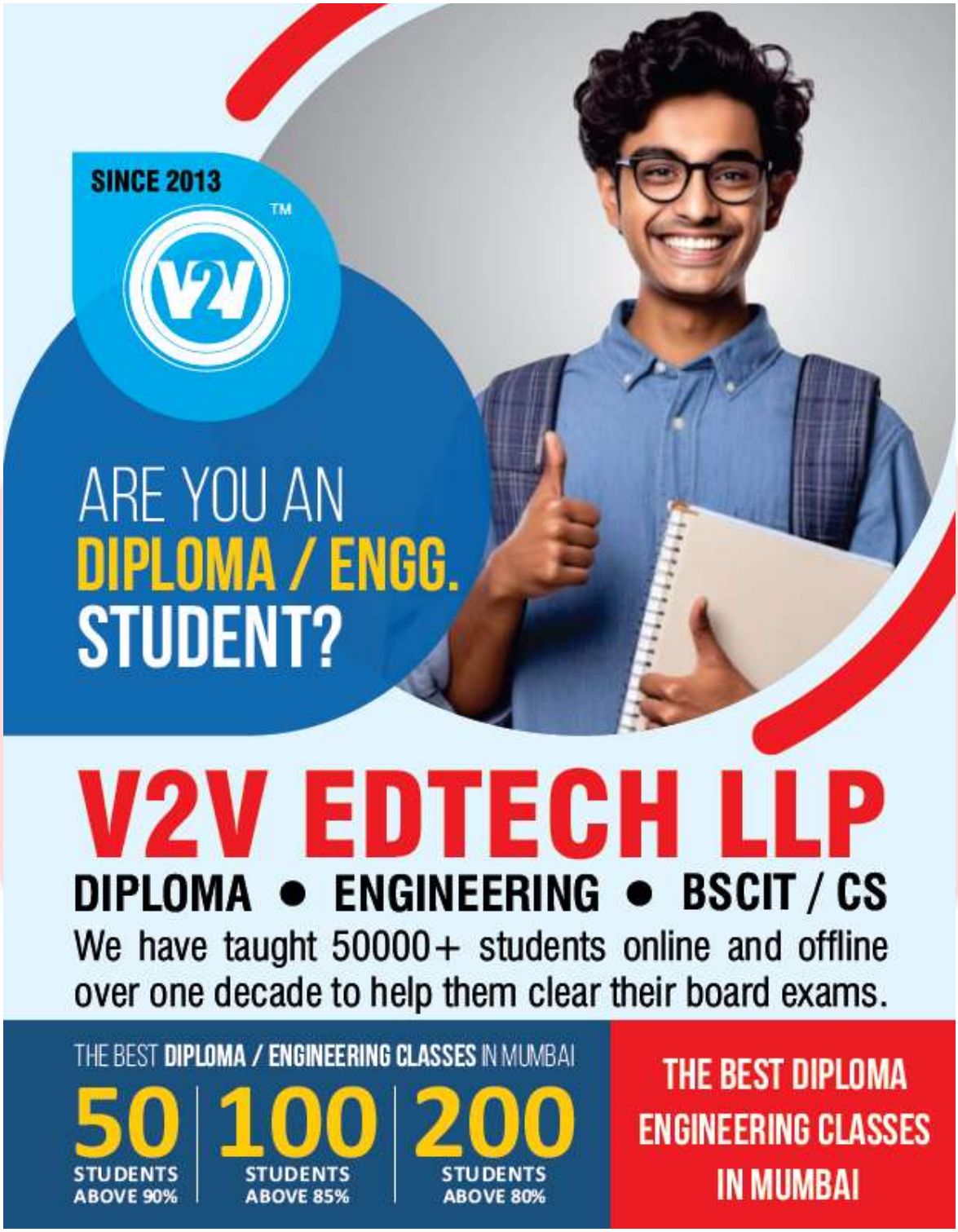


YouTube live Session Link :
https://www.youtube.com/live/wEBWHLy-stY?si=giD3SAqgk_YPrfwd

