# RRB NTPC CBT 2 (Level-5) Official Paper (Held On: 15 June 2022 Shift 2) (Previous Year Paper)

RRB NTPC • 2022 • 120 questions • 90 minutes • Answer key and solutions

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## FULL TEST

**Q1.** A car covers a certain distance at a speed of 45 km/h and returns to the starting point following the same path at a speed of 36 km/h. Find the average speed for the entire journey (in km/h).

**(a)** 40
**(b)** 38
**(c)** 42
**(d)** 35

**Q2.** Which of the following law states that "as more and more units of a variable factor are employed with fixed factors and technology, its marginal product eventually declines."

**(a)** The law of diminishing returns to a factor
**(b)** Law of diminishing marginal utility
**(c)** The law of variable proportions
**(d)** The marginal rate of technical substitution

**Q3.** Jai, Pia, Era, Ram and Shubh are sitting in a straight line facing north. Jai is sitting second to the left of Shubh. Shubh is sitting to the immediate right of Era. Pia is sitting at the extreme right end. Ram is sitting to the immediate right of Shubh. Who among the following is sitting at the extreme left end?

**(a)** Jai
**(b)** Era
**(c)** Shubh
**(d)** Ram

**Q4.** Simplify the following expression.

0.1212...-0.66... + 0.33...

**(a)** 9/100
**(b)** 37/33
**(c)** −5/11
**(d)** −7/33

**Q5.** Which of the following festivals is NOT celebrated in the river island of Majuli?

**(a)** Ali-Aye-Ligang
**(b)** Raja Parba
**(c)** Falgutsav
**(d)** Bihu

**Q6.** Five students A, B, C, D and E study in different schools K, L, M, N and O, but not necessarily in the same order. Each one likes only one subject, viz., Hindi, Mathematics, Science, Social Science and English. C studies in M. B does not like Social Science. D likes English and studies in N. The student of L likes Math. E likes Hindi but is neither from O nor L. B studies in O.

Which one of the following students studies in school L and likes Mathematics?

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

**Q7.** Chakma refugees are migrants to India from which of the following neighbouring countries?

**(a)** Bangladesh
**(b)** Myanmar
**(c)** China
**(d)** Nepal

**Q8.** Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

All horses are pigs.

All pigs are fishes.

Conclusions:

I. All fishes are pigs.

II. All horses are fishes.

**(a)** Neither conclusion I nor II follows
**(b)** Only conclusion II follows
**(c)** Both conclusions I and II follow
**(d)** Only conclusion I follows

**Q9.** Select the option that is related to the fifth alphanumeric-cluster in the same way as the second alphanumeric-cluster is related to the first alphanumeric-cluster and the fourth alphanumeric-cluster is related to the third alphanumeric-cluster.

NT14 : QW7 :: CR24 : FU12 :: PV36 : ?

**(a)** TY8
**(b)** ST13
**(c)** SY18
**(d)** TZ17

**Q10.** Which of the following scientists has NOT received the Shanti Swarup Bhatnagar Prize 2021?

**(a)** Dr Amit Singh
**(b)** Dr Binoy Kumar Saikia
**(c)** Dr Anish Ghosh
**(d)** Dr. Dheeraj Kumar

**Q11.** The Green Revolution within India led to an increase in agricultural production, especially in _____.

**(a)** Rajasthan, Maharashtra, and Gujarat
**(b)** Haryana, Punjab, and Uttar Pradesh
**(c)** Jharkhand, Punjab, and Uttarakhand
**(d)** Chhattisgarh, Bihar, and Odisha

**Q12.** The role of the _____ is to recommend to the President measures needed to augment the Consolidated Fund of a State to supplement the resources of the Municipalities in the State based on the recommendations made by the Finance Commission of the State.

**(a)** NITI Aayog
**(b)** Comptroller and Auditor General of India
**(c)** Finance Ministry
**(d)** Finance Commission

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**Q13.** Point A is 15 m to the west of Point C. Point B is 22 m to the north of Point C. Point D is 18 m to the east of Point B. Point E is 11 m to the south of point D. Point X is 33 m to the west of Point E.

What is the shortest distance between Point A and Point X?

**(a)** 10 m
**(b)** 22 m
**(c)** 3 m
**(d)** 11 m

**Q14.** Which institute developed a digital certificate using the Block Chain-driven technology, which was to give digital certificates to the 61 winners of PMRBP 2021 and 2022 by the Prime Minister?

**(a)** IIT Kanpur
**(b)** IIT Madras
**(c)** IIT Kharagpur
**(d)** IIT Bombay

**Q15.** The ratio of the length, width and height of a cuboid is 60 : 24 : 7 and the length of each of its four space diagonals is 130 cm. What is the volume (in $cm^3$) of the cuboid?

**(a)** 86400
**(b)** 80640
**(c)** 80460
**(d)** 84600

**Q16.** In what way can the terms of the given set be rearranged into three sets such that the sum of the two terms in each set is equal?

(947, 861, 1304, 1218, 1378, 787)

**(a)** (787, 1378), (947, 1304), (861, 1218)
**(b)** (947, 1218), (861, 1304), (787, 1378)
**(c)** (861, 1218), (947, 1378), (787, 1304)
**(d)** (947, 1304), (861, 1378), (787, 1218)

**Q17.** Which of the following does NOT support bidirectional data transmission?

**(a)** Half-duplex
**(b)** Simplex
**(c)** Full-duplex
**(d)** Both, half-duplex and full-duplex

**Q18.** Giorgio Parisi won the Nobel Prize 2021 in _____.

**(a)** Economic Sciences
**(b)** Physics
**(c)** Medicine
**(d)** Chemistry

**Q19.** When was "Food for Work" programme first launched in India?

**(a)** 1976
**(b)** 1977
**(c)** 1975
**(d)** 1978

**Q20.** The variable x takes integer values with $0 \le x \le 4$. If the frequency is given by

$f(x) = 1 + x + x(x - 1) + 1/2\ x(x - 1)(x - 2) - 1/3\ x(x - 1)(x - 2)(x - 3)$, then what is the mode of x?

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

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**Q21.** Simplify:

$18 + 48 \div 12 \times (32 \div 4)^2 - 8$

**(a)** 344
**(b)** 266
**(c)** 242
**(d)** 308

**Q22.** Who won the Sahitya Akademi Yuva Puraskar 2021 for her first book 'A Burning', published in 2020?

**(a)** Ganga Sharma
**(b)** Yashica Dutt
**(c)** Bipasha Bora
**(d)** Megha Majumdar

**Q23.** Identify the INCORRECT pair of Primitive subsistence agriculture and related state from following -

**(a)** Kuruwa - Jharkhand
**(b)** Koman - Kerala
**(c)** Podu - Andhra Pradesh
**(d)** Dahiya - Madhya Pradesh

**Q24.** Which economist has written the book "The General Theory of Employment, Interest and Money (1936)"?

**(a)** John Maynard Keynes
**(b)** Milton Friedman
**(c)** Adam Smith
**(d)** Vincent Crawford

**Q25.** Which of the following was the capital of Magadh for several years before it was shifted to Pataliputra?

**(a)** Patna
**(b)** Gaya
**(c)** Nalanda
**(d)** Rajgriha

**Q26.** Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

All dusters are balls.

All cups are balls.

Conclusions:

I. All balls are cups.

II. No duster is a cup.

**(a)** Only conclusion I follows.
**(b)** Neither conclusion I nor II follows.
**(c)** Only conclusion II follows.
**(d)** Both conclusions I and II follow.

**Q27.** Travelling at 7/8 of his usual speed, Ansh covered a distance of 35 km in 50 minutes. What will be Ansh's usual speed in km/h?

**(a)** 54
**(b)** 60
**(c)** 48
**(d)** 64

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**Q28.** The Indian Railways has completed the world's highest railway-arch bridge over the _____ river in Jammu and Kashmir.

**(a)** Ravi
**(b)** Chenab
**(c)** Indus
**(d)** Jhelum

**Q29.** On compound interest, a certain sum becomes Rs. 19,360 after 2 years and Rs. 21,296 after 3 years. Find the simple interest on the same sum at the same rate of interest for 3 years.

**(a)** Rs. 4,760
**(b)** Rs. 4,675
**(c)** Rs. 4,725
**(d)** Rs. 4,800

**Q30.** Select the letter-cluster from among the given options that can replace the question mark (?) in the following series.

ADF, GJL, MPR, ?, YBD

**(a)** SVX
**(b)** SXA
**(c)** SVY
**(d)** STU

**Q31.** Independence of Judiciary and Judicial review provided in the Constitution of India has been adopted from _____.

**(a)** The British Constitution
**(b)** The US Constitution
**(c)** The Canadian Constitution
**(d)** The Weimar Constitution

**Q32.** The Appalachians mountain region is a part of which continent?

**(a)** North America
**(b)** Asia
**(c)** Africa
**(d)** South Africa

**Q33.** On simple interest a certain sum becomes 160% of itself in 5 years at a certain rate of interest per annum. In how many years will the sum double itself under the same rate of interest?

**(a)** 7
**(b)** 10
**(c)** 8 1/3
**(d)** 9 1/2

**Q34.** Which of the following chemical reactions is a combination reaction? (Here A, B, C and D represent any element/molecule)?

**(a)** A + B → AB
**(b)** AB + C → AC + B
**(c)** AB → A + B
**(d)** AB + CD → AD + BC

**Q35.** Ten people are sitting in two parallel rows 1 and 2. A, B, C, D and E are sitting in row 1 facing north, and V, W, X, Y and Z are sitting in row 2 facing south, in such a way that each member in row 1 faces a member of row 2.

A sits second from the left end of the row, V faces an immediate neighbour of A. W sits second to the left of V. The one who faces W, sits to the immediate left of B. E sits at one of the positions to the right of B. Z faces an immediate neighbour of E. Neither X nor D sit at any of the extreme ends of the row.

Who faces D?

**(a)** X

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**(b)** Z
**(c)** W
**(d)** V

**Q36.** The difference between 8% profit and 13% loss while selling an item was Rs. 115.50. What was the cost price of the item?
**(a)** Rs. 540
**(b)** Rs. 560
**(c)** Rs. 550
**(d)** Rs. 580

**Q37.** In which year did Mahatma Gandhi start the Rowlatt Satyagraha?
**(a)** 1919
**(b)** 1935
**(c)** 1923
**(d)** 1920

**Q38.** Who introduced binomial nomenclature?
**(a)** Claude Louis Berthollet
**(b)** Dmitri Mendeleev
**(c)** Carolus Linnaeus
**(d)** John Dalton

**Q39.** Which state has launched 'Khel Nursery Scheme 2022-2023' to promote sports in the state?
**(a)** Haryana
**(b)** Uttarakhand
**(c)** Uttar Pradesh
**(d)** Karnataka

**Q40.** An equilateral triangle ABC is inscribed in a circle with radius 12 cm and centre O. Find the length of each side of the triangle ABC (in cm).
**(a)** 10 √5
**(b)** 14 √3
**(c)** 10 √3
**(d)** 12 √3

**Q41.** In a certain code language, 'CHERRY' is coded as '6-16-10-36-36-50', and 'GRAPES' is coded as '14-36-2-32-10-38'. How will 'LITCHI' be coded in that language?
**(a)** 26-18-38-6-16-18
**(b)** 26-18-40-6-16-18
**(c)** 24-16-40-6-18-16
**(d)** 24-18-40-6-16-18

**Q42.** If
'P + Q' means 'P is the father of Q',
'P − Q' means 'P is the mother of Q',
'P / Q' means 'P is the sister of Q',
'P U Q' means 'P is the son of Q',
'P ∩ Q' means 'P is the daughter of Q',
then which of the following means that ' A is E's daughter's son?
**(a)** A ∩ B ∩ C / D + E
**(b)** A / B U C U D / E
**(c)** A / B + C − D U E
**(d)** A U B / C / D U E

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**Q43.** What is the HCF of 875, 245 and 1225?

**(a)** 105
**(b)** 5
**(c)** 7
**(d)** 35

**Q44.** Which of the following is NOT a Percussion Instrument used in Carnatic Music?

**(a)** Mridangam
**(b)** Morsing
**(c)** Mandolin
**(d)** Ghatam

**Q45.** Two statements I and II are given. These statements may be either independent causes or may be the effects of independent causes or a common cause. One of these statements may be the effect of the other statement. Read both the statements and decide which of the following options correctly depicts the relationship between these two statements.

Statements:

I. A substantial increase in the spread of COVID positive cases especially among people less than 18 years of age is expected in the city during the next 2 months.

II. The government has announced that all schools will remain closed until the COVID situation subsides.

**(a)** Statement I is the cause and statement II is its effect
**(b)** Both statements I and II are independent causes
**(c)** Both statements I and II are the effects of independent causes
**(d)** Statement II is the cause and statement I is its probable effect

**Q46.** Which of the following groups of metals are so soft that they can be cut with a knife and have low densities and low melting points?

**(a)** Arsenic, Antimony, Bismuth
**(b)** Beryllium, Calcium, Magnesium
**(c)** Germanium, Galium, Indium
**(d)** Lithium, Sodium, Potassium

**Q47.** Sri Lanka is separated from India by a narrow channel of sea formed by _____.

**(a)** The Palk Strait and the Gulf of Mannar
**(b)** Only the Gulf of Mannar
**(c)** Strait of Malacca
**(d)** Only the Palk Strait

**Q48.** In a row of a few students, P was standing 17^(th) from the left end and 23^(rd) from the right end. If Q was standing exactly in the middle of the row, what was his position from the extreme left end? Assume that the students were facing the north.

**(a)** 22^(nd)
**(b)** 18^(th)
**(c)** 19^(th)
**(d)** 20^(th)

**Q49.** A question is given, followed by two statements labelled I and II. Identify which of the statements is/are sufficient/necessary to answer the question.

Question:

How many workers are there in a factory?

Statements:

I. There are more than 30 but less than 37 workers in the factory.

II. There are more than 34 but less than 41 workers in the factory. The number of workers in the factory can be divided into two groups in such a manner that each group contains an equal number of workers.

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**(a)** Statements I and II together are not sufficient to answer the question
**(b)** Statement I alone is sufficient to answer the question
**(c)** Both statements I and II together are sufficient to answer the question
**(d)** Statement II alone is sufficient to answer the question

**Q50.** A can do 87.5% of the work in 35 days while B can do 65% of the same work in 23.4 days. If they work together, what fraction of the work will get done in 1 day?
**(a)** 1/19
**(b)** 7/120
**(c)** 19/360
**(d)** 1/20

**Q51.** In a row of students all facing north, Aniket is 12^(th) from the left and Kavlin is 18^(th) from the right. If their positions are swapped, Kavlin becomes 14^(th) from the right. What is the total number of students in the row?
**(a)** 31
**(b)** 26
**(c)** 25
**(d)** 27

**Q52.** In each of the number-pairs, the second number is obtained by performing a certain mathematical operation on the first number. Three of the following pairs follow the same pattern and thus form a group. Select the number-pair that does NOT belong to that group.
**(a)** 324-19
**(b)** 625-26
**(c)** 441-22
**(d)** 144-15

**Q53.** Promoting education and economic interests of weaker sections of the society, especially the Scheduled Castes and Scheduled Tribes comes under which of the following?
**(a)** Fundamental Rights
**(b)** Directive principles of the State policy
**(c)** Fundamental duties
**(d)** Fifth Schedule

**Q54.** Which of the following persons played the Shehnai at the Red Fort to celebrate the occasion of India's independence in August 1947?
**(a)** Anant Lal
**(b)** Vasant Desai
**(c)** Ali Ahmed Hussain Khan
**(d)** Bismillah Khan

**Q55.** In a queue of 80 people, Angelina is 13^(th) from the right and Margareta is 18^(th) from the left. How many people are there between Angelina and Margareta?
**(a)** 48
**(b)** 38
**(c)** 50
**(d)** 49

**Q56.** The 40^(th) Indian site to be inscribed on the UNESCO World Heritage List is located in the state of _____.
**(a)** Uttar Pradesh
**(b)** West Bengal
**(c)** Bihar
**(d)** Gujarat

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**Q57.** If it was Wednesday on Rahul's birthday in the year 2005, then what will be the day of the week on his next birthday?

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

**Q58.** A pipe can fill an empty tank in 12.5 hours. At the bottom of the tank there was a leakage point which can drain the completely filled tank in 17.5 hours. The leakage point could be closed after 14 hours of opening the pipe to fill the tank. What was the total time taken (in hours) to fill the tank?

**(a)** 22.5
**(b)** 20.5
**(c)** 27
**(d)** 25

**Q59.** Rachel borrowed Rs. 10,000 at 10% simple interest per annum. She paid back Rs. 3,000 after Year 1, Rs. 2,800 after Year 2, and the remaining amount due after Year 3. If interest was charged on reducing balance, what was the amount Rachel paid as the final instalment?

**(a)** Rs. 7,200
**(b)** Rs. 6600
**(c)** Rs. 4,620
**(d)** Rs. 5,850

**Q60.** Goswami Tulsidas who composed Ramcharitmanas was born in the modern state of _____.

**(a)** Uttar Pradesh
**(b)** Tamil Nadu
**(c)** Maharashtra
**(d)** Karnataka

**Q61.** A man on the top of a vertical tower observes a car moving at a uniform speed coming directly towards it. If it takes 10 minutes for the angle of depression to change from 45° to 60°, in how much total time will the car reach the tower?

**(a)** (15 + 5 √3) minutes
**(b)** (3 + 5 √3) minutes
**(c)** (15 + 8 √3) minutes
**(d)** (15 + 3 √3) minutes

**Q62.** 48 square plates of side 2 cm are arranged in the form of a rectangle such that its sides are in the ratio 3 : 4. Find the perimeter of the rectangle (in cm).

**(a)** 56
**(b)** 52
**(c)** 48
**(d)** 58

**Q63.** Simplify the expression:

(4^(524)−4^(522)+30)/(4^(522)+2)

**(a)** 25/4
**(b)** 15/4
**(c)** 30
**(d)** 15

**Q64.** Which of the following is NOT among the three distinct human races identified by Georges Cuvier (1828)?

**(a)** Caucasoid
**(b)** Negroid
**(c)** Laplanderiod
**(d)** Mongoloid

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**Q65.** In a certain code language,

'never speak ill' is coded as ' ml un ha',

'fall ill often' is coded as 'ed pe ml',

'they speak often' is coded as 'ha ed os'.

