



# रेल भर्ती बोर्ड / RAILWAY RECRUITMENT BOARDS

सी ई एन आर आर बी - ०२/२०२४ - CEN RRB - 02/2024



Test Date	28/12/2024
Test Time	9:00 AM - 10:30 AM
Subject	RRB Technicians Grade III

**\* Note**

Correct Answer will carry 1 mark per Question.

Incorrect Answer will carry 1/3 Negative mark per Question.

1. Options shown in green color with a tick icon are correct.

2. Chosen option on the right of the question indicates the option selected by the candidate.

## Section : RRB Technicians Grade III

**Q.1** Refer to the given number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) 6 @ \$ 7 & 9 # 1 \* £ 5 3 2 + % 8 4 Ω (Right)

How many such symbols are there, each of which is immediately preceded by a number and also immediately followed by another number?

- Ans**
- ☒ 1. 4
  - ☒ 2. 1
  - ☒ 3. 2
  - ☒ 4. 3

**Q.2** If 6 men and 8 boys can do a piece of work in 10 days, while 26 men and 48 boys can do the same in 2 days, the time taken by 25 boys in doing the same type of work will be:

- Ans**
- ☒ 1. 6 days
  - ☒ 2. 5 days
  - ☒ 3. 4 days
  - ☒ 4. 8 days

**Q.3** B, C, D, E, F, G and K are sitting around a circular table, facing the centre. Only two people sit between E and F when counted from the left of F. G sits third to the left of K. C sits to the immediate right of K. C sits second to the left of E. B is not an immediate neighbour of G.

Who sits third to the right of B?

- Ans**
- ☒ 1. K
  - ☒ 2. D
  - ☒ 3. F
  - ☒ 4. G

Q.4 In a certain code language,

'A + B' means 'A is the sister of B',

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

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

and 'A ÷ B' means 'A is the son of B'.

How is Z related to C if 'X - Y x Z + A x B ÷ C'?

Ans

- ✓ 1. Wife's sister
- ✗ 2. Mother
- ✗ 3. Daughter
- ✗ 4. Wife's mother

Q.5 Which of the following are cells of phloem?

Ans

- ✗ 1. Tracheids and companion cells
- ✗ 2. Tracheids and vessels
- ✓ 3. Sieve tubes and companion cells
- ✗ 4. Sieve cells and vessels

Q.6 Who is the author of INDIA'S ECONOMY 2024: Disparities in Fractured Democracy?

Ans

- ✗ 1. Kingshuk Nag
- ✓ 2. Satyaki Roy
- ✗ 3. Sanjaya Baru
- ✗ 4. Milan Vaishnav

Q.7 The sale bill of an article after two successive discounts of 20% each is ₹16,000. The MRP of the article is:

Ans

- ✓ 1. ₹25,000
- ✗ 2. ₹25,220
- ✗ 3. ₹24,000
- ✗ 4. ₹24,560

Q.8 Which of the following seeds are dispersed by animals, especially spiny seeds with hooks, that get attached to their bodies and are carried to distant places?

Ans

- ✓ 1. Xanthium and Urena
- ✗ 2. Castor and Balsam
- ✗ 3. Drumstick and Maple
- ✗ 4. Sunflower and Madar

Q.9 In July 2024, the first Project PARI (Public Art of India), an initiative by the Ministry of Culture, Government of India, was organised in which of the following locations?

Ans

- ✗ 1. Ahmedabad
- ✓ 2. New Delhi
- ✗ 3. Hyderabad
- ✗ 4. Bengaluru

- Q.10** In a right-angled triangle, if the hypotenuse is 10 units and one of its sides is 8 units then find the area of the triangle.
- Ans**
- ☐ 1. 48 sq. units
  - ☐ 2. 16 sq. units
  - ☐ 3. 32 sq. units
  - ☒ 4. 24 sq. units

- Q.11** Every cell has a \_\_\_\_\_ around it to keep its own contents separate from the external environment.
- Ans**
- ☐ 1. mitochondria
  - ☐ 2. nucleus
  - ☐ 3. cell wall
  - ☒ 4. membrane

- Q.12** What will come in the place of '?' in the following equation, if '-' and '+' are interchanged and '×' and '÷' are interchanged?
- $$17 + 13 \times 3 \div 12 - 4 = ?$$
- Ans**
- ☐ 1. 206
  - ☐ 2. 211
  - ☒ 3. 221
  - ☐ 4. 241

- Q.13** What is the equivalent resistance of a series combination of resistors?
- Ans**
- ☐ 1. The reciprocal of the sum of the individual resistances.
  - ☒ 2. The sum of the individual resistances.
  - ☐ 3. The product of the individual resistances.
  - ☐ 4. The difference between the individual resistances.

