SSC CHSL Tier-1 2024: Official Paper (Held On: 03 Jul, 2024 Shift 2) (Previous Year Paper)

SSC Combined Higher Secondary Level (CHSL) • 2024 • 100 questions • 60 minutes • Answer key and solutions

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ENGLISH LANGUAGE

Q1. The following sentence has been split into four segments. Identify the segment that contains a grammatical error.

Urgent activities are those things / that you must do immediately, / as they require quick action / and cannot be put on.

(a) Urgent activities are those things
(b) that you must do immediately
(c) as they require quick action
(d) and cannot be put on

Q2. The following sentence has been divided into four segments. Identify the segment that contains a grammatical error.

The meeting / will taking / place next / Wednesday.

(a) will taking
(b) The meeting
(c) Wednesday.
(d) place next

Q3. The following sentence has been split into four segments. Identify the segment that contains a grammatical error.

(1) When Christy (2) grew out, (3) he turned out (4) to be a gentleman.

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

Q4. The following sentence has been split into four segments. Identify the segment that contains a grammatical error.

Rashmi was / quite amusing when / she heard about / what had happened.

(a) Rashmi was
(b) quite amusing when
(c) she heard about
(d) what had happened

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.

There is nothing more (1)_____ than when you sit down at your table to study with the most sincere of intentions and instead of being able to finish the task at hand you find your thoughts (2)_____. However, there are certain techniques that you can use to (3)__ your concentration. To begin with, one should (4)__ to create the physical environment that is conducive to (5)___ thought.

Q5. Select the most appropriate option to fill in blank no. 1

(a) surprising
(b) interesting
(c) exciting
(d) frustrating

Q6. Select the most appropriate option to fill in blank no. 2.

(a) tiring
(b) wandering
(c) interesting
(d) worrying

Q7. Select the most appropriate option to fill in blank no. 3.

(a) discover
(b) commit
(c) enhance
(d) convince

Q8. Select the most appropriate option to fill in blank no. 4.

(a) announce
(b) imagine
(c) attempt
(d) lead

Q9. Select the most appropriate option to fill in blank no. 5.

(a) joyful
(b) dazzling
(c) focussed
(d) cautious

Q10. Select the INCORRECTLY spelt word.

(a) Professional
(b) Combat
(c) Immigrete
(d) Relevant

Q11. Select the most appropriate option to fill in the blank.

My sister’s paintings were _____ at the national museum.

(a) upon display
(b) into display
(c) in display
(d) on display

Q12. Select the most appropriate meaning of the given idiom.

Have a bee in your bonnet

(a) Having a cruel intention or grudge against someone
(b) Unable to stay at a place for long
(c) To keep worrying about yourself
(d) Be preoccupied or obsessed with something

Q13. Select the most appropriate ANTONYM of the underlined word in the given sentence.

Anthony Trollope was an industrious and disciplined writer.

(a) Exhausting
(b) Dizzy
(c) Skittish

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(d) Lazy

Q14. Select the most appropriate option that can substitute the underlined segment in the given sentence.

There is no way I can swallow the ghastly medicine.

(a) comforting
(b) pleasant
(c) horrible
(d) agreeable

Q15. Select the most appropriate ANTONYM of the underlined word in the given sentence.

Please don’t touch that, it’s flammable.

(a) Incendiary
(b) Nonexplosive
(c) Fire-resistant
(d) Non-combustible

Q16. Select the most appropriate ANTONYM of the word ‘Contaminate’ from the given sentence.

She spent the entire night working non-stop to clean the blood stains from the rug.

(a) rug
(b) spent
(c) working
(d) clean

Q17. Select the most appropriate ANTONYM of the given word.

Fastidious

(a) Speedy
(b) Lax
(c) Late
(d) Scrupulous

Q18. Select the option that will improve the underlined part of the given sentence.

I was looking for a barren seat in the bus but could not find one.

(a) deserted seat
(b) vacant seat
(c) hollow seat
(d) vacuous seat

Q19. Select the most appropriate option that can replace the bracketed word segment in the following sentence.

An (imperfect positioning) of the Sun, Earth and Moon results in the Moon passing through only part of Earth’s umbra, resulting in a partial lunar eclipse.

(a) imperfect revolution
(b) imperfect alignment
(c) imperfect alliance
(d) imperfect allegiance

Q20. Select the most appropriate meaning of the given idiom.

Stick to one’s guns

(a) To remain faithful to
(b) To shoot at
(c) To become a rebel
(d) To become unfaithful to

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Q21. Select the INCORRECTLY spelt word.

(a) Litrature
(b) Reformation
(c) Schedule
(d) Miserable

Q22. Select the most appropriate option that can substitute the underlined segment in the given sentence.

The new chief is gifted at the power of eloquence.

(a) gifted for
(b) gifted with
(c) gifted among
(d) gifted of

Q23. Select the most appropriate option that can substitute the underlined word in the given sentence.

The recent cloudburst completely dismantled the village and its people.

(a) took after
(b) took back
(c) took apart
(d) took up

Q24. Select the most appropriate synonym of the given word.

Frivolity

(a) Insignificance
(b) Consequence
(c) Meaningful
(d) Substantial

Q25. Select the option that can substitute the bracketed word segment meaningfully.

The city of Hyderabad is located (on the heart from Telangana).

(a) with the heart in Telangana
(b) in the heart with Telangana
(c) in the heart of Telangana
(d) of the heart in Telangana

GENERAL INTELLIGENCE

Q26. ‘D + E’ means ‘D is the father of E’

‘D - E’ means ‘D is the sister of E’

‘D × E’ means ‘D is the mother of E’

‘D ÷ E’ means ‘D is the brother of E’.

Which of the following represents ‘K is the brother's daughter of L’?

(a) L - F + K - P
(b) L ÷ Z × X - K
(c) K - L × X ÷ U
(d) U + F + K ÷ P

Q27. Select the combination of letters that when sequentially placed in the blanks of the given series will logically complete the series.

AB_Z DEF_ G_IX JKL_ M_OV

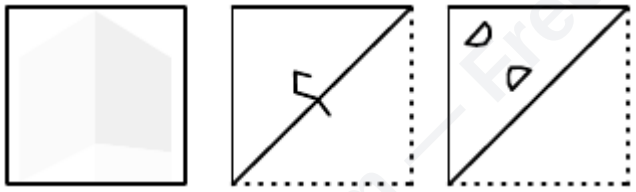
(a) YGHVN
(b) CYHVN
(c) CYGWN
(d) CYHWN

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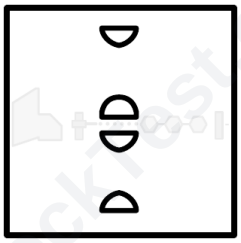
Q28. The position of how many letters will remain unchanged if each of the letters in the word MENTOR is arranged in the alphabetical order?

(a) One
(b) None
(c) Three
(d) Two

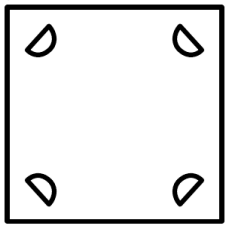
Q29. A paper is folded and cut as shown below. How will it appear when unfolded?



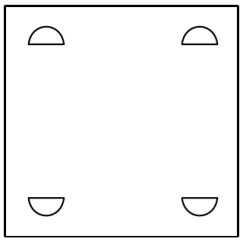
(a)



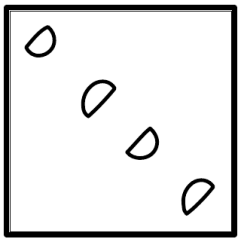
(b)



(c)



(d)

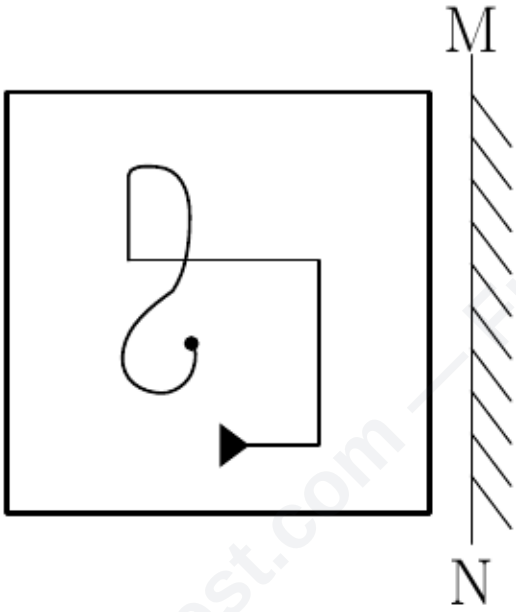


Q30. If 'H' stands for '÷', 'A' stands for '+', 'B' stands for '-' and 'L' stands for '×' what will come in place of the question mark (?) in the following equation?

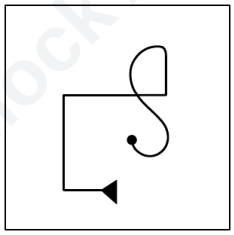
84 H 42 A 63 L 46 B 23 = ?

(a) 4632
(b) 2482
(c) 2864
(d) 2877

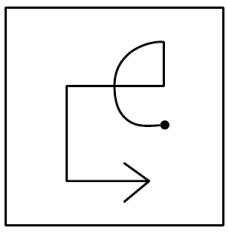
Q31. Select the correct mirror image of the given figure when the mirror is placed at MN.



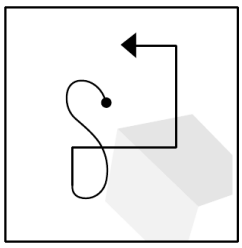
(a)



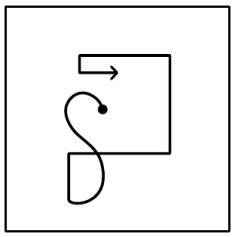
(b)



(c)



(d)



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Q32. In a certain code language,

'A @ B' means 'A is the husband of B',

'A # B' means 'A is the mother of B',

'A & B' means 'A is the sister of B'.

Based on the above, how is T related to P if 'P @ Q # R & S @ T'?

(a) Sister

(b) Wife's sister

(c) Son's wife

(d) Daughter

Q33. If 'Z' stands for '÷', 'H' stands for '×', 'M' stands for '+' and 'T' stands for '-', what will come in place of the question mark (?) in the following equation?

52 M 36 Z 18 T 46 H 19 = ?

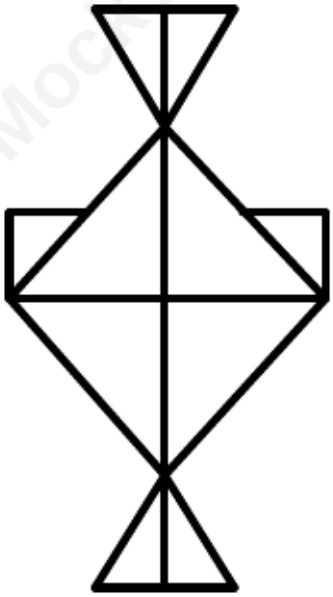
(a) -754

(b) -898

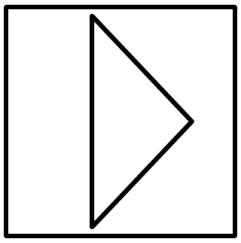
(c) -820

(d) -654

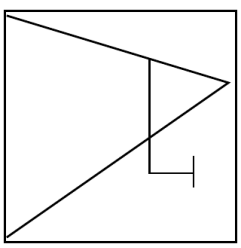
Q34. Select the option that is embedded in the given figure (rotation is NOT allowed).