(Note: All codes are two-letter codes only)

What is the probable code for 'they fall' in the given code?

**(a)** ed pe
**(b)** pe os
**(c)** ml ed
**(d)** os ml

**Q66.** Six people D, E, K, L, S and T are each of a different height. E is taller than only two people. T is taller than E but shorter than D. Neither D nor K is the tallest. S is shorter than T but not the shortest.

How many people are taller than L?

**(a)** More than two
**(b)** Two
**(c)** One
**(d)** None

**Q67.** The average of 25 numbers is 55. The average of first 11 numbers is 51 and the average of last 10 numbers is 56. What is the average of 66, 70 and the remaining 4 numbers out of given 25 numbers?

**(a)** 68
**(b)** 65
**(c)** 66
**(d)** 64

**Q68.** In a certain code language, 'TONGUE' is written as 'EOUGNT', and 'JEALOUS' is written as 'AEOUJLS'. How will 'STOMACH' be written in that language?

**(a)** ACMOHST
**(b)** MOSTACH
**(c)** ACOHMST
**(d)** AOCHMST

**Q69.** The compound interest on a sum of Rs. 1,250 for two years is Rs. 102 when interest is compounded annually at a certain rate per cent p.a. What is the rate of interest per annum?

**(a)** 3.5%
**(b)** 4.08%
**(c)** 4%
**(d)** 3.9%

**Q70.** _____ is when a government taxing, spending, or borrowing decision has or is intended to have no net effect on the economy.

**(a)** Fiscal profit
**(b)** Fiscal deficit
**(c)** Fiscal expenditure
**(d)** Fiscal neutrality

**Q71.** IPv4 address is a string of numbers consisting of four parts, where each part is a number between _____ and _____.

**(a)** 0, 255
**(b)** 1, 256
**(c)** 0, 256
**(d)** 1, 255

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**Q72.** Which of the following symbols is a correct representation for air mass above a hot and dry desert region?

**(a)** cP
**(b)** cA
**(c)** cT
**(d)** mP

**Q73.** There are seven members in a family. D is the mother of F. D is G's father's mother. G is the brother of A, and C. F is the only son of E. How is E related to C?

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

**Q74.** If $\sec\theta - \tan\theta = 2.5$, then what is the value of $\sec\theta$?

**(a)** 1.30
**(b)** 1.60
**(c)** 1.45
**(d)** 1.70

**Q75.** The sum of the radius of the base and the height of a solid right circular cylinder is 39 cm. Its total surface area is 1716 $cm^2$. What is the volume (in $cm^3$) of the cylinder? (Take $\pi = 22/7$)

**(a)** 4774
**(b)** 5082
**(c)** 4928
**(d)** 4620

**Q76.** Under which of the following Seismic Zones do the Andaman and Nicobar Islands fall?

**(a)** Zone V
**(b)** Zone II
**(c)** Zone IV
**(d)** Zone III

**Q77.** The _____ of Gunadhya is written in the Paisachi language.

**(a)** Mrichchhakatika
**(b)** Panchatantra
**(c)** Brihatkatha
**(d)** Kathasaritsagara

**Q78.** Find the HCF of $3x^2yz$, $5xy^2z$, $12x^2y^2z^3$.

**(a)** 180xyz
**(b)** xyz
**(c)** 180x^5y^5z^5
**(d)** $180x^2y^2z^3$

**Q79.** From the top of a tree 7 m high, the angle of elevation of a tower is 30°. If the tower is 47 m high, how far away from the tower is the tree positioned?

**(a)** 45 √3 m
**(b)** 40 m
**(c)** 15 √3 m
**(d)** 40 √3 m

**Q80.** Select the option related to the fifth letter-cluster in the same way the second letter-cluster is related to the first letter-cluster and the fourth letter-cluster is related to the third letter-cluster.

SEVERAL : MZSDWDT :: TRACKED : EDLBBQU :: HEADING : ?

**(a)** DBCJMH

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**(b)** HMJCBDI
**(c)** JDBCIMH
**(d)** HMICBDJ

**Q81.** If in a certain code language, 'Cricket' is called 'Archery', 'Archery' is called 'Football', and 'Football' is called 'Volleyball', then which game is played with a bat?
**(a)** Volleyball
**(b)** Archery
**(c)** Cricket
**(d)** football

**Q82.** A reduction of 20% in the price of wheat enables a housewife to obtain 4 kgs more for Rs. 1200, what is the reduced price per kg (in Rs.)?
**(a)** 40
**(b)** 60
**(c)** 75
**(d)** 50

**Q83.** The Lauria Nandangarh Pillar is located in _____.
**(a)** Kumrahar
**(b)** Patna
**(c)** Varanasi
**(d)** Champaran

**Q84.** The kingdom of Awadh was formally annexed by the British in the year _____.
**(a)** 1897
**(b)** 1856
**(c)** 1801
**(d)** 1805

**Q85.** What is the value of $\sec^2 37° - \tan^2 37°$?
**(a)** 1
**(b)** −1
**(c)** 0
**(d)** 2

**Q86.** According to the Union Budget 2022-23, which among the following is NOT one of the seven engines of economic growth under "PM Gati Shakti"?
**(a)** Communication
**(b)** Roadways
**(c)** Railways
**(d)** Ports

**Q87.** A set of four numbers that begins with the number 53 is arranged from the smallest to largest. If the median is 56, which of the following could possibly be the set of numbers?
**(a)** 53, 57, 61, 65
**(b)** 53, 53, 57, 59
**(c)** 53, 55, 57, 58
**(d)** 53, 56, 59, 62

**Q88.** Three varieties of tea, whose cost prices per kg are Rs. 500, Rs. 720 and Rs. 900 are blended in the ratio 9 : 5 : 11. What should be the selling price per kg of the blended tea if the seller has to make a profit of 20%?
**(a)** Rs. 884
**(b)** Rs. 854
**(c)** Rs. 844
**(d)** Rs. 864

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**Q89.** In February 2022, the Sports Authority of India (SAI) established a Para Centre under the National Centre of Excellence (NCOE) Scheme at which of the following SAI Regional Centres?

**(a)** Lucknow
**(b)** Bhopal
**(c)** Mumbai
**(d)** Gandhinagar

**Q90.** Which style of singing is traditionally performed by men with tenpura and pakhawaj as instrumental accompaniments?

**(a)** Tarana
**(b)** Thumri
**(c)** Dhrupad
**(d)** Ghazal

**Q91.** Few people are sitting in a straight row facing north. A is sixth to the left of C. D is in fourth position to the right of A. Exactly two people are sitting between H and A. B is fourth to the right of C. E is an immediate neighbour of both D and C, F is second to the left of E. C is eighth from the right end. There are exactly six persons sitting between G and F. G is third from one of the extreme ends. How many people are sitting in the row in total?

**(a)** 8
**(b)** 14
**(c)** 20
**(d)** 22

**Q92.** Find k such that a 7-digit number 51032kk is divisible by 12.

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

**Q93.** Chinook wind also known as 'snow eater' flows in which of the following continents?

**(a)** Australia
**(b)** Asia
**(c)** Africa
**(d)** North America

**Q94.** Two cubes, each having the length of each side as 8 cm, are joined to form a cuboid. What will be the total surface area of the cuboid?

**(a)** 704 $cm^2$
**(b)** 640 $cm^2$
**(c)** 768 $cm^2$
**(d)** 576 $cm^2$

**Q95.** Which of the following states in general receives maximum proportion of its rainfall from northeast monsoon rainfall?

**(a)** Gujarat
**(b)** Uttar Pradesh
**(c)** Tamil Nadu
**(d)** Punjab

**Q96.** The product of 15% of A and 35% of B, when divided by 21% of C gives 37 as the answer. What will be the answer if the product of A and B is divided by C?

**(a)** 111
**(b)** 185
**(c)** 148
**(d)** 74

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**Q97.** Find the average of 45% of 70 and 35% of 110.

**(a)** 34.5
**(b)** 35
**(c)** 37.5
**(d)** 35.5

**Q98.** Evaluate:

$(0.4 \times 0.4 \times 0.4 + 0.05 \times 0.05 \times 0.05)/(0.8 \times 0.8 \times 0.8 + 0.1 \times 0.1 \times 0.1)$

**(a)** 1/7
**(b)** 1/4
**(c)** 1/8
**(d)** 1/10

**Q99.** The given question is based on the following series of letters, numbers and symbols.

(Left) G 6 Y $ V R 7 % @ S 5 4 D W L + 2 M 9 £ (Right)

Which element is fifth to the left of the thirteenth element from the left?

**(a)** R
**(b)** %
**(c)** @
**(d)** S

**Q100.** The National Tribal Dance Festival 2021 was held in which city?

**(a)** Raipur
**(b)** Bhubaneshwar
**(c)** Guwahati
**(d)** Kolkata

**Q101.** Rishu went 5 km towards the west from her house. From here, she turned left and covered a distance of 4 km. She took a left turn again and covered a distance of 5 km. She finally turned right and travelled 3 km and stopped. What is the shortest distance between the point where she stopped and her house? (All turns are 90° turns only)

**(a)** 7 km
**(b)** 12 km
**(c)** 10 km
**(d)** 8 km

**Q102.** Number A is eight times as large as number B. By what percentage is number B less than number A?

**(a)** 87.5%
**(b)** 20%
**(c)** 80%
**(d)** 12.5%

**Q103.** Select the number from among the given options that can replace the question mark (?) in the following series.

0, 7, 26, 63, ?, 215

**(a)** 216
**(b)** 124
**(c)** 74
**(d)** 80

**Q104.** Which one of the following is a characteristic of the Green Revolution in India?

**(a)** Considerable rise in the production of quantity of apples
**(b)** Increased and appropriate application of chemical fertilizers for increasing agricultural production.
**(c)** Collection of quality milk from members in rural areas;
**(d)** Steady and assured supply of poultry products.

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**Q105.** _____ is an exclusive martial dance form of Manipur that includes unique display of skill, creativity and agility in which the performers enact a mock fight sequence

**(a)** Singhi Chamm
**(b)** Chakyar Koothu
**(c)** Rangama
**(d)** Thang Ta

**Q106.** Who is the ex-officio Chairman of the Council of States as per the Constitution of India?

**(a)** The Governor
**(b)** The Vice President
**(c)** The President
**(d)** The Prime Minister

**Q107.** Select the letter-cluster from among the given options that can replace the question mark (?) in the following series.
CBDD, EBBD, ?, IBXD, KBVD

**(a)** HCYE
**(b)** GCZD
**(c)** GBZD
**(d)** GCZF

**Q108.** Ten people are sitting in two parallel rows 1 and 2. A, B, C, D and E are sitting in row 1 facing the South and V, W, X, Y and Z are sitting in row 2 facing the North, in such a way that each member in row 1 faces a member of row 2.
W sits at the extreme left end of the row. W faces an immediate neighbour of B. C sits at one of the positions to the left of B but not at the extreme end of the row. The one who faces C sits to the immediate left of Y. D sits third to the right of A. V sits to the immediate right of X. Who faces Z?

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

**Q109.** According to World Bank, which of the following countries had almost no rural population in the year 2020?

**(a)** Australia
**(b)** Switzerland
**(c)** Kuwait
**(d)** Israel

**Q110.** Which two countries conducted the first bilateral tri-service exercise 'Konkan Shakti 2021'?

**(a)** India and Maldives
**(b)** Indonesia and India
**(c)** Russia and India
**(d)** India and the UK

**Q111.** Which of the following allotropes of carbon is the hardest natural substance known that has a very high melting and boiling point?

**(a)** Fullerenes
**(b)** Diamond
**(c)** Dry ice
**(d)** Graphite

**Q112.** Which among the following is NOT a work to be consulted for the history of Mughal India?

**(a)** Shahnameh
**(b)** Shahjahan Nama
**(c)** Akbar Nama
**(d)** Alamgir Nama

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**Q113.** If '<' means '−', '>' means '+', '&' means '×', and '@' means '÷', then what would be the value of the following expression?

119 < 56 @ 4 > 23 & 2

**(a)** 231
**(b)** 151
**(c)** 191
**(d)** 202

**Q114.** If diameter of a circle is 16 m, then what is the area of the circle?

**(a)** 128 π m²
**(b)** 256 π m²
**(c)** 96 π m²
**(d)** 64 π m²

**Q115.** In a certain code language,

'we can sing' is coded as 'pd ns ca',

'sing new songs' is coded as 'io uv ca',

'can join new' is coded as 'km uv pd'.

(Note: All codes are two letter codes only)

What is the probable code for 'we join' in the given code language?

**(a)** uv km
**(b)** ns pd
**(c)** km ns
**(d)** pd uv

**Q116.** The surface area of a sphere is 38.5 cm². Find the radius of the sphere. [Use π = 22/7]

**(a)** 1.4 cm
**(b)** 1.75 cm
**(c)** 1.5 cm
**(d)** 1.8 cm

**Q117.** A tourist group plto visit six places A, B, C, D, E and F on different days of the same week (starting on Monday and ending on Saturday) during their tour. They visited place D on Monday. They visited only one place between visiting place B and place D. They visited place F the immediate next day of visiting place C. They neither visited place C nor place A on Thursday. On which day did they visit place E?

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

**Q118.** Select the correct conclusion that could be drawn from the given expression.

F ≤ E < C = V > A ≥ Y > N

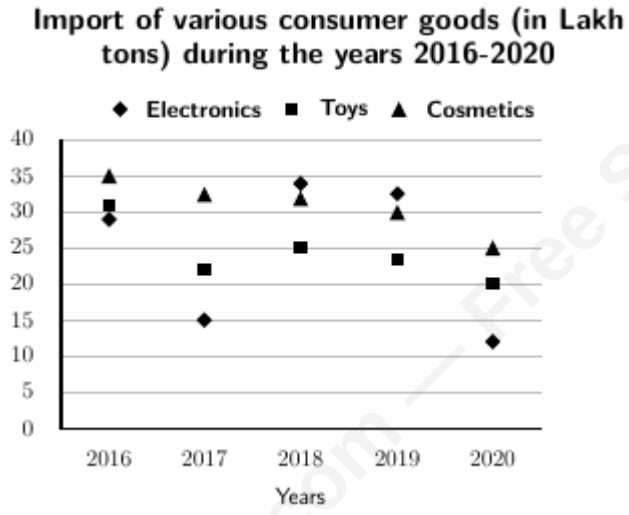
**(a)** E > Y
**(b)** N < V
**(c)** F = V
**(d)** V < Y

**Q119.** Which Article of the Indian Constitution is related with the Right of President to address and send messages to Houses?

**(a)** Article 88
**(b)** Article 84
**(c)** Article 90
**(d)** Article 86

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**Q120.** The given chart represents the import of various consumer goods (in Lakh tons) during the years 2016 - 2020.




What is the ratio of the number of cosmetics imported in years 2016 and 2020 together to that of toys in the year 2018 and 2020 together?

**(a)** 7 : 6
**(b)** 5 : 2
**(c)** 4 : 3
**(d)** 3 : 1

## ANSWER KEY

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | a | 2 | a | 3 | a | 4 | d | 5 | b | 6 | b | 7 | a | 8 | b | 9 | c | 10 | d |
| 11 | b | 12 | d | 13 | d | 14 | a | 15 | b | 16 | b | 17 | b | 18 | b | 19 | b | 20 | d |
| 21 | b | 22 | d | 23 | b | 24 | a | 25 | d | 26 | b | 27 | c | 28 | b | 29 | d | 30 | a |
| 31 | b | 32 | a | 33 | c | 34 | a | 35 | c | 36 | c | 37 | a | 38 | c | 39 | a | 40 | d |
| 41 | d | 42 | d | 43 | d | 44 | c | 45 | a | 46 | d | 47 | a | 48 | d | 49 | c | 50 | c |
| 51 | c | 52 | d | 53 | b | 54 | d | 55 | d | 56 | d | 57 | c | 58 | a | 59 | b | 60 | a |
| 61 | a | 62 | a | 63 | d | 64 | c | 65 | b | 66 | d | 67 | b | 68 | d | 69 | c | 70 | d |
| 71 | a | 72 | c | 73 | d | 74 | c | 75 | c | 76 | a | 77 | c | 78 | b | 79 | d | 80 | b |
| 81 | b | 82 | b | 83 | d | 84 | b | 85 | a | 86 | a | 87 | c | 88 | d | 89 | d | 90 | c |
| 91 | c | 92 | c | 93 | d | 94 | b | 95 | c | 96 | c | 97 | b | 98 | c | 99 | b | 100 | a |
| 101 | a | 102 | a | 103 | b | 104 | b | 105 | d | 106 | b | 107 | c | 108 | b | 109 | c | 110 | d |
| 111 | b | 112 | a | 113 | b | 114 | d | 115 | c | 116 | b | 117 | c | 118 | b | 119 | d | 120 | c |

## SOLUTIONS

**Q1. Answer: (a) 40**

Given:

Speed at the time of going = 45 km/h

Speed at the time of return to the starting point = 36 km/h.

Concept used:

When distance is constant then,

Average speed = (2xy)/(x + y)

Here,

x = Speed at time of going

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y = speed at the time of returning

Calculation:

Average speed = (2 × 45 × 36)/(45 + 36) km/hr.

=> (2 × 45 × 36)/81 km/hr.

=> (3240)/81 km/hr.

=> 40 km/hr.

Therefore The average speed for the entire journey (in km/h) is 40.

**Q2. Answer: (a) The law of diminishing returns to a factor**

The correct answer is The law of diminishing returns to a factor.

Key Points

• Pattern of consistent, predictable losses expresses that as one variable information is expanded, with all others staying fixed, a point will be reached past which the peripheral actual result of the variable element will start to diminish.

• All things considered, assuming extra factor input is added, it will prompt negative minimal creation.

• For instance, in the event that a plant utilizes laborers to make its items, sooner or later, the organization will work at an ideal level; with any remaining creation factors consistent, adding extra specialists past this ideal level will bring about less proficient tasks as the size of the production line and hardware will stay for what it's worth however laborers will increment bringing about the disorder which will decrease effectiveness.

Additional Information

• As indicated by the Law of Diminishing Marginal Utility, peripheral utility of a decent lessens as an individual consumes more units of a decent. All in all, as a shopper takes more units of a decent, the additional utility or fulfillment that he gets from an additional unit of the great continues falling.