- Q.14** The National Pension System Vatsalya (NPS Vatsalya) was launched on \_\_\_\_\_.
- Ans**
- ☐ 1. 8 September 2024
  - ☐ 2. 28 September 2024
  - ☒ 3. 18 September 2024
  - ☐ 4. 26 September 2024

- Q.15** Which of the following gases present in the atmosphere is used by terrestrial organisms for respiration?
- Ans**
- ☐ 1. Nitrogen
  - ☒ 2. Oxygen
  - ☐ 3. Neon
  - ☐ 4. Hydrogen

- Q.16** On simple interest, a certain sum of money amounts to ₹1,250 in 2 years and to ₹2,000 in 5 years. Find the rate of interest per annum (rounded off to two places of decimal).
- Ans**
- ☒ 1. 33.33%
  - ☐ 2. 27.27%
  - ☐ 3. 16.67%
  - ☐ 4. 11.11%

**Q.17** How many prime numbers lie between 1 and 30?

- Ans**
- ✓ 1. 10
  - ✗ 2. 8
  - ✗ 3. 9
  - ✗ 4. 11

**Q.18** Among the following cases, which kind of magnetic field production is found similar to the magnetic-field of a bar magnet?

- Ans**
- ✗ 1. A circular loop carrying current.
  - ✗ 2. A rectangular loop carrying current.
  - ✗ 3. An infinitely long wire carrying current.
  - ✓ 4. A solenoid of finite length carrying current.

**Q.19** If  $a - b = 1$  and  $a^3 - b^3 = 61$ , then the value of  $ab$  is :

- Ans**
- ✓ 1. 20
  - ✗ 2. 60
  - ✗ 3. -20
  - ✗ 4. 30

**Q.20** Evaluate the given expression.

$$\left(\frac{-2}{5}\right)^{-2} \times \left(\frac{-4}{5}\right)^4$$

- Ans**
- ✗ 1.  $\frac{25}{26}$
  - ✗ 2.  $\frac{25}{64}$
  - ✓ 3.  $\frac{64}{25}$
  - ✗ 4.  $\frac{26}{25}$

**Q.21** Which of the following examples is NOT an example of combination reaction?

- Ans**
- ✗ 1. Burning of coal
  - ✗ 2. Formation of slaked lime from quick lime
  - ✗ 3. Formation of water
  - ✓ 4. Formation of iron sulphate from copper sulphate and iron

**Q.22** Which of the following reproduces by budding?

- Ans**
- ✗ 1. Mosquito
  - ✗ 2. Liver fluke
  - ✗ 3. Algae
  - ✓ 4. Hydra

**Q.23** Refer to the given series and answer the question that follows (all numbers are single-digit numbers only, and all counting is to be done from left to right).

(Left) 4 5 1 8 3 6 3 6 8 4 5 7 6 7 1 9 2 4 6 2 7 8 6 1 8 8 1 7 7 3 (Right)

How many such even digits are there, each of which is immediately preceded by a perfect square and immediately followed by an even digit? (Note: 1 will be considered as a perfect square.)

- Ans**
- ☒ 1. 2
  - ☒ 2. 4
  - ☒ 3. 3
  - ☒ 4. 5

**Q.24** Which of the following organisms show a parasitic nutritive strategy?

- Ans**
- ☒ 1. Cuscuta
  - ☒ 2. Acacia
  - ☒ 3. Mosses
  - ☒ 4. Orchids

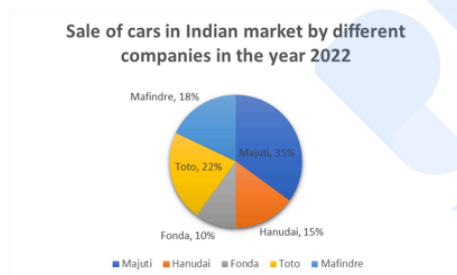
**Q.25** Which of the following options should come in place of the question mark (?) in the given series based on the English alphabetical order?