(a)

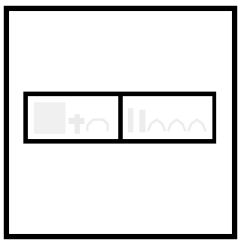


(b)

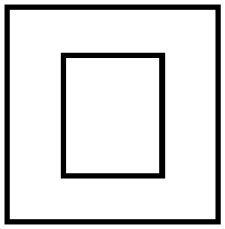


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(c)



(d)

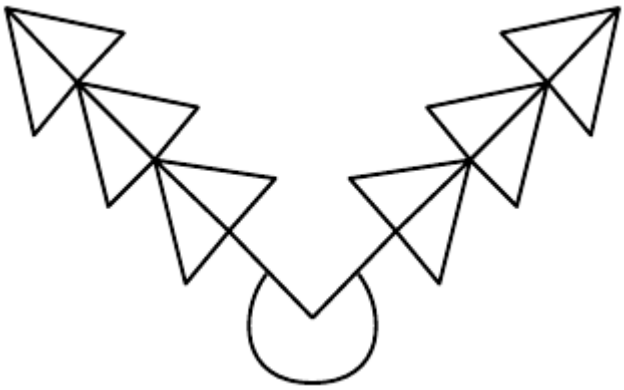


Q35. 100 is related to 20 following a certain logic. Following the same logic, 250 is related to 50. To which of the following is 550 related, following the same logic?

(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 /deleting /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) 105
(b) 115
(c) 110
(d) 100

Q36. How many triangles are there in the given figure?



(a) 15
(b) 16
(c) 20
(d) 18

Q37. In this question, three statements are given, followed by three conclusions numbered I, II and III. Assuming the statements to be true, even if they seem to be at variance with commonly known facts, decide which of the conclusion(s) logically follows/follow from the statements.

Statements:

No pen is a scale.

All scales are erasers.

All pens are calculators.

Conclusions:

I. Some erasers are calculators.

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II. No pen is an eraser.

III. No scale is a calculator.

(a) Both conclusions I and II follow.
(b) Both conclusions II and III follow.
(c) Neither conclusions I, II nor III follows.
(d) All conclusions I, II and III follow.

Q38. Select the word-pair that best represents a similar relationship to the one expressed in the pair of words given below.

(The words must be considered as meaningful English words and must not be related to each other based on the number of letters/consonants/vowels in the word.)

Pleasure : Delight

(a) Silly : Serious
(b) Rain : Sky
(c) Demolish : Destroy
(d) Knowledge : Book

Q39. In a certain code language, COMB is coded as 2681 and MOBE is coded as 8163. What is the code of E in that language?

(a) 6
(b) 3
(c) 8
(d) 1

Q40. What will come in the place of the question mark (?) in the following equation, if '+' and '-' are interchanged and '×' and '÷' are interchanged?

198 × 9 + 29 - 7 ÷ 10 = ?

(a) 62
(b) 61
(c) 60
(d) 63

Q41. 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.)

(245, 49, 5)

(144, 9, 16)

(a) (246, 9, 28)
(b) (312, 24, 9)
(c) (186, 21, 8)
(d) (200, 8, 25)

Q42. In a certain code language, 'COVER' is coded as '9 - 45 - 66 - 15 - 54' and 'BOAST' is coded as '6 - 45 - 3 - 57 - 60'. What is the code for 'APRON' in the given code language?

(a) 4-47-53-42-40
(b) 3-48-54-45-42
(c) 2-46-52-40-41
(d) 2-46-52-44-40

Q43. Select the word-pair that best represents a similar relationship to the one expressed in the pair of words given below.

(The words must be considered as meaningful English words and must not be related to each other based on the number of letters/number of consonants/vowels in the word)

Proud : Arrogant

(a) Trust : Doubt

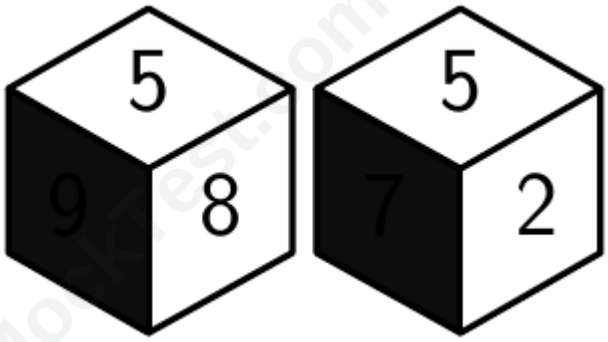
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(b) Wise : Ignorant
(c) Authentic : Genuine
(d) Offend : Praise

Q44. What should come in place of ? in the given series based on the English alphabetical order?
PHO SRP VBQ ? BVS

(a) CFF
(b) VX
(c) YLR
(d) UMO

Q45. Six numbers 2, 3, 5, 7, 8 and 9 are written on different faces of a dice, Two positions of this dice are shown in the figure. Which is the number on the face opposite to the face containing 5?

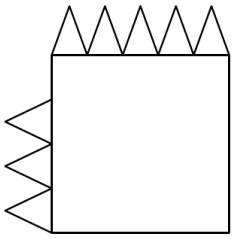


(a) 2
(b) 8
(c) 3
(d) 9

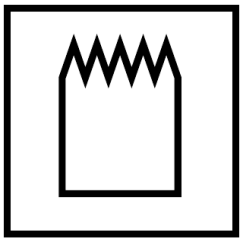
Q46. Identify the figure in the options that when put in place of the question mark (?) will logically complete the series?



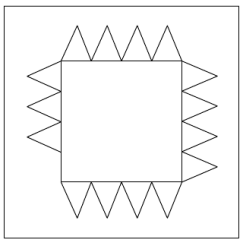
(a)



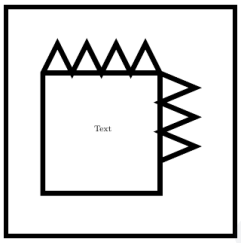
(b)



(c)



(d)



Q47. Which of the following numbers will replace the question mark (?) in the given series?

7 28 84 336 1008 ?

(a) 4128
(b) 4032
(c) 3902
(d) 3036

Q48. What should come in place of the question mark (?) in the given series?

91, 100, 109, 118, 127, ?

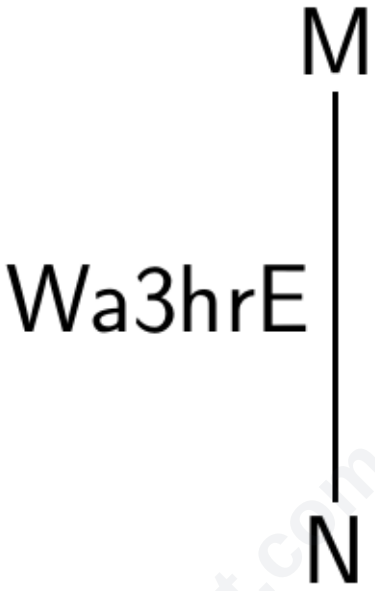
(a) 138
(b) 136
(c) 135
(d) 137

Q49. If 17 August 2003 was a Sunday, then what was the day of the week on 12 September 2014?

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

Q50. Select the correct mirror image of the given combination when the mirror is placed at MN as shown below.

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(a)



(b)



(c)



(d)



QUANTITATIVE APTITUDE

Q51. Find the value of the following expression.

sin(30 + θ) - cos(60 - θ)

(a) 2sin (30 + θ)
(b) √3/2
(c) 0
(d) 1

Q52. A sells a bike to B at 45% profit. Then B sells it to C at 30% profit. If C pays Rs. 43,355, then what is the cost price of the bike for A?

(a) Rs. 23,000
(b) Rs. 27,000
(c) Rs. 21,000

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(d) Rs. 29,000

Q53. The curved surface area of a right circular cylinder of height 14 cm, is 88 cm². Find the total surface area of the cylinder.

(a) 560/7 cm²
(b) 460/7 cm2
(c) 660/7 cm2
(d) 360/7 cm2

Q54. In a right-angled triangle ABC such that angle BAC = 90° and AD is perpendicular to BC. If the area of ΔABC is 63 cm², area of ΔACD = 7 cm², and AC = 5 cm, then the length of BC is equal to:

(a) 18 cm
(b) 10 cm
(c) 12 cm
(d) 15 cm

Q55. By selling an article at 66% of its marked price, a merchant makes a profit of 10%. If he sells the article at 80% of its marked price, then the profit percentage will be:

(a) 33 2/3 %
(b) 20%
(c) 33 1/3 %
(d) 25%

Q56. The following table shows admitted students in an institute during the academic years 2015 to 2020 in different courses.

Academic year	Engineering	Science	Arts	Management
2015	1200	850	450	240
2016	1362	821	525	275
2017	1351	870	624	286
2018	1409	921	615	293
2019	1421	931	795	300
2020	1400	950	750	320

Which course had the highest growth rate (in percentage) during the period from 2015 to 2020?

(a) Arts
(b) Science
(c) Management
(d) Engineering

Q57. The value of (17 + 15) ÷ 2 - 11 + 16 × 4 - 28 + 13 (-16 + 13) is:

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

Q58. 18 men can complete 1/5 of a work in 10 days. How many people are required to complete 2/5 of the same work in 5 days?

(a) 72
(b) 54
(c) 90
(d) 36

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Q59. A, B, C are three points such that AB = 11 cm, BC = 13 cm and AC = 24 cm. Number of circles passing through the points A, B, C is:

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

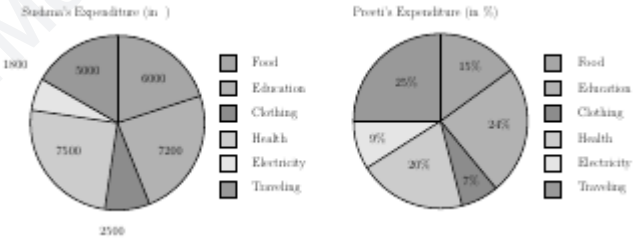
Q60. Two circles touch each other externally at M. PQ is a direct common tangent to the two circles, P and Q are points of contact and angle MPQ = 38°. angle MQP is:

(a) 48°
(b) 52°
(c) 42°
(d) 38°

Q61. What is the area of the region created by the two linear equations 2x + y = 6 and 2x - y = -2 bounded by these lines and the x-axis?

(a) 3 sq. units
(b) 8 sq. units
(c) 6 sq. units
(d) 5 sq. units

Q62. Following Pie chart presents monthly expenditure Sushma and Preeti in different heads. Sushma and Preeti make equal expenditure every month.



What is the ratio of central angles of expenditure of Education incurred by Sushma and Preeti?

(a) 2 : 3
(b) 1 : 1
(c) 2 : 1
(d) 1 : 2

Q63. If a : b = 3 : 7 and b : c = 4 : 9, then find a : b : c.

(a) 3 : 28 : 63
(b) 3 : 28 : 9
(c) 12 : 28 : 63
(d) 12 : 28 : 9

Q64. Find the remainder when 179 × 172 × 173 is divided by 17.

(a) 6
(b) 2
(c) 3
(d) 9

Q65. The area of a rectangular field is 3600 m². If the field is 45 m long, what is its perimeter?

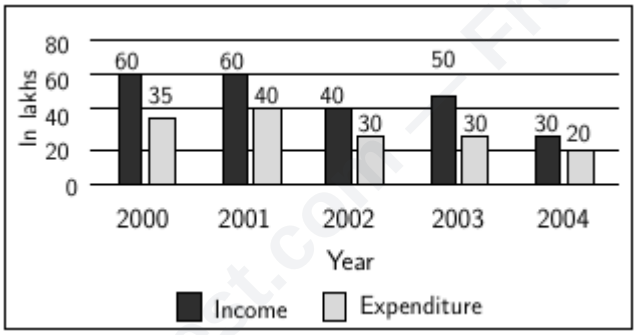
(a) 255 m
(b) 265 m
(c) 260 m
(d) 250 m

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Q66. A person wants to buy 10 chairs. The total cost of 10 chairs is Rs. 4,500. After bargaining, the shopkeeper agrees to decrease the cost of each chair by 20%. Then the person purchased 10% more chairs. What will be the cost of the chairs that he purchased?

(a) Rs. 4,100
(b) Rs. 3,260
(c) Rs. 3,960
(d) Rs. 3,900

Q67. Study the following bar chart, which represents the income and expenditure of a company.

