.1188
Formula used:
Discount% = (M.P - S.P)/M.P
Calculation:
Rate of discount = {(1350 - 1188) × 100}/1350
=> 1620/135 = 12%
Therefore The correct answer is 12%.

Q61. Answer: (d) 110

Given:
a + 1/a = 5
Concept used:
If a + 1/a = P
then $a^3 + (1/a^3) = P^3 - (3 \times P)$
Calculation:
a + 1/a = 5
=> a3 + (1/a3) = 5^3 - (3 × 5)
=> 125 - 15 = 110
Therefore The correct answer is 110.

Q62. Answer: (c) • √3

Given:
tan θ × tan 2θ = 1
Formula used:
If Tan θ1 = cot θ2then,
θ1 + θ2 = 90°
Cot (90 + θ) = - tan θ
Calculation:
=> Tan 2θ = 1/tan θ
=> Tan 2θ = cot θ
From the above relation, we can conclude that
=> 2θ + θ = 90
=> θ = 90/3 = 30°
Cot 5θ = Cot 5 × 30
=> cot 150° = cot (90° + 60)
=> - tan 60° = - √3
Therefore The correct answer is - √3.

Q63. Answer: (a) 44%

Given:
Profit % on rice = 8%
Percentage less in weight = 25%
Concept used:

If profit = P%
C.P : S.P = 100 : (100 + P%)
Calculation:
Profit% = 8%
C.P : S.P = 100 : 108 = 25 : 27
Percentage less in weight = 25%
1000 : 750 = 4 : 3
C.P : S.P = 3 : 4
Total C.P : total S.P = 75 : 108
Gain % = {(108 - 75) × 100}/75
=> (33 × 4)/3 = 44%
Therefore The correct answer is 44%.

Q64. Answer: (a) 300

Given:
Principal (P) = Rs.12,300
Rate (R) = 12% ; Time (T) = 73 days
Formula used:
Simple interest (S.I) = (P × R × T)/100
Calculation:
S.I = (P × R × T)/100
=> (12300 × 12 × 73)/(365 × 100)
=> (123 × 12)/5
=> 1476/5 = 295.2 ≈ 300
Therefore The correct answer is 300.

Q65. Answer: (a) 0.8

Given:
PQ = 3 cm
Radius (OP) = 1.7 cm
Concept used:
The distance of a chord from the centre cuts the chord in half and perpendicular to it.
Calculation:
OM perpendicular to PQ
PM = 3/2 = 1.5 cm
Now, By Pythagoras theorem
=> $H^2 = P^2 + B^2$
=> $(1.7)^2 = OM^2 + (1.5)^2$
=> $OM^2 = 1.7^2 - 1.5^2$
=> OM = √{(1.7 + 1.5)(1.7 - 1.5)}
=> OM = √{3.2 × 0.2} = √0.64
=> OM = 0.8 cm
Therefore The correct answer is 0.8 cm.
Given:
Two points P and Q are 3 cm apart. These two points lie on the circumference of a circle with a radius of 1.7 cm.
Concept Used:
Use the properties of circles and right triangles to find the perpendicular distance from the center of the circle to the line segment PQ.
Formula Used:
1. Pythagorean theorem: $a^2 + b^2 = c^2$
2. The perpendicular distance from the center to the chord: d = √(r^2 - ((chord length)/2)²)
Calculation:

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Identify the given values:
Radius of the circle r = 1.7 cm
Length of the chord PQ = 3 cm
Calculate half of the chord length
Use the formula to find the perpendicular distance from the center to the chord: (chord length)/2 = 3/2 = 1.5 cm
$d = \sqrt{(r^2 - ((\text{chord length})/2)^2)}$ $d = \sqrt{(1.7^2 - 1.5^2)}$ $d = \sqrt{(2.89 - 2.25)}$ $d = \sqrt{0.64}$ d = 0.8 cm
So, the distance of the line segment PQ from the center of the circle is 0.8 cm.