HJG, KMI, NPM, QSP, ?

- Ans**
- ☒ 1. VTS
  - ☒ 2. TVS
  - ☒ 3. VST
  - ☒ 4. TSV

**Q.26** Study the following pie-chart and answer the question that follows.

The following pie-chart shows the breakup of the percentage sale of cars by different companies in India in the year 2022.



If the total number of cars sold in India in the year 2022 was 15,00,000, then what was the number of cars sold by Mafindre in India in the year 2022?

- Ans**
- ☒ 1. 3,00,000
  - ☒ 2. 2,40,000
  - ☒ 3. 2,80,000
  - ☒ 4. 2,70,000

**Q.27** What will come in the place of '?' in the following equation, if '+' and '-' are interchanged and '×' and '÷' are interchanged?

$$3 + 13 \times 26 \div 8 - 4 = ?$$

- Ans**
- ☒ 1. 63
  - ☒ 2. 43
  - ☒ 3. 73
  - ☒ 4. 53

**Q.28** Which of the following is NOT a characteristic of a gas?

- Ans**
- ☐ 1. It is highly compressible.
  - ☐ 2. The particles are very loosely packed.
  - ☐ 3. The rate of diffusion is very high.
  - ☒ 4. It has a fixed shape.

**Q.29** Hariteja walked to his school at a speed of 4 km/h and returned on a scooter at 20 km/h. His average speed during the two-way journey is:

- Ans**
- ☐ 1. 12 km/h
  - ☐ 2. 6 km/h
  - ☒ 3.  $\frac{20}{3}$  km/h
  - ☐ 4. 8 km/h

**Q.30** Select the parasitic plant from the given options.

- Ans**
- ☐ 1. Cucumber
  - ☒ 2. Cuscuta
  - ☐ 3. Cabbage
  - ☐ 4. Cactus

**Q.31** By 20% decrease in the price of rice, people can buy 10 kg more rice for ₹100. What is the original price of 1 kg of rice?

- Ans**
- ☒ 1. ₹2.50
  - ☐ 2. ₹5.00
  - ☐ 3. ₹4.50
  - ☐ 4. ₹1.50

**Q.32** Union Budget 2024-25 enhanced the limit of Mudra loans under the 'Tarun' category to \_\_\_\_\_ for entrepreneurs who have availed and successfully repaid previous loans.

- Ans**
- ☐ 1. ₹15 lakh
  - ☒ 2. ₹20 lakh
  - ☐ 3. ₹12 lakh
  - ☐ 4. ₹25 lakh

**Q.33** If the length of a rectangle is thrice its breadth and the perimeter of that rectangle is 48 cm, then find its area (in cm<sup>2</sup>).

- Ans**
- ☐ 1. 84
  - ☐ 2. 112
  - ☒ 3. 108
  - ☐ 4. 96

**Q.34** Which of the following does NOT correctly match a change in the state of matter with its corresponding process?

- Ans**
- ☐ 1. Gas to Solid: Deposition
  - ☒ 2. Gas to Liquid: Sublimation
  - ☐ 3. Solid to Gas: Sublimation
  - ☐ 4. Liquid to Gas: Evaporation

**Q.35** What least digit must be assigned to k so that the 7-digit number 86325k6 is divisible by 11?

- Ans**
- ☐ 1. 1
  - ☒ 2. 3
  - ☐ 3. 4
  - ☐ 4. 2

**Q.36** Which of the following statements is/are correct related to respiration?

- (i) Pyruvate is converted into ethanol and carbon dioxide in yeast during fermentation.
- (ii) The break-down of pyruvate using oxygen takes place in chloroplast.
- (iii) In muscle cells, pyruvate is converted into lactic acid.