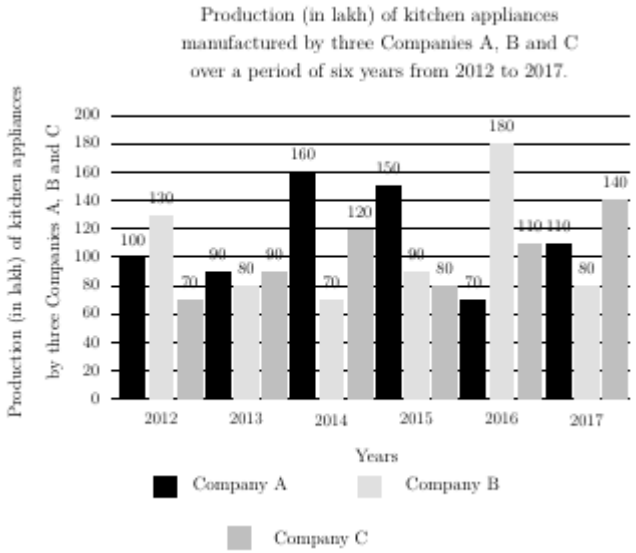


What is the difference of profit between the years 2001 and 2002?

(a) 15 lakhs
(b) 5 lakhs
(c) 2 lakhs
(d) 10 lakhs

Q68. Study the given bar-graph and answer the question that follows.

The bar-graph shows the production (in lakh) of kitchen appliances manufactured by three companies A, B, and C over a period of six years from 2012 to 2017.



What is the difference (in lakh) between the average production of company B during the period 2012 to 2017 and the combined average of the production of company A in 2012, 2014, 2015 and the production of company C in 2014, 2016 and 2017, respectively?

(a) 25
(b) 40
(c) 30
(d) 50

Q69. A circle of diameter 26 cm has two equal parallel chords of length 10 cm each, then the distance between the two chords is:

(a) 26 cm
(b) 24 cm
(c) 21 cm
(d) 23 cm

Q70. The salaries of T in twelve months of a year are: Rs. 12,000, Rs. 12,000, Rs. 12,000, Rs. 15,000, Rs. 15,000, Rs. 15,000, Rs. 21,000, Rs. 21,000, Rs. 21,000, Rs. 30,000, Rs. 30,000, Rs. 30,000. The average salary of T per month in Rs. is _____.

(a) 18000
(b) 19000
(c) 18500
(d) 19500

Q71. A policeman starts chasing a thief who is 500 m ahead of him. The speed of the thief is 18 km/h, and the speed of the policeman is 36 km/h. Find the time taken by the policeman to catch the thief.

(a) 100 sec
(b) 250 sec
(c) 300 sec
(d) 150 sec

Q72. Ramana spends 75% of his income. His income is increased by 25% and he increases his expenditure by 10%. By what percentage are his savings increased?

(a) 40%
(b) 60%
(c) 70%
(d) 50%

Q73. A fraction 3/5 is decreased by 2/5. The resulting fraction is then increased by 20%. What is the percentage decrease/increase in the value of the original fraction?

(a) Increase, 60%
(b) Increase, 50%
(c) Decrease, 60%
(d) Decrease, 50%

Q74. A man invested a sum of Rs. 5,000 on simple interest for 5 years such that the rate of interest for the first 2 years is 10% per annum, for the next 3 years it is 12% per annum How much interest (in Rs.), will he earn at the end of 5 years?

(a) 2800
(b) 3180
(c) 3000
(d) 2450

Q75. If the surface area of cuboid is 108 m^2, then find the height of the cuboid, whose length is 6 m and breadth is 3 m.

(a) 5.5 m
(b) 4 m
(c) 4.5 m
(d) 5 m

GENERAL AWARENESS

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Q76. How many censuses had been completed in India as of year 2011?

(a) 12
(b) 15
(c) 16
(d) 7

Q77. According to Census of India 2011, what was the sex ratio recorded in the Union Territory of Puducherry?

(a) 1095 females/1000 males
(b) 1037 females/1000 males
(c) 890 females/1000 males
(d) 980 females/1000 males

Q78. Which of the following statement(s) is/are INCORRECT vis-à-vis features of the Indian Constitution?

1) Though India has a federal system, the Constitution does not mention the word ‘federation’.
2) Article 5 of the Constitution says that the Parliament by law can create a new state.
3) On the subjects in the Union list, each State Legislature can enact laws for the State.
4) Both the Parliament and State Legislature can pass laws on subjects in concurrent list.

(a) Only 1
(b) 1 and 3
(c) 2 and 3
(d) 1 and 4

Q79. Under which Gharana do the composition of blend of Khayal and Dhrupad-Dhamar styles come?

(a) Indore Gharana
(b) Gwalior Gharana
(c) Agra Gharana
(d) Patiala Gharana

Q80. The famous book ‘Sangraha Choodamani’, which deals with the current system of Carnatic music was written by:

(a) Haripala
(b) Matanga
(c) Damodara Misra
(d) Govindacharya

Q81. Who among the following launched the digital platform ‘FASTER’?

(a) President
(b) Chief Justice of India
(c) Finance Minister
(d) Prime Minister

Q82. Which river is known as the sorrow of Bihar?

(a) Mahi
(b) Betwa
(c) Son
(d) Kosi

Q83. We can add a table in an MS Word document from which of the following tabs?

(a) Design Tab
(b) View Tab
(c) Home Tab
(d) Insert Tab

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Q84. Which of the following statements best describes the Hardy Schulze rule?

(a) This is applied to obtain a colloidal solution of metals such as gold, silver or platinum.
(b) The ions are removed from the solution by the phenomenon of diffusion through a permeable membrane.
(c) The amount of electrolyte required for the coagulation of a definite amount of a colloidal solution is dependent on the valency of the coagulating ion.
(d) The partial pressure of a component in a liquid mixture is proportional to its mole fraction in that mixture.

Q85. In MS-Word, a number printed above the base line is called _____.

(a) superscript
(b) strikethrough
(c) subscript
(d) above BL

Q86. What do you mean by semiconservative DNA replication?

(a) RNA is dependent on DNA for the synthesis of proteins
(b) After the completion of replication, each DNA molecule would have one parental and one newly synthesised strand.
(c) After the completion of replication, each DNA molecule would have two parental and two newly synthesised strand.
(d) DNA is dependent on RNA for the synthesis of proteins

Q87. Indian Constitution came into force on _____ and is celebrated as Republic Day.

(a) 26 Jan 1951
(b) 26 Jan 1950
(c) 26 Jan 1948
(d) 26 Feb 1950

Q88. Name the digital payment platform launched in 2021 by the National Payments Corporation of India (NPCI) in association with Department of Financial Services (DFS), National Health Authority (NHA) and Ministry of Health and Family Welfare (MoHFW).

(a) Dhani
(b) MobiKwik
(c) YONO
(d) e-RUPI

Q89. Guru Vempati Chinna Satyam is a famous dancer of _____ dance form of India.

(a) Bharatanatyam
(b) Odissi
(c) Manipuri
(d) Kuchipudi

Q90. What was the name of Swami Vivekanand’s guru?

(a) Swami Dayanand
(b) Swami Ram Singh
(c) Ramakrishna Paramhansa
(d) Aadi Shankaracharya

Q91. Kiran Nadar was conferred with the highest civilian award of which country in April 2023?

(a) France
(b) Egypt
(c) Poland
(d) Germany

Q92. The Green Revolution was due to the introduction of:

(a) fertilisers
(b) fisheries
(c) high yielding varieties of seeds

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(d) irrigation

Q93. The colour of the surface of Mars is red because of the presence of large amounts of chemical compounds in it. What is the name of that compound?

(a) Tin oxide
(b) Iron oxide
(c) Magnesium oxide
(d) Nitrogen oxide

Q94. The number of Indian athletes who participated in the Tokyo Paralympics 2020 was _____.

(a) 57
(b) 56
(c) 54
(d) 55

Q95. Which Article of the Constitution mentions that “the Parliament consists of the President and two Houses known as the Council of States (Rajya Sabha) and the House of the People (Lok Sabha)”?

(a) 79
(b) 70
(c) 82
(d) 73

Q96. The Ultimate Kho-Kho League was started in which year?

(a) 2021
(b) 2023
(c) 2020
(d) 2022

Q97. In which year was the first underground section (Vishwavidyalaya- Kashmere Gate) of the Golden Route opened in New Delhi?

(a) 2004
(b) 1997
(c) 2000
(d) 1998

Q98. In field hockey, in a penalty stroke, an attacker shoots at goal from _____ yards away in a one-on-one confrontation with the goalkeeper.

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

Q99. Which Pala ruler temporarily occupied Kanauj?

(a) Dharmapala
(b) Gopala
(c) Devapala
(d) Harapala

Q100. Who was appointed as the Chief Economic Advisor to the Government of India in the year 2022?

(a) S Somanath
(b) V Anantha Nageswaran
(c) R Rangarajan
(d) Krishnamurthy Subramanian

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ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) and cannot be put on

The erroneous part is: and cannot be put on.

Key Points

• In the fourth part of the given sentence, the phrase 'put on' is incorrect.

• The correct phrase should be 'put off', which means to delay or postpone something.

• Therefore, the correct phrase should be used in place of the incorrect one.

Hence, the correct answer is option 4.

Correct sentence: Urgent activities are those things that you must do immediately, as they require quick action and cannot be put off.

Q2. Answer: (a) will taking

The correct answer is 'will taking' i.e. this part of the sentence has an error.

Key Points

• In the second part of the given sentence, the verb form 'taking' is incorrect.

• The correct form should be 'will take' to match the future tense.

• The verb 'will' should be followed by the base form of the verb, which is 'take' in this context.

• Example: The meeting will take place next Wednesday.

Hence, the correct answer is option 1.

Correct sentence: The meeting will take place next Wednesday.

Additional Information

• When constructing sentences in the future tense, always ensure that the modal 'will' is followed by the base form of the verb.

• Example: She will go to the market tomorrow.

• This rule applies to all subjects, whether singular or plural.

• Example: They will arrive at the station soon.

Q3. Answer: (c) 2

The correct answer is '2' i.e. this part of the sentence has an error.

Key Points

• In the second part of the given sentence, the phrasal verb 'grew out' is incorrect.

• The correct phrasal verb should be 'grew up', which means to mature or to become an adult.

• Therefore, the phrasal verb 'grew up' should be used in place of the incorrect phrasal verb 'grew out'.

Hence, the correct answer is option 3.

Correct sentence: When Christy grew up, he turned out to be a gentleman.

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Q4. Answer: (b) quite amusing when

The correct answer is: quite amusing when.

Key Points

• In the second part of the given sentence, the verb 'amusing' is incorrect when describing Rashmi's reaction.

• Instead, it should be 'amused', which describes Rashmi's feeling.

Correct sentence: Rashmi was quite amused when she heard about what had happened.

Hence, the correct answer is option 2.

Q5. Answer: (d) frustrating

The solution is in Hindi. Read it online.

Q6. Answer: (b) wandering

The solution is in Hindi. Read it online.

Q7. Answer: (c) enhance

The solution is in Hindi. Read it online.

Q8. Answer: (c) attempt

The solution is in Hindi. Read it online.

Q9. Answer: (c) focussed

The solution is in Hindi. Read it online.

Q10. Answer: (c) Immigrete

The solution is in Hindi. Read it online.

Q11. Answer: (d) on display

The correct answer is '4' i.e. on display is the correct phrase.

Key Points

• The phrase 'on display' is commonly used to indicate that something is being shown or exhibited in a place where people can see it.

• Other options such as 'upon display', 'into display', and 'in display' are incorrect and not commonly used in standard English.

• Therefore, the correct phrase to use in this context is 'on display'.

Hence, the correct answer is option 4.

Correct sentence: My sister’s paintings were on display at the national museum.

Q12. Answer: (d) Be preoccupied or obsessed with something

The solution is in Hindi. Read it online.

Q13. Answer: (d) Lazy

The solution is in Hindi. Read it online.

Q14. Answer: (c) horrible

The solution is in Hindi. Read it online.

Q15. Answer: (d) Non-combustible

The solution is in Hindi. Read it online.

Q16. Answer: (d) clean

The solution is in Hindi. Read it online.

Q17. Answer: (b) Lax

The solution is in Hindi. Read it online.

Q18. Answer: (b) vacant seat

The solution is in Hindi. Read it online.

Q19. Answer: (b) imperfect alignment

The solution is in Hindi. Read it online.

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Q20. Answer: (a) To remain faithful to

The solution is in Hindi. Read it online.

Q21. Answer: (a) Litrature

The solution is in Hindi. Read it online.

Q22. Answer: (b) gifted with

The correct answer is: gifted with.

