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PREVIOUS PAPER

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Based on Memory

1. If the point A (7, k) is the vertex of an isosceles triangle ABC with base BC, where B = (2, 4) and C = (6, 10), then what is 'k'?

1) 6 2) 3 3) 4 4) 5

2. If the distance between the points (na, nb) and (a, b) is 4 times the distance between the points (5a, 5b) and (a, b), then 'n' is equal to-

a) 11 or –13 2) 11 3) 13 4) 17 or –15

3. ABC is a tringle whose centroid is G. If A is (–3, 1) B is (2, b), C is (a, –4) and G is (1, –1) then find 'a' and 'b'.

1) a = 4, b = 0 2) a = 0, b = 4

3) a = 3, b = 2 4) a = 5, b = 2

4. An angle is equal to $\frac{3\pi}{5}$ radians. What is its measure in degrees?

1) 145° 2) 72° 3) 108° 4) 120°

5. The equation of a straight line is 2x-3y+2 = 0. What is its slope?

1) $\frac{2}{3}$ 2) –2 3) 2 4) $-\frac{2}{3}$

6. Find the range of values of x, which satisfy the inequality-

$-\frac{1}{5} \leq \frac{3x}{10} + 1 < \frac{2}{5}$, $x \in R$

1) $(x : x \in R, 0.3 \leq x < 9)$ 2) $(x : x \in R, -4 \leq x < -2)$

3) $(x : x \in R, 4 \geq x > -2)$ 4) $(x : x \in R, 5 < x \leq 8)$

7. Read the law given below and identify the same:

The mass on any substance liberated from an electrolyte is directly proportional to the quantity of charge passing through the solution.

1) Avogadro's law

2) Faraday's first law of electrolysis

3) Faraday's second law of electrolysis

4) Kirchhaoff's law of electricity

8. The value of Avogadro's constant is-

1) 6.022×10^{23} per mole 2) 58.04×10^{-2} per mole

3) 69.51×10^{-18} per mole 4) 6.022×10^{14} per mole

9. In an experiment, 295 mg of copper is deposited when a current of 500 mA passes for 30 minutes. Find the electrochemical equivalent of copper-

1) 32.77 a 10^{-8} kg/ coulomb 2) 58.4 kg/ coulomb

3) 109.5×10^{8} kg/ coulomb 4. $\frac{1}{32.77 \times 10^{-8}}$ kg/ coulomb

10. Which one of the following is the correct unit of angular velocity?

1) m/ minute 2) cm/ sec^2 3) cm/sec 4) radians/ sec

11. The force by which a body is attracted towards the centre of the earth is called-

1) Gravitational force 2) Mass

3) Momentum 4) Impulsive force

12. The maximum displacement of a vibrating body from its mean position is called-

1) Gyration 2) Wavelength 3) Amplitude 4) Impulse

13. The kinetic energy of a body depends upon-

1) Mass, gravity and height 2) Its mass alone

3) Its velocity alone 4) Both mass and velocity

14. A ball weighing 25 grams is thrown vertically into the air. It takes 15 seconds to reach its highest point. How much time would it take to reach the ground from its highest point?

1) More data are required for calculation

2) Less than 15 seconds

3) More than 15 seconds

4) 15 seconds

15. The term 'Squirrel Cage' is associated with

1) Pressure gauges 2) Internal combustion engines

3) Potentiometers 4) Electric motors

16. The phenomenon of increase in the temperature of the earth's atmosphare due to absorption of the infra-red radiations reflected from the earth's surface is called-