• The law of variable extents expresses that as the amount of component increments while keeping different elements steady the complete item first increments with a rising rate then increments with the diminishing rate and afterward lessens. Plan There are three phases of law of variable extent.

• The minor pace of specialized replacement (MRTS) is a financial hypothesis that outlines the rate at which one element should diminish so a similar degree of efficiency can be kept up with when another component is expanded.

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

Given:

• Number of people in a row = 5, namely Jai, Pia, Era, Ram and Shubh.

• They are facing the North direction.

To find: The name of the person sitting at extreme left end.

Explanation:

• Pia is sitting at the extreme right end.

• Shubh is sitting to the immediate right of Era.

Jai is sitting second to the left of Shubh.

• Case 1 gets eliminated because Jai cannot be placed second to the left of Shubh.

• Ram is sitting to the immediate right of Shubh.

Only case 2 can place Ram as per the given condition. So, case 3 gets eliminated.

• So, Jai is sitting at the extreme left end.

• Hence, Jai is the correct answer.

**Q4. Answer: (d) −7/33**

Given:

0.1212...-0.66... + 0.33...

Concept used:

0.ab = ab/99

Calculation:

0.1212...-0.66... + 0.33...

=> 12/99 -6/9 + 3/9

=> (12 - 66 + 33)/99

=> (45 - 66)/99

=> (-21)/99

=> −7/33

Therefore Required answer is −7/33.

**Q5. Answer: (b) Raja Parba**

The correct answer is Raja Parba.

Key Points

• Raj Parba is a carnival celebrated in Odisha in India.

• Also known as Mithuna Sankranti, Raj Parba, the Hindu carnival is generally celebrated for three to four days in the middle of June.

Important Points

• The Ali-Aye-Ligang Festival in Assam is held every time on the first Wednesday of the month of Gimur Polo or February (Gregorian timetable).

• Ali-Aye-Ligang is a traditional carnival of Machines, the second largest lineage of Assam.

• Falgutsav, Doul Yatra, or Phakuwa is a festival of colour.

• Bihu Festival:

• Bihu is the substance of Assam and is celebrated across the state with tremendous zeal and enthusiasm.

Additional Information

• About Assam (as of 2022):

• Chief Minister: Himanta Biswa Sarma.

• Governor: Jagdish Mukhi.

• Rajya Sabha Seats: 7.

• Lok Sabha Seats: 14.

• State Animal: Indian rhinoceros.

• State Bird: White-winged duck.

• National Park: Dibru-Saikhowa National Park, Kaziranga National Park, Manas National Park, Nameri National Park, Rajiv Gandhi Orang National Park.

• Dam: Subansiri Lower Dam (Subansiri River), Karbi Langpi Dam (Borpani River).

Important Points

• Important Festivals of North East India

| State | Festivals |
|---|---|
| Manipur | Yaoshang, Porag, Chavang Kut |
| Mizoram | Chapcharkut Festival |
| Tripura | Kharchi Puja |
| Assam | Ambubachi, Bhogali Bihu, Baishagu, Dehing Patkai |
| Arunachal Pradesh | Boori Boot, Myoko, Dree, Pongtu, Monpa festival |
| Meghalaya | Nongkrem festival, Khasis festival, Wangla |
| Sikkim | Losar, Saga Dawa |

**Q6. Answer: (b) A**

Given:

• Number of students:5, namely A, B, C, D and E.

• Number of schools:5, namely K, L, M, N and O.

• Number of subjects:5, namely Hindi, Mathematics, Science, Social Science and English

Explanation :

• C studies in M

• D likes English and studies in N.

• B studies in O and does not like Social Science.

• | Student | School | Subject |

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| | | |
|---|---|---|
| **A** | | |
| B | O | Social Science |
| C | M | |
| D | N | English |
| E | | |

• E likes Hindi but is neither from O nor L.

• | Student | School | Subject |

| | | |
|---|---|---|
| **A** | **L** | |
| B | O | Social Science |
| C | M | |
| D | N | English |
| E | K | Hindi |

• The student of L likes Math.

• | Student | School | Subject |

| | | |
|---|---|---|
| **A** | **L** | **Math** |
| B | O | Science |
| C | M | Social Science |
| D | N | English |
| E | K | Hindi |

• Thus, student A studies in school L and likes Mathematics.

Hence, A is the correct answer.

**Q7. Answer: (a) Bangladesh**

The Correct Answer is Bangladesh.

Key Points

• The Chakma population is estimated to be around 60,000.

• Chakma, also called Changma, Sakuma, or Sangma, the largest of the populations of Bangladesh, also settled in a passage between northeastern India and Myanmar (Burma).

• Chakma language is an Indo- Aryan language spoken by the Chakma and Daingnet people.

• The language has common features with other languages in the region like the Chittagonian, Tanchangya, Arakanese, and, others.

Additional Information

• Chakma history says that they migrated to Arakan from the ancient area of Magadha in the present Bihar state of India.

• The Chakma and the Hajong were settled in Arunachal Pradesh between 1964- 69 by the Indian government.

• The original population was around five thousand, but at present, it's said to be close to one lakh.

• Chakmas practice Theravada Buddhism pigmented with aspects of animism and Hinduism.

Important Points

• Some Important Points about Bangladesh.

• Prime Minister - Sheikh Hasina.

• President - Mohammad Abdul Hamid.

• National Bird - Magpie Robin

• National Animal - The Royal Bengal Tiger.

• Currency - Bangladeshi Taka.

• Population - 16.47 Crores. (Acc. to 2020)

• Capital - Dhaka.

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**Q8. Answer: (b) Only conclusion II follows**

Given:

Statements

All horses are pigs.

All pigs are fishes.

To check the authenticity of Conclusions:

I. All fishes are pigs.

II. All horses are fishes.

Explanation:

The Venn diagram using the given statements can be represented as follows:

• Conclusion I → all pigs are fishes. But all fishes are pigs is not true because this is a possibility but not definite. So Conclusion I is false.

• Conclusion II → All horses are pigs and all pigs are fishes. So Conclusion II is true.

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

**Q9. Answer: (c) SY18**

Given:

NT14 : QW7 :: CR24 : FU12 :: PV36 : ?

Explanation:

The pattern followed here is:

Hence, SY18 is the correct answer.

**Q10. Answer: (d) Dr. Dheeraj Kumar**

The correct answer is Dheeraj Kumar.

Key Points

• The Shanti Swarup Bhatnagar Prize for the time 2019 in the Medical category has been awarded to Dr Dheeraj Kumar of the International Centre for Genetic Engineering and Biotechnology, New Delhi, for his outstanding work on host-directed intervention strategies to target tuberculosis.

• In Biological Science Category, Dr. Amit Singh won the award in the department of microbiology and cell biology.

• He is from the Indian Institute of Science, Bengaluru.

• In Earth, Atmosphere, Ocean, Planetary, Category, Dr. Binoy Kumar Saikia from Coal and Energy Research Group, won this award.

• In Mathematical Category, Dr. Anish Ghosh, from the academy of mathematics, won the award.

Additional Information

• Bhatnagar Award is awarded annually for notable and outstanding exploration in the following categories Biological category, Chemical category, Earth, Atmosphere, Ocean, and Planetary lines.

• It was introduced in 1958 by the Council of Scientific and Industrial Research in honour of Shanti Swarup Bhatnagar, its author-director, and recognises excellence in scientific exploration in India.

• Nallathamby Kalaiselvi has been appointed as the Director-General of the Council of Scientific and Industrial Research (CSIR) and Secretary of the Department of Scientific and Research (DSIR).

• This award has been given to 11 scientists from the country for their significant contributions to science and technology.

• Shanti Swarup Bhatnagar is also known as the "father of research laboratories" in India.

Important Points

• Awarded For- Multi-disciplinary science award.

• Sponsored By - Council of Scientific and Industrial exploration.

• First Winner - Kariamanickam Srinivasa Krishnan.

• First Awarded - 1958.

• Categories in which Shanti Swarup Bhatnagar Divided:

• Biological Sciences.

• Chemical Sciences.

• Earth, Atmosphere, Ocean, and Planetary Sciences.

• Engineering Sciences.

• Mathematical Sciences.

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• Medical Sciences.

• Physical Sciences.

• (Each Category can have multiple winners {Maximum two}).

**Q11. Answer: (b) Haryana, Punjab, and Uttar Pradesh**

The correct answer is Haryana, Punjab and Uttar Pradesh.

Key Points

• In Punjab, where it was first introduced, the Green Revolution led to significant increases in the state's agrarian affair, supporting India's overall frugality.

• The Green Revolution was the emergence of new kinds of crops, specifically wheat and rice varietals, that were suitable to double if not triadic product of those crops in two countries

• The Green Revolution within India led to an increase in agrarian products, especially in Haryana, Punjab, and Uttar Pradesh.

• Major mileposts in this undertaking were the development of a high-yielding variety of seeds of wheat and rust-resistant strains of wheat.

Additional Information

• The crop area under high-yielding kinds of wheat and rice grew vastly during the Green Revolution.

• The Green Revolution in India was initiated in the 1960s by introducing high-yielding kinds of rice and wheat to increase food products in order to palliate hunger and poverty.

• The term green revolution was first used by William Gaud and Norman Borlaug is the Father of the Green Revolution.

• In the time 1965, the government of India launched the Green Revolution with the help of a geneticist, now known as the father of the Green revolution(India)M.S. Swaminathan.

• The Green Revolution, or the Agricultural Revolution (after the Neolithic Revolution and the British Agricultural Revolution), is the set of studies on generation switch initiatives happening between 1950 and the late Nineteen Sixties.

• It became associated with chemical fertilizers, agrochemicals, controlled water-deliver (generally concerning irrigation), and greater current techniques of cultivation, which consist of mechanization.

• One leader has become agricultural scientist Norman Borlaug, the "Father of the Green Revolution", who acquired the Nobel Peace Prize in 1970.

Important Points

| **White Revolution.** | **Milk/Dairy Products.** |
|---|---|
| Blue Revolution | Fish and Aqua. |
| Silver Revolution | Eggs. |
| Yellow Revolution | Oil Seeds |
| Pink Revolution | Pharmaceuticals, Prawns and Onion. |

**Q12. Answer: (d) Finance Commission**

The correct answer is Finance Commission.

Key Points

• Finance Commission measures needed to augment the Consolidated Fund of a State to supplement the resources of the Panchayats and Municipalities in the State on the basis of the recommendations by the Finance Commission of the State.

• The Finance Commission is composed by the President under article 280 of the Indian Constitution, mainly used to give its recommendations on the distribution of tax revenues among the Central and the States themselves.

• The finance committee was established on 22 November 1951.

Additional Information

• NITI AAYOG stands for National Institution for Transforming India.

• Its function is to encourage cooperative federalism by structured support initiatives and mechanisms with the States on a continuous basis, recognizing that strong States make a strong nation.

• The role of the Comptroller and Auditor General is to audit receipts and expenditures of the Union and each State and the Union Territory Governments.

• Finance Ministry is responsible for financial rules and regulations, financial sanctions relating to all Ministries and offices of the Government of India,

• It also advises Ministries and government undertakings on Cost Account matters, and expenditure proposals relating to the Delhi Administration.

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**Q13. Answer: (d) 11 m**

Given:

• Point A is 15 m to the west of Point C.

• Point B is 22 m to the north of Point C.

• Point D is 18 m to the east of Point B.

• Point E is 11 m to the south of point D.

• Point X is 33 m to the west of Point E.

To find: The shortest distance between Point A and Point X.

Explanation:

The shortest distance between Point A and Point X is 11m.

Hence, 11m is the correct answer.

**Q14. Answer: (a) IIT Kanpur**

The correct answer is IIT Kanpur.

Key Points

• IIT Kanpur developed a digital certificate using Block Chain-driven technology.

• The digital instruments are stored on a digital hold all installed on the mobile bias of the donors.

• The instruments issued using the SSI- enabled blockchain-driven technology are unforgeable, Existential, widely disclosable, and sensitive to stoner content.

• The thing of blockchain is to allow digital information for recording and distributing, but not editing.

• In this way, a blockchain is a foundation for inflexible checks, or records of deals that can not be altered, deleted, or destroyed.

Additional Information

• Blockchain is a participated, inflexible tally that facilitates the procedure of recording deals and tracking means in a business network.

• An asset can be Visible(a house, auto, cash, land) or Untouchable(intellectual property, patents, imprints, branding).

• It'll produce a trusted, unfilterable, uncensorable depository of data and information that's accessible worldwide.

• It's this characteristic that will drive the creation of the third generation of the internet. And this is why the blockchain is the future of the internet.

• 56% of Indian businesses are moving towards blockchain technology

• The countrywide Informatics Centre has established a Centre of Excellence (CoE) in Blockchain technology which operates as a coordinated, interoperable blockchain atmosphere around the country.

**Q15. Answer: (b) 80640**

Given:

Length : width : height = 60 : 24 : 7

Diagonal = 130 cm

Concept used:

$d^2 = l^2 + b^2 + h^2$

Volume of a cuboid = l × b × h

Here,

d = diagonals

l = length

b = breadth or width

h = height

Calculation:

Let the length, width, and height of the cuboid be 60x, 24x, 7x

According to the question,

$130^2 = (60x)^2 + (24x)^2 + (7x)^2$

$\Rightarrow 16900 = 3600x^2 + 576x^2 + 49x^2$

$\Rightarrow 16900 = 4225x2$

$\Rightarrow x2 = 16900/4225$

$\Rightarrow x2 = 4$

$\Rightarrow x = 2$

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So, length = 60 × 2 = 120 cm

width = 24 × 2 = 48 cm

height = 7 × 2 = 14 cm

Now,

Volume = 120 × 48 × 14

=> 80640

So, volume of the cuboid 80640 $cm^3$

Therefore The volume (in $cm^3$) of the cuboid is 80640.

**Q16. Answer: (b) (947, 1218), (861, 1304), (787, 1378)**

The pattern followed here is:

1. (787, 1378), (947, 1304), (861, 1218)

• 787 + 1378 = 2165

• 947 + 1304 = 2251

• Thus, the sums of the terms in these two sets are different.

2. (947, 1218), (861, 1304), (787, 1378)

• 947 + 1218 = 2165

• 861 + 1304 = 2165

• 787 + 1378 = 2165

• The sum in each set is equal.

3. (861, 1218), (947, 1378), (787, 1304)

• 861 + 1218 = 2079

• 947 + 1378 = 2325

• Thus, the sums of the terms in these two sets are different.

4. (947, 1304), (861, 1378), (787, 1218)

• 947 + 1304 = 2251

• 861 + 1378 = 2039

• Thus, the sums of the terms in these two sets are different.

Hence, option 2 is the correct answer.

**Q17. Answer: (b) Simplex**

The correct answer is Simplex.

Key Points

• The simplex type of Data transmission Mode does not support any Bidirectional data transmission.

• The simplex mode is used in the business field as in deals that don't bear any corresponding reply.

• Transmission mode means transferring data between two biases.

• It's also known as a communication mode.

• Bidirectional is a communications mode this is capable of transmitting records in both directions (send and acquire), however now not at the same time.

• The mediums that are frequently used for bidirectional conversation are e-mail messages, face-to-face conversations or smartphone conversations.

Additional Information

• The transmission mode is also known as the communication mode.

• The transmission mode is defined in the physical sub caste.

• A Walkie-Talkie is an example of the Half- duplex mode. In Walkie-talkie, one party speaks, and another party listens.

• The most common example of the full-duplex mode is a telephone network.

• There are three type of Transmission mode

• Simple mode

• Half Duplex mode.

• Full Duplex mode.

• In Simplex mode, the communication is unidirectional, as on a one-way road.

• In half-duplex mode, each station can both transmit and admit, but not at the same time

• In full-duplex mode, both stations can transmit and admit contemporaneously.

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**Q18. Answer: (b) Physics**

The correct answer is Physics.

Key Points

• Giorgio Parisi takes his Nobel Prize on Wednesday 8 December 2021.

• Giorgio Parisi also won Wolf Award(2021), and the Max Planck medal (2021).

• He was awarded the 2021 Nobel Prize for Physics for his work on spin glasses, which proved widely applicable in the study of complex systems.

• Spin spectacles are liquid equipment into which many glamorous titles are introduced.

Additional Information

• Nobel prizes are provided yearly for great work in physics, chemistry, physiology or medicinal drug, literature, economics, and the promotion of peace.

• The Nobel Prizes, first offered in 1901, are decided via contributors of Swedish found out societies or, in the case of the peace prize, the Norwegian Parliament.

• A never-ending exploration was driven by means of intellectual passion.

• The Nobel Prize in Literature 2021 turned into awarded to Abdulrazak Gurnah for his uncompromising and compassionate penetration of the results of colonialism and the fate of the refugee in the gulf among cultures and continents."

Important Points

• Other Nobel prize winner in 2021.

• Chemistry - Benjamin List.

• Physiology or drug- David Julius and Ardem patapoutian.

• Nobel prize in Peace- Dmitry Muratov and Maria Ressa.

• Nobel Prize in Literature- Abdulrazzak Gurnah.

**Q19. Answer: (b) 1977**

The correct answer is 1977.

Key Points

• The Government of India launched the Food for Work Program'(FWP) in April 1977.

• The program is open to all Indian poor who are ready to do homemade unskilled labour work and are in the need of pay envelope employment.

• It's enforced as a centrally- patronized scheme.

• The program has ago been contained in the National Rural Employment Guarantee Act(NREGA) of 2005 which has come into force in 200 linked sections of the country including 150 NFFWP sections.

• MGNREGA is now the principal right-grounded employment guarantee scheme.

• The National Food for Work program was intermingled with NREGA latterly.

Additional Information

• Latterly in 2006, the Food for Work Program got intermingled with Mahatma Gandhi's National Rural Employment Guarantee Act with numerous changes in policy enactment, perpetration, and control.

• Presently, the Food for Work Programme is one and the same part of(the MGNREGA) Act, Mahatma Gandhi National Rural Employment Act, which guarantees the " right to work " and ensures a minimum of 100 days of work for the pastoral poor as livelihood security.

**Q20. Answer: (d) 4**

Given:

The variable x takes integer values with $0 \le x \le 4$.