Key Points

• The phrase "gifted at" is not correct in this context. The correct preposition to use is "gifted with".

• The term "gifted with" is used to indicate that someone has a particular talent or ability.

• Using the correct preposition is essential for proper sentence structure and meaning.

Hence, the correct answer is option 2.

Correct sentence: The new chief is gifted with the power of eloquence.

Q23. Answer: (c) took apart

The solution is in Hindi. Read it online.

Q24. Answer: (a) Insignificance

The solution is in Hindi. Read it online.

Q25. Answer: (c) in the heart of Telangana

The correct answer is '3' i.e. in the heart of Telangana.

Key Points

• The phrase in the heart of is used to indicate that something is located in the central part of a place.

• Hyderabad is a major city in the state of Telangana, and it is centrally located within the state.

• The other options do not correctly convey the intended meaning or are grammatically incorrect.

• Therefore, the correct phrase to use is in the heart of Telangana.

Hence, the correct answer is option 3.

Correct sentence: The city of Hyderabad is located in the heart of Telangana.

Q26. Answer: (a) L - F + K - P

Decoding the Symbols:

D is				
Symbol	•	•	×	÷
Meaning	Father	Sister	Mother	Brother
to E				

Now, checking options one by one:

Option - (1): L - F + K - P → L is the sister of F who is the father of K who is the sister of P.

Here, K is the brother's daughter or niece of L.

Option - (3): L ÷ Z × X - K → L is the brother of Z who is the mother of X who is the sister of K.

Here, K is either niece of nephew of L.

Option - (3): K - L × X ÷ U → K is the sister of L who is the mother of X who is the brother of U.

Here, K is the sister of L.

Option - (4): U + F + K ÷ P → U is the father of F who is the father of K who is the brother of P.

Here, K is the granddaughter of L.

So, out of all the options 'L - F + K - P' represents that K is the brother's daughter of L.

Hence, the correct answer is "Option - (1)".

Q27. Answer: (d) CYHWN

Given : AB_Z DEF_ G_IX JKL_ M_OV

By checking options :

Option 1) YGHVN → ABYZ / DEFG / GHIX / JKLV / MNOV → (It doesn't Follow the pattern)

Option 2) CYHVN → ABCZ / DEFY / GHIX / JKLV / MNOV → (It doesn't Follow the pattern)

Option 3) CYGWN → ABCZ / DEFY / GGIX / JKLW / MNOV → (It doesn't Follow the pattern)

Option 4) CYHWN → ABCZ / DEFY / GHIX / JKLW / MNOV → (It follows the pattern)

So, out of all the options "Option - (4)" follows the pattern.

Hence, "Option 4" is the correct answer.

Q28. Answer: (a) One

Given word: 'MENTOR'

After arranged in alphabetical order:

Alphabets	M	E	N	T	O	R
Alphabetical order	E	M	N	O	R	T

Now,

there is One alphabet "N" will remain unchanged if each of the letters in the word 'MENTOR' is arranged in English alphabetical order.

Hence, the correct answer is "Option 1".

Q29. Answer: (d) [figure]

According to the given figure:

The figure will appear when it is opened as follows:

Hence, "Option - (4)" is the correct answer.

Q30. Answer: (d) 2877

Given Equation: 84 H 42 A 63 L 46 B 23 = ?

BODMAS Rule:

Decoding the given information:

Alphabet	H	A	B	L
Meaning	÷	•	•	×

Now replacing the sign from left to right using BODMAS Rule, we get:

=> 84 ÷ 42 + 63 × 46 - 23 = ?

=> 2 + 63 × 46 - 23 = ?

=> 2 + 2898 - 23 = ?

=> 2900 - 23 = 2877.

Hence, the correct option is "Option 4".

Q31. Answer: (a) [figure]

The correct mirror image of the given figure is:

Hence, the correct answer is "Option 1".

Q32. Answer: (c) Son's wife

Decoding the Symbols:

A is			
Symbol	@	#	&
Meaning	Husband	Mother	Sister
to B			

Given: P @ Q # R & S @ T

P @ Q → P is the husband of Q.

Q # R → Q is the mother of R.

R & S → R is the sister of S.

S @ T → S is the husband of T.

So, T is the son's wife or daughter-in-law of P.

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

Q33. Answer: (c) -820

Given Equation: 52 M 36 Z 18 T 46 H 19 = ?

BODMAS Rule:

Decoding the given information:

Alphabet	Z	H	M	T
Meaning	÷	×	•	•

Now replacing the sign from left to right using BODMAS Rule, we get:

=> 52 + 36 ÷ 18 - 46 × 19 = ?

=> 52 + 2 - 46 × 19 = ?

=> 52 + 2 - 874 = ?

=> 54 - 874 = -820.

Hence, the correct option is "Option 3".

Q34. Answer: (a) [figure]

The image embedded in the given figure is as shown below :

Therefore Here, Option Figure - 1 is embedded in the given figure.

Hence, the correct answer is "Option- (1)".

Q35. Answer: (c) 110

The logic followed here is:

Logic: (1st number ÷ 5) = 2nd number.

Now,

For, 100 : 20

=> (100 ÷ 5) = 20.

For, 250 : 50

=> (250 ÷ 5) = 50.

Similarly, for 550 : ?

=> (550 ÷ 5) = 110.

Hence, the correct answer is "Option 3".

Q36. Answer: (d) 18

The number of triangles in the given figure is shown below :

Here, as marked there are a total of 18 triangles.

Hence, "18" is the correct answer.

Q37. Answer: (c) Neither conclusions I, II nor III follows.

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

Conclusions:

I. Some erasers are calculators → Does not follow (As no pen is a scale, all scales are erasers and all pens are calculators. So, it is possible but not definitely true)

II. No pen is an eraser → Does not follow (As no pen is a scale and all scales are erasers. So, no direct relation is given between erasers and scales, therefore it is false)

III. No scale is a calculator → Does not follow (As no pen is a scale and all pens are calculators. So, no direct relation is given between erasers and scales, therefore it is false)

Therefore Here, Neither conclusions I, II nor III follows.

Hence, the correct answer is "Neither conclusions I, II nor III follows"

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Q38. Answer: (c) Demolish : Destroy

The logic followed here is:
Logic: Synonyms.
Here,
Pleasure : Delight → Pleasure and Delight are synonyms.
Similarly,
Demolish : Destroy → Demolish and Destroy are synonyms.
Hence, the correct answer is "Option 3".

Q39. Answer: (b) 3

The logic followed here is: No specific pattern is followed here, random digits are assigned to each letter of the word.
COMB is coded as 2681

Letters	O / M / B	C
Codes	1 / 6 / 8	2

And,
MOBE is coded as 8163

Letters	O / M / B	E
Codes	1 / 6 / 8	3

As, 'M', 'O', and 'B' are common, therefore it can be concluded that :
C is coded as → 2
E is coded as → 3
So, the code for 'E' is '3'.
Hence, "Option - (2)" is the correct answer.

Q40. Answer: (d) 63

Given : 198 × 9 + 29 - 7 ÷ 10 = ?
According to the question, after replacing the signs :
'+' and '-' are interchanged and,
'×' and '÷' are interchanged
So,
198 × 9 + 29 - 7 ÷ 10 = ? => 198 ÷ 9 - 29 + 7 × 10 = ?
198 ÷ 9 - 29 + 7 × 10 = ?
22 - 29 + 7 × 10 = ?
70 + 22 - 29 = ?
92 - 29 =?
63 = ?
Hence, "63" is the correct answer.

Q41. Answer: (d) (200, 8, 25)

The logic followed here is:
Logic: 2nd number × 3rd number = 1st number.
Now,
For, 245, 49, 5
=> 49 × 5 = 245.
For, 144, 9, 16
=> 9 × 16 = 144
Similarly, For, 200, 8, 25
=> 8 × 25 = 200.
Hence, the correct answer is "Option 4".

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Q42. Answer: (b) 3-48-54-45-42

Logic: (3) is multiplied by the position values according to the English alphabetic series.

So,

'COVER' is coded as '9 - 45 - 66 - 15 - 54'

And,

'BOAST' is coded as '6 - 45 - 3 - 57 - 60'

Similarly,

'APRON' is coded as

Hence, "Option - (2)" is the correct answer.

Q43. Answer: (c) Authentic : Genuine

The logic followed here is:

Logic: Synonyms Relationship.

Here,

Proud : Arrogant → Proud is a synonym of Arrogant.

Similarly,

Authentic : Genuine → Authentic is a synonym of Genuine.

Hence, the correct answer is "Option 3".

Q44. Answer: (c) YLR

The logic followed here is: (3), (10), and (1) are added to the first, second, and third letters position values according to the English alphabetic series respectively.

So,

Hence, "Option - (2)" is the correct answer.

Q45. Answer: (c) 3

The logic followed here is :-

From the given two different cubes the adjacent sides are as shown below :

As 5 is common on both the dice, it is clear that 9, 8, 7, and 2 are adjacent to it, and the remaining number i.e., 3the will be opposite to it.

Opposite pairs:

8 → 2

9 → 7

5 → 3

So, the opposite side of "5" will be side "3".

Hence, the correct answer is "3".

Q46. Answer: (c) [figure]

The logic followed here is :

1) For '

' element → Number of triangles is increasing in the clockwise direction in the order of consecutive multiples of (3).

2) For '

' element → No change.

Thus, the final series is :

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

Q47. Answer: (b) 4032

Logic : Alternately (4) and (3) are multiplied by each number subsequently.

Hence, "4032" is the correct answer.

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Q48. Answer: (b) 136

Logic : (9) is added to each number in the given series.

Hence, "136" is the correct answer.

Q49. Answer: (c) Friday

Given: 17 August 2003 was Sunday.

Now,

2003 to 2014 = 11 Years (8 Ordinary Years and 3 Leap Years).

And, In 11 Years = 3 Leap years and 8 Ordinary Years.

So, 3 Leap Years have 6 odd days,

And, 8 Ordinary Years have 8 odd days.

Total odd days = 6 + 8 = 14.

14 odd days → 14/7 = 2 weeks and 0 odd days.

then, 17 August 2014 will be Sunday + 0 = Sunday.

Now, the number of days between 17 August 2014 to 12 September 2014

= 14(August) + 12(September) = 26 days.

= 26 days → 26/7 = 3 weeks and 5 odd days.

So, 12 September 2014 will be Sunday + 5 = Friday.

Hence, the correct answer is "Option 3".

Q50. Answer: (b) [figure]

The correct mirror image of the given figure is:

Hence, the correct answer is "Option 2".

Q51. Answer: (c) 0

Given:

sin (30 + θ) - cos (60 - θ)

Formula used:

sin (30 + θ) = sin 30 cos θ + cos 30 sin θ

cos (60 - θ) = cos 60 cos θ + sin 60 sin θ

Calculation:

sin (30 + θ) - cos (60 - θ)

sin 30 cos θ + cos 30 sin θ - (cos 60 cos θ + sin 60 sin θ)

=> 1/2 cos θ + √3/2 sin θ - (1/2 cos θ + √3/2 sin θ)

=> 1/2 cos θ + √3/2 sin θ - 1/2 cos θ - √3/2 sin θ

=> 0

Therefore The correct answer is option (3).

Q52. Answer: (a) Rs. 23,000

Shortcut Trick

Using the ratio method: 45% = 9/20 and 30% = 3/10.

Cost Price to Selling Price ratios: (20 → 29) and (10 → 13).

Combined ratio for A to C: (20 × 10) : (29 × 13) = 200 : 377.

Given 377 units = Rs. 43,355 => 1 unit = 115.

Initial Cost Price for A = 200 × 115 = 23,000.

Therefore The correct answer is Rs. 23,000.

Alternate Method

Given:

Profit of A = 45% | Profit of B = 30% | Final Price paid by C = Rs. 43,355

Let the cost price for A be x.