1) Tsunami 2) Solar heating

3) Green-house effect 4) Seismic effect

17. Why is it recommended that people should not use charcoal or gas stoves in closed rooms?

1) The electrical wiring in the room may catch fire

2) The stoves will get extinguished

3) It can cause carbon monoxide poisoning

4) The stoves may burst

18. The most effective way to improve safety in a vast organisation like the Indian Railways is to

1) Ignore small acts of negligence by the staff

2) Carry out frequant checks

3) Educate the staff at all levels

4) Punish defaulting staff

19. The density of water is maximum at

1) 100°C 2) 0°C 3) –273°C 4) 4°C

20. Which one of the following quantities does not have a unit?

1) Velocity 2) Density 3) Specific Gravity 4) Mass

21. A Swimmer finds it easier to swim in sea water than in plain water. Why?

1) Sea water has less contamination

2) Sea waves help a swimmer to swim

3) Sea water has higher density than plain water

4) Sea has a much higher volume of water

22. Humidity refers to-

1) Both temperature and moisture contents of the air

2) Temperature of the air

3) Moisture content of the air

4) Presure of the air

23. Boyle's law states that-

1) Volume is directly proportional to temperature

2) Pressure is inversely proportional to temperature

3) Pressure is directly proportional to temperature

4) Presure is inversely proportional to valume

24. Purity of milk is confirmed by-

1) Barometer 2) Lactometer 3) Altimeter 4) Hygroscope

25. A stick is dipped in a vessel containing water. It appears bent due to the property of-

1) Reflection 2) Newton's Law of Motion

3) Refraction 4) Buoyancy

26. The temperature on the surface of the sun is about-

1) 8×10^{15}°C 2) 500°C 3) 6000°C 4) 1000°C

27. The planet farthest from the Sun is-

1) Pluto 2) Mercury 3) Jupiter 4) Neptune

28. Which one of the following is measured on the 'RICHTER SCALE'?

1) The speed of a rocket 5 seconds after take off

2) The intensity of thunderstorm

3) The intensity of an earthquake

4) The speed at which a player serves the ball in Lawn Tennis

29. As a train approaches us, the frequency or shrillness of its whistle increases. This phenomenon is explained by-

1) Big Bang Theory 2) Doppler Effect

3) Charles' Law 4) Archimedes Principle

30. The load on a spring per unit deflection is called-

1) Stress 2) Flexbility 3) Stiffness 4) Strain

31. The term acceleration means-

1) Maximum speed of a vehicle 2) Rate of change of time

3) Rate of change of velocity 4) Rate of change of distance

32. A body of mass 10 kg accelerates from rest at the rate of 3 m/sec^2. What distance would the body travel in 10 seconds?

1) 250 metres 2) 100 metres 3) 150 metres 4) 200 metres

33. The efficiency of a heat engine is 40%. If 10,000 joules of heat energy are supplied to it, then the useful work done by the engine would be-

1) 40,000 Joules 2) 10,000 Joules 3) 25,000 Joules 4) 4,000 Joules

34. A gas is allowed to expand at constant temperature from an initial volume of 10 ml to a final volume of 300 ml. At the end of the expansion, the pressure of the gas was found to be 1 atmosphere. What was the initial pressure of the gas?

1) 9 atmosphere 2) 1 atmosphere 3) 3 atmosphere 4) $\frac{1}{3}$ atmosphere

35. There are three non-collinear points. How many circles can be drawn passing through them?

1) Infinite 2) One 3) Two 4) Three

36. What do you understand by the term 'Absolute Pressure'?

1) It is the atmospheric pressure at mean sea level

2) It is the atmospheric pressure expressed in kg/ cm^2

3) It is the pressure equal to the algebraic sum of atmospheric and gauge pres sures

4) It is the pressure as seen on the gauge of a pressure measuring instrument

Directions (Qs. 37 to 39): Study the folloiwng number sequence to answer these questions.

5 1 4 7 3 9 8 5 7 2 6 3 1 5 8 6 3 8 5 2 2 4 3 4 9 6

37. How many odd numbers in the above sequence are immediately followed by an odd number?

1) More than 4 2) 2 3) 3 4) 4

38. How many even numbers are there in the sequence which are immediately preceded by an odd number but immediately followed by an even number?

1) 5 2) 2 3) 3 4) 4

39. How many odd numbers are there in the sequence which are immediately preceded and also immediately followed by an even number-

1) 5 2) 2 3) 3 4) 4

40. Study the following number sequence-

5 9 8 1 3 2 7 4 3 8

If the first and the second digits in the sequence are interchanged, also the third and fourth digits, the fifth and sixth digits, and so on, then which digit would be the seventh counting to your left?

1) 8 2) 1 3) 4 4) 7

41. If the numbers from 1 to 45 which are exactly divisible by 3 are arranged in an ascending order, minimum number being kept frist, then which number would come at the ninth place from the first?