Q66. Answer: (c) 26 sec

Given:
Length of the circular track = 400 m
Speed of A = 10 m/s
Speed of B = 40 m/s
Formula used:
Distance = relative speed × time
Calculation:
Distance = relative speed × time
=> 400 = 50 × T
=> T = 400/50 = 8 sec
Now, According to the question:
A new speed = 20 m/s
B new speed = 20 m/s
Distance = relative speed × time
=> 400 = 40 × T
=> T = 400/40 = 10 sec
A's new speed = 40 m/s
B's new speed = 10 m/s
Distance = relative speed × time
=> 400 = 50 × T
=> T = 400/50 = 8 sec
Total time to meet for third time = 8 + 10 + 8 = 26 sec
Therefore The correct answer is 26 sec.

Q67. Answer: (c) 530450

Given:
Population of the city = 500000
Birth rate = 6% ; death rate = 3%
Formula used:
Present population = past population (1 + R%)^T
R = rate% ; T = time
Calculation:
Effective rate = 6 - 3 = 3%
Present population = past population (1 + R%)T
=> 500000 × $(1 + 3\%)^2$
=> 500000 × 103% × 103%
=> 530450
Therefore The correct answer is 3.

Q68. Answer: (c) 28/135

Concept used:
Calculation:
(21/2÷17/8) ÷ (93/8÷112/3 of 1/8)
=> {(5/2) ÷ (15/8)} ÷ {(75/8) ÷ (35/3) × (1/8)}

=> {(5/2) × (8/15)} ÷ {(75/8) ÷ (35/24)}
=> {4/3} ÷ {(75/8) × (24/35)}
=> {4/3} ÷ {45/7}
=> {4/3} × {7/45}
=> 28/135

Q69. Answer: (d) 79

Shortcut Trick
Identify the prime numbers between 69 and 92: 71, 73, 79, 83, 89.
Assume an average of 79 and find the net deviation: −8, −6, 0, +4, +10.
The sum of deviations = −8 − 6 + 0 + 4 + 10 = 0.
Since the net deviation is 0, the assumed average is the actual average.
Therefore The correct answer is 79.
Alternate Method
Given: Prime numbers between 69 and 92.
Formula Used: Average = Sum of all observations ÷ Total number of observations
=> Prime numbers between 69 and 92 are 71, 73, 79, 83, and 89.
=> Number of prime numbers (n) = 5
=> Sum = 71 + 73 + 79 + 83 + 89 = 395
=> Average = 395 ÷ 5
=> Average = 79
Therefore The correct answer is 79.
Additional Information
Prime Numbers
A prime number is a natural number greater than 1 that has only two factors: 1 and itself.
Average of Observations
The average or arithmetic mean is calculated as the total sum divided by the count of items: ∑x ÷ n.
Sieve of Eratosthenes
A simple algorithm for finding all prime numbers up to a specified integer by iteratively marking composite numbers.

Q70. Answer: (b) 48 cm

Given:
PR : RQ = 1 : 3
PR = 6 cm
Concept used:
The line segment in a triangle joining the midpoint of any two sides
is parallel to its third side and is also half of the length of the third side.
Calculation:
PR : PQ = 1 : 3
=> 1 unit = 6 cm
=> PQ = 4 units = 4 × 6 = 24 cm
So, BC = 2 × PQ
=> BC = 2 × 24 = 48 cm
Therefore The correct answer is 48 cm.

Q71. Answer: (a) 1437 1/3 cm³

Given:
Diameter of sphere (D) = 14 cm
Formula used:
Volume of the sphere = (4/3) × π × r³
Diameter = 2 × r
Calculation:
Radius of sphere = 14/2 = 7 cm

Volume of the sphere = (4/3) × π × r3
=> (4/3) × (22/7) × (7)3
=> (4/3) × 22 × 49
=> 4312/3 = 1437 1/3 cm3
Therefore The correct answer is 1437 1/3 cm3.