=> Price for B = x × (1 + 45/100) = 1.45x

=> Price for C = (1.45x) × (1 + 30/100) = 1.45x × 1.3

=> 1.885x = 43,355

=> x = 43,355 ÷ 1.885
=> x = 23,000
Therefore The correct answer is Rs. 23,000.
Additional Information
Successive Percentage Formula
When two profits x% and y% occur successively, the net profit percentage is given by [x + y + (x × y)/100]%.
Ratio Method for Profit/Loss
Profit of P% means CP : SP = 100 : (100 + P). This can be simplified into fractions for faster calculations in chains.
Cost Price (CP) vs Selling Price (SP)
SP = CP × (100 + Profit%)/100. To find CP from SP, use CP = SP × 100 / (100 + Profit%).

Q53. Answer: (c) 660/7 cm2

Given:
The curved surface area of a right circular cylinder of height 14 cm, is 88 cm².
Formula used:
Curved Surface Area (CSA) of a cylinder = 2πrh
Total Surface Area (TSA) of a cylinder = 2πrh + 2πr²
Calculation:
Given CSA = 88 cm²
Height (h) = 14 cm
Using CSA formula:
2πrh = 88
=> 2 × (22/7) × r × 14 = 88
=> 2 × 22 × r × 2 = 88
=> 88r = 88
=> r = 1 cm
Now, using TSA formula:
TSA = 2πrh + 2πr²
=> TSA = 2 × (22/7) × 1 × 14 + 2 × (22/7) × 1²
=> TSA = 2 × 22 × 2 + 2 × (22/7)
=> TSA = 88 + (44/7)
=> TSA = 88 + 6.2857
=> TSA = 94.2857
=> TSA = (660/7) cm²
Therefore The correct answer is option (3).

Q54. Answer: (d) 15 cm

Given:
Area of ΔABC = 63 cm²
Area of ΔACD = 7 cm²
AC = 5 cm
Formula used:
If ΔABC ~ ΔXYZ, then
ar(ΔABC) / ar(ΔXYZ) = (AB/XY)² = (BC/YZ)2 = (AC/XZ)2
Calculation:
In ΔABC and ΔACD
angle BAC = angle ADC = 90°
angle C = angle C (Common in both triangles)
So, ΔABC ~ ΔDAC (by AA Similarity)
Now,
ar(ΔABC) / ar(ΔACD) = (BC/AC)²
=> 63/7 = (BC/5)²

=> 9/1 = (BC/5)2

=> √(9/1) = BC/5

=> 3 = BC/5

=> BC = 5 × 3 = 15 cm

Therefore The length of BC is 15 cm

Q55. Answer: (c) 33 1/3 %

Shortcut Trick

Equate Selling Price (SP) in terms of Cost Price (CP) and Marked Price (MP):

66% of MP = 110% of CP (since 10% profit is made)

=> 1% of MP = (110 / 66)% of CP = (5 / 3)% of CP

=> 80% of MP = (5 / 3) × 80% of CP = (400 / 3)% of CP = 133 1/3% of CP

=> New Profit % = 133 1/3% − 100% = 33 1/3%

Therefore The correct answer is 33 (1)/(3) %.

Alternate Method

Given: SP1 = 66% of MP, Profit = 10%, SP2 = 80% of MP.

Formula: Cost Price (CP) = [Selling Price (SP) / (100 + Profit %)] × 100

=> Let Marked Price (MP) = Rs. 100

=> Case 1: SP1 = 66% of 100 = Rs. 66

=> CP = (66 ÷ 110) × 100 = Rs. 60

=> Case 2: SP2 = 80% of 100 = Rs. 80

=> Profit = SP2 − CP = 80 − 60 = Rs. 20

=> Profit % = (20 ÷ 60) × 100 = (1/3) × 100

=> Profit % = 33 1/3%

Therefore The correct answer is 33 (1)/(3) %.

Additional Information

CP and MP Relationship

The ratio of Marked Price to Cost Price is given by: MP/CP = (100 + Profit %)/(100 − Discount %).

Profit and Loss Basics

Profit % = (Profit ÷ CP) × 100, and Discount % = (Discount ÷ MP) × 100. Profit or Loss is always calculated on the Cost Price unless stated otherwise.

Successive Discounts

If two discounts d1% and d2% are given, the Equivalent Discount is [d1 + d2 − (d1 × d2)/100]%.

Q56. Answer: (a) Arts

Given:

Enrollment data from 2015 to 2020 for different courses (Engineering, Science, Arts, Management)

Formula used:

Growth Rate (%) = [(Final Value - Initial Value) / Initial Value] × 100

Calculation:

For Engineering:

Initial Value (2015) = 1200, Final Value (2020) = 1400

Growth Rate = [(1400 - 1200) / 1200] × 100

=> Growth Rate = [200 / 1200] × 100

=> Growth Rate ≈ 16.67%

For Science:

Initial Value (2015) = 850, Final Value (2020) = 950

Growth Rate = [(950 - 850) / 850] × 100

=> Growth Rate = [100 / 850] × 100

=> Growth Rate ≈ 11.76%

For Arts:

Initial Value (2015) = 450, Final Value (2020) = 750

Growth Rate = [(750 - 450) / 450] × 100

=> Growth Rate = [300 / 450] × 100

=> Growth Rate ≈ 66.67%

For Management:

Initial Value (2015) = 240, Final Value (2020) = 320

Growth Rate = [(320 - 240) / 240] × 100

=> Growth Rate = [80 / 240] × 100

=> Growth Rate ≈ 33.33%

Therefore The course with the highest growth rate is Arts, with a growth rate of approximately 66.67%.

Q57. Answer: (c) 2

Given:

The value of (17 + 15) ÷ 2 - 11 + 16 × 4 - 28 + 13 (-16 + 13) is:

Formula used:

Order of operations (PEMDAS/BODMAS): Parentheses, Exponents, Multiplication and Division (from left to right), Addition and Subtraction (from left to right)

Calculation:

(17 + 15) ÷ 2 - 11 + 16 × 4 - 28 + 13 (-16 + 13)

=> 32 ÷ 2 - 11 + 16 × 4 - 28 + 13 (-3)

=> 16 - 11 + 64 - 28 + 13 (-3)

=> 16 - 11 + 64 - 28 - 39

=> 5 + 64 - 28 - 39

=> 69 - 28 - 39

=> 41 - 39

=> 2

Therefore The correct answer is option 3.

Q58. Answer: (a) 72

Shortcut Trick

Using the MDH formula: (M1 × D1) / W1 = (M2 × D2) / W2

Given: (18 × 10) / (1/5) = (M2 × 5) / (2/5)

=> 180 × 5 = M2 × 5 × (5/2)

=> 180 = M2 × (5/2)

=> M2 = (180 × 2) / 5 = 72

Therefore The correct option is 1.

Alternate Method

Given:

Initial men (M1) = 18

Initial days (D1) = 10

Initial work (W1) = 1/5

New days (D2) = 5

New work (W2) = 2/5

Formula Used:

(M1 × D1) / W1 = (M2 × D2) / W2

CASE 1 Men (M1) = 18 Days (D1) = 10 Work (W1) = 1/5 CASE 2 Men (M2) = ? Days (D2) = 5 Work (W2) = 2/5 M1 × D1 / W1 = M2 × D2 / W2

Calculations:

=> (18 × 10) / (1/5) = (M2 × 5) / (2/5)

=> 180 × 5 = (M2 × 5 × 5) / 2

=> 900 = (25 × M2) / 2

=> 1800 = 25 × M2

=> M2 = 1800 / 25

=> M2 = 72

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Therefore The correct option is 1.

Additional Information

MDH Rule / Chain Rule

The general formula is (M1 × D1 × H1 × E1) / W1 = (M2 × D2 × H2 × E2) / W2, where M is men, D is days, H is hours, E is efficiency, and W is work.

Inverse Proportion

For a constant amount of work, the number of men is inversely proportional to the number of days taken: M1D1 = M2D2.

Work and Efficiency

Total work is the product of the number of workers, the time they work, and their individual efficiency: W = M × D × H × E.

Q59. Answer: (a) 0

Given:

A, B, C are three points such that AB = 11 cm, BC = 13 cm, and AC = 24 cm.

Formula used:

For three points to lie on a circle, the sum of the lengths of any two sides must be greater than the third side (Triangle Inequality Theorem).

Calculation:

Check triangle inequality for AB, BC, and AC:

AB + BC > AC

11 + 13 > 24

24 = 24 (Not greater)

BC + AC > AB

13 + 24 > 11

37 > 11 (True)

AC + AB > BC

24 + 11 > 13

35 > 13 (True)

Since AB + BC is not greater than AC, the points A, B, C do not form a triangle and hence cannot lie on the same circle.

Therefore The correct answer is option 1.

Q60. Answer: (b) 52°

Shortcut Trick

For two circles touching externally at point M, the angle subtended by the direct common tangent PQ at the point of contact M is always 90°.

=> angle PMQ = 90°

In triangle ΔPMQ, the sum of angles is 180°.

=> angle MQP = 90° − angle MPQ

=> angle MQP = 90° − 38° = 52°

Therefore The correct answer is 52°.

Alternate Method

Given:

angle MPQ = 38°

Circles touch at M; PQ is a direct common tangent.

Formula Used:

1. Lengths of tangents from an external point to a circle are equal.

2. Sum of angles in a triangle = 180°.

Calculations:

=> Let the common tangent at M intersect PQ at point R.

=> From point R, RP and RM are tangents to the first circle, so RP = RM.

=> From point R, RQ and RM are tangents to the second circle, so RQ = RM.

=> Thus, RP = RQ = RM. This implies R is the midpoint of PQ and RM = ½ PQ.

=> In ΔPMQ, if the median RM is half the side PQ, then angle PMQ = 90°.

=> In ΔPMQ, angle MPQ + angle MQP + angle PMQ = 180°

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=> 38° + angle MQP + 90° = 180°

=> angle MQP = 180° − 128°

=> angle MQP = 52°

Therefore The correct answer is 52°.

Additional Information

Direct Common Tangent (DCT)

The length of the direct common tangent for two circles with radii r1 and r2 and distance d between centers is $\sqrt{(d^2 - (r1 - r2)^2)}$.

Tangents from an External Point

Tangents drawn from an external point to a circle are always equal in length and subtend equal angles at the center.

Circles Touching Externally

When two circles touch externally, the distance between their centers d = r1 + r2, and they have three common tangents (two direct and one transverse).

Q61. Answer: (b) 8 sq. units

Shortcut Trick

Identify the vertices of the triangle formed by the lines and the x-axis (where y = 0).

Line 1 (2x + y = 6) intersects x-axis at (3, 0) and Line 2 (2x − y = −2) intersects x-axis at (−1, 0).

The base of the triangle along the x-axis is |3 − (−1)| = 4 units.

Solve the equations for the intersection point: Adding 2x + y = 6 and 2x − y = −2 gives 4x = 4 => x = 1. Substitute x = 1 in 2x + y = 6 => 2(1) + y = 6 => y = 4.

The height of the triangle is the y-coordinate of the intersection point, which is 4 units.

Area = 1/2 × base × height = 1/2 × 4 × 4 = 8 sq. units.

Therefore The correct answer is 8 sq. units.

Alternate Method

Given Equations:

Equation 1: 2x + y = 6

Equation 2: 2x − y = −2

Formula Used:

Area of a triangle with base (b) and height (h) = 1/2 × b × h

Step-by-step Calculations:

=> Finding x-intercept of 2x + y = 6: Set y = 0 => 2x = 6 => x = 3. Point A is (3, 0).

=> Finding x-intercept of 2x − y = −2: Set y = 0 => 2x = −2 => x = −1. Point C is (−1, 0).

=> Solving for intersection point P: Adding (2x + y) and (2x − y) = 6 + (−2) => 4x = 4 => x = 1.

=> Substituting x = 1 into 2x + y = 6 => 2(1) + y = 6 => y = 4. Point P is (1, 4).

=> Base of triangle along x-axis = x_A − x_C = 3 − (−1) = 4 units.

=> Height of triangle = y-coordinate of P = 4 units.

=> Area = 1/2 × 4 × 4 = 8 sq. units.

Therefore, the calculation shows the area of the region is 8 sq. units, which matches Option (2).

Therefore The correct answer is 8 sq. units.

Additional Information

Area of Triangle (Coordinate Geometry)

For vertices (x1, y1), (x2, y2), and (x3, y3), Area = 1/2 |x1(y2 − y3) + x2(y3 − y1) + x3(y1 − y2)|.