1) 30 2) 21 3) 24 4) 27

42. Find the value of-

$8.55 \times 8.55 - 2 \times 8.55 \times 3.55 + 3.55 \times 3.55$

1) 27.5 2) 20 3) 25 4) 36

43. A husband and wife have six married sons and each of them has four children. The total number of members in the family is-

1) 40 2) 30 3) 36 4) 38

Directions (Qs. 44 to 46): In each of the letter series given in these questions, some of the letters are missing. The missing letters are given in that order as one of the alterntives below it. Choose the correct alternative.

44. ba–b–aab–a–b

1) babb 2) abab 3) abba 4) baba

45. mnonopqopqrs -----

1) qrstu 2) mnopq 3) oqrst 4) pqrst

46. c–bba–cab–ac–ab–ac

1) bcacb 2) abcbc 3) acbcb 4) babcc

47. $\frac{1}{4}\left(\frac{1}{216}\right)^{-\frac{2}{3}} \div \left(\frac{1}{27}\right)^{-\frac{4}{3}} = ?$

1) $\frac{1}{9}$ 2) $\frac{1}{6}$ 3) $\frac{5}{36}$ 4) $\frac{1}{12}$

Directions (Qs. 48 & 49): Study the information given below to answer these questions:

On a playground, Dinesh, Kunal, Nitin, Atul and Prashant are standing as described below facing the North.

i. Kunal is 40 metres to the right of Atul

ii. Dinesh is 60 metres to the South of Kunal

iii. Nitin is 25 metres to the West of Atul

iv. Prashant is 100 metres to the North of Dinesh

48. Who is to the North-east of the person who is to the left of Kunal?

1) Prashant 2) Dinesh 3) Nitin 4) Atul

49. If a boy walks from Nitin, meets Atul, followed by Kunal, Dinesh and Prashant, then how many metres has he walked if he travelled the straight distance all through?

1) 245 metres 2) 155 metres 3) 185 metres 4) 225 metres

50. Roshan is taller than Rahul who is shorter than Sushil. Mirza is taller than Harry but shorter than Rahul. Sushil is shorter than Roshan. Who is the tallest?

1) Harry 2) Roshan 3) Sushil 4) Rahul

51. Roshan is taller than Rahul who is shorter than Sushil. Mirza is taller than Harry but shorter than Rahul. Sushil is shorter than Roshan. Who is the shortest?

1) Roshan 2) Harry 3) Mirza 4) Rahul

52. Which one of the following causes of environmental pollution cannot be attributed to human beings?

1) Uncontrolled growth of human population

2) Rapid industrialisation

3) Rapid urbanisation

4) Volcanic eruptions

53. Which one of the following gases is manly responsible for the GREENHOUSE EFFECT?

1) Sulphur dioxide 2) Carbon mono-oxide

3) Hydrogen sulphide 4) Carbon dioxide

54. Which one of the following is a major constituent of petrol?

1) Pentane (C_5H_{12}) 2) Octane (C_8H_{18})

3) Methane (CH_4) 4) Hexane (C_6H_{14})

55. Which one of the following is a widely used solid lubricant?

1) Graphite 2) Sodium 3) Lithium 4) Zinc

56. The world TSUNAMI is derived from which of the following languages?

1) Sinhalese 2) Korean 3) Chinese 4) Japanese

57. A major nuclear power plant, located in one of the countries affected by TSUNAMI, escaped damage. Where is it located?

1) Bali in Indonesia 2) Galle in Sri Lanka

3) Phuket in Thailand 4) Kalpakkam in India

58. A major cricket ground was severely damanged by the rescent TSUNAMI. Where is it locted?

1) Candy in Sri Lanka 2) Chittagong in Bangladesh

3) Galle in Sri Lanka 4) Nairobi in Kenya

59. The sound waves in the audible range have frequencies in the range of-

1) 20 Hz to 20,000 Hz 2) 0.5 Hz to 5 Hz

3) 1 Hz to 10 Hz 4) 20,000 hz to 40,000 Hz

60. Which of the following being used for applicationis such as assessing depth of oceans, thickness measurement, determination of the position of icebergs, flaw detection in metals, etc?