Concept used:

The mode of a continuous random variable is the value at which the probability density function, f(x), is at a maximum

Calculation:

For x = 0

f(0) = 1 + 0 + 0(0 − 1) + 1/2 .0.(0 − 1)(0 − 2) − 1/3 .0.(0 − 1)(0 − 2)(0 − 3)

=> 1 + 0 + 0 + 0 - 0

=> 1

For x = 1

f(0) = 1 + 1 + 1(1 − 1) + 1/2 .1.(1 − 1)(1 − 2) − 1/3 .1.(1 − 1)(1 − 2)(1 − 3)

=> 1 + 1 + 0 + 0 - 0

=> 2

For x = 2

f(0) = 1 + 2 + 2(2 − 1) + 1/2 .2.(2 − 1)(2 − 2) − 1/3 .2.(2 − 1)(2 − 2)(2 − 3)

=> 1 + 2 + 2 + 0 - 0

=> 5

For x = 3

f(0) = 1 + 3 + 3(3 − 1) + 1/2 .3.(3 − 1)(3 − 2) − 1/3 .3.(3 − 1)(2 − 2)(3 − 3)

=> 1 + 3 + 6 + 3 - 0

=> 13

For x = 4

f(0) = 1 + 4 + 4(4 − 1) + 1/2 .4.(4 − 1)(4 − 2) − 1/3 .4.(4 − 1)(4 − 2)(4 − 3)

=> 1 + 4 + 12 + 12 - 8

=> 21

So, for x = 4

The equation is heighest

So, mode of x = 4

Therefore Required answer is 4.

**Q21. Answer: (b) 266**

Given:

18 + 48 ÷ 12 × (32 ÷ 4)2 − 8

Concept used:

Calculation:

18 + 48 ÷ 12 × (32 ÷ 4)2 − 8

=> 18 + 48 ÷ 12 × 82 − 8

=> 18 + 4 × 82 − 8

=> 18 + 4 × 64 − 8

=> 18 + 256 − 8

=> 274 − 8

=> 266

Therefore Required answer is 266.

**Q22. Answer: (d) Megha Majumdar**

The correct answer is Megha Majumdar.

Key Points

• Megha Majumdar is an Indian, who lives in New York City.

• Her novel, A Burning, was her debut novel.

• In 2022 her Novel "A Buning" had won a Whiting Award.

• The Yuva Puraskar, also referred to as Sahitya Akademi Yuva Puraskar is a literary honor in India that Sahitya Akademi.

Additional Information

• Author Namita Gokhale won the Sahitya Akademi Award 2021 in English for her novel effects to Leave Behind'; the award was given to 19 other authors in colourful languages.

• Ganga Sharma Come to be the first girl from Jammu and Kashmir to be conferred with the celebrated Sahitya Akademy Yuva Award 2020 for her Poetry compilation “Mannae Da Boaal.”

• Yashica Dutt is a leading anti-caste expert, journalist and the award-prevailing creator of the non-fiction memoir, popping out as Dalit.

• Yuva Puraskar winner from the state is Bipasha Bora for her brief story collection Mou Makshi Samrajya.

**Q23. Answer: (b) Koman - Kerala**

The correct answer is Koman - Kerala.

Key Points

• Koman agriculture

• Koman agriculture is found in Orissa.

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• Kerala produces 96% of the country's national output of pepper.

• The important spices are cardamom, cinnamon, clove, turmeric, nutmeg and vanilla.

• Other cash crops that constitute the agricultural sector include tea, coffee cashew, pulses, areca nut, ginger and coconut.

Additional Information

• The 'slash and burn agriculture is called 'Kuruwa' in Jharkhand.

• The 'slash and burn' agriculture is burned 'Valre' in Jharkhand. The 'slash and burn' agriculture is called 'Conuco' in Conocohand.

• Podu is a form of shifting agriculture using slash-and-burn methods. Traditionally used on the hill-hill slopes of Andhra Pradesh,

• This primitive form of cultivation is called 'Beware' or 'Dahiya' in Madhya Pradesh,

**Q24. Answer: (a) John Maynard Keynes**

The option is John Maynard Keynes.

Key Points

• The General Theory of Employment, Interest, and Money are a book by English economist John Maynard Keynes published in February 1936.

• “The Price of Peace”: Biography of John Maynard Keynes Wins Prestigious Arthur Ross Book Award.

• John Maynard Keynes is regarded as the founder of modern macroeconomics.

Additional Information

• Capitalism and Freedom are rightfully regarded as one of the most popular Milton Friedman books and one of the best-dealing Friedman books. Capitalism and Freedom were published in the time of 1962.

• Adam Smith is also known as" The Father of Economics" or" The Father of Capitalism", he wrote two classic business units, The Theory of Moral Sentiments(1759) and the Wealth of Nations(1776).

• Essays in Economic Theory, by Vincent Crawford was first published in 1983.

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

The correct answer is Rajgriha.

Key Points

• The core of the area was the area of Bihar south of the Ganges; its first capital was Rajagriha(ultramodern day Rajgir), also Pataliputra(ultramodern Patna).

• Pataliputra, conterminous to ultramodern- day Patna, was a megacity in ancient India, firstly erected by Magadha sovereign Ajatashatru in 490 BCE as a small stronghold(Pātaligrāma) near the Ganges swash.

• It came the capital of major powers in ancient India, similar as the Shishunaga Empire(c. 413 – 345 BCE), Nanda Empire(c. 460 or 420 – 325 BCE), the Maurya Empire(c. 320 – 180 BCE), the Gupta Empire(c. 320 – 550 CE), and the Pala Empire(c. 750 – 1200 CE). During the Maurya period(see below), it came as one of the largest metropolises in the world.

• Rajagriha was originally known as' Girivrijja' and latterly came to be known as so during the reign of Ajatashatru.

• Udayin laid the foundation of the megacity of Pataliputra at the convergence of two waterways, the Son and the Ganges. He shifted his capital from Rajgriha to Patliputra due to the latter's central position in the conglomerate.

Additional Information

• It was the ancient capital megacity of the Magadha lords until the 5th century BC when Udayin(460 – 440 BC), son of Ajatshatru, moved the capital to Pataliputra(ultramodern Patna). Shishunaga(413- 395 BC) innovated the Shishunaga dynasty in 413 BC with Rajgir as its original capital before it was moved to Pataliputra.

• Ajatashatru, who shifted the capital of Magadha from Girivraj to Pataliputra(ultramodern Patna, Bihar). Ever ago, Pataliputra has remained the capital of that fiefdom, down to this day.

• It was King Bimbisara(543- 491 BCE) of the Haranyaka Dynast who ruled Magadha, made Rajgir his capital.

Important Points

• The alternate capital of Magadha was Pataliputra(present-day Patna).

• The megacity of Rajgir was the first seat of power in the ancient area of Magadha – the state center of the important Mauryan emperors.

• The Rajgir Hills, also known as" Rajgriha" hills, lie near the megacity of Rajgir in central regions of the Indian state of Bihar.

**Q26. Answer: (b) Neither conclusion I nor II follows.**

Given:

Statements:

All dusters are balls.

All cups are balls.

Conclusions:

I. All balls are cups.

II. No duster is a cup.

Explanation:

These questions are solved using the Venn diagram method.

Using the statements, the Venn diagram is as follows:

• Conclusion I → Does not follow (it is possible but not definite)

• Conclusion II → Does not follow (it is possible but not definite)

Hence, Neither I nor II conclusion follows is the correct answer.

**Q27. Answer: (c) 48**

Shortcut Trick

Ansh current speed = 35 km / (50/60) h = 42 km/h.

Ratio of Usual speed to Current speed = 8 : 7.

7 units = 42 km/h.

1 unit = 6 km/h.

Usual speed (8 units) = 8 × 6 = 48 km/h.

Therefore The correct option is C.

Alternate Method

Given:

Reduced speed = 7/8 of usual speed

Distance covered = 35 km

Time taken = 50 minutes = 50/60 h = 5/6 h

Formula Used:

Speed = Distance ÷ Time

Start

End

Distance = 35 km

Time = 5/6 hr

S = 7/8 × Usual Speed

=> Current speed = 35 ÷ (5/6)

=> Current speed = (35 × 6) ÷ 5

=> Current speed = 7 × 6 = 42 km/h

=> Let usual speed be V.

=> 42 = (7/8) × V

=> V = (42 × 8) ÷ 7

=> V = 6 × 8 = 48 km/h

Therefore The correct option is C.

Additional Information

Speed-Time Relation

When the distance is constant, speed is inversely proportional to time: S1 × T1 = S2 × T2.

Unit Conversion

To convert speed from km/h to m/s, multiply by 5/18. To convert from m/s to km/h, multiply by 18/5.

Average Speed

Average speed is calculated as the total distance covered divided by the total time taken: V_(avg) = Total Distance ÷ Total Time.

**Q28. Answer: (b) Chenab**

The correct answer is Chenab.

Key Points

• The Indian Railway has completed the world's loftiest road- bow ground over the Chenab River in Jammu and Kashmir.

• Chenab Rail Bridge is an Indian road sword and concrete bow ground between Bakkal and Kauri in the Reasi quarter of Jammu and Kashmir, India.

• The ground has a total length of 473.25 meters, while the length of the viaduct is 120 meters and the central dam 94.25 meters, according to officers, adding it's supported by 96 lines.

• In April 2021 the Chenab Rail Bridge's bow was completed and it's anticipated to open to rail business in December 2022.

Additional Information

• Before Chenab Rail Bridge, Indian Railroads' ambitious Bilaspur- Manali- Leh line along the India- China border, is touted to be the world's loftiest rail track. After its completion, Taglang La will come the loftiest road station in the world at a height of,359 mt above ocean position.

• The world's longest ground is the Danyang – Kunshan Grand Bridge in China.

• Pir Panjal road Lair, the11.2 km long road lair, passes through the Pir Panjal Range of the middle Himalayas in Jammu and Kashmir.

• Dhola Sadiya ground is the first largest ground in India.

• Dibang River Bridge is the alternate-longest ground in India.

Important Points

• Chenab Rail Bridge length 1315 m(4314 ft), including the 650 m (2,130 ft) long viaduct on the northern side

**Q29. Answer: (d) Rs. 4,800**

Given:

A sum becomes Rs. 19360 in 2 years and Rs. 21296 in 3 years

Concept used:

A = P(1 + r/100)^t

S. I = Ptr/100

Here,

P = principal

t = time

r = rate

A = amount

Calculation:

Let the sum be Rs. P and the rate be r

According to the question,

19360 = $P(1 + r/100)^2$ ----(i)

21296 = P(1 + r/100)3 ----(ii)

By dividing eq (i) from eq (ii) we get,

21296/19360=$(P(1 + r/100)^3)/(P(1 + r/100)^2)$

=> 11/10=(1 + r/100)

=> 11/10=((100 + r)/100)

=> 1100 = 1000 + 10r

=> 10r = 100

=> r = 100/10

=> r = 10

So, rate = 10%

Now putting the value of r in the eq (i) we get,

19360 = $P(1 + 10/100)^2$

=> 19360 = $P(1 + 1/10)^2$

=> 19360 = P(11/10)2

=> 19360 = 121P/100

=> P = 19360 × (100/121)

=> P = 16000

So, sum = Rs. 16000

Now,

S. I = (16000 × 3 × 10)/100

=> S. I = 160 × 3 × 10

=> S. I = 4800

So, simple interest = Rs. 4800

Therefore The simple interest on the same sum at the same rate of interest for 3 years is Rs. 4800.

**Q30. Answer: (a) SVX**

The pattern followed here is:

Hence, SVX is the correct answer.

**Q31. Answer: (b) The US Constitution**

The correct answer is the USA.

Key Points

• Judicial Review refers to the power of the Supreme Court(or High Courts) to observe the constitutionality of law if the Court comes to the conclusion that the law is inconsistent with the vittles of the Constitution, such a law is pronounced as unconstitutional and in suitable.

• India has espoused certain features like abecedarian rights, judicial review, independence of bar, functions of chairman and vice-president, and indictment of the President from the U.S.A.

• The law has to pass the test of constitutionality if it qualifies it can be made a law. On the negative, the court can declare it null and void.

Additional Information

• Lord Cornwallis Governor-General from Warren Hastings in 1786. In the times 1787, 1790, and 1793, he introduced judicial reforms.

• Article 372(1) establishes the judicial review of the there-constitution legislation. Composition 13 declares that any law which contravenes any of the vittles of the part of Fundamental Rights shall be void.

• Judicial Review is governed by the principle of “Procedure established by law” as given in Article 21 of the Indian Constitution.

• Judicial review gives the strength of the courts to declare the constitutionality of acts of organs of Government and declare it unconstitutional if it violates or is inconsistent with the introductory principles of the Constitution.

Important Points

• The main point espoused in the Irish Constitution is the provision of the Directive Principles of State Policy(DPSP).

• The U.S. Constitution, for illustration, protects judicial independence in two ways. First, Composition III says that civil judges may hold their positions “ during good Behaviour. ” In effect, they've continuance movables as long as they satisfy the ethical and legal norms of their judicial office.

• Neelakanta Ramakrishna Madhava Menon was an Indian civil menial, counsel, and legal preceptor, considered by numerous as the father of ultramodern legal education in India.

**Q32. Answer: (a) North America**

The correct answer is North America.

Key Points

• The Appalachians, located in the Central and Southern regions, It is one of the most biodiverse locations in North America

• the Appalachian Mountains, which are also known as the Appalachians, a great highland system of North America, and the eastern part of the Rocky Mountains.

• The Region's 26 million live in parts of Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and Virginia, and all of West Virginia.

• Most of the parts of the Appalachian region are mountainous and rocky while others do have flat fertile lands. Many other of crops are grown in this region including fruits, berries, grain, and potatoes. They are grown mostly in the Annapolis Valley.

• The Appalachian Mountains formed from terrane accretion and the collision of Gondwanaland with ancient North America as the Iapetus Ocean close

Additional Information

• Mountain Peak - Country.

• Atna Peaks - Alaska.

• Avalanche Peak - Yukon.

• Bald Mountain - Colarado.

• Denali - Alaska.

• Mount Darwin - California.

• Mount Dubois - California.

**Q33. Answer: (c) 8 1/3**

Given:

Time = 5 years

Sum become 160% of itself after 5 years

Concept used:

S.I = Ptr/100

Here,

P = Principal or sum

r = rate

t = time

Calculation:

Let the sum be 100P and rate of interest be r

So, after the amount = 100P × 160%

=> 160P

So, interest in 5 years = 160P - 100P

=> 60P

Now,

60P = (100P × 5 × r)/100

=> 60P = 5Pr

=> 5r = 60

=> r = 60/5 = 12

So, rate = 12%

Now,

Double of sum = 200P

So, interest = 200P - 100P

=> 100P

Now,

Let time for the sum to become double of itself be t

So,

100P = (100P × t × 12)/100

=> 100P = 12Pt

=> 12t = 100

=> t = 100/12

=> t = 8 1/3

So, the required time is 8 1/3

Therefore In 8 1/3 years will the sum double itself under the same rate of interest.

**Q34. Answer: (a) A + B → AB**

The correct answer is A + B → AB.

Explanation:

Combination reaction:

• It is a reaction where two or more elements or compounds combine to form a single compound.

• Such reactions are represented by equations of the following form: X + Y → XY.

• The combination of two or more elements to form one compound is called a combination reaction.

• Example of combination reaction is Mg(s) + Cl2(g) → Mgcl2(s)

Additional Information

• Decomposition reaction: The opposite of a combination reaction, a complex molecule breaks down to make simpler ones. Such reactions are represented by equations of the following form: AB → A + B.

• Precipitation reaction: Two solutions of soluble salts are mixed resulting in an insoluble solid (precipitate) forming. Such reactions are represented by equations of the following form: A + Soluble salt B → Precipitate + soluble salt C.

• Neutralization reaction: An acid and a base react with each other. Generally, the product of this reaction is salt and water. Such reactions are represented by equations of the following form: Acid + Base → Salt + Water.

• Combustion reaction: Oxygen combines with a compound to form carbon dioxide and water.

• These reactions are exothermic, meaning they give off heat.

• Such reactions are represented by equations of the following form: A + O2 → H2O + CO2.

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• Displacement reaction: One element takes place with another element in the compound. Such reactions are represented by equations of the following form: A + BC → AC + B.

**Q35. Answer: (c) W**

Given:

• Total number of people = 10

• People in each row = 5

• People facing North = 5, namely A, B, C, D and E in Row 1.

• People facing South = 5, namely V, W, X, Y and Z in Row 2.

Explanation:

• A sits second from the left end of the row.

• V faces an immediate neighbour of A.

• W sits second to the left of V.

• The one who faces W, sits to the immediate left of B

• B cannot be placed in case (a) as no on sits to the left of W. So, case (a) is eliminated.

• E sits at one of the positions to the right of B.

• Z faces an immediate neighbour of E.

• Neither X nor D sit at any of the extreme ends of the row.

• This is the final result of the arrangement.

• W faces D.

• Hence, W is the correct answer.

**Q36. Answer: (c) Rs. 550**

Shortcut Trick

Let the Cost Price (CP) be 100%.

Profit of 8% => SP1 = 108%

Loss of 13% => SP2 = 87%

Difference in percentages = 108% − 87% = 21% (or simply 8% + 13% = 21%).

Given: 21% = Rs. 115.50

Therefore 100% (CP) = (115.50 ÷ 21) × 100 = 5.5 × 100 = Rs. 550.

Therefore The correct answer is Rs. 550.

Alternate Method

Given: Profit% = 8%, Loss% = 13%, Difference in SP = Rs. 115.50.

Formulas: SP = CP × (100 + Profit%) ÷ 100 | SP = CP × (100 − Loss%) ÷ 100

=> Let CP be x.

=> SP1 = 1.08x and SP2 = 0.87x

=> 1.08x − 0.87x = 115.50

=> 0.21x = 115.50

=> x = 115.50 ÷ 0.21 = 550

Therefore The correct answer is Rs. 550.

Additional Information

Profit and Loss Gap

When comparing a profit and a loss scenario for the same item, the total difference in Selling Price is the sum of the profit and loss percentages. Formula: CP = (Difference in SP) ÷ (Profit% + Loss%) × 100.

Cost Price Calculation

The Cost Price is always considered as the base (100%) for calculating profit or loss percentages unless specified otherwise.

**Q37. Answer: (a) 1919**

The correct answer is 1919.

Key Points

• On 6 April 1919, Mahatma Gandhi started a non-violent Satyagraha against the British.

• The Champaran Satyagraha of 1917 was the first Satyagraha movement led by Gandhi in India and is also known as an

important revolution in the Indian Independence Movement.