Intercept Form of Linear Equation

A line can be represented as x/a + y/b = 1, where 'a' is the x-intercept and 'b' is the y-intercept.

Region Bounded by Axes

If a region is bounded by the y-axis, use the x-coordinate of the intersection as the height and the difference between y-intercepts as the base.

Q62. Answer: (b) 1 : 1

Given:

Expenditure on Education for Sushma = Rs. 7200

Expenditure on Education for Preeti = 24%

Formula used:

Central Angle = (Expenditure / Total Expenditure) × 360°
Calculation:
Sushma's Total Expenditure = Rs. 30,000
Sushma's Central Angle for Education = (7200 / 30,000) × 360°
=> Sushma's Central Angle for Education = 86.4°
Preeti's Central Angle for Education = (24 / 100) × 360°
=> Preeti's Central Angle for Education = 86.4°
Ratio of Central Angles = 86.4° : 86.4° = 1 : 1
Therefore The correct answer is option (2) 1:1.

Q63. Answer: (c) 12 : 28 : 63

Given:
If a : b = 3 : 7 and b : c = 4 : 9
Formula used:
To find a : b : c, we need to make the values of b in both ratios equal.
Calculation:
a : b = 3 : 7
b : c = 4 : 9
Make the value of b equal in both ratios:
LCM of 7 and 4 = 28
Convert a : b to have b = 28:
3 : 7 = 3×4 : 7×4 = 12 : 28
Convert b : c to have b = 28:
4 : 9 = 4×7 : 9×7 = 28 : 63
Combine to get a : b : c:
12 : 28 : 63
Therefore The correct answer is option 3.

Q64. Answer: (c) 3

Given:
Find the remainder when 179 × 172 × 173 is divided by 17.
Formula used:
Using the property of modular arithmetic:
(a × b) mod m = [(a mod m) × (b mod m)] mod m
Calculation:
179 mod 17 = 179 - (17 × 10) = 179 - 170 = 9
172 mod 17 = 172 - (17 × 10) = 172 - 170 = 2
173 mod 17 = 173 - (17 × 10) = 173 - 170 = 3
=> 179 × 172 × 173 mod 17 = (9 × 2 × 3) mod 17
=> 54 mod 17 = 54 - (17 × 3) = 54 - 51 = 3
Therefore The correct answer is option 3.

Q65. Answer: (d) 250 m

Shortcut Trick
Width of the rectangular field = Area ÷ Length = 3600 ÷ 45 = 80 m.
Perimeter = 2 × (Length + Width) = 2 × (45 + 80) = 2 × 125 = 250 m.
Therefore The correct answer is 250 m.
Alternate Method
Given:
Area of the rectangle = 3600 m^2
Length (L) of the rectangle = 45 m
Formula Used:
1. Area = Length × Width (W)

2. Perimeter = 2 × (Length + Width)

Calculations:

=> Area = L × W

=> 3600 = 45 × W

=> W = 3600 ÷ 45

=> W = 80 m

=> Perimeter = 2 × (L + W)

=> Perimeter = 2 × (45 + 80)

=> Perimeter = 2 × 125

=> Perimeter = 250 m

Therefore, Option 4 is the correct choice.

Therefore The correct answer is 250 m.

Additional Information

Properties of a Rectangle

A rectangle is a quadrilateral with four right angles. Opposite sides are equal and parallel. The diagonals bisect each other and are equal in length.

Important Formulas

1. Diagonal (d) = $\sqrt{(L^2 + W^2)}$

2. If perimeter is P and length is L, then Width = (P ÷ 2) − L

3. A square is a special case of a rectangle where Length = Width.

Q66. Answer: (c) Rs. 3,960

Given:

A person wants to buy 10 chairs. The total cost of 10 chairs is Rs. 4,500. After bargaining, the shopkeeper agrees to decrease the cost of each chair by 20%. Then the person purchased 10% more chairs.

Formula used:

New Cost of Each Chair = Original Cost of Each Chair × (1 - Discount Percentage)

Total Cost = Number of Chairs × New Cost of Each Chair

Calculation:

Original Cost of Each Chair = Rs. 4500 / 10

=> Original Cost of Each Chair = Rs. 450

New Cost of Each Chair = Rs. 450 × (1 - 0.20)

=> New Cost of Each Chair = Rs. 450 × 0.80

=> New Cost of Each Chair = Rs. 360

Number of Chairs Purchased = 10 + (10 × 0.10)

=> Number of Chairs Purchased = 10 + 1

=> Number of Chairs Purchased = 11

Total Cost = 11 × Rs. 360

=> Total Cost = Rs. 3960

Therefore The correct answer is option (3).

Q67. Answer: (d) 10 lakhs

Given:

Income and Expenditure for the year 2001: 60 lakhs and 40 lakhs respectively

Income and Expenditure for the year 2002: 40 lakhs and 30 lakhs respectively

Formula used:

Profit = Income - Expenditure

Difference in Profit = Profit in 2001 - Profit in 2002

Calculation:

Profit in 2001 = 60 - 40

=> Profit in 2001 = 20 lakhs

Profit in 2002 = 40 - 30

=> Profit in 2002 = 10 lakhs

Difference in Profit = 20 - 10

=> Difference in Profit = 10 lakhs

Therefore The difference of profit between the years 2001 and 2002 is 10 lakhs.

Q68. Answer: (a) 25

Given:

Production data for company B from 2012 to 2017 and for company C in specific years (2014, 2016, 2017).

Formula used:

Average Production = (Sum of Production for given years) / Number of Years

Difference in production = Average of Company B - Combined Average of specific years for Company A and Company C

Calculation:

Company B (2012-2017):

Total Production = 130 + 80 + 70 + 90 + 180 + 80 = 630 lakhs

Average Production of Company B = 630 / 6

=> Average Production of Company B = 105 lakhs

Company A (2012, 2014, 2015) Production:

Company A 2012 = 100 lakhs

Company A 2014 = 160 lakhs

Company A 2015 = 150 lakhs

Total Production of Company A = 100 + 160 + 150 = 410 lakhs

Company C (2014, 2016, 2017) Production:

Company C 2014 = 120 lakhs

Company C 2016 = 110 lakhs

Company C 2017 = 140 lakhs

Total Production of Company C = 120 + 110 + 140 = 370 lakhs

Combined Production = 410 (Company A) + 370 (Company C) = 780 lakhs

Number of Years Considered = 6 years

Combined Average Production = 780 / 6

=> Combined Average = 130 lakhs

Difference = 130 - 105

=> Difference = 25 lakhs

=> Difference in average production of Company B and the combined average of Company A and Company C together = 25 lakhs

Therefore The correct difference is 25 lakhs.

Q69. Answer: (b) 24 cm

Given:

A circle of diameter 26 cm has two equal parallel chords of length 10 cm each.

Formula used:

Let the radius of the circle be R, and the distance of each chord from the center be d1 and d2.

Using the perpendicular distance formula from the center to a chord:

$\sqrt{(R^2 - ((\text{chord length})/2)^2)}$ = distance from center to chord

Calculations:

Radius (R) = 26/2 = 13 cm

Half of chord length = 10/2 = 5 cm

Distance from center to each chord (d1 and d2):

$\sqrt{(13^2 - 5^2)}$

=> $\sqrt{(169 - 25)}$

=> $\sqrt{144}$

=> 12 cm

The distance between the two chords = 2 × 12 = 24 cm

Therefore The correct answer is option 2.

Q70. Answer: (d) 19500

Shortcut Trick

Since each salary slab occurs for the same duration (3 months each), the overall average is the simple average of the distinct salary values.

Average = (12000 + 15000 + 21000 + 30000) ÷ 4

Average = 78000 ÷ 4 = 19500

Therefore The correct answer is Rs. 19500.

Alternate Method

Given: Monthly salaries for 12 months in groups of 3 months each.

Formula Used: Average = Total Sum of Salaries ÷ Total Number of Months

=> Total salary for first 3 months = 3 × 12000 = Rs. 36,000

=> Total salary for next 3 months = 3 × 15000 = Rs. 45,000

=> Total salary for next 3 months = 3 × 21000 = Rs. 63,000

=> Total salary for last 3 months = 3 × 30000 = Rs. 90,000

=> Sum of all salaries = 36000 + 45000 + 63000 + 90000 = Rs. 2,34,000

=> Average salary = 234000 ÷ 12

=> Average salary = Rs. 19500

Therefore The correct answer is Rs. 19500.

Additional Information

Arithmetic Mean

The simple average of n observations is calculated as (x1 + x2 + ... + x_n) ÷ n.

Weighted Average

When values have different weights/frequencies, Average = (Σw_ix_i) ÷ (Σw_i), where w is the weight (frequency).

Average of Groups

If every group has the exact same number of items, the overall average is simply the average of the individual group averages.

Q71. Answer: (a) 100 sec

Given:

A policeman starts chasing a thief who is 500 m ahead of him. The speed of the thief is 18 km/h, and the speed of the policeman is 36 km/h.

Formula used:

Relative speed = Speed of policeman - Speed of thief

Time = Distance / Relative speed

Calculations:

Speed of thief = 18 km/h = 18 × (1000/3600) m/s = 5 m/s

Speed of policeman = 36 km/h = 36 × (1000/3600) m/s = 10 m/s

Relative speed = 10 m/s - 5 m/s = 5 m/s

Distance = 500 m

=> Time = 500 / 5

=> Time = 100 seconds

Therefore The correct answer is option (1).

Q72. Answer: (c) 70%

Given:

Initial Income (I1) = Rs. 100

Initial Expenditure (E1) = 75% of I1 = Rs. 75

Initial Savings (S1) = I1 - E1 = Rs. 100 - Rs. 75 = Rs. 25

New Income (I2) = I1 + 25% of I1 = Rs. 100 + Rs. 25 = Rs. 125

New Expenditure (E2) = E1 + 10% of E1 = Rs. 75 + Rs. 7.5 = Rs. 82.5

Formula used:

Percentage Increase in Savings = (New Savings - Initial Savings)/(Initial Savings) × 100

Calculation:

New Savings (S2) = I2 - E2 = Rs. 125 - Rs. 82.5 = Rs. 42.5

=> Percentage Increase in Savings = (Rs. 42.5 - Rs. 25)/(Rs. 25) × 100
=> Percentage Increase in Savings = (Rs. 17.5)/(Rs. 25) × 100
=> Percentage Increase in Savings = 70%
Therefore The correct answer is option 3.

Q73. Answer: (c) Decrease, 60%

Given:
A fraction 3/5 is decreased by 2/5. The resulting fraction is then increased by 20%.
Formula used:
New Value = Original Value × (1 + Percentage Change)
Calculation:
Initial Fraction = 3/5
Decreased Fraction: 3/5 - 2/5 = 1/5
Increased by 20%: 1/5 × (1 + 0.20) = 1/5 × 1.20
=> 1/5 × 1.20 = 1.20/5 = 6/25
Percentage Change = (6/25 - 3/5)/(3/5) × 100%
=> (6/25 - 15/25)/(3/5) × 100%
=> (-9)/25 × 5/3 × 100 %
=> -60%
Therefore The correct answer is option 3 i.e. decrease by 60%.

Q74. Answer: (a) 2800

Given:
Principal (P) = Rs. 5,000
Time for first period (t1) = 2 years
Rate for first period (r1) = 10% per annum
Time for second period (t2) = 3 years
Rate for second period (r2) = 12% per annum
Formula used:
Simple Interest (SI) = P × (r × t)/100
Calculation:
SI1 = 5000 × (10 × 2)/100
=> SI1 = 5000 × 0.2
=> SI1 = Rs. 1000
SI2 = 5000 × (12 × 3)/100
=> SI2 = 5000 × 0.36
=> SI2 = Rs. 1800
Total Interest = SI1 + SI2
=> Total Interest = 1000 + 1800
=> Total Interest = Rs. 2800
Therefore The correct answer is option (1).

Q75. Answer: (b) 4 m

Given:
Surface area of cuboid (S) = 108 m^2
Length (l) = 6 m
Breadth (b) = 3 m
Formula used:
S = 2(lb + bh + hl)
Where, h = height
Calculation:
108 = 2(6 × 3 + 3 × h + 6 × h)
=> 108 = 2(18 + 3h + 6h)

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=> 108 = 2(18 + 9h)

=> 108 = 36 + 18h

=> 108 - 36 = 18h

=> 72 = 18h

=> h = 72 ÷ 18

=> h = 4 m

Therefore The correct answer is option 2.