- Ans**
- ☐ 1. Only (i) and (ii)
  - ☐ 2. Only (i)
  - ☒ 3. Only (i) and (iii)
  - ☐ 4. (i), (ii) and (iii)

**Q.37** Which institution launched India's first-ever book on sports psychology?

- Ans**
- ☐ 1. Indian Institute of Management (IIM)
  - ☐ 2. National Sports University
  - ☒ 3. International Institute of Sports Management (IISM)
  - ☐ 4. Sports Authority of India (SAI)

**Q.38** Which of the following organisms has NO genetically predetermined sex?

- Ans**
- ☐ 1. Dogs
  - ☐ 2. Pigeon
  - ☐ 3. Human
  - ☒ 4. Snail

**Q.39** JM HK is related to NQ LO in a certain way based on the English alphabetical order. In the same way, MP KN is related to QT OR. To which of the following options is PS NQ related, following the same logic?

- Ans**
- ☐ 1. WTRU
  - ☐ 2. TWUR
  - ☒ 3. TWRU
  - ☐ 4. WTUR

**Q.40** Kartik starts from Point A and drives 42 km towards South. He then takes a left turn, drives 25 km, turns left and drives 12 km. He then takes a left turn and drives 20 km. He takes a final right turn, drives 30 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again?

(All turns are 90 degree turns only unless otherwise specified.)

- Ans**
- ☒ 1. 5 km towards West
  - ☐ 2. 5 km towards South
  - ☐ 3. 5 km towards East
  - ☐ 4. 5 km towards North



**Q.41** The potential energy possessed by an object of mass 8 kg when it is at a height of 5 m above the ground will be (g is acceleration due to gravity in SI unit):

- Ans**
- ☐ 1. 100g J
  - ☐ 2. 200g J
  - ☒ 3. 40g J
  - ☐ 4. 20g J

**Q.42** Which of the following options should come in place of the question mark (?) in the given series to make it logically complete?

912, 865, 826, 779, 740, ?

- Ans**
- ☐ 1. 650
  - ☒ 2. 693
  - ☐ 3. 675
  - ☐ 4. 689

**Q.43** Seven people, A, B, C, L, X, Y and Z are sitting in a row, facing north. Only five people sit between B and L. Z sits to the immediate left of L. Only one person sits between Z and C. A sits at some place to the left of Y but at some place to the right of X.

Who sits third from the left end of the line?

- Ans**
- ☒ 1. A
  - ☐ 2. Y
  - ☐ 3. C
  - ☐ 4. Z

**Q.44** In the following number-pairs, the second number is obtained by applying certain mathematical operations to the first number. Which numbers should replace X and Y so that the pattern followed by the two numbers on the left side of :: is the same as that on the right side of ::?

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

X : 54 :: 8 : Y

- Ans**
- ☐ 1. X = 10, Y = 39
  - ☐ 2. X = 10, Y = 59
  - ☐ 3. X = 11, Y = 36
  - ☒ 4. X = 11, Y = 39

**Q.45** Which of the following is an example of a heterogeneous solution?

- Ans**
- ☐ 1. Mixture of ethanol in water
  - ☒ 2. Mixture of oil in water
  - ☐ 3. Lemonade
  - ☐ 4. Tincture of iodine



**Q.46** Select the set in which the numbers are related in the same way as are the numbers of the following sets.

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

(16, 4, 20)

(36, 9, 45)

- Ans**
- ✓ 1. (56, 14, 70)
  - ✗ 2. (56, 12, 70)
  - ✗ 3. (54, 14, 70)
  - ✗ 4. (56, 14, 65)

**Q.47** Pipes A and B can fill a tank in 7 hours and 10 hours, respectively, and pipe C can empty the full tank in 14 hours. All three pipes are opened together, but pipe A is closed after 4.5 hours. In how many hours will the remaining part of tank be filled?

- Ans**
- ✗ 1. 16
  - ✗ 2. 24
  - ✗ 3. 12
  - ✓ 4. 8

**Q.48** Select the triad which follows the same pattern as that followed by the two triads given below. Both triads follow the same pattern.