1) Ultrasonic waves 2) X–rays 3) Light waves 4) γ–rays

61. The isotopes of an element are characterised by which of the following?

1) Presence of neutrons of unusual size

2) Different number of electrons in the atom

3) Different number of protons in the nucleus

4) Different number of neutrons in the nucleus

62. How do you understand by the term 'Binding Energy'?

1) Energy released when a nucleus is formed from protons and neutrons

2) The force of attraction between an electron in the first orbit and the nucleus

3) Electron belonging to the same major energy level

4) Energy associated with a photon

63. Which of the following statements in wrong?

1) Ionic bonds are non-rigid and non-directional

2) Compounds formed by ionic bonds are non-conductors of electricity

3) Ionic bonds are formed by transfer of electrons from a metal to a non–metal atom

4) Compounds fromed by ionic bonds are hard and brittle

64. Arrange the following materials in the order of decreasing conductivity:

Silicon, Glass, Aluminium, Silver

1) Glass, Silicon, Aluminium, Silver

2) Aluminium, Silver, Glass, Silicon

3) Silver, Silicon, Aluminium, Glass

4) Silver, Aluminium, Silicon, Glass

65. If a barometer carries water instead of mercury, then the height of the column for a pressure equivalent to 75 cm of mercury would be-

1) 1050 cm 2) 1020 cm 3) 1000 cm 4) 5.5 cm

66. The term EURO–II in the context of modern cars refers to-

1) Emission from cars 2) Speed of cars

3) Fuel efficiency 4) Torque available

67. What is the ultimate benefit of good communication in a vast organisation like the Indian Railways?

1) Improved productivity and profits

2) Reduced frustration among the employees

3) Development of good human relations

4) Improved image of the organisation

68. What is the term AGMARK used for?

1) Grading various agricultural commodities

2) Grading battery toys

3) Grading polyester textiles

4) Grading engine lubricating oils

69. The standard used in India for certifying the quality of Industrial goods is-

1) ISI 2) ISO 3) ITI 4) CEERI

70. An electric heater of 1 kW rating is used to heat water everday for 2 hours. In 10 days, it will consume-

1) 20 kWh 2) 2 kWh 3) 0.2 kWh 4) 200 kWh

71. Ozone is a gas having ..... atoms of Oxgen in its molecules.

1) Four 2) One 3) Two 4) Three

72. A Family consumes 14.5 Kg Of LPG in 29 days. The calorific value of LPG is 55 Kl/ gm. the average energy consumed per day is-

1) 275 kj 2) 27.5 kj 3) 27,500 kj 4) 0.275 kj

73. The chemical formula of natural gas is-

1) C_3H_8 2) CH_4 3) C_4H_{10} 4) C_2H_6

74. The percentage of carbon in one molecule of carbon dioxide is approximately-

1) 2.73% 2) 72.7% 3) 80% 4) 27.3%

75. The term 'Cracking' in the context of organic molecules is-

1) The process of fractional distillation in the refineries

2) Breaking of a large alkane molecule into smaller hydrocarbon molecules

3) A nuclear reaction where in the nucleus is broken

4) Use of fire crackers to produce heat to initiate certain chemical reactions

76. In a nuclear power station, which one of the following is commonly used as a fuel for producing heat?

1) Coal 2) Helium 3) Heavy Water 4) Uranium–235

77. Fission of one nucleus releases 3.2×10^{-11} Joules energy. The number of fissions required to produce energy at the rate of 10 MW for 10 hours is-

1) 6.5×10^{50} 2) 2.1×10^{12} 3) 1.125×10^{22} 4) 1800

78. A stove consumes 1 gram of kerosene in 48 seconds. if the calorific value of kerosene is 48 KJ / gm, then the power of consumption of the stove in kW is-

1) 0.1 2) 1.5 3) 1 4) 0.5

79. If acceleration due to gravity is 10 m/ sec^2, then the potential energy of a body of mass 1 kg kept at a height of 5 metres is-

1) 50 Joules 2) 500 Joules 3) 100 Joules 4) 10 Joules

80. A boat weighing 200 kg floats on water. The weight of water displaced would be-

1) 220 kg 2) 0 kg 3) 180 kg 4) 200 kg

81. An iron spherical ball having an external volume of 10 cu cm is dipped in a beaker containing water of specific gravity 1 gm/ cu cm. The weight of the ball would be reduced by-