• It was a farmer's revolution that took place in the Champaran quarter of Bihar, India, during the British colonisation, Rowaltt Act was passed by the British government.

• This Act which gave the Police more power was against the people. The Act was called as " No Dalil, No Vakil, No Appeal.

Additional Information

• Under the Government of India Act (1935), Bengal has constituted as an autonomous province in 1937. That remained the situation until the Indian subcontinent was partitioned into the two dominions of Pakistan and India after the British withdrawal in 1947.

• The British Indian government announced the "Eight Unit Scheme of Indianisation" of the Indian Army, to be under the command of Indian military officers with the certification as King's Commissioned Indian Officer (KCIO) after training at the one of the military institutes in Brita

**Q38. Answer: (c) Carolus Linnaeus**

The correct option is Carolus Linnaeus.

Key Points

EXPLANATION:

Carolus Linnaeus:

• Carolus Linnaeus is best known for Scientific classification and Binomial nomenclature.

• He is also known as the father of modern taxonomy.

• He is also known by the name Carl von Linne.

• He created a new system of classification for all living things.

• This nomenclature system was given by him in his book 'Species Plantarum'.

• In this technique, any living organism is named in two parts.

• For example - the fruit mango is called "Mangifera indica",

• In this 'Magnifera' is the name showing its genus while 'indica' shows the script.

Additional Information Dmitri Mendeleev:

• The Periodic table is discovered by Dmitri Mendeleev.

• Dmitri Mendeleev laid the foundation of the modern periodic table.

• He organized elements into groups and rows according to their physical and chemical behavior.

• Mendeleev arranged elements based on their atomic mass and physical properties.

• Mendeleev also predicted some properties of unidentified elements that were expected to fill gaps within the table.

John Dalton:

• In 1808, John Dalton first proposed an atomic theory of matter and he named it Dalton's atomic theory.

• Dalton’s atomic theory was able to explain the law of conservation of mass, the law of constant composition, and the law of multiple proportions very successfully

• As per the theory, all matter whether it is a mixture, compound, or element, consists of invisible particles called ‘atoms’.

Claude Louis Berthollet:

• Claude Louis Berthollet was a Savoyard-French chemist.

• He is known for his scientific contributions to the theory of chemical equilibria via the mechanism of reverse chemical reactions.

• He was the first to demonstrate the bleaching action of chlorine gas.

• He was the first to develop a solution of sodium hypochlorite as a modern bleaching agent.

**Q39. Answer: (a) Haryana**

The correct answer is Haryana.

Key Points

• Haryana’s Minister of State for Sports and Youth Affairs, Sandeep Singh launched ‘ Khel Nursery Scheme 2022- 23 ’ to promote sports in the state

• The players of Haryana have given a new identity to the state at the transnational position with their sports gift. The state government is always seeking to develop new sports bents in the state.

• The scheme promotes sports nurseries that will be started in government, private educational institutions, and private sports institutions.

• The minister said players of Haryana have given a new identity to the state at the transnational position with their sports gift.

• The state government is always seeking to develop new sports bents in the state. He said the Haryana government is reaching out to similar youths who can bring orders.

• Resources related to sports are being expanded in the state.

Additional Information

• Scheme Name- Khel Nursery Scheme.

• Scheme Under- Haryana Government.

• Blazoned By- State Sports and Youth Affairs Minister Sandeep Singh.

• Start Date- 2022

• Perpetration By- Department of Sports and Youth Affairs, Haryana.

• Major Ideal- To expand the sport's coffers and nurture the youthful sports gift in the state.

**Q40. Answer: (d) 12 √3**

Given:

Radius of the circle = 12 cm

Concept used:

If an equilateral triangle is inscribed in a cirlce then,

r = a/√3

Here,

r = radius of the circle

a = side of the equilateral triangle

Calculation:

In ΔABC

AB = BC = CA = side of the equilateral triangle

OA = OC = OB = 12 cm = radius of the circle

Let side of the triangle be a

So, according to the question,

12 = a/√3

=> a = 12√3

So, side of the triangle = 12√3 cm

Therefore The length of each side of the triangle ABC (in cm) is 12√3.

**Q41. Answer: (d) 24-18-40-6-16-18**

Given:

• CHERRY' is coded as '6-16-10-36-36-50'.

• 'GRAPES' is coded as '14-36-2-32-10-38'

• To find: Code for 'LITCHI'.

Explanation:

Using the above information, code for LITCHI will be 24-18-40-6-16-18.

24-18-40-6-16-18 is the correct answer.

**Q42. Answer: (d) A U B / C / D U E**

Given:

'P + Q' means 'P is the father of Q',

'P − Q' means 'P is the mother of Q',

'P / Q' means 'P is the sister of Q',

'P U Q' means 'P is the son of Q',

'P ∩ Q' means 'P is the daughter of Q',

Explanation:

• Option 1: A ∩ B ∩ C / D + E

• • Here, A is a female. So, this option is incorrect.

• Option 2: A / B U C U D / E

• • Here, A is a female. So, this option is incorrect.

• Option 3:A / B + C − D U E

• • Here, A is a female. So, this option is incorrect.

• Option 4: A U B / C / D U E

• • Here, A is the son of E's daughter, B.

• Hence, A U B / C / D U E is the correct answer.

**Q43. Answer: (d) 35**

Given:

Numbers are 875, 245, and 1225

Concept used:

The highest common factor or HCF of two or more numbers is the greatest number that divides exactly the given numbers.

Calculation:

$875 = 5^3 \times 7$

$245 = 5 \times 7^2$

$1225 = 5^2 \times 7^2$

HCF of these three numbers = $5 \times 7$

=> 35

Therefore Required HCF of the numbers is 35.

**Q44. Answer: (c) Mandolin**

The correct answer is Mandolin.

Key Points

• A mandolin is a stringed consumed music instrument in the flute family and it is generally plucked with a plectrum. It most generally has four courses of doubled essence.

• Mandolins are involved in flute family instruments in Europe.

• The Mandolin has most generally four courses of doubled essence strings tuned in accord, therefore giving an aggregate of 8 strings, although five(10 strings) and six(12 strings) course performances are also live.

• There are numerous styles of mandolin, but the three most common types are the Neapolitan or round-backed mandolin, the archtop mandolin, and the flat-backed mandolin

Additional Information

• Percussion Instrument

• Percussion instruments include any instrument that makes a sound when it's hit, shaken, or scraped.

• The common percussion instruments in the symphony include the timpani, xylophone, cymbals, triangle, snare barrel, brass barrel, tambourine, maracas, gongs, chimes, celesta, and piano.

• The mridangam is a percussion instrument of ancient times. It's the primary metrical incident in a Carnatic music ensemble.

• Both Indians and Carnatic styles are corrected by a plethora of instruments classified under Stringed Instruments(Veena, Sitar, Sarod, Gottuvadyam, Santoor, Tambura, Chitraveena etc), Bowed instruments(Violin, Sarangi) Wind instruments(Flute, Shehnai, Nadaswaram etc.)

Important Points

• The ghatam is the most ancient percussion type of instrument in India. It's a complexion pot with a narrow mouth. From the mouth, it slants outwards to form a crest.

• The conception of Mridangamela was developed by Korambu Subrahmanian Namboodiri and is presently propagated by Korambu Vikraman Namboodiri.

• The morsing is an instrument analogous to the Jew's harp, substantially used in Rajasthan, in the Carnatic music of South India, and in Sindh, Pakistan.

**Q45. Answer: (a) Statement I is the cause and statement II is its effect**

Briefly discussing the concept,

• Cause is the reason why event has occurred.

• Effect is the outcome of the cause.

• In addition to this, these statements may be either independent causes or may be the effects of independent causes or a common cause.

Given:

Statements:

I. A substantial increase in the spread of COVID positive cases especially among people less than 18 years of age is expected in the city during the next 2 months.

II. The government has announced that all schools will remain closed until the COVID situation subsides.

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Explanation:

• Statement I describes the substantial rise of infection among people less than 18 years of age due to COVID.So, statement I adheres to Cause.

• Statement II shows light on the effective measures taken by the government as the affected age group is related to students going to school. This follows the outcome of the cause. Thus statement II is its effect.

Hence, Statement I is the cause and statement II is its effect is the correct answer.

**Q46. Answer: (d) Lithium, Sodium, Potassium**

The correct answer is Lithium, Sodium, or Indium.

Key Point

• Melting and Boiling Points:

• Essence has high melting and boiling points.

• Tungsten actually has one of the highest melting points of all elements, not the lowest. It melts at around 3422°C (6192°F). Its boiling point is also very high, at about 5555°C (10031°F).

On the other hand, mercury has one of the lowest melting points of all metallic elements, melting at -38.83°C (-37.89°F). Its boiling point, however, is not the lowest; it boils at 356.73°C

• Sodium and potassium also have low melting points.

Additional Information

• The melting point of a pure substance is always advanced and has a lower range than the melting point of an impure substance or, more generally, of fusions. The more advanced the volume of other factors, the lower the melting point and the broader will be the melting point range, frequently appertained to as the" doughy range".

• Lithium, Sodium, and Potassium essence are soft because the cohesive forces between these essences are veritably weak, therefore these essences have a soft texture and are fluently cut with a cutter.

• Essence like Gold and Iron is hard and thick. They're malleable and ductile. They're veritably tough and it's nearly insolvable to be cut with a cutter.

• If an object is light for its size it has a low viscosity. A pebble is heavy for its size, compared to a piece of popcorn which is light for it's size.

**Q47. Answer: (a) The Palk Strait and the Gulf of Mannar**

The correct answer is The Palk Strait and the Gulf of Mannar.

Key Points

• Sri Lanka is separated from India by a narrow channel of sea formed by The Palk Strait and the Gulf of Mannar.

• The Palk Strait connects India (Tamil Nadu) with Sri Lanka (Jaffna).

• The Mannar Gulf is located near Mannar Island in Sri Lanka.

• Adam's Bridge (Rama Setu), which is 50 kilometres long, connects the Palk Strait with the Gulf of Mannar.

• The Gulf of Mannar is a huge shallow harbour in the Indian Ocean that is part of the Laccadive Sea.

• The Coromandel Coast region is located between the southeastern tip of India and the west coast of Sri Lanka.

Additional Information

• The Gulf of Mannar is a small harbour in the Indian Ocean's the Laccadive Sea. The Gulf of Mannar is separated from the Palk Strait, which lies to the north between India and Sri Lanka, by Adam's Bridge, also known as Ramsethu, which includes Mannar Island.

• The Malacca Strait is a canal that connects the Andaman Sea (Indian Ocean) to the South China Sea (Pacific Ocean).

• Palk Strait is a Bay of Bengal strait located between southern India and northern Sri Lanka. Pamban Island (India), Adam's (Rama's) Bridge (a chain of shoals), the Gulf of Mannar, and Mannar Island border it on the south (Sri Lanka).

**Q48. Answer: (d) 20^(th)**

Given:

• Position of P from left end = 17

• Position of P from right end = 23

• Q is in the middle of the row.

To find: Position of Q from left end.

Explanation:

• Total number of students = Position of P from left end+Position of P from right end - 1

• 17 + 23 - 1 = 39

• So, the position of Q from left end = (total number of students + 1) / 2 = (39 + 1) / 2 = 20th

Hence, 20th is the correct answer.

**Q49. Answer: (c) Both statements I and II together are sufficient to answer the question**

Data sufficiency can be dealt in the following ways:

• Two statements are provided which will help in determining whether the question can be answered or not.

• If only one statement(individually) can help in answering the question, then the answer will be chosen from option 2 or option 4.

• Then, we will check whether both statements together are required to solve the question, choose option 3, otherwise option 1.

Explanation:

Statement I:

• There are more than 30 but less than 37 workers in the factory.

• 31 ≤ number of workers ≤ 36

Statement II:

• There are more than 34 but less than 41 workers in the factory.

• 35 ≤ number of workers ≤ 40.

• The number of workers in the factory can be divided into two groups in such a manner that each group contains an equal number of workers.

• number of workers = 36, or 38, or 40.

Combining statement I and II, we get 36 as the answer.

Hence, Both statements I and II together are sufficient to answer the question is the correct answer.

**Q50. Answer: (c) 19/360**

Given:

A can do 87.5% of the work in 35 days

B can do 65% of the same work in 23.4 days.

Concept used:

If a person can complete a work alone in x days, then the efficiency (part of the work completed in one day) = 1/x

Calculation:

A can-do 87.5% of the work in 35 day

A can-do 1% of the work in (35/87.5) days

A can-do 100% of the work in (35/87.5) × 100 days

=> 40 days

Similarly

B can-do 65% of the work in 23.4 day

B can-do 1% of the work in (23.4/65) days

B can-do 100% of the work in (23.4/65)× 100 days

=> 36 days

One day's work of A = 1/40 units

One day's work of B = 1/36 units

In one day together they will do = (1/40) + (1/36) units of the work

=> [(9 + 10)/360] units of the work

=> 19/360 units of the work

Therefore The work will get done in 1 day by them is 19/360.

**Q51. Answer: (c) 25**

Given:

• All are facing North.

• Aniket is 12th from the left.

• Kavlin is 18th from the right.

• If their positions are swapped, Kavlin becomes 14th from the right

Explanation:

Total number of students = Position of Aniket from left + Position of Kavlin from right after interchange - 1

= 12 + 14 - 1 = 25

Hence 25 is the correct answer.

**Q52. Answer: (d) 144-15**

The pattern followed here is $n^2$: (n + 1)

• Option1: → $(18)^2$: (18 + 1) = 324:19

• Option2: → (25)2 : (25 + 1) = 625:26

• Option3: → (21)2 : (21 + 1) = 441:22

• Option4: → (12)2 : (12 + 1) = 144:13 ≠ 144:15

Hence, 144:15 is the odd one out.

**Q53. Answer: (b) Directive principles of the State policy**

The correct answer is Directive principles of state policy.

Key Points

• In Article 46 of the Indian Constitution Promotion of educational and profitable interests of slated gentries, slated lines and other weaker sections.

• The State shall promote with special care the educational and profitable interests of the weaker sections of the people, and, in particular, of the slated gentries and slanted lines, and shall cover them from social injustice and all forms of exploitation is given.

• According to the Indian Constitution, The term weaker section refers to a section of the population that's socially, economically, and politically behind the other sections of the population and has been passing colorful forms of incompetence as a result of their backwardness. The Government of India Act, 1935 defines " weaker sections " as class or classes of people who are suffering from educational and profitable backwardness, as well as some aspects of social life, due to traditional customs of untouchability, ethnical background, ethnical way of life or another backwardness.

• Different judgments of the Indian government have divided the weaker groups into three main orders.

• slated gentries.

• slated lines.

• Other backward classes.

Additional Information

• Directive Principles of State Policy aim to produce social and profitable conditions under which the citizens can lead a good life. They also aim to establish a social and profitable republic through a weak state.

• Though the Directive Principles are non-justiciable rights of the people abecedarian in the governance of the country, it shall be the duty of the State to apply these principles in making laws per Article 37.

• Besides, all administrative agencies of unions and countries should also be guided by these principles. Indeed the bar has to keep them in mind in deciding cases.

• An being policy in line with DPSP can't be reversed, still, it can be expanded further in line with DPSP. The policy changes applicable under DPSP shall not be reversible unless the applicable DPSP is deleted by indigenous correction.

• Directive Principles of State policy Come under Article 36- 51 of the Indian Constitution.

**Q54. Answer: (d) Bismillah Khan**

The correct answer is Bismillah Khan.

Key Points

• Bismillah Khan played the shehnai on 15 August 1947 at the Red Fort. He was the first Indian to hail the nation with his musical instrument.

• This event was major because we got independence on that day.

• Khan's music echoed from the ramparts of Red Fort in New Delhi on August 1947 the day India declared its independence from the 200- time-old British rule. He also performed on the country's first Republic Day form on January 26, 1950.

• Khan continues to be one of the many musicians to have entered the Bharat Ratna, Padma Vibhushan, Padma Bhushan, Padma Shri, and Sangeet Natak Akademi awards.

• Khan is the man who introduced the world to the air of Indian classical music and created a unique space for himself.

Additional Information

• Ustad Bismillah Khan was born in Bihar on March 21, 1916.

• Shehnai, double-wimp conical oboe of North India.

• The shehnai is made of wood, except for a glaring essence bell attached to the bottom of the instrument, and measures about 12 – 20 elevation(30 – 50 cm) in length, with six to eight crucial cutlets holes along its body.

• Ali Bux was the official shehnai player of the Vishnu temple in Varanasi.

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**Q55. Answer: (d) 49**

• Total number of people = 80

• Position of Angelina from right = 13

• Position of Margareta from left =18

• Number of people between Margareta and Angelina = 80 - (18 + 13) = 49

Hence, 49 is the correct answer.

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

The Correct answer is Gujarat.

Key Points

• The 40th Indian point to be inscribed on the UNESCO World Heritage List is located in Gujarat.

• India's name of Dholavira, the Harappan City in the Rann of Kutch, Gujarat has been named on UNESCO's World Heritage list.

• After the addition of the two spots, the number of World Heritage spots in India stands to be 40.

• While Dholavira came to the fourth point from Gujarat and 40th from India to make the list, it's the first point of the ancient Indus Valley Civilisation(IVC) in India to get the label.

• In total, there are 121 monuments listed in UNESCO spots, across 167 countries.

• The oldest point of the Indus Valley Civilization, Bhirrana, and the largest point Rakhigarhi are located in the Indian state of Haryana.

• Further, 90 of the inscribed objects and seals discovered were set up at ancient civic centres along the Indus swash in Pakistan, substantially Harappa(Punjab) and Mohenjo- Daro(Sindh).

Additional Information

• Dholavira is an archaeological point at Khadirbet in Bhachau Taluka of Kutch District, in the state of Gujarat in western India.

• Also known locally as Kotada timba, the point contains remains of a megacity of the ancient Indus Valley civilization.

• Dholavira’s position is on the Tropic of Cancer.

• It's one of the five largest Harappan spots and the most prominent of archaeological spots in India belonging to the Indus Valley Civilization.

• The point was" officially" discovered in 1967- 68 by J.P. Joshi, one of the Archaeological Survey of India(ASI).

Important Points

• UNESCO United Nations Educational, Scientific and Cultural Organization. The United Nations Educational, Scientific and Cultural Organization(UNESCO) was established on 16 November 1945.