Q72. Answer: (d) (799+315√5)/8

Given:
x = (7 + 3√5)
Formula used:
$(a + b)^2 = a^2 + b^2 + 2ab$
(a - b)2 = a2 + b2 - 2ab
Calculation:
x = (7 + 3√5)
then, 1/x = 1/(7 + 3√5)
=> $(7 - 3\sqrt{5})/\{7^2 - (3\sqrt{5})^2\}$
=> (7 - 3√5)/4
Now,
x2 + (1/x2)
=> $(7 + 3\sqrt{5})^2 + \{(7 - 3\sqrt{5})/4\}^2$
=> $7^2 + (3\sqrt{5})^2 + 2 \times 7 \times 3\sqrt{5} + \{(72 + (3\sqrt{5})2 - 2 \times 7 \times 3\sqrt{5})/16\}$
=> 49 + 45 + 42√5 + (49 + 45 - 42√5)/16
=> 94 + 42√5 + (94 - 42√5)/16
=> (1504 + 672√5 + 94 - 42√5)/16
=> (1598 + 630√5)/16
=> (799+315√5)/8
Therefore The correct answer is (799+315√5)/8.

Q73. Answer: (c) Rs. 60,000

Given:
Expense for groceries = 12% × income
Expense for medicines = 8% × income
Expense for school fee = 20% × income
Remaining income = Rs.36000
Calculation:
Total expenses = 12 + 8 + 20 = 40%
According to the question:
=> 60% = 36000
=> 100% = {36000 × 100}/60
Income of the person = 60000
Therefore The correct answer is 60000.

Q74. Answer: (c) 39.5

Calculation:
Total cement production during six years = 35 + 40 + 45 + 35 + 35 + 47 = 237
Average cement production during six years = 237/6 = 39.5
Therefore The correct answer is 39.5.

Q75. Answer: (b) 45 days

Shortcut Trick
Let the Total Work be the LCM of 9, 18, and 30 = 90 units.
Combined efficiency of A + B + C = 90 ÷ 9 = 10 units/day.
Efficiency of A = 90 ÷ 18 = 5 units/day and efficiency of B = 90 ÷ 30 = 3 units/day.

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Efficiency of C = (Efficiency of A + B + C) − (Efficiency of A + B) = 10 − (5 + 3) = 2 units/day.
Time taken by C alone = Total Work ÷ Efficiency of C = 90 ÷ 2 = 45 days.
Therefore The correct answer is 45 days.
Alternate Method
Given:
Time taken by (A + B + C) = 9 days
Time taken by A = 18 days
Time taken by B = 30 days
Formula Used:
Total Work = Time × Efficiency

Person	Days	Total Work	Efficiency
A + B + C	9	90	10
A	18	5	
B	30	3	

Calculations:
=> Total Work = LCM of (9, 18, 30) = 90 units
=> Efficiency of (A + B + C) = 90 ÷ 9 = 10 units/day
=> Efficiency of A = 90 ÷ 18 = 5 units/day
=> Efficiency of B = 90 ÷ 30 = 3 units/day
=> Combined efficiency of A and B = 5 + 3 = 8 units/day
=> Efficiency of C = Efficiency of (A + B + C) − Efficiency of (A + B)
=> Efficiency of C = 10 − 8 = 2 units/day
=> Time taken by C = Total Work ÷ Efficiency of C
=> Time taken by C = 90 ÷ 2 = 45 days
Therefore The correct answer is 45 days.
Additional Information
Work and Efficiency Relationship
Efficiency is inversely proportional to the time taken to complete a work. If time ratio is x : y, efficiency ratio is y : x.
Pipes and Cisterns
Similar to time and work, the rate of filling is efficiency. Outlets have negative efficiency while inlets have positive efficiency.
Work and Wages
Wages are distributed in the ratio of the amount of work done by each person, which is the product of time and efficiency.