1) Colleting more data for making the calculation

2) 0.1 gm

3) 1 gm

4) 10 gm

82. Archimedes Principle is related to-

1) laws of floatation 2) Right–angled triangle

3) Laws of gravity 4) Relation between current and voltage

83. The commonly used washing soda is-

1) Sodium Bicarbonate 2) Sodium Carbonate

3) Sodium Chloride 4) Magnesium Chloride

84. The chemical formula of 'plaster of paris' is-

1) $2CaSO_4.\frac{1}{2}\ H_2O$ 2) $Ca(OH)_2$

3) $(CaSO_4)_2.H_2O$ 4) $CaOCl_2$

85. A sanitary worker uses a white substanced to clean water tanks. The substance has a strong smell of chlorine. The substance is-

1) Bleaching powder 2) Slaked lime

3) Backing powder 4) Common salt

86. A person bakes a cake. It turns out to be hard and small in size. Which ingredient has he forgotten to add that would have caused the cake to rise and become light?

1) Cooking oil 2) Baking powder

3) Bleaching powder 4) Sugar

87. A White chemical compound becomes hard on mixing proper quantity of water. It is also used in surgery to repair fractured bones. What is it?

1) Plaster of paris 2) Slaked lime 3) Bleaching power 4) lime

88. Brass has which of the following compositions?

1) 40% copper, 40% zinc and 20% tin 2) 50% zinc and 50% copper

3) 80% zinc, 10% copper and 10% lead 4) 80% copper and 20% zinc

89. Broneze has which of the following compositions?

1) 50% copper, 10% iron and 40% zinc 2) 90% copper and 10% tin

3) 10% copper and 90% tin 4) 40% copper, 40% tin and 20% zinc

90. Solder has which of the follwing compositions?

1) 50% lead and 50% tin 2) 70% lead, 20% copper and 10% tin

3) 20% lead, 40% copper and 40% tin 4) 10% lead and 90% tin

91. Galvansation is the process of-

1) Drawing metals into thin wires

2) Giving a coating of zinc metal on iron

3) Making aluminium metal into thin wire

4) Making thin aluminium foils

92. German silver has which of the following compositions?

1) 20% copper, 20% chromium and 60% zinc

2) 40% copper, 20% zinc and 40% silver

3) 60% copper, 20% zinc and 20% nickel

4) 80% copper, 10% zinc and 10% silver

93. The symbol of Magnesium is Mg. What does Mg^{2+} mean?

1) Magnesium atom has acquired two protons

2) two atoms of magnesium have combined

3) Magnesium atom has donated two outermost electrons to form a positive ion

4) The charged Mg. ion attracts oppositely charged negative ions with twice as much intensity

94. When Sodium (Na), Copper (Cu) and Zinc (Zn) are placed in the order of decreasing reactivity, then their order would be-

1) Na > ZN > Cu 2) Na > Cu > Zn 3) Cu > Na > Zn 4) Zn > Na > Cu

95. Which of the following metals is more reactive than Hydrogen?

1) Gold 2) Calcium 3) Aluminium 4) Iron

96. Which of the following metals can displace Hydrogen from its compounds like water and acids to form hydrogen gas?

1) Tin 2) Copper 3) Mercury 4) Silver

97. The approximate percentage of salt by weight in sea water is-

1) 41% 2) 3.6% 3) 0.1% 4) 10.2%

98. The common salt is iodised to prevent occurence of which of the following diseases in the human body?

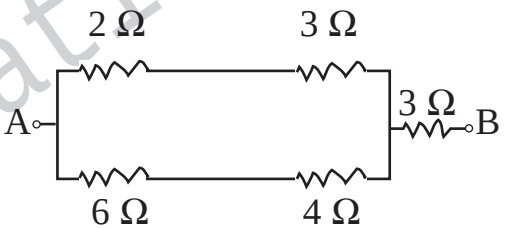
1) Diabetes 2) Goitre

3) Beri–beri 4) Night–blindness

99. A wire of a certain length has a resistance of 2.2Ω. If the wire is stretched to twice its original length, then find the new resistence.

1) 8.8Ω 2) 1.1Ω 3) 2.2Ω 4) 4.4Ω

100. In the above circuit, the effective resitance between the points A and B is-



1) 18 Ω 2) $4\frac{4}{9}$ Ω 3) $6\frac{1}{3}$ Ω 4) $3\frac{1}{3}$ Ω

ANSWERS

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