Q76. Answer: (b) 15

The correct answer is 15

Key Points

• 15 censuses had been completed in India as of the year 2011.

• The census in India is conducted every ten years by the Office of the Registrar General and Census Commissioner, under the Ministry of Home Affairs.

• The first census in India was conducted in 1872, but the first complete census was taken in 1881.

• The 2011 Census was the 15th National Census of the country.

• The census provides critical data on population demographics, economic activity, literacy and education, housing and household amenities, urbanization, fertility and mortality, and many other socio-economic characteristics.

Additional Information

• The Census is one of the most reliable sources of data on various demographic and socio-economic parameters.

• It helps in planning and formulation of policies for the government at all levels.

• The Census of India 2011 was conducted in two phases: the House listing and Housing Census (April to September 2010) and the Population Enumeration (9th to 28th February 2011).

• India's census is the largest administrative exercise in the world, covering all individuals residing in the country.

• The next census was scheduled for 2021 but was postponed due to the COVID-19 pandemic.

Q77. Answer: (b) 1037 females/1000 males

The correct answer is 1037 females/1000 males

Key Points

• According to the Census of India 2011, the sex ratio in the Union Territory of Puducherry was 1037 females per 1000 males.

• This sex ratio indicates a higher number of females compared to males in Puducherry.

• The sex ratio is an important demographic indicator that reflects the status of women in society and helps in planning and policy-making for gender-related issues.

Additional Information

• The Census of India is conducted every 10 years by the Office of the Registrar General and Census Commissioner, under the Ministry of Home Affairs, Government of India.

• The census collects a wide range of demographic, social, and economic data that is essential for the planning and implementation of various government policies and programs.

• The 2011 Census was the 15th National Census of the country since 1872 and the 7th after independence.

• Besides sex ratio, other important metrics collected in the census include population density, literacy rate, and workforce participation rate.

Q78. Answer: (c) 2 and 3

The correct answer is 2 and 3

Key Points

• Statement 2: Article 5 of the Constitution does not pertain to the creation of new states. It deals with the citizenship at the commencement of the Constitution. The power to create new states is vested in Parliament under Article 3.

• Statement 3: The subjects in the Union List are exclusively under the purview of the Union Parliament. State Legislatures cannot enact laws on subjects in the Union List.

• Since both statements 2 and 3 are incorrect, the correct answer is option 3.

Additional Information

• Statement 1: It is correct that the Constitution of India does not use the word 'federation' but describes India as a 'Union of States'.

• Statement 4: Both the Parliament and State Legislatures can indeed pass laws on subjects listed in the Concurrent List, with the central law prevailing in case of conflict.

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• The Constitution of India is a comprehensive document that lays down the framework for governance and the distribution of powers between the Union and the States.

Q79. Answer: (c) Agra Gharana

The correct answer is Agra Gharana

Key Points

• The Agra Gharana is known for its blend of Khayal and Dhrupad-Dhamar styles.

• This Gharana emphasizes the importance of swara (notes) and laya (tempo) in its compositions.

• It has a rich history and has contributed significantly to Hindustani classical music.

• The compositions from this Gharana often feature intricate and robust patterns.

• Famous exponents of the Agra Gharana include Faiyaz Khan and Vilayat Hussain Khan.

Additional Information

• The Indore Gharana is known for its unique style of Khayal singing and was popularized by Ustad Amir Khan.

• The Gwalior Gharana is one of the oldest Khayal Gharanas and emphasizes the use of simple and straightforward compositions.

• The Patiala Gharana is famous for its elaborate and intricate taans (fast melodic passages).

• Gharanas are schools or styles of music that are passed down through generations, each with its own distinct features and techniques.

Q80. Answer: (d) Govindacharya

The correct answer is Govindacharya

Key Points

• Govindacharya is the author of the famous book 'Sangraha Choodamani', which deals with the current system of Carnatic music.

• 'Sangraha Choodamani' is an important text in the field of Carnatic music, offering a comprehensive overview of its system and theory.

• The book is highly regarded for its detailed classification and explanation of various ragas and musical compositions.

Additional Information

• Carnatic music is a system of music commonly associated with the southern part of India, known for its rich history and complex compositions.

• Theoretical texts like 'Sangraha Choodamani' play a crucial role in preserving and propagating the knowledge of Carnatic music to future generations.

• Govindacharya’s work continues to be a vital resource for students, practitioners, and scholars of Carnatic music.

Q81. Answer: (b) Chief Justice of India

The correct answer is Chief Justice of India

Key Points

• The digital platform FASTER was launched by the Chief Justice of India.

• FASTER stands for Fast and Secure Transmission of Electronic Records.

• This platform aims to ensure swift and secure transmission of court orders and other judicial documents.

• It enhances the efficiency of the judicial system by reducing delays in communication and implementation of court orders.

Additional Information

• The Supreme Court of India is the highest judicial forum and final court of appeal under the Constitution of India.

• The Chief Justice of India is the head of the judiciary of India and the Supreme Court.

• The Supreme Court consists of the Chief Justice and a maximum of 33 other judges, appointed by the President of India.

• The judiciary plays a crucial role in the interpretation and protection of the Constitution and the rights of individuals.

• Technological advancements like the FASTER platform are part of ongoing efforts to modernize the judicial system and improve access to justice.

Q82. Answer: (d) Kosi

The correct answer is Kosi

Key Points

• The river Kosi is known as the "sorrow of Bihar" due to its frequent and devastating floods.

• It is one of the major tributaries of the Ganges, flowing through Nepal and the Indian state of Bihar.

• The floods caused by the Kosi river have led to significant loss of life, property, and crops over the years.

• The river has a highly dynamic course, which makes flood management challenging.

Additional Information

• The Kosi river originates from the Himalayas in Tibet and Nepal, and it joins the Ganges near Kursela in Bihar.

• Efforts have been made to control the flooding through the construction of embankments and the Kosi barrage.

• Despite these measures, the river's unpredictable behavior continues to pose a challenge to flood management in the region.

• The Kosi river basin is also known for its rich biodiversity and fertile soil, which supports agriculture in the region.

Q83. Answer: (d) Insert Tab

The correct answer is Insert Tab

Key Points

• You can add a table in an MS Word document by navigating to the Insert Tab.

• Within the Insert Tab, you can find the option to create a table, allowing you to specify the number of rows and columns.

• The Insert Tab provides various other functionalities such as inserting pictures, shapes, charts, and other elements into your document.

• Using the Insert Tab for adding tables helps in organizing data effectively in a structured format.

Additional Information

• The Design Tab is primarily used for formatting and designing the layout of the document, including themes, colors, and fonts.

• The View Tab allows you to change the view modes of your document, such as Print Layout, Web Layout, and Reading Mode.

• The Home Tab contains basic formatting options like font style, size, paragraph alignment, and bullet points.

• MS Word offers a range of features to enhance the usability and presentation of documents, making it a versatile tool for both personal and professional use.

Q84. Answer: (c) The amount of electrolyte required for the coagulation of a definite amount of a colloidal solution is depe...

The correct answer is The amount of electrolyte required for the coagulation of a definite amount of a colloidal solution is dependent on the valency of the coagulating ion

Key Points

• The amount of electrolyte required for the coagulation of a definite amount of a colloidal solution is dependent on the valency of the coagulating ion describes the Hardy Schulze rule.

• The rule states that ions with higher valency are more effective in causing coagulation of colloids compared to ions with lower valency.

• This principle is important in understanding the stability of colloidal solutions and the process of coagulation.

• It helps in predicting the amount and type of electrolyte needed to destabilize a colloidal system.

Additional Information

• Colloids are mixtures where one substance is dispersed evenly throughout another.

• The Hardy Schulze rule is named after the scientists who discovered it.

• It is a key concept in colloid chemistry and is used in various industrial and research applications.

• Understanding this rule is crucial for processes like water purification, where coagulation is used to remove impurities.

Q85. Answer: (a) superscript

The correct answer is superscript

Key Points

• A number printed above the base line in MS-Word is referred to as a superscript.

• Superscripts are often used in mathematical expressions, chemical formulas, and for footnotes or endnotes in documents.

• To apply superscript formatting in MS-Word, you can use the shortcut key Ctrl + Shift + + or use the Superscript button in the Font group on the Home tab.

• Examples of superscripts include 2^(nd), x^2, and H2O where the "2" is in a smaller, raised font above the baseline.

• Superscripts are different from subscripts, which are printed below the baseline and are used for different purposes.

Additional Information

• MS-Word offers various text formatting options, including bold, italic, underline, strikethrough, subscript, and superscript.

• Formatting text can enhance the readability and presentation of your document.

• Using the correct formatting options ensures that your document is clear and professional.

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Q86. Answer: (b) After the completion of replication, each DNA molecule would have one parental and one newly synthesised st...

The correct answer is After the completion of replication, each DNA molecule would have one parental and one newly synthesised strand.

Key Points

• Semiconservative DNA replication means that after the completion of replication, each DNA molecule consists of one parental (original) strand and one newly synthesized strand.

• This model of DNA replication was first proposed by Watson and Crick in 1953 and later confirmed by the Meselson-Stahl experiment in 1958.

• The semiconservative nature ensures genetic consistency through generations, as each new DNA molecule retains one strand from the original DNA.

• This mechanism is crucial for the accurate transmission of genetic information during cell division.

Additional Information

• DNA replication is a fundamental process that occurs in all living organisms to copy their DNA, allowing for cell division and reproduction.

• There are three main hypotheses for DNA replication: conservative, semiconservative, and dispersive. The semiconservative model is the one that has been experimentally validated.

• In the Meselson-Stahl experiment, E. coli bacteria were grown in a medium containing a heavy isotope of nitrogen (15N) and then transferred to a medium with a lighter isotope (14N). The results showed that after one round of replication, the DNA consisted of hybrid molecules (one strand 15N and one strand 14N), supporting the semiconservative model.

• This process ensures that the genetic material is accurately duplicated and passed on to daughter cells, maintaining the integrity of the genome.

Q87. Answer: (b) 26 Jan 1950

The correct answer is Jan 26 1950

Key Points

• Jan 26 1950 is the date when the Indian Constitution came into force and is celebrated as Republic Day.

• The date marks the transition of India from a British Dominion to a republic, and the Constitution of India became the supreme law of the land.

• Republic Day is one of the three national holidays in India, along with Independence Day and Gandhi Jayanti.

• The main celebration takes place in the national capital, New Delhi, at the Rajpath before the President of India.

• The event includes a grand parade showcasing India's defense capability, cultural and social heritage.

Additional Information

• The Constitution of India was adopted by the Constituent Assembly on 26th November 1949 and came into effect on 26th January 1950.

• It lays down the framework defining fundamental political principles, establishes the structure, procedures, powers, and duties of government institutions, and sets out fundamental rights, directive principles, and the duties of citizens.

• The Constitution of India is the longest written constitution of any country in the world.

• It declares India a sovereign, socialist, secular, and democratic republic, assuring its citizens justice, equality, and liberty, and endeavors to promote fraternity.

• The Seventh Schedule of the Constitution contains three lists which delineate the subjects under the Union, State, and Concurrent lists.

• Amendments to the Constitution can be made through a process outlined in Article 368.

• The Union List has been amended several times to meet the evolving needs of the nation.

Q88. Answer: (d) e-RUPI

The correct answer is e-RUPI

Key Points

• e-RUPI is a digital payment platform launched in 2021 by the National Payments Corporation of India (NPCI) in association with the Department of Financial Services (DFS), National Health Authority (NHA), and Ministry of Health and Family Welfare (MoHFW).

• It is a cashless and contactless instrument for digital payments.

• The platform is designed to deliver benefits and services to citizens in a seamless and efficient manner.

• e-RUPI is a QR code or SMS string-based e-voucher, which is delivered to the beneficiaries' mobile phones.

• Users can redeem the voucher without needing a card, digital payments app, or internet banking access.

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• It ensures that the payment to the service provider is made only after the transaction is completed.