Q76. Answer: (a) to argue with him

The correct answer is: to argue with him
Key Points
• The original sentence is grammatically incorrect because "for" should not be used with "argue".
• The correct preposition to use with "argue" is "to" and "with".
• The infinitive form "to argue" is the correct construction to use in this sentence.
• The sentence means that Sheela attempted to argue with him, even though she knew it was pointless.
Therefore, the correct answer is option 1.
Corrected sentence: Sheela tried to argue with him though she knew it was of no use.

Q77. Answer: (c) Rub in the wrong way

The solution is in Hindi. Read it online.

Q78. Answer: (c) attract

The solution is in Hindi. Read it online.

Q79. Answer: (c) Wise

The solution is in Hindi. Read it online.

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Q80. Answer: (b) The company manufactured the car in a factory overseas.

The correct answer is: The company manufactured the car in a factory overseas.

Key Points

• In active voice, the subject of the sentence should perform the action.

• Structure of the Passive Voice: Subject (The car) + Auxiliary verb (was) + Main verb (manufactured) + By + Agen (The Company) + Adverbial Phrase (in a factory overseas)

• Structure of the Active Voice: Subject (The company) + Verb (manufactured) + Object (the car) + Adverbial Phrase (in a factory overseas)

• To convert the given sentence into active voice, we need to make the company the subject and the car the object of the sentence.

• The sentence in option 2 correctly places the subject (company) before the verb (manufactured) and the object (car) after the verb.

• The sentence is grammatically correct and conveys the same meaning as the given sentence.

Therefore, the correct answer is option 2.

Q81. Answer: (c) Haste is waste.

The solution is in Hindi. Read it online.

Q82. Answer: (a) Archie has been made rich by the garment business.

The correct answer is: Archie has been made rich by the garment business.

Key Points

• Passive voice is formed by using the object of the active sentence as the subject of the passive sentence and adding a form of the verb "to be" and the past participle of the main verb.

• Structure of the Active Voice: Subject + Verb + Object

• Structure of the Passive Voice: Object+ Auxiliary verb (has been)+ 3rd form of the Main verb (made) + Subject of the Active voice

• In this sentence, "Archie" is the object of the active sentence, so it becomes the subject of the passive sentence.

• The verb "has made" becomes "has been made" in the passive voice, and "rich" remains the same.

• The phrase "by the garment business" is added to show who performed the action in the active sentence.

Therefore, the correct answer is option 1.

Q83. Answer: (c) warmth

The solution is in Hindi. Read it online.

Q84. Answer: (d) Maintanence

The solution is in Hindi. Read it online.

Q85. Answer: (b) By virtue off

The correct answer is: By virtue off

Key Points

• The correct phrase is 'By virtue of', not 'By virtue off'.

• 'By virtue of' means 'because of' or 'due to'.

• "Off" is often used as a preposition indicating a direction away from a particular place or position.

• "Of" is a preposition used to show possession, origin, connection, or association.

• The error is a spelling mistake, where 'of' has been misspelt as 'off'.

• The correct sentence would be: "By virtue of the power given to the leader, the followers accepted his decision."

Therefore, the correct answer is option 2.

Q86. Answer: (d) endurance

The solution is in Hindi. Read it online.

Q87. Answer: (c) Malignant

The solution is in Hindi. Read it online.

Q88. Answer: (c) BDCAE

The correct answer is: BDCAE

Key Points

• Part B: Sets the stage for the context of the sentence. It introduces the overarching topic.

• Part D: Provides more information about the global health systems mentioned in the first part of the sentence. It suggests a challenge or problem faced by these systems.

• Part C: Further specifies the context, narrowing down the focus to health services within the global health systems.

• Part A: Completes the thought by explaining the consequence of the disruption mentioned earlier. It gives the reason why the global health systems and health services are overwhelmed.

• Part E: Provides additional information about the situation, indicating that the disruption has implications for efforts in fighting other deadly diseases. It connects the disrupted health systems to a broader context.