• UNESCO has 195 Members and 8 Associate Members and is controlled by the General Conference and the Executive Board.

• A World Heritage Site is a corner or area with legal protection by a transnational convention administered by the United Nations Educational, Scientific and Cultural Organization(UNESCO).

• World Heritage spots are designated by UNESCO for having artistic, literal, scientific, or other forms of significance.

• Aux Meadows National Historic Park, was the first UNESCO world heritage point.

• The “ World Heritage Convention ” classifies the world heritage of humankind into two orders,' artistic heritage' and' natural heritage', easily indicated in the title of the convention.

**Q57. Answer: (c) Thursday**

Given: It was Wednesday on Rahul's birthday in the year 2005.

Explanation: 2005 and 2006 are normal years, and not leap years.

• There are 365 days in a year.

• number of odd days from Rahul's birthday in 2005 to his birthday in 2006 = remainder obtained on dividing 365 by 7= 1

• Thus it will be Thursday on his next birthday.

Hence, Thursday is the correct answer.

**Q58. Answer: (a) 22.5**

Given:

Pipe can fill the tank in 12.5 hours

Leakage can drain in 17.5 hours

Concept used:

Total work = Efficiency of the pipe × time taken

Calculation:

LCM of 12.5 and 17.5 = 87.5 units i.e total work

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So, efficiency of filling pipe = 87.5/12.5
=> 7 units/hour
Efficiency of the leakage = 87.5/17.5
=> 5 units/hour
Effective efficiency = 7 - 5 [leakage will drain the water so its efficiency will be subtracted from the efficiency of filling the pipe]
=> 2 units/hour
So, in 14 hours the tank will be filled by 2 × 14
=> 28 units
Remaining = 87.5 - 28
=> 59.5 units
Time taken to fill the remaining portion by the filling pipe = 59.5/7
=> 8.5 hours
So, total time taken to fill the tank completely = 14 + 8.5
=> 22.5 hours.
Therefore The total time taken (in hours) to fill the tank is 22.5.

**Q59. Answer: (b) Rs. 6600**

Given:
Sum = Rs. 10000
Rate of interest = 10%
Concept used:
Amount = Principal + interest
Calculation:
Amount after 1st year = 10000 + 10000 × 10%
=> Rs. 11000
Principal after paying the 1st installment = 11000 - 3000
=> Rs. 8000
Amount after 2nd year = 8000 + 8000 × 10%
=> Rs. 8800
Principal after paying the 2nd installment = 8800 - 2800
=> 6000
Amount after 3rd year = 6000 + 6000 × 10%
=> Rs. 6600
Now,
Rachel paid back the remaining principal of Rs. 6600 after 3rd year
Therefore The amount Rachel paid as the final installment was Rs. 6600.

**Q60. Answer: (a) Uttar Pradesh**

The Correct answer is Uttar Pradesh.
Key Points
• Goswami Tulsidas was born In modern Uttar Pradesh.
• He wrote several popular works in Sanskrit and Awadhi.
• But is best known as the author of the Hanuman Chalisa and of the grand Ramcharitmanas, a retelling of the Sanskrit Ramayana grounded on Rama's life in the conversational Awadhi.
• Tulsidas spent the utmost of his life in the megacity of Varanasi and Ayodhya.
• The Tulsi Ghat on the Ganges River in Varanasi is named after him.
• He has been accredited as one of the topmost muses in Hindi, Indian, and World Literature.
Additional Information
• Ramcharitmanas is a grand lyric in the Awadhi language, composed by the 16th- century Indian bhakti minstrel Tulsidas.
• It's considered one of the topmost workshops of Hindu literature.
• The word Ramcharitmanas literally means" Lake of the deeds of Rama".
• The jotting of Ramcharitmanas also heralded numerous artistic traditions.

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• Most significantly that of the tradition of Ramlila, the dramatic enactment of the textbook. Ramcharitmanas is considered by numerous as a work belonging to the Saguna academy.

Important Points

• Important Fact about Uttar Pradesh according to 2022.

• Chief Minister - Yogi Adiyanath.

• Governor - Anandi Ben Patel.

• Capital - Lucknow.

• State Bird - Sarus Crane.

• State Tree - Ashok.

• Official Language - Hindi.

• MP(Lok Sabha) - 80.

• MP(Rajya Sabha) - 31.

**Q61. Answer: (a) (15 + 5 √3) minutes**

Given:

The car takes 10 min for the angle of depression to change from 45° to 60°

Concept used:

tanθ = P/B

Calculation:

In ΔABC,

AB/BC = tan60°

=> h/x = √3

=> h = √3x ----(i)

In ΔABD,

AB/BD = tan45°

=> [h/(x + y)] = 1

=> h = x + y ----(ii)

Comparing eq (i) & (ii) we get

√3x = x + y

=> √3x - x = y

=> (√3 − 1)x = y

Car covers the distance y in 10 min

So, (√3 − 1)x distance is covered in 10 min

So, x distance will be covered in 10/(√3 - 1) min

10/(√3 - 1) × (√3 + 1)/(√3 + 1)

=> (10(√3 + 1))/((√3)² - 1²)

=> (10(√3 + 1))/(3 - 1)

=> (10(√3 + 1))/2

=> 5(√3 + 1) min

=> (5√3 + 5) min

So, total time = 5√3 + 5 + 10

=> 15 + 5√3 min

Therefore The car will reach the tower in (15 + 5√3) minutes.

**Q62. Answer: (a) 56**

Shortcut Trick

Ratio of sides (in plates) = 3 : 4 => Total plates = 3x × 4x = 12x²

Given 12x² = 48 => x² = 4 => x = 2

Plates along sides = 3 × 2 = 6 and 4 × 2 = 8

Perimeter (in units of plate side) = 2 × (6 + 8) = 28

Actual Perimeter = 28 × 2 cm = 56 cm

Therefore The correct answer is 56 cm.

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Alternate Method

Given: Total square plates = 48, Side of each plate = 2 cm, Ratio of sides = 3 : 4.

Formula: Area = Length × Width; Perimeter = 2 × (Length + Width).

=> Let the number of plates along the length be 4x and along the width be 3x.

=> Total plates = $4x \times 3x = 12x^2$.

=> $12x^2 = 48 \Rightarrow x^2 = 4 \Rightarrow x = 2$.

=> Length in terms of plates = $4 \times 2 = 8$; Width in terms of plates = $3 \times 2 = 6$.

=> Actual Length (L) = $8 \times 2$ cm = 16 cm.

=> Actual Width (W) = $6 \times 2$ cm = 12 cm.

=> Perimeter = $2 \times (L + W) = 2 \times (16 + 12) = 2 \times 28 = 56$ cm.

Therefore The correct answer is 56 cm.

Additional Information

Perimeter and Area Relation

For a fixed area, the square is the rectangle that possesses the minimum possible perimeter.

Diagonal of a Rectangle

The diagonal (d) can be calculated using the Pythagoras theorem: $d = \sqrt{(L^2 + W^2)}$.

Scaling Factor

If the linear dimensions of a 2D shape are increased by a factor k, the perimeter increases by k, while the area increases by $k^2$.

**Q63. Answer: (d) 15**

Given:

(4^(524)−4^(522)+30)/(4^(522)+2)

Concept used:

x^a × x^b = x^((a + b))

Calculation:

(4^(524)−4^(522)+30)/(4^(522)+2)

=> (4^(522)(4² − 1)+30)/(4^(522) + 2)

=> (4^(522)(16 − 1)+30)/(4^(522) + 2)

=> (4^(522)(15) + 30)/(4^(522) + 2)

=> (15[4^(522)(1) + 2])/(4^(522) + 2)

=> (15(4^(522) + 2))/(4^(522) + 2)

=> 15

Therefore Required answer is 15.

**Q64. Answer: (c) Laplanderiod**

The correct answer is Laplanderiod.

Key Point

Human Races

• The 18th and 19th centuries saw widespread use of the idea of race, despite the fact that it was rooted in misunderstanding and dispute.

• According to Hooton (1926), a "race" is a significant division of humanity, whose members, with individual differences, are distinguished as a group by certain combinations of morphological, metrical traits, primarily non-adaptive, that have been inherited from their shared ancestry.

• Certain physical traits, like skin colour, eye shape, and hair type, as well as genetic traits, like blood types, biochemical parameters, DNA, etc., are thought to be the basis for the idea that humans can be divided into different races.

• Based on differences in skin tone, Georges Cuvier (1828) distinguished three distinct human races:

• Caucasoid

• Negroid and

• Mongoloid

• According to him, the first race of humans was Caucasian, and the other two races came into existence later on.

Additional Information

• Francois Bernier (1684), a naturalist, used face and physical features to divide people into four stocks, creating the first systematic classification of humans.

• Buffon (1749), a monogenist, coined the term "race" in natural history and divided people into six racial groups based on their skin tone, stature, and physical characteristics: Laplander, Tartar, European, South Asian, American, and Ethiopian.

• Later, based on geography and appearance, the father of modern anthropology, Blumenbach (1775), divided people into five races: Mongolian, Malayan, Ethiopian, American, and Caucasian.

• The ABO blood group system's distribution was used by Reuben Ottonberg to make the first attempt at racial classification of people.

• One could argue that the term "race" was coined by anthropologists to describe the diversity of people.

**Q65. Answer: (b) pe os**

Given:

Explanation:

| never | un |
|---|---|
| speak | ha |
| ill | ml |
| fall | pe |
| often | ed |
| they | os |

• "they fall" will be coded as pe os.

Hence, pe os is the correct answer.

**Q66. Answer: (d) None**

Given:

Number of people = 6

Name: D, E, K, L, S and T

Explanation:

• E is taller than only two people.

| (Tallest) |
|---|
| |
| |
| E |
| |
| (Shortest) |

• Neither D nor K is the tallest.

• T is taller than E but shorter than D.

| D, K (Tallest) |
|---|
| D |
| T |
| E |
| |
| (Shortest) |

• S is shorter than T but not the shortest.

| L(Tallest) |
|---|
| D |
| T |

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| |
|---|
| E |
| S |
| K (Shortest) |

Hence, None is the correct answer.

**Q67. Answer: (b) 65**

Given:

Average of 25 numbers is 55

Average of first 11 numbers is 51

Average of last 10 numbers is 56.

Concept used:

Average = Sum of elements/Number of elements

Calculation:

Total of 25 numbers = 55 × 25

=> 1375

Total of first 11 numbers = 51 × 11

=> 561

Total of last 10 numbers = 56 × 10

=> 560

Total of remaining 4 numbers = 1375 - (561 + 560)

=> 1375 - 1121

=> 254

Now,

Total of remaining 4 numbers and 66, 70 = 254 + 66 + 70

=> 390

Average = 390/6

=> 65

Therefore Required average is 65.

**Q68. Answer: (d) AOCHMST**

Explanation:

The pattern followed here is:

Code = vowels in alphabetical order followed by consonants in alphabetical order.

• 'TONGUE' is written as 'EOUGNT'

• Here, vowels = O, U, E => alphabetical order: E < O < U.

• Consonants = T, N, G => alphabetical order: G < N < T.

• Thus, code = EOUGNT

• 'JEALOUS' is written as 'AEOUJLS'

• Here, vowels = E, A, O, U => alphabetical order: A < E < O < U.

• Consonants = J, L, S => alphabetical order: J < L < S.

• Thus, code = AEOUJLS

• Code for STOMACH

• Here, vowels = O, A => alphabetical order: A < O

• Consonants = S, T, M, C, H => alphabetical order: C < H < M < S < T.

• Thus, code = AOCHMST

Hence, AOCHMST is the correct answer.

**Q69. Answer: (c) 4%**

Given:

Sum = Rs. 1250

Interest = Rs. 102

Time = 2 years

Concept used:

Interest = P(1 + r/100)^t - P

Here,

P = principal or sum

r = rate

t = time

Calculation:

Let the rate of interest be r

According to the question,

$102 = 1250(1 + r/100)^2 - 1250$

=> 102 + 1250 = 1250(1 + r/100)2

=> 1352 = 1250(1 + r/100)2

=> 1352/1250 = (1 + r/100)2

=> 676/625 = (1 + r/100)2

=> $(26/25)^2$ = (1 + r/100)2

=> 26/25 = 1 + r/100

=> 26/25 = (100 + r)/100

=> 2600 = 2500 + 25r

=> 25r = 2600 - 2500

=> 25r = 100

=> r = 4

So, rate of interest = 4%

Therefore The rate of interest per annum is 4%.

**Q70. Answer: (d) Fiscal neutrality**

The correct answer is Fiscal Neutrality.

Key Points

• Fiscal Neutrality is when a government trying, spending, or adopting a decision has or is intended to have no net effect on frugality.

• Policy changes can be considered neutral in either their macroeconomic or microeconomic impact or both.

• Because the term financial impartiality can be applied in several different senses, it's important to understand the environment and purpose for which it's being used in order to understand its meaning.

• In the realm of macroeconomic, financial policy, government deficiency spending, or budget overpluses, are encouraged as a means to increase or drop aggregate demand in frugality in order to stabilize macroeconomic growth and avoid recessions.

• In a microeconomic sense, financial impartiality centres on the idea that government policy can impact individual profitable geste.

• A neutral financial policy in sense is one that leaves individualities to decide to work, consume, save, invest, or engage in other profitable conduct unaltered.

Additional Information

• Financial Profit is the process by which, during affectation, rising inflows draw people into advanced duty classes, so that their real inflows may fall; this acts as a restraint on the expansion of frugality. financial time.

• A financial deficiency is a space in a government's income compared with its spending. The government that has a financial deficiency is spending beyond its means.

• A financial deficiency is calculated as a chance of gross domestic product(GDP), or simply as total bones spent in excess of income.

• Financial expenditure refers to the sum of government charges, including spending on goods and services, investment and transfer payments like social security and severance benefits.

• Financial expenditures are part of government budget balance computation.

**Q71. Answer: (a) 0, 255**

The correct answer is 0, 255.

Key Points

• IPv4 address is a string of numbers consisting of four parts, where each part is a number between 0 and 255.

• An Internet Protocol address (IP address) is a numerical marker that identifies a computer network that employs the Internet

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Protocol for communication.

• An example of such an IP address is 192.0.2.1.

• Identification of the network interface and location addressing are the two primary purposes of an IP address.

• An IP address is a 32-bit number according to Internet Protocol version 4 (IPv4).

• Some of these are designated for special uses, such as multicast addressing (270 million addresses) and private networks (18 million addresses).

• Dot-decimal notation is the most common way to express IPv4 addresses.

• It consists of four decimal values, each ranging from 0 to 255, separated by dots, for example, 192.0.2.1.

• Each component represents an octet, or 8-bit section, of the address.

• Technical writing may occasionally use different hexadecimal, octal, or binary representations of IPv4 addresses.

Additional Information

• Since an IPv4 address can only be 32 bits long, there are only 4294967296 (232) addresses in the address space.

• However, a new version of IP (IPv6), utilising 128 bits for the IP address, was established in 1998 in response to the expansion of the Internet and the exhaustion of IPv4 addresses.

• Deployment of IPv6 has been happening since the middle of the 2000s.

• Internet Assigned Numbers Authority (IANA), a global organisation, and five regional Internet registries (RIRs) oversee the management of the IP address space

• IANA distributed IPv4 addresses to the RIRs in blocks of roughly 16.8 million addresses each, however, the supply has been depleted at the IANA level since 2011.

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

The correct answer is cT.

Key Points

• cT symbol is used to represent air mass above hot and dry desert regions.

• Hot dry international tropical(cT) air forms over hot desertlike international disciplines in summer in association with low-pressure areas, which are occasionally called heat lows.

• Continental tropical(cT) air millions are hot, dry, unstable at low situations and generally stable above(upper- position crest) Continental tropical air millions appear in northern Mexico.

• They generally form over the Desert Southwest and northern Mexico during summer.

Additional Information

• An air mass is like a platoon whose players are all wearing the same livery. In this case, the players are air, not people.

• The border between two air masses at the Earth’s face is called rainfall front.

• | cA | Found in Northern Canada, Alaska as a result of radiational cooling. |

| **cP** | **cP is used to refer to Continental Polar region.** |
|---|---|
| cT | cT is used to refer to the continental tropical region. |
| mP | mPis used to refer to the maritime polar region. usually occurs in Southweswar countries and Northeast countries. |

**Q73. Answer: (d) Father's father**

Given: Number of members in a family = 7, namely A, B, C, D, E, F, G.

Explanation:

• D is the mother of F.

• D is G's father's mother.

• F is the only son of E.

• G is the brother of A and C.

• E is the father's father of C.

Hence, Father's father is the correct answer.

**Q74. Answer: (c) 1.45**

Given:

$\sec\theta - \tan\theta = 2.5$

Concept used:

$\sec2\theta - \tan2\theta = 1$

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

Calculation:

$\sec\theta - \tan\theta = 2.5$ ----(i)

Now,

$\sec^2\theta - \tan^2\theta = 1$

=> $(\sec\theta + \tan\theta)(\sec\theta - \tan\theta) = 1$

=> $(\sec\theta + \tan\theta) \times 2.5 = 1$

=> $\sec\theta + \tan\theta = 1/2.5$ ----(ii)

By adding eq (i) and eq (ii) we get

$2\sec\theta = 2.5 + (1/2.5)$

=> $2\sec\theta = [(6.25 + 1)/2.5]$

=> $\sec\theta = [(7.25)/5]$

=> $\sec\theta = 1.45$

Therefore Value of $\sec\theta$ is 1.45.

**Q75. Answer: (c) 4928**

Shortcut Trick

Given Total Surface Area (TSA) = $2\pi r(r + h) = 1716$ cm² and $(r + h) = 39$ cm.

Substitute $(r + h)$: $2 \times (22/7) \times r \times 39 = 1716$ => $r = (1716 \times 7) \div (2 \times 22 \times 39) = 7$ cm.

Height $h = 39 - 7 = 32$ cm.

Volume = $\pi r^2 h = (22/7) \times 7 \times 7 \times 32 = 154 \times 32 = 4928$ cm³.

Therefore The correct answer is 4928 cm³.

Alternate Method

Given: Sum of radius (r) and height (h) = 39 cm; TSA = 1716 cm².

Formula: TSA of cylinder = $2\pi r(r + h)$; Volume = $\pi r^2 h$.