QL-GK-ON

MH-CG-KJ

- Ans**
- ✗ 1. PJ-EI-ML
  - ✗ 2. OJ-EH-MK
  - ✓ 3. OJ-EI-ML
  - ✗ 4. PJ-EI-MK

**Q.49** A blanket is sold for ₹1,148, which results in a loss of 30%. For how much should it be sold to gain 5%?

- Ans**
- ✗ 1. ₹1,423
  - ✗ 2. ₹1,734
  - ✗ 3. ₹1,543
  - ✓ 4. ₹1,722

**Q.50** The median of the observations 4, 14, 11, 9, 7, 8, 9, 12, 4 and 6 is:

- Ans**
- ✗ 1. 9.5
  - ✗ 2. 9
  - ✓ 3. 8.5
  - ✗ 4. 8

**Q.51** The relation between power (  $P$  ), voltage (  $V$  ) and resistance (  $R$  ) is given by \_\_\_\_.

- Ans**
- ✓ 1.  $P = \frac{V^2}{R}$
  - ✗ 2.  $P = V^2 R$
  - ✗ 3.  $P = \frac{R}{2V^2}$
  - ✗ 4.  $P = \frac{R^2}{V}$

**Q.52** Refer to the given number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) 3 @ 2 % 9 + 7 £ \* 5 6 # Ω \$ 1 & 8 4 (Right)

How many such symbols are there, each of which is immediately preceded by a symbol and also immediately followed by another symbol?

- Ans**
- ✓ 1. 1
  - ✗ 2. 2
  - ✗ 3. 0
  - ✗ 4. 3

**Q.53** What causes the wavy appearance of objects seen through a turbulent stream of hot air?

- Ans**
- ✓ 1. Refraction of light
  - ✗ 2. Diffraction of light
  - ✗ 3. Absorption of light
  - ✗ 4. Interference of light

**Q.54** Which of the following statements is INCORRECT for colloid?

- Ans**
- ✓ 1. Colloid is a homogeneous mixture.
  - ✗ 2. They do not settle down when left undisturbed.
  - ✗ 3. Colloid is a heterogeneous mixture.
  - ✗ 4. Colloidal particles scatter a beam of light passing through it.

**Q.55** Six boxes P, Q, R, S, T and U are kept one over the other but not necessarily in the same order. P is kept third from the bottom. Only two boxes are kept between P and Q. Only three boxes are kept between Q and R. S is kept immediately below R. T is kept immediately below Q.

Q. How many boxes are kept between U and S?

- Ans**
- ✗ 1. One
  - ✗ 2. Three
  - ✗ 3. Zero
  - ✓ 4. Two

**Q.56** In which plant do the buds produced in the notches along the leaf margin, fall on the soil and develop into a new plant?

- Ans**
- ✗ 1. Grapes
  - ✓ 2. Bryophyllum
  - ✗ 3. Rose
  - ✗ 4. Jasmine

**Q.57** In a test, B got 60 marks while A got 75 marks. What percentage of A's marks was B's marks?

- Ans**
- ☐ 1. 65%
  - ☐ 2. 75%
  - ☒ 3. 80%
  - ☐ 4. 60%

**Q.58** Which phenomenon is responsible for the blue colour of the sky?

- Ans**
- ☒ 1. Scattering of light
  - ☐ 2. Total internal reflection
  - ☐ 3. Reflection
  - ☐ 4. Atmospheric refraction

**Q.59** Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster does not belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

- Ans**
- ☐ 1. BVP
  - ☒ 2. PKI
  - ☐ 3. KEY
  - ☐ 4. UOI

**Q.60** At which of the following temperatures does a liquid change into a solid upon cooling?

- Ans**
- ☐ 1. Condensation point
  - ☒ 2. Freezing point
  - ☐ 3. Boiling point
  - ☐ 4. Melting point

**Q.61** The problem of myopia in human eye can be corrected by using:

- Ans**
- ☐ 1. a convex lens of suitable power
  - ☐ 2. a convex mirror of suitable focal length
  - ☒ 3. a concave lens of suitable power
  - ☐ 4. a plain glass plate

**Q.62** \_\_\_\_\_ an initiative by the Ministry of Culture, Government of India, being executed by Lalit Kala Akademi and National Gallery of Modern Art, in July 2024.

- Ans**
- ☐ 1. Project PIAR
  - ☐ 2. Project PRAI
  - ☐ 3. Project APRI
  - ☒ 4. Project PARI

**Q.63** Which of the following statements is true about suspension?

- Ans**
- ☒ 1. The particles of a suspension can be seen by the naked eye.
  - ☐ 2. It is a homogeneous mixture.
  - ☐ 3. The solute particles don't settle down when a suspension is left undisturbed.
  - ☐ 4. The solute particles cannot be separated from the mixture.