• The platform is aimed at improving the delivery of welfare services and ensuring leak-proof transactions.

Additional Information

• The National Payments Corporation of India (NPCI) is an umbrella organization for operating retail payments and settlement systems in India.

• It was established in 2008 and is an initiative of the Reserve Bank of India (RBI) and Indian Banks' Association (IBA).

• The NPCI aims to create infrastructure to handle the entire volume of retail payment systems in the country.

• e-RUPI is part of the Indian government's efforts to promote digital transactions and financial inclusion.

• The platform is expected to play a significant role in achieving the vision of a Digital India.

Q89. Answer: (d) Kuchipudi

The correct answer is Kuchipudi

Key Points

• Guru Vempati Chinna Satyam is renowned for his contributions to the Kuchipudi dance form.

• Kuchipudi is one of the eight major Indian classical dance forms and originates from the state of Andhra Pradesh.

• It is known for its graceful movements, expressive gestures, and strong narrative character.

• Guru Vempati Chinna Satyam played a significant role in popularizing Kuchipudi both in India and internationally.

Additional Information

• Kuchipudi performances often depict stories from Hindu epics and scriptures, combining dance, music, and acting.

• The dance form requires rigorous training and a deep understanding of the associated mythology and literature.

• Guru Vempati Chinna Satyam established the Kuchipudi Art Academy in Chennai in 1963 to train students in this classical dance form.

• His choreographies and innovations have left a lasting legacy on the Kuchipudi dance tradition.

Q90. Answer: (c) Ramakrishna Paramhansa

The correct answer is Ramakrishna Paramhansa

Key Points

• Ramakrishna Paramhansa was the spiritual guru of Swami Vivekananda.

• Ramakrishna Paramhansa was a well-known saint and mystic of 19th-century Bengal.

• He played a crucial role in the Indian Renaissance and the revival of Hinduism in India.

• Swami Vivekananda was deeply influenced by Ramakrishna's teachings and later spread his message globally.

Additional Information

• Swami Vivekananda, born as Narendranath Datta, was a key figure in the introduction of Indian philosophies of Vedanta and Yoga to the Western world.

• He founded the Ramakrishna Mission, which is involved in various forms of social service.

• Ramakrishna Paramhansa's teachings emphasized the unity of all religions and the importance of personal spiritual experience.

• Swami Vivekananda's famous speech at the Parliament of the World's Religions in Chicago in 1893 brought him international fame and established him as a major force in the revival of Hinduism in India.

Q91. Answer: (a) France

The correct answer is France

Key Points

• Kiran Nadar was conferred with the highest civilian award of France in April 2023.

• This award is known as the Legion of Honour or Légion d'Honneur in French.

• The award was established by Napoleon Bonaparte in 1802 and is the highest French order of merit for military and civil merits.

• Kiran Nadar is recognized for her significant contributions to the arts and philanthropy.

• The award ceremony took place in a grand event attended by dignitaries and notable personalities from various fields.

Additional Information

• Kiran Nadar is a prominent Indian art collector and philanthropist.

• She is the founder of the Kiran Nadar Museum of Art, which is a private museum exhibiting modern and contemporary works from India and the subcontinent.

• Her efforts have significantly contributed to promoting Indian art on the global stage.

• The Legion of Honour is awarded in various degrees, including Chevalier (Knight), Officier (Officer), Commandeur (Commander), Grand Officier (Grand Officer), and Grand-Croix (Grand Cross).

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Q92. Answer: (c) high yielding varieties of seeds

The correct answer is high yielding varieties of seeds

Key Points

• The Green Revolution was primarily due to the introduction of high yielding varieties of seeds.

• This revolution started in the 1960s in India and significantly increased agricultural production, especially in wheat and rice.

• Other factors contributing to the Green Revolution included the use of fertilizers, pesticides, and improved irrigation techniques, but the high yielding varieties of seeds were the cornerstone.

• The main aim was to make India self-sufficient in food grains and reduce dependency on imports.

• The Green Revolution had a significant impact on food security and rural development in India.

Additional Information

• The Green Revolution was led by agricultural scientists like Dr. M.S. Swaminathan in India.

• It was part of a larger initiative supported by international organizations such as the Food and Agriculture Organization (FAO) and the International Rice Research Institute (IRRI).

• The high yielding varieties of seeds were developed through cross-breeding and genetic modifications to increase resistance to pests and diseases.

• Although the Green Revolution had many benefits, it also led to environmental issues such as soil degradation, overuse of water resources, and increased use of chemical inputs.

Q93. Answer: (b) Iron oxide

The correct answer is Iron oxide

Key Points

• The surface of Mars appears red due to the presence of large amounts of Iron oxide.

• Iron oxide is commonly known as rust, and its reddish color gives Mars its characteristic hue.

• Mars is often referred to as the "Red Planet" because of this distinctive coloration.

• The iron oxide particles are distributed across the Martian soil and dust, contributing to the planet's overall red appearance.

Additional Information

• Mars is the fourth planet from the Sun and is named after the Roman god of war.

• The planet has a thin atmosphere, composed mostly of carbon dioxide, with traces of nitrogen and argon.

• Mars has the largest volcano in the solar system, Olympus Mons, and a canyon system, Valles Marineris, that dwarfs the Grand Canyon.

• Exploration missions to Mars aim to understand its geology, climate, and potential for past or present life.

• Recent missions include NASA's Perseverance rover, which is searching for signs of ancient microbial life and collecting samples for future return to Earth.

Q94. Answer: (c) 54

The correct answer is 54

Key Points

• 54 Indian athletes participated in the Tokyo Paralympics 2020.

• This was the largest contingent India has sent to any Paralympics.

• India competed in nine different sports, including archery, athletics, badminton, shooting, swimming, powerlifting, table tennis, and taekwondo.

• The athletes delivered India's best ever performance at the Paralympics, winning a total of 19 medals (5 gold, 8 silver, and 6 bronze).

• India's previous best medal tally was 4 medals at the Rio 2016 Paralympics.

Additional Information

• The Tokyo Paralympics 2020 were held from 24th August to 5th September 2021, having been postponed due to the COVID-19 pandemic.

• The event featured 539 events across 22 sports, with over 4,500 athletes from around the world participating.

• India made its Paralympic debut in 1968 and has since participated in every edition except for the 1976 Games.

• The Paralympic Games are a major international multi-sport event for athletes with disabilities, organized by the International Paralympic Committee.

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Q95. Answer: (a) 79

The correct answer is Article 79

Key Points

• Article 79 of the Constitution of India states that the Parliament consists of the President and two Houses known respectively as the Council of States (Rajya Sabha) and the House of the People (Lok Sabha).

• The Rajya Sabha is the upper house of the Parliament, representing the states and union territories.

• The Lok Sabha is the lower house of the Parliament, representing the people of India as a whole.

• This structure ensures a bicameral legislative system, providing a system of checks and balances within the Parliament.

Additional Information

• The Constitution of India was adopted by the Constituent Assembly on 26th November 1949 and came into effect on 26th January 1950.

• It lays down the framework defining fundamental political principles, establishes the structure, procedures, powers, and duties of government institutions, and sets out fundamental rights, directive principles, and the duties of citizens.

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• The Seventh Schedule of the Constitution contains three lists which delineate the subjects under the Union, State, and Concurrent lists.

• Amendments to the Constitution can be made through a process outlined in Article 368.

• The Union List has been amended several times to meet the evolving needs of the nation.

Q96. Answer: (d) 2022

The correct answer is 2022

Key Points

• The Ultimate Kho-Kho League was started in the year 2022.

• This league is a significant step towards popularizing the traditional Indian sport of Kho-Kho at a national and international level.

• The league features teams from various regions of India, promoting regional talent and providing a platform for athletes to showcase their skills.

• It aims to professionalize the sport and bring it to the mainstream, similar to other popular sports leagues in the country.

Additional Information

• Kho-Kho is a traditional Indian sport that is played by teams of twelve players, of which nine enter the field, who try to avoid being touched by members of the opposing team.

• The sport has a rich history and is known for its speed, agility, and teamwork.

• The Ultimate Kho-Kho League aims to elevate the sport's status and provide better infrastructure, coaching, and facilities for players.

• Efforts are being made to broadcast the matches on various media platforms to reach a wider audience and increase the sport's popularity.

Q97. Answer: (a) 2004

The correct answer is 2004

Key Points

• The first underground section (Vishwavidyalaya- Kashmere Gate) of the Golden Route in New Delhi was opened in the year 2004.

• This section is part of the Delhi Metro, which is a rapid transit system serving Delhi and its satellite cities.

• The opening of this section marked a significant milestone in the development of the Delhi Metro network, facilitating efficient and quick transportation for commuters.

• The Delhi Metro has since expanded significantly and is considered one of the most successful metro systems in India.

Additional Information

• The Delhi Metro Rail Corporation (DMRC) was established in 1995 to build and operate the Delhi Metro.

• Shri E. Sreedharan, also known as the "Metro Man," played a crucial role in the successful implementation of the Delhi Metro project.

• The Delhi Metro network is known for its punctuality, cleanliness, and efficient service, setting a benchmark for other metro projects in India.

• As of now, the Delhi Metro network spans over 300 kilometers, covering a large part of the National Capital Region (NCR).

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Q98. Answer: (d) 7

The correct answer is 7 yards

Key Points

• In field hockey, during a penalty stroke, an attacker shoots at the goal from a distance of 7 yards away.

• This creates a one-on-one confrontation between the attacker and the goalkeeper.

• The penalty stroke is awarded for serious fouls committed by defenders within the shooting circle.

• The goalkeeper must remain on the goal line until the ball is played by the attacker.

Additional Information

• Field hockey is played on grass, watered turf, artificial turf, or synthetic field, as well as an indoor boarded surface.

• A field hockey match consists of two halves of 30 minutes each, with a 5-minute half-time interval.

• So, the total duration of a field hockey match, including the break, is 70 minutes (60 minutes of play and 10 minutes of break).

• The game is played by two teams of eleven players each, including the goalkeeper.

• Field hockey is governed by the International Hockey Federation (FIH), which sets the rules of the game.

• Penalty strokes are one of the most critical and high-pressure moments in a field hockey game.

Q99. Answer: (a) Dharmapala

The correct answer is Dharmapala

Key Points

• Dharmapala was a significant ruler of the Pala dynasty who temporarily occupied Kanauj.

• He was the son of Gopala, the founder of the Pala dynasty, and succeeded him in the throne.

• Dharmapala is known for his military conquests and for expanding the Pala Empire, making it one of the dominant powers in northern India during his reign.

• He played a crucial role in the tripartite struggle for control over the city of Kanauj, which was a strategic and prestigious center during that period.

Additional Information

• The Pala dynasty ruled over the eastern regions of the Indian subcontinent, mainly the present-day Bengal and Bihar, from the 8th to the 12th century.

• The dynasty is noted for its patronage of Buddhism and the establishment of many Buddhist institutions and temples, including the famous Vikramashila and Odantapuri universities.

• The Palas were known for their contributions to art, culture, and education, which helped in the spread of Buddhism to Tibet and Southeast Asia.

• Dharmapala's reign marked the height of the Pala dynasty's power and influence in India.

Q100. Answer: (b) V Anantha Nageswaran

The correct answer is V Anantha Nageswaran

Key Points

• V Anantha Nageswaran was appointed as the Chief Economic Advisor to the Government of India in January 2022.

• He succeeded Krishnamurthy Subramanian, who completed his three-year term in December 2021.

• Nageswaran is an academic and former executive with a rich background in economic analysis and financial markets.

• He holds a doctoral degree from the University of Massachusetts in Amherst and has previously worked as a writer, teacher, and consultant.

• As the Chief Economic Advisor, Nageswaran is responsible for advising the government on economic matters and providing insights into policy decisions.

Additional Information

• The Chief Economic Advisor (CEA) is a key position in the Ministry of Finance, Government of India.

• The CEA plays a crucial role in the preparation of the Economic Survey, which is presented before the Union Budget.

• The Economic Survey provides a detailed report on the state of the economy and outlines the policy challenges and solutions.

• Previous CEAs include prominent economists such as Arvind Subramanian and Raghuram Rajan.

• The position of CEA is instrumental in shaping the economic policy and direction of the country.

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