=> $2 \times (22/7) \times r \times 39 = 1716$

=> $(44/7) \times r \times 39 = 1716$

=> $r = (1716 \times 7) \div (44 \times 39)$

=> $r = 7$ cm

=> $h = 39 - 7 = 32$ cm

=> Volume = $(22/7) \times 7 \times 7 \times 32$

=> Volume = $22 \times 7 \times 32 = 154 \times 32 = 4928$

Therefore The correct answer is 4928 cm³.

Additional Information

Curved Surface Area (CSA)

The area of the side surface of a cylinder is given by $2\pi rh$.

Volume of a Hollow Cylinder

Volume = $\pi(R^2 - r^2)h$, where R is the outer radius and r is the inner radius.

Divisibility Trick

Since the formula for volume contains $\pi$ (22/7), the answer is usually a multiple of 11. 4928: $(4+2) - (9+8) = 6 - 17 = -11$ (divisible by 11).

**Q76. Answer: (a) Zone V**

The correct answer is "Zone V".

Key Points

• Zone- V comprises of entire northeastern India, the corridor of Jammu and Kashmir, Himachal Pradesh, Uttaranchal, Rann of Kutch in Gujarat, a corridor of North Bihar and Andaman & Nicobar Islands.

• The Alpine- Himalayan seismic belt extending up to Andaman- Nicobar islet region, is known to be one of the seismically active belts of the world.

• The A&N islands are in the most severe seismic zone, and the eastern seacoast of India is in the moderate-to-low seismic zone source BIS 2002.

Additional Information

• A seismic zone is used to describe an area where earthquakes tend to concentrate; for illustration, the New Madrid Seismic

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Zone in the Central United States

• A seismic hazard zone describes an area with a particular position of hazard due to earthquakes.

• As per the seismic zoning chart of the country, the total area is classified into four seismic zones. Zone V is seismically the most active region, while zone II is the least.

• Different Seismic Zones Of India

• Seismic Zone II - Zone II is classified as the low-damage threat zone.

• Seismic Zone III - Seismic Zone 3/ III is classified as the moderate-damage threat zone.

• Seismic Zone IV - Zone IV is considered the high-damage threat zone.

• Seismic Zone V - Zone V has the loftiest threat of damaging earthquakes.

• Seismic zonation chart of India, published by Bureau of Indian norms(IS- 2002).

**Q77. Answer: (c) Brihatkatha**

The correct answer is Brihatkatha.

Key Points

• Brihatkatha of Gunadhya is written in the Paisachi language.

• Brihatkatha is an ancient Indian epic reported to have been authored by Guhya in the poorly understood Paisachi language.

• The Brihatkatha existed in the sixth century CE, according to subsequent Sanskrit poets such as Dain, Subandhu, and Ba.

• Other estimates place it several centuries before that time period. For example, if the poet Bhsa's account of Udayana (and later by Harsha in Ratnavali) was influenced by Brihatkatha, it had to be older than Bhsa's time — which is unknown, but before the 3rd century CE.

Additional Information

• Mcchakatika is a ten-act Sanskrit drama claimed to Draka, an ancient playwright who lived in the 5th century CE and is described in the prologue as a Kshatriya ruler as well as a Siva devotee who lived for more than 110 years.

• The Panchatantra is a collection of interconnected animal fables written in Sanskrit verse and prose and structured within a frame plot.

• The Kathsaritsgara is a well-known collection of Indian stories, fairy tales, and folk tales retold in Sanskrit by Shaivite Somadeva in the 11th century.

• Gunadya was a scholar in Satvahana King Hala's court.

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

Shortcut Trick

To find the HCF of algebraic expressions, calculate the HCF of their numerical coefficients and multiply it by the common variables raised to their lowest powers.

HCF of coefficients (3, 5, 12) = 1

Lowest power of common variables: $x^1$, $y^1$, $z^1$

HCF = 1 × x × y × z = xyz

Therefore The correct answer is xyz.

Alternate Method

Given:

The three algebraic expressions are $3x^2yz$, $5xy^2z$, and $12x^2y^2z^3$.

Method Used:

Expand each expression into its prime numerical factors and fundamental variables to easily identify all common elements.

Calculations:

=> First expression = 3 × x × x × y × z

=> Second expression = 5 × x × y × y × z

=> Third expression = 2 × 2 × 3 × x × x × y × y × z × z × z

=> Comparing the numerical coefficients (3, 5, and 12), there are no common prime factors. Thus, their HCF is 1.

=> Comparing the variable parts, the common variables that appear in all three expressions are x, y, and z.

=> Taking only the common variables corresponding to the lowest exponent available across all expressions gives us 1 × x × y × z.

=> Multiplying these gives the overall HCF as xyz.

Therefore The correct answer is xyz.

Additional Information

Highest Common Factor (HCF) of Polynomials

The HCF is the largest term that divides all the given terms completely. For variable parts, it corresponds to the lowest power (exponent) of each common variable present in all terms.

Least Common Multiple (LCM) of Polynomials

The LCM is the smallest term that is completely divisible by all the given terms. It is obtained by finding the LCM of the numerical coefficients and multiplying it by all variables raised to their highest available powers.

HCF and LCM Relation

For any two mathematical expressions A and B, the product of the two expressions is equal to the product of their HCF and LCM: A × B = HCF(A, B) × LCM(A, B).

**Q79. Answer: (d) 40 √3 m**

Shortcut Trick

The height difference between the tower and the tree is 47 − 7 = 40 m.

In a 30°−60°−90° right triangle, the ratio of sides opposite to the angles is 1 : √3 : 2.

The side opposite to 30° represents the height difference = 1 unit = 40 m.

The side opposite to 60° represents the horizontal distance = √3 units = 40√3 m.

Therefore The correct answer is 40√3 m.

Alternate Method

Given: Height of the tree = 7 m, Height of the tower = 47 m, Angle of elevation = 30°.

Formula: tan θ = Opposite / Adjacent

=> Height of tower above the tree level = 47 m − 7 m = 40 m.

=> Let the distance between the tree and the tower be d.

=> In the right-angled triangle formed at the top:

=> tan 30° = 40 / d

=> 1 / √3 = 40 / d

=> d = 40 × √3

=> d = 40√3 m.

Therefore The correct answer is 40√3 m.

Additional Information

Angle of Elevation

The angle formed by the line of sight with the horizontal when an object is viewed above the horizontal level.

Trigonometric Ratios for 30°

For a 30° angle: sin 30° = 1/2, cos 30° = √3/2, and tan 30° = 1/√3.

Relation between Elevation and Depression

The angle of elevation from point A to point B is always equal to the angle of depression from point B to point A due to alternate interior angles.

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

The pattern followed here is:

Hence, HMJCBDI is the correct answer.

**Q81. Answer: (b) Archery**

Given: 'Cricket' is called 'Archery', 'Archery' is called 'Football', and 'Football' is called 'Volleyball'.

Explanation:

• The game played with a bat is cricket. Here,

• 'Cricket' is called 'Archery'.

Hence, Archery is the correct answer.

**Q82. Answer: (b) 60**

Given:

For reduction of 20% in the price of wheat she can get 4 kg more in Rs. 1200

Calculation:

Let the price per kg of wheat was Rs. 100x and

So, after 20% reduction new price = 100x - 100x × 20%

=> Rs. 80x

According to question,

New quantity rice – old quantity rice = 4 kg

=> 1200/80x – 1200/100x = 4

=> 15/x - 12/x = 4

=> (15 - 12)/x = 4

=> 3/x = 4

=> x = 3/4

S0, new price = Rs. (80 × 3/4)

=> Rs. 60 per kg

Therefore The reduced price per kg (in Rs.) is 60.

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

The correct answer is Bihar.

Key Points

• The Lauria Nandangarh Pillar is Located In the Champaran District Of Bihar.

• Remains of the Mauryan period have been set up then.

• Lauriya Nandangarh is also a point for about 20 archaeological banks organized in three rows.

• Forty pillars were erected then by Emperor Ashoka firstly but a moment only one pillar exists in complete form, at its original position in Lauriya Nandangarh.

• It's positioned near the banks of the Burhi Gandak River.

• Many times latterly Henry Bailey Wade Garrick shovelled several mounds with indifferent results.

Additional Information

• Some Data about Bihar as of July 2022.

• Capital: Patna.

• Chief Minister: Nitish Kumar.

• Governor Phagu Chauhan.

• High Court: Patna

• MP(Lok Sabha): 40

• MP(Rajya Sabha):16

• State Bird : House sparrow

• State: AnimalGaur.

**Q84. Answer: (b) 1856**

The correct answer is 1856.

Key Points

• British interest in Awadh began in the 1760s, and after 1800 they exercised control there.

• The Annexation of Awadh on 11th February 1856,

• It was neighbor (as Oudh) by the British in 1856, an action that greatly angry Indians and which has been mentioned as a cause of the Indian revolt (1857 – 58), the largest Indian rebellion against British rule.

• Awadh joined other India in a storm against British rule in 1858 during one of the last of conduct in the Indian rebellion of 1857.

Additional Information

• The Battle of Saragarhi was a last-stage battle fought before the Tirah battle between the British Raj and Afghan tribesmen. On 12 September 1897.

• In 1801, all major revolutionists including the Marudu sisters, Veerapandia Kattabomman's sisters Sevathaiah and Oomaithurai, Virupachi Gopala Naicker, and Bommu Naicker were hanged, and the British established social rule over 72 Palayams in Tamil Nadu.

• 1805, there was another soldier revolt in the south, The Vellore sepoy insurgency throughout short-short bloody and violent. for one long day, revolt stationed posted at the major stronghold of Vellore.

**Q85. Answer: (a) 1**

Given:

sec237° − tan237°

Concept used:

$Sec^2\theta - tan^2\theta = 1$

Calculation:

sec237° − tan237°

According to the concept,

sec237° − tan237° = 1

Therefore Required answer is 1.

**Q86. Answer: (a) Communication**

The correct is Communication.

Key Points

• In Union Budget 2022-23, Communication is not one of the seven engines of economic growth under "PM Gati Shakti".

• Finance Minister Nirmala Sitaraman said on 1 February that PM Gati Shakti National Mater Plan is a Transformative approach for economic growth and sustainable development by and driven by seven engines, Roads, Railways, airports, ports, mass, transport, waterways, and logistics, infrastructure.

• PM Gati Shakti National Master Plan (PMGS-NMP) was launched on 13th October 2021 for providing multimodal connectivity infrastructure to various economic zones.

Additional Information

• To prioritize its projects under the PM Gati Shakti Scheme, the Ministry of Railways has set up a new directorate under the Railway Board.

• The Road Transportation and Indian Highways Ministry had made notable progress under the PM Modi government's "PM Gati Shakti National Master Plan", which was aimed at improving the multi-modal connectivity and Connectivity of India also.

• The Union Minister for Ports, Shipping, and, Waterways, Sarbananda Sonowal said that the PM Gati Shakti mission will lead to the removal of all bottlenecks in infrastructure development along with achieving timely completion of projects.

**Q87. Answer: (c) 53, 55, 57, 58**

Concept used:

The median is defined to be the mean of the two middle values in the case of an even data set.

Calculation:

Option 1:

Mean of the given distribution

=> 57 + 61 over 2

=> 59

Option 2:

Mean of the given distribution

=> 53 + 57 over 2

=> 55

Option 3:

Mean of the given distribution

=> 55 + 57 over 2

=> 56

Since we've already encountered an option in which 56 is the mean of the given distribution, we aren't required to check any further.

Therefore If the median is 56, the set of numbers could possibly be 53, 55, 57, 58.

**Q88. Answer: (d) Rs. 864**

Given:

Cost price of three varieties of tea = Rs. 500/kg, Rs. 720/kg, and Rs. 900/kg

These are blended in the ratio of 9 : 5 : 11

Concept used:

Selling Price = Cost Price + Cost Price × profit%

Calculation:

Let the quantity of three varieties of tea be 9x kg, 5x kg and 11x kg

So, cost price of 1st variety = 9x × 500

=> Rs. 4500x

Cost price of 2nd variety = 5x × 720

=> Rs. 3600x

Cost price of 3rd variety = 11x × 900

=> Rs. 9900x

Total cost three mixed varieties of tea = 4500x + 3600x + 9900x

=> Rs. 18000x

Total selling price of the three mixed varieties of tea = 18000 + 18000 × 20%

=> Rs. 21600x

Total quantity of three mixed varieties of tea = 9x + 5x + 11x

=> 25x kg

So, selling price of each kg = 21600x/25x

=> Rs. 864

Therefore The selling price per kg of the blended tea if the seller has to make a profit of 20% is Rs. 864.

**Q89. Answer: (d) Gandhinagar**

The correct answer is Gandhinagar.

Key Points

• Union Minister for Youth Affairs and Sports Vijay Goel declared Netaji Subhas western regional center of the Sports Authority of India (SAI) in Gandhinagar as a Centre of Excellence for para-athletics.

• It is the first ever training center dedicated to Para athletes in the country.

• In this Centre Para athletes will be trained for various International Competitions including Asian Games, Common Wealth Games, and Olympic Games.

Additional Information

• The Sports Science Centre, Directorate of Sports and Youth Welfare (DSYW), in Bhopal caters to all the Elite Sports Academies run by the Sports and Youth Welfare Department, Government of M.P.

• Facts about Sports Authority of India(SAI).

| **Headquarters.** | **Delhi, India.** |
|---|---|
| Founder. | Ministry of Youth affairs and sports, Government of India. |
| Establishment. | 1982. |
| Parent Agency. | Department of Sports. |
| Annual Budget. | 500 crores. |

**Q90. Answer: (c) Dhrupad**

The correct answer is Dhrupad.

Key Points

• The Dhrupad Style of Singing is traditionally performed by men with tanpura and Pakhawaj as instrumental accompaniment.

• Dhrupad is a style historical style of singing, traditionally performed by male singers.

• Dhrupad is a genre in Hindustani classical music from the Indian subcontinent.

Additional Information

• Tarana is a kind of composition in Indian classical expressed music in which certain words and languages are based on Persian and Arabic meanings of sound.

• The thumri is other North Indian expressed form and is based on the romantic-devotional writing inspired by the bhakti movement.

• The text is usually derived from the Radha-Krishna theme and is of primary importance.

• A ghazal commonly consumes five to fifteen couples, which are free, but are linked conceptually, in their them.

• The structural needs of the ghazal are common in stringency to those of the Petrarchan sonnet.

**Q91. Answer: (c) 20**

Explanation:

• C is eighth from the right end.

• A is sixth to the left of C.

• B is fourth to the right of C.

• D is in fourth position to the right of A.

• E is an immediate neighbour of both D and C.
• F is second to the left of E.
• There are exactly six persons sitting between G and F.
• G is third from one of the extreme ends.
• Exactly two people are sitting between H and A.
• Total number of people sitting in the arrangement = 20
Hence, 20 is the correct answer.

**Q92. Answer: (c) 8**

Shortcut Trick
For divisibility by 12, the number must be divisible by both 3 and 4.
Divisibility by 4: Last two digits 'kk' must be divisible by 4 → 00, 44, or 88 Therefore k = 0, 4, 8.
Divisibility by 3: Sum of digits (5+1+0+3+2+k+k) = 11 + 2k must be a multiple of 3.
If k = 0: 11 + 0 = 11 (No); If k = 4: 11 + 8 = 19 (No); If k = 8: 11 + 16 = 27 (Yes).
Therefore The correct answer is 8.
Alternate Method
Given: 7-digit number 51032kk is divisible by 12.
Formula: A number is divisible by 12 if it satisfies divisibility rules for 3 and 4.
Number: 51032kk
Divisibility by 4
Last two digits 'kk'
k in {0, 4, 8}
Divisibility by 3
Sum: 11 + 2k
must be multiple of 3
k = 8
=> Divisibility by 4: The number formed by the last two digits (kk) must be divisible by 4.
=> Possible values for kk are 00, 44, 88. Thus, k in {0, 4, 8}.
=> Divisibility by 3: Sum of digits = 5 + 1 + 0 + 3 + 2 + k + k = 11 + 2k.
=> Case 1 (k = 0): Sum = 11 + 2(0) = 11 (Not divisible by 3).
=> Case 2 (k = 4): Sum = 11 + 2(4) = 19 (Not divisible by 3).
=> Case 3 (k = 8): Sum = 11 + 2(8) = 27 (Divisible by 3 because 27 ÷ 3 = 9).
Therefore The correct answer is 8.
Additional Information
Divisibility Rule for 3
A number is divisible by 3 if the sum of its individual digits is divisible by 3.
Divisibility Rule for 4
A number is divisible by 4 if the number formed by its last two digits is divisible by 4 or if the last two digits are 00.
Composite Divisibility
For a number to be divisible by a composite number n, it must be divisible by the co-prime factors of n (e.g., for 12, the factors are 3 and 4).

**Q93. Answer: (d) North America**

The correct answer is North America.
Key Points
• Chinook winds are flows in North America.
• The interior Chinooks are Seasonally warm, dry föhn winds flow from the eastern sides of interior mountain ranges.
• The Chinooks were the real term, used onward the northwest coast,
• The term in the interior of North America is later extracted from the coastal term.
Additional Information
• Brickfielder hot and dry winds are flows in Southern Australia.
• Loo hot winds are Flows in Southern Asia.

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• Simoom (Samiel) (strong, dry, desert wind that blows in Israel, Jordan, Syria, and the desert of Arabia) also flows in western Asia.

• Harmattan (Gulf of Guinea) and Khamsin (Sudan) winds are flows in Africa.

**Q94. Answer: (b) 640 cm²**

Shortcut Trick

When two cubes are joined, two faces (one from each cube) disappear at the junction.

Total faces of two separate cubes = 6 + 6 = 12 faces.

Visible faces of the new cuboid = 12 − 2 = 10 faces.

Area of one face = side² = 8² = 64 cm².

Total Surface Area = 10 × 64 = 640 cm².

Therefore The correct answer is 640 cm².

Alternate Method

Given: Side of each cube (a) = 8 cm.

When two cubes are joined end-to-end to form a cuboid, its dimensions are:

=> Length (L) = 8 + 8 = 16 cm

=> Breadth (B) = 8 cm

=> Height (H) = 8 cm

=> Total Surface Area (TSA) of cuboid = 2 × (LB + BH + HL)

=> TSA = 2 × (16 × 8 + 8 × 8 + 8 × 16)

=> TSA = 2 × (128 + 64 + 128)

=> TSA = 2 × (320)

=> TSA = 640 cm²

Therefore The correct answer is 640 cm².