**Q.64** At the 2024 Paris Olympics, Manu Bhaker made history by becoming the first Indian woman to win an Olympic shooting medal and the first Indian to win \_\_\_\_ medals in shooting events.

- Ans**
- ☐ 1. 4
  - ☒ 2. 2
  - ☐ 3. 5
  - ☐ 4. 3

**Q.65** Hindustan Aeronautics Limited (HAL) has been upgraded to which status by the Ministry of Finance in 2024?

- Ans**
- ☒ 1. Maharatna CPSE
  - ☐ 2. Mini Ratna CPSE
  - ☐ 3. Saksham CPSE
  - ☐ 4. Navratna CPSE

**Q.66** As per the SDG India Index 2023-24 prepared by NITI Aayog, what is India's composite score?

- Ans**
- ☐ 1. 60
  - ☐ 2. 65
  - ☐ 3. 95
  - ☒ 4. 71

**Q.67** Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which pair does not belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter cluster.)

- Ans**
- ☒ 1. OS-NR
  - ☐ 2. IM-HK
  - ☐ 3. LP-KN
  - ☐ 4. FJ-EH

**Q.68** A sum of money is distributed among four people A, B, C and D in the ratio 4 : 7 : 9 : 3. If B gets ₹600 more than A, then how much more will C get than D?

- Ans**
- ☐ 1. ₹800
  - ☐ 2. ₹600
  - ☒ 3. ₹1,200
  - ☐ 4. ₹1,400

**Q.69** Which unicellular organism has a whip-like structure at one end of the cell and binary fission occurs in a definite orientation in relation to these structures?

- Ans**
- ☐ 1. Amoeba
  - ☐ 2. Yeast
  - ☐ 3. Plasmodium
  - ☒ 4. Leishmania

**Q.70** Read the given statements and conclusions carefully. You have to take the given statements to be true even if they seem to be at variance from commonly known facts and decide which conclusion(s) logically follow(s) from the given statements.

Statements:

All buds are flowers.

All insects are flowers.

Conclusions:

(I) All buds are insects.

(II) All flowers are buds.

- Ans**
- ☒ 1. Only conclusion (II) follows
  - ☒ 2. Neither conclusion (I) nor (II) follows
  - ☒ 3. Only conclusion (I) follows
  - ☒ 4. Both conclusions (I) and (II) follow

**Q.71** Evaluate the given expression.

$$36 - [12 + (3 \times 10 \div 2)]$$

- Ans**
- ☒ 1. 2
  - ☒ 2. 1
  - ☒ 3. 10
  - ☒ 4. 9

**Q.72** In a parallel combination of two different resistors, which of the following is/are correct?

(A) The potential difference across each resistor has the same value.

(B) The current flowing through each resistor has the same value.

- Ans**
- ☒ 1. Both 'A' and 'B' are incorrect.
  - ☒ 2. 'A' is incorrect and 'B' is correct.
  - ☒ 3. 'A' is correct and 'B' is incorrect.
  - ☒ 4. Both 'A' and 'B' are correct.

**Q.73** The phenomenon of change of liquid into vapours at any temperature below its boiling point is known as \_\_\_\_\_.

- Ans**
- ☒ 1. fusion
  - ☒ 2. sublimation
  - ☒ 3. evaporation
  - ☒ 4. deposition

**Q.74** 'When a sailor jumps out of a rowing boat, the boat moves backwards' is an example of which law of motion?

- Ans**
- ☒ 1. Newton's third law of motion
  - ☒ 2. Newton's first law of motion
  - ☒ 3. Newton's second law of motion
  - ☒ 4. Law of inertia

**Q.75** Which of the following phenomena is responsible for Tyndall effect?

- Ans**
- ✓ 1. Scattering of light
  - ✗ 2. Dispersion of light
  - ✗ 3. Refraction of light
  - ✗ 4. Reflection of light

**Q.76** Ramu has been given a tub of water with a refractive index of 1.33, a mug of oil with a refractive index of 1.46, a bottle of glycerine with a refractive index of 1.5 and a glass-slab with a refractive index of 1.65. Light will travel fastest in:

- Ans**
- ✗ 1. glycerine
  - ✗ 2. oil
  - ✓ 3. water
  - ✗ 4. glass-slab

**Q.77** The laws of reflection are applicable to:

- Ans**
- ✗ 1. only plane reflecting surface
  - ✓ 2. all types of reflecting surfaces including spherical surfaces
  - ✗ 3. only curved reflecting surface
  - ✗ 4. all types of reflecting surfaces excluding spherical surfaces

**Q.78** Select the most appropriate hydrogen atom radius from the given options.

- Ans**
- ✗ 1.  $10^{-8}$  m
  - ✗ 2.  $10^{-12}$  m
  - ✓ 3.  $10^{-10}$  m
  - ✗ 4.  $10^{-6}$  m

**Q.79** In September 2024, researchers at (the) \_\_\_\_\_ developed a 'brain on a chip' that can store and process data in 16,500 states within molecular film.

- Ans**
- ✗ 1. Indian Space Research Organisation (ISRO)
  - ✗ 2. Indian Institute of Space Sciences
  - ✗ 3. IIT Bombay
  - ✓ 4. Indian Institute of Science (IISc)

**Q.80** The sum of three sides of an isosceles triangle is 20 cm, and the ratio of an equal side to the base is 3 : 4, The altitude of the triangle is:

- Ans**
- ✓ 1.  $2\sqrt{5}$  cm
  - ✗ 2.  $3\sqrt{3}$  cm
  - ✗ 3.  $3\sqrt{5}$  cm
  - ✗ 4.  $4\sqrt{5}$  cm

**Q.81** How many eggs is/are produced every month by one of the ovaries?

- Ans**
- ☐ 1. Three
  - ☐ 2. Four
  - ☒ 3. One
  - ☐ 4. Two

**Q.82** Which of the following statements is true regarding a dilute solution?

- Ans**
- ☐ 1. It exhibits a heterogeneous appearance.
  - ☒ 2. It has a small amount of solute dissolved in a large amount of solvent.
  - ☐ 3. It contains a large amount of solute dissolved in a small amount of solvent.
  - ☐ 4. It has an equal ratio of solute to solvent by mass.

**Q.83** Which of the following options should come in place of the question mark (?) in the given series based on the English alphabetical order?

ABC, EDH, IFM, MHR, ?

- Ans**
- ☐ 1. RSW
  - ☒ 2. QJW
  - ☐ 3. QNW
  - ☐ 4. QIW

**Q.84** \_\_\_\_\_ is found as chromatin material in a non-dividing cell's structure.

- Ans**
- ☐ 1. RNA
  - ☒ 2. DNA
  - ☐ 3. Ribosome
  - ☐ 4. Nucleus

**Q.85** If 7, 12, 21 and k are in proportion, the value of k is:

- Ans**
- ☐ 1. 24
  - ☒ 2. 36
  - ☐ 3. 27
  - ☐ 4. 35

**Q.86** The smallest six-digit natural number that is exactly divisible by 8, 10, 12 and 16 is:

- Ans**
- ☐ 1. 100020
  - ☐ 2. 100040
  - ☐ 3. 100060
  - ☒ 4. 100080

**Q.87** Whenever an object falls toward the earth, acceleration is involved. Which of the following forces provides this acceleration?

- Ans**
- ☐ 1. Nuclear force
  - ☐ 2. Electromagnetic force
  - ☒ 3. Earth's gravitational force
  - ☐ 4. Earth's repulsive force



**Q.88** Find the simple interest on ₹700 at 7% per month in 9 months.

- Ans**
- ☐ 1. ₹434
  - ☐ 2. ₹461
  - ☐ 3. ₹474
  - ☒ 4. ₹441

**Q.89** Read the given statements and conclusions carefully. You have to take the given statements to be true even if they seem to be at variance from commonly known facts and decide which conclusion(s) logically follow(s) from the given statements.

Statements:

Some pens are sketch pens.

All sketch pens are erasers.

Some erasers are rulers.

Conclusions:

(I) Some rulers are sketch pens.

(II) Some erasers are pens.