• So, when combined, the sentence reads: "Global health systems have been overwhelmed, and many essential health services have been disrupted, posing major threats to progress in fighting other deadly diseases."

Hence, option 3 is the correct answer.

Q89. Answer: (c) swept away by the emotive power

The correct answer is: Swept away by the emotive power

Key Points

• "Swept away" means to be completely carried away by something.

• In this case the emotive power of the music.

• "Emotive power" refers to the ability of the music to evoke strong emotions in the listener.

• This option captures the idea of the audience being completely absorbed and moved by the music.

Therefore, the correct answer is option 3.

Q90. Answer: (c) Pacifist

The solution is in Hindi. Read it online.

Q91. Answer: (a) intoxication

The solution is in Hindi. Read it online.

Q92. Answer: (d) QSPR

The correct answer is: QSPR.

Key Points

• Part Q: Introduces the subject of the sentence, specifying who is being discussed.

• Part S: Provides additional information about the main target consumers mentioned earlier. It further defines the demographic group.

• Part P: Introduces the action taken by food companies in response to the target consumer demographic. It sets the stage for explaining the strategy employed.

• Part R: Completes the sentence by explaining the purpose of the advertisements mentioned earlier. It indicates the desired outcome or effect on consumers.

• So, when combined, the sentence reads: "The main target consumers of food companies are children and youth of the country, so they design the advertisement of products in such a way that consumers are stimulated to buy them repeatedly."

Therefore, the correct answer is option 4.

Q93. Answer: (d) were conducting

The correct answer is: were conducting

Key Points

• The error in the given sentence is in the subject-verb agreement.

• The subject-verb agreement is a grammatical rule that states that the verb in a sentence should agree in number with its subject.

• In this case, "team" is a collective noun, referring to a group of individuals working together.

• When the collective noun is the subject of the sentence, it is treated as a singular entity.

• So, the word "team" is a collective noun, and when it is the subject of the sentence, it should take a singular verb form, which is "was" in this case, instead of "were."

• The correct verb should be "was conducting" to match the singular subject "team."

• The correct sentence should be: "The team of scientists was conducting experiments to test its hypothesis."

Therefore, the correct answer is option 4.

Q94. Answer: (a) QRPS

The correct answer is: QRPS

Key Points

• Part Q: Sets the context by specifying the subject of the sentence.

• Part R: Provides information about the nature of the route mentioned earlier, indicating that it is challenging or difficult.

• Part P: Explains the reason for the arduous nature of the route. It provides additional details about the challenging features of the terrain.

• Part S: Adds another layer of information, highlighting the scenic beauty of the place. It gives context to why the route, despite its challenges, might be worth traversing.

• So, when combined, the sentence reads: "The route to Badrinath is one of the most arduous ones due to the lofty hilly terrain, curves, and cliffs, amidst the most scenically beautiful place on the earth."

Thus, option 1 is the correct answer.

Q95. Answer: (b) Indifference

The solution is in Hindi. Read it online.

Q96. Answer: (b) orbit

The solution is in Hindi. Read it online.

Q97. Answer: (d) including

The solution is in Hindi. Read it online.

Q98. Answer: (b) Some

The correct answer is: Some.

Key Points

• Some indicate a quantity that is more than "few" but less than "many" or "a lot".

• Grammatically, "some" is a determiner that is used to refer to an unspecified or indefinite number or amount of people or things.

• Example: Some of the students were absent from class today.

• As a result, 'some' is the appropriate option to fill in the blank 3.

Therefore, the correct answer is option 2.

Additional Information

• Few indicate a small quantity or number.

• Many indicate a large quantity or number.

• 'A lot' is an informal way of indicating a large quantity or number.

Q99. Answer: (a) classified

The solution is in Hindi. Read it online.

Q100. Answer: (c) clues

The solution is in Hindi. Read it online.

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