Additional Information

Volume of a Cuboid

The space occupied by the cuboid is calculated as Length × Breadth × Height (V = L × B × H).

Lateral Surface Area (LSA)

The area of the four side walls of a cuboid is given by 2 × H × (L + B).

Diagonal of a Cuboid

The longest rod that can be placed inside a cuboid is √(L² + B² + H²).

Surface Area of a Cube

For a cube with side 'a', the Total Surface Area is 6a² and the Lateral Surface Area is 4a².

**Q95. Answer: (c) Tamil Nadu**

The correct answer is Tamil Nadu.

Key Points

• The state has the highest rainfall in North-East Monsoon in Tamil Nadu.

• The North East Monsoon usually occurs from October to March.

• North East Monsoon is also called Retreating monsoon.

Additional Information

• The northeast monsoon is limited to south India, bringing rain to Tamil Nadu, Puducherry, Karaikal, Yanam, Andhra Pradesh, Kerala.

• Gujrat receives rainfall after the monsoon system gets activated from the Bay of Bengal.

• Uttar Pradesh receives rainfall from South West monsoon.

• Punjab, Haryana plain and this area receives rainfall both from the Bay of Bengal and the Arabian Sea monsoons.

**Q96. Answer: (c) 148**

Given:

[(15% of A) × (35% of B)] ÷ 21% of C = 37

Calculation:

According to the question,

(15A/100×35B/100)/(21C/100) = 37

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=> 15A/100×35B/100×100/21C = 37

=> AB/4C = 37

So,

AB/C = 37 × 4

=> AB/C = 148

Therefore Required answer is 148.

**Q97. Answer: (b) 35**

Given:

Numbers are 70 and 110

Concept used:

Average = Sum of elements/No. of elements

Calculation:

45% of 70 = 70 × (45/100)

=> 31.5

35% of 110 = 110 × (35/100)

=> 38.5

Total two numbers = 31.5 + 38.5

=> 70

Average = 70/2

=> 35

Therefore Required answer is 35.

**Q98. Answer: (c) 1/8**

Given:

(0.4 × 0.4 × 0.4 + 0.05 × 0.05 × 0.05)/(0.8 × 0.8 × 0.8 + 0.1 × 0.1 × 0.1)

Calculation:

(0.4 × 0.4 × 0.4 + 0.05 × 0.05 × 0.05)/(0.8 × 0.8 × 0.8 + 0.1 × 0.1 × 0.1)

=> $(0.1^3(4 \times 4 \times 4 + 0.5 \times 0.5 \times 0.5))/(0.1^3(8 \times 8 \times 8 + 1 \times 1 \times 1))$ [By taking (0.1)3 common from both denominator and numerator]

=> $(4^3 + 0.5^3)/(8^3 + 1^3)$

=> (64 + 0.125)/(512 + 1)

=> 64.125/513

=> 1/8

Therefore Required answer is 1/8.

**Q99. Answer: (b) %**

Given: The alpha-numeric series is: G 6 Y $ V R 7 % @ S 5 4 D W L + 2 M 9 £

Explanation:

Fifth to the left of the thirteenth element from the left will be (13 - 5) 8^(th) element from left.

(Left) G 6 Y $ V R 7 % @ S 5 4 D W L + 2 M 9 £ (Right)

The 8th element from left in the given series is %.

Hence, % is the correct answer.

**Q100. Answer: (a) Raipur**

The Correct Answer is Raipur.

Key Points

• The National Tribal Dance Festival is being organized in Raipur (Chattisgarh) from October 28-30, 2021.

• The festival is being organized under the supervision tourism development plan of the Chhattisgarh government.

• The Dance performance will be Organized in two following categories - wedding ceremonies and other prominent rituals.

Additional Information

• Jagannath Ratha Yatra is the well-known festival of Odisha. It is the most anticipated festival in India because of its historical and religious importance.

• The most important festival in Guwahati is the Bohag Bihu, which is the start of the Assamese New Year and falls.

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• Durga Puja is the most significant festival in Kolkata city.
• This festival is celebrated for the victory of good over evil.
• This festival is celebrated for five days and is marked by prayers to goddess Durga, feasts, rejoicing, music, dance and drama.

**Q101. Answer: (a) 7 km**

Explanation:
• Rishu went 5 km towards the west from her house.
• From here, she turned left and covered a distance of 4 km.
• She took a left turn again and covered a distance of 5 km.
• She finally turned right and travelled 3 km and stopped
.
• So the shortest distance = 4 + 3 = 7 km
Hence, 7 km is the correct answer.

**Q102. Answer: (a) 87.5%**

Shortcut Trick
Let B = 1 part, then A = 8 parts.
Difference (Reduction) = 8 − 1 = 7 parts.
Required Percentage = (Difference ÷ Base value A) × 100
Percentage = (7 ÷ 8) × 100 = 87.5%.
Therefore The correct answer is 87.5%.
Alternate Method
Given:
Number A is 8 times Number B.
Formula Used:
Percentage Less = [(Value 1 − Value 2) ÷ Value 1] × 100
Calculations:
=> Let Number B = x
=> Number A = 8x
=> Difference = 8x − x = 7x
=> Percentage by which B is less than A = (7x ÷ 8x) × 100
=> Percentage = (7/8) × 100
=> Percentage = 0.875 × 100 = 87.5%
Therefore The correct answer is 87.5%.
Additional Information
Percentage Change
Percentage change is calculated as (Change ÷ Original Value) × 100. In 'less than' questions, the value after 'than' is the base.
Fraction to Percentage Conversion
Common fractions: 1/8 = 12.5%, 3/8 = 37.5%, 5/8 = 62.5%, and 7/8 = 87.5%.
Base Change Rule
If A is x% more than B, then B is [x/(100+x)] × 100% less than A.

**Q103. Answer: (b) 124**

Explanation:
The pattern followed here is $n^3 - 1$.
$1^3 - 1 = 0$
$2^3 - 1 = 7$
$3^3 - 1 = 26$
$4^3 - 1 = 63$
$5^3 - 1 = 124$
$6^3 - 1 = 215$
Hence, 124 is the correct answer.

**Q104. Answer: (b) Increased and appropriate application of chemical fertilizers for increasing agricultural production.**

The correct answer is Increased and appropriate application of chemical fertilizers for increasing agricultural production.

Key Points

• Increased and appropriate application of chemical fertilizers for increasing agricultural production is a characteristic of the Green Revolution in India.

• In India, the Green Revolution increased agricultural production, particularly in Haryana, Punjab, and Uttar Pradesh.

• The development of a high-yielding variety of wheat seeds and rust-resistant wheat strains were significant milestones in this project.

• New and high-yielding seed varieties are being introduced.

• Increased application of fertilizers, insecticides, and weedicides to reduce agricultural losses.

• Increased fertilizer application to boost agricultural productivity.

• Utilization of cutting-edge agricultural machineries such as tractors, seed drills, threshers, and harvesters.

• Use disease-resistant cultivars to increase productivity

Additional Information

• The Golden Revolution is associated with honey production and horticulture.

• The White Revolution helped to alleviate poverty in India to a considerable extent.

• The poultry industry is linked to the Silver Revolution. It is a massive surge in egg or poultry output

**Q105. Answer: (d) Thang Ta**

The correct answer is Thang-Ta.

Key Points

• Thang Ta is an exclusive martial dance from Manipur that includes the unique display of skill, creativity, and agility in which dance performers enact a mock fight sequence.

• Thang Ta is an ancient Manipuri Martial Art developed from the war environment of Manipur & created by the Meitei.

• It is also known as the art of sword and spear, this Manipuri traditional dance features a wide range of martial arts weaponry in its performance.

Additional Information

• Singhi Chham or Kanchendzonga Dance is a lion dance form in Sikkim whereby the dancers perform in a lion costume that represents the snow lion.

• Singhi Chamm is a dance of the Bhutani people and was told to have been established by Chador Namgyal, the third Chogyal of Sikkim, at the time of the 18th century.

• Chakyar Koothu is a dance performance art in Kerala, India. It is firstly a type of highly refined speech where the performer relates episodes from Hindu epics (such as the Ramayana and the Mahabharata) and stories from the Puranas.

• The Rangma dance is a representation of battle culture in Nagaland. The dancers dressed up as warriors and move to the beat of a drum in a rhythmic method.

**Q106. Answer: (b) The Vice President**

The correct answer is The Vice President.

Key Points

• Article 63 of the Indian Constitution tells that there shall be a Vice-President of India.

• Articles 64 and 89 (1) tell that the Vice-President of India shall be the ex-officio Chairman of the Council of States(Rajya Sabha).

• In the constitutional setup of India, the holder of the office of the Vice president is part of the executive but as the chairman of the Rajya Sabha, he is a part of Parliament. He has thus a dual capacity and holds two distinct and separate offices.

Additional Information

• The Governor is the ex - officio Chairman of the state Legislative Council (Vidhan Parishad).

• The Prime Minister of India is the ex-officio chairman of the NITI Aayog. NITI Aayog is an executive body, that was initiated by the Indian government in 2015.

• The executive power of the State shall be vested in the Governor and shall be exercised by him either directly or through officers subordinate to him in accordance with the Constitution of India (Article 154).

• Article 53, the executive power of the country is vested in the president and is exercised by the president either directly or through officers subordinate to him in accordance with the constitution.

• Article 78(1) states that it is the Prime Minister's job to keep the President up to date on the decisions made by the Council of Ministers in relation to administrative concerns and legislative proposals.

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**Q107. Answer: (c) GBZD**

Explanation:

The pattern followed here is:

Hence, GBZD is the correct answer.

**Q108. Answer: (b) E**

Given:

• A, B, C, D and E are sitting in row 1 facing the South.

• V, W, X, Y and Z are sitting in row 2 facing the North.

Explanation:

• W sits at the extreme left end of the row.

• W faces an immediate neighbour of B.

• C sits at one of the position to the left of B but not at the extreme end of the row.

• D sits third to the right of A (so case 1 will be rejected)

• V sits to the immediate right of X

• The one who faces C sits to the immediate left of Y.

• Therefore, E faces Z

So, the correct solution is

Hence, E is the correct answer.

**Q109. Answer: (c) Kuwait**

The correct answer is Kuwait.

Key Points

• The estimate for the Rural population in Kuwait was 0.00 as of 2020.

• For the earlier 60 years this, indicator approached a maximum estimates09,844.00 in 1974 and a minimum estimate of 0.00 in 2002.

• Definition of Rural Population: Rural population is called when people livinliveural areas as defined by national analytical offices.

• According to the World Bank collection of development measures, compiled from officially recognized sources. Kuwait - Rural population - actual values, historical data, forecasts and projections were sourced from the World Bank in June of 2022.

Additional Information

• Around 7 million people – or 28% of the Australian population – live in rural and remote areas, which encompass many diverse locations and communities

• Switzerland's rural population for 2021 was 2,261,756, a 0.4% increase from 2020.

• Israel's rural population for 2021 was 686,007, a 0.42% increase from 2020. Israel rural population for 2020 was 683,115, a 0.61% increase from 2019.

**Q110. Answer: (d) India and the UK**

The correct answer is India and UK.

Key Points

• The India – UK Joint Tri-Service exercise Konkan Shakti was held in India From 21 - 27 October 2021.

• 'Konkan Shakti 2021' among the Armed Forces of India and the United Kingdom (UK) was held on the Konkan coast of the Arabian Sea.

• As a fragment of the exercise, troops of the Indian Army, Navy, and Air Force were deployed for marine landing in close coordination with the para drop of airborne troops, which they noted is known the as Tri-Service exercise.

Additional Information

• 11th edition of the joint Indo-Maldives training exercise "Ex-Ekuverin" between India and Maldives was conducted at Kadhdhoo islands, Maldives.

• The 37th edition of India-Indonesia Coordinated Patrol (CORPAT) was organized in the Indian Ocean from 23-24 November 2021. CORPAT is organized twice a year to confirm security.

• From the 8th to the 19th of December 2019, India and Russia conducted a joint tri-services exercise called 'INDRA 2019′ at Babina, Pune, and Goa.

**Q111. Answer: (b) Diamond**

The correct answer is Diamond.

Key Points

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• Diamond is the hardest natural known substance and has top melting and boiling point.

• Diamonds are made by carbon which has been under high pressure and heat found in depths of the Earth.

• The heat and pressure cause the diamonds molecules for changing so that they can bond together.

• The Copper and Iron are not as hard as diamonds and can melt easily in comparison to Diamond.

Additional Information

• A fullerene is a type of allotrope of carbon whose molecule containing of carbon atoms joints by single and double bonds to form a closed or partially closed mesh, with fused rings of five to seven atoms.

• The molecule must be a hollow sphere, ellipsoid, tube, or many other shapes and sizes.

• Dry Ice is the other name for solid carbon dioxide (CO2). this name is because of it does not melt into a liquid when heated; instead, it changes directly into a gas (a process known as sublimation).

• Graphite is a crystalline form of the element carbon. It consists of stacked layers of graphene. Graphite occurs naturally and is the most stable form of carbon under standard conditions.

**Q112. Answer: (a) Shahnameh**

The correct answer is Shahnameh.

Key Points

• The Shahnameh is a long poem composed by the Persian poet Ferdosi between the time period of 977 and 1010 CE and is the national epic of Greater Iran.

• Shahnameh is one of the two ancient Iranian manuscripts listed on the United Nations Educational, Scientific, and Cultural Organization's Memory of the World register.

• Abul-Qâsem Ferdosi Tusi, also Firdausisi, was a Persian poet and the author of Shahnameh.

Additional Information

• The Shahjahan-nama is a book in which written about the Mughal Emperor Shah Jahan. Padshah-nama is a word for lavishly illuminated versions.

• Akbar-Nama was composed in Persian, which is the written language of the Mughals. It contains detailed information about Akbar's life and times.

• Alamgir-namah the history of Emperor aurangzeb (1658-1707) is composed by Mirza Muhammad Kazim.

• By following the tradition of the Mughal emperors from the time of Akbar, Aurangzeb ordered his court historian Mirza Muhammad Kazim to record and compile the history of his reign.

**Q113. Answer: (b) 151**

Given:

| **Symbol** | **<** | | **&** | **@** |
|---|---|---|---|---|
| Meaning | • | • | × | ÷ |

Explanation:

= 119 < 56 @ 4 > 23 & 2

= 119 - 56 ÷ 4 + 23 × 2

= 119 - 14 + 23 × 2

= 119 - 14 + 46

= 119 + 46 - 14

= 165 - 14

= 151

Hence, 151 is the correct answer.

**Q114. Answer: (d) 64 π m²**

Given:

Diameter of the circle = 16 m

Formula used:

Area of a circle = $\pi r^2$

Concept used:

r = Radius i.e (diameter/2)

Calculation:

Radius of the circle = 16/2 = 8 m

Area = π × 8²

=> 64π m²

Therefore The area of the circle is 64π m2.

**Q115. Answer: (c) km ns**

Explanation:

• In tabular form, the data can be represented as follows:

| Code | Word |
|---|---|
| ns | we |
| pd | can |
| ca | sing |
| uv | new |
| io | songs |
| km | join |

'we join' will be coded as 'ns km' or 'km ns'.

From option3, we get km ns.

Hence, km ns is the correct answer.

**Q116. Answer: (b) 1.75 cm**

Given:

The surface area of a sphere is 38.5 cm2

Concept used:

Surface area of a sphere = 4πr²

Here,

r = radius

Calculation:

Let the radius of the sphere be r

So, 4πr² = 38.5

=> r² = 38.5 × (7/22) × (1/4)

=> r² = 269.5/88

=> r2 = 3.0625

=> r2 = 30625/10000

=> r2 = (175/100)²

=> r = 175/100

=> r = 1.75

Therefore The radius of the sphere is 1.75 cm.

**Q117. Answer: (c) Thursday**

Puzzle: Related to week days, i.e., starting on Monday and ending on Saturday.

Number of people: 6

Name: A, B, C, D, E, F

Explanation:

• Place D is visited on Monday.

• There is gap of one day between B and D.

| Days | Name |
|---|---|
| Monday | D |
| Tuesday | |
| Wednesday | B |

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| | |
|---|---|
| Thursday | |
| Friday | |
| Saturday | |

• Neither C nor A visited on Thursday.

| Days | Name |
|---|---|
| Monday | D |
| Tuesday | |
| Wednesday | B |
| Thursday | C, A |
| Friday | |
| Saturday | |

• F visited immediately after C.

| Days | Name |
|---|---|
| Monday | D |
| Tuesday | A |
| Wednesday | B |
| Thursday | E |
| Friday | C |
| Saturday | F |

Thus, E visited on Thursday.

Hence, Thursday is the correct answer.

**Q118. Answer: (b) N < V**

Statement:

F ≤ E < C = V > A ≥ Y > N

1. E > Y → False (As E < C = V > A ≥ Y → a definite relation between E and Y cannot be determined).
2. N < V → True (V > A ≥ Y > N → N < V)
3. F = V → False (As F ≤ E < C = V → F < V).
4. V < Y → False (As V > A ≥ Y→ V > Y).

Hence, N < V is the correct answer.

**Q119. Answer: (d) Article 86**

The correct answer is Article 86.

Key Points

• Article 86 of the Indian Constitution is related to the Right of the President to address and send messages to Houses.

• Article 86 is captioned "The President's Right to Address and Send Messages to Houses." The President may address any House of Parliament or both Houses assembled together, and the attendance of members is required for this purpose.

• The President may transmit messages to either House of Parliament, whether in relation to a Bill currently pending in Parliament or otherwise, and any House to whom a message is conveyed shall consider any subject required by the message to be taken into account as soon as possible.

Additional Information

• Article 88 deals with the rights of ministers and the attorney general in relation to the Houses. Every Minister and the Attorney-General of India shall have the right to speak in, and otherwise participate in, He may attend the proceedings of either House, any joint sitting of the Houses, and any committee of Parliament to which he may be appointed, but he shall not have the right to vote as a result of this article.

• Article 90 deals with vacation, resignation, and removal from the position of Deputy Chairman.

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**Q120. Answer: (c) 4 : 3**

Calculation:

Total number of cosmetics are imported in year 2016 and 2020 = 35 + 25

=> 60 (in lakh tons)

Total number of toys are imported in year 2018 and 2020 = 25 + 20

=> 45 (in lakh tons)

Ratio = 60 : 45

=> 4 : 3

Therefore Required answer is 4 : 3.

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