- Ans**
- ☐ 1. Only conclusion (I) follows.
  - ☐ 2. Neither conclusion (I) nor (II) follows.
  - ☐ 3. Both conclusions (I) and (II) follow.
  - ☒ 4. Only conclusion (II) follows.

**Q.90** After a hot sunny day, people sprinkle water on the roof or open ground because:

- Ans**
- ☒ 1. large latent heat of vaporisation of water helps to cool the hot surface
  - ☐ 2. less latent heat of vaporisation of water helps to cool the hot surface
  - ☐ 3. large latent heat of vaporisation of water does not help to cool the hot surface
  - ☐ 4. large latent heat of vaporisation of water helps to heat the cold surface

**Q.91** Which of the following are bacterial infections that occur due to sexual contact?

A. Gonorrhoea

B. AIDS

C. Syphilis

- Ans**
- ☐ 1. Both A and B
  - ☐ 2. A, B and C
  - ☒ 3. Both A and C
  - ☐ 4. Both B and C

**Q.92** Given below is a statement followed by two possible reasons numbered I and II. Read the statement carefully and decide which of the two explain(s) the event/observation/information given in the statement.

Statement - Even though sugar is added in most of the food items cooked, it is not good for health.

Reasons:

I. Sugar adds more taste into any food being cooked.

II. Sugar is the most consumed material in the country

- Ans**
- ☒ 1. Both I and II are possible reasons.
  - ☒ 2. Only I is a possible reason.
  - ☒ 3. Only II is a possible reason.
  - ☒ 4. Neither I nor II is a possible reason.

**Q.93** Which of the following is NOT an example of a homogeneous mixture?

- Ans**
- ☒ 1. Orange juice with pulp
  - ☒ 2. Sugar solution
  - ☒ 3. Vinegar
  - ☒ 4. Pure Air

**Q.94** The average of the first 10 odd prime numbers is:

- Ans**
- ☒ 1. 13.8
  - ☒ 2. 17
  - ☒ 3. 12.9
  - ☒ 4. 15.8

**Q.95** The value of  $\left[ \frac{\cos 50^\circ}{1 + \sin 50^\circ} \right] + \left[ \frac{1 + \sin 50^\circ}{\cos 50^\circ} \right]$  is:

- Ans**
- ☒ 1.  $2 \tan 50^\circ$
  - ☒ 2.  $2 \sec 50^\circ$
  - ☒ 3.  $2 \cot 50^\circ$
  - ☒ 4.  $2 \operatorname{cosec} 50^\circ$

**Q.96** Ravi is younger than Kishan by 3 years. If the ages of Ravi and Kishan are in the ratio 7 : 8, then how old is Kishan?

- Ans**
- ☒ 1. 24 years
  - ☒ 2. 21 years
  - ☒ 3. 18 years
  - ☒ 4. 27 years

**Q.97** In a certain code language, 'I Drink Juice' is written as 'Hu Pu Nu' and 'We Drink Water' is written as 'Tu Su Hu' and 'Juice and Water' is written as 'Pu Du Tu'. How is 'We' written in the given language?

- Ans**
- ☒ 1. Hu
  - ☒ 2. Pu
  - ☒ 3. Tu
  - ☒ 4. Su

**Q.98** In a certain code language, 'He Loves Cricket' is written as 'Ki Mi Gi', 'She Loves To Play' is written as 'Si Di Ci Ki', and 'He Play Chess' is written as 'Ti Gi Di'. How is 'Chess' written in the given language?

- Ans**
- ☐ 1. Gi
  - ☒ 2. Ti
  - ☐ 3. Di
  - ☐ 4. Ki

**Q.99** What is the cause of the apparent elevation of a star's position when viewed near the horizon?

- Ans**
- ☐ 1. Atmospheric absorption of starlight
  - ☐ 2. Reflection of starlight away from the normal
  - ☒ 3. Atmospheric refraction of starlight towards the normal
  - ☐ 4. The gravitational force of Earth on starlight

**Q.100** By what per cent does the curved surface area of a cylinder decrease, if the radius is increased by 20% and the height is decreased by 30%?

- Ans**
- ☐ 1. 20%
  - ☒ 2. 16%
  - ☐ 3. 14%
  - ☐ 4. 23%

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