Program: All Programs of Diploma in Engineering	Program Code:- EE / CO / EJ / CE / ME
Scheme:- K	Semester:- 1
Course:- Physics	Course Code:- 311305

Units and Measurement	Marks:- 05

Content of Chapter:-

1.1 Unit, Physical Quantities: Fundamental and Derived Quantities and their units
1.2 Systems of Units: CGS, MKS, FPS and SI
1.3 Dimensions and Dimensional Formula
1.4 Errors, Types of errors: instrumental, systematic and random error, Estimation of errors: absolute, relative and percent error, Significant Figures

1. The physical quantities which don't depend on any other quantities for its measurement are called (A) Fundamental physical quantities (B) Derived physical quantities
(C) Mathematical quantities (D) chemical quantities
Answer:- Option A
Explanation:- These are the basic (fundamental) quantities that define themselves.

2. Electric current, thermodynamic temperature, Amount of substance, luminous intensity are_____quantities
(A) Fundamental physical quantities (B) Derived physical quantities
(C) Mathematical quantities (D) chemical quantities
Answer:- Option A
Explanation:- These are the basic (fundamental) quantities those define themselves

3. The length of the table is 3 meter, here 3 is the
(A) Standard (B) unit
(C) Magnitude (D) quantity
Answer:- Option C
Explanation:- In the measurement of a physical quantity, the numerical part implies the quantity and the alphabetical one implies the unit of the quantity measured.

4. Which of the following units is a derived unit?
(A) second (B) meter
(C) ampere (D) meter / second square
Answer:- Option D
Explanation:- The unit depends on two fundamental units: meter, second.

5. Dimensional formula for 'area' is

(A) $[L^2M^0T^0]$ (B) $[L^2M^{-1}T^0]$

(C) $[L^0M^2T^1]$ (D) $[L^0M^0T^2]$

Answer:- Option A

Explanation:- Area = Length x Length = [L x L] = $[L^2]$

6. For less error, measurement is

(A) More accurate (B) less accurate

(C) Constant accurate (D) both (a) and (b)

Answer:- Option A

Explanation:- As error decreases, the measurement gets more and more accurate.

7. There are 20 divisions in 4 cm of the main scale. The vernier scale has 10 divisions. The least count of the instrument is

(A) 2.0 cm (B) 0.2 cm

(C) 0.02 cm (D) 0.002 cm

Answer:- Option C

Explanation:-

8. 1 nanometer equals to _____

(A) 10^{-3}m (B) 10^{-12}m

(C) 10^{-6}m (D) 10^{-9}m

Answer:- Option D

Explanation:- nano = 10^{-9}

9. The errors due to sudden change in experimental conditions are called

(A) Instrumental errors (B) systematic errors

(C) Random errors (D) force errors

Answer:- Option C

Explanation:- Errors due to sudden change in experimental conditions are called random errors (as name suggests)

10. To measure shorter lengths with their accurate reading we use

(A) Measuring tapes (B) meter ruler

(C) Vernier caliper (D) all of them

Answer:- Option c

Explanation:- Vernier caliper has least error and high accuracy than others.

11. The physical quantity having the same unit in all the systems of unit is

(A) Length (B) time

(C) Mass (D) foot

Answer:- Option B

Explanation:- Time has the same unit in all the systems i.e. second.

12. How to minimize the errors in the measurement?

(A) Taking a large magnitude of the quantity to be measured
(B) Taking large number of readings and find its mean value
(C) Using an instrument whose least count is small
(D) All of the above

Answer:- Option D
Explanation:- All the techniques are used for minimizing the error in a measurement.

13. Which of the following numerical values have significant figure 4?

(A) 1.011 (B) 0.010
(C) 0.001 (D) 0.100

Answer:- Option A
Explanation:- One zero before 1 in option B and 2 zeroes before 1 in option C are non-significant. Hence, option B and option C have 2 and 1 significant figures respectively. Option D has 3 significant figures. **All the 4 figures in option A are significant.**

14. The significant figures in 500.5000 are

(A) 5 (B) 3
(C) 7 (D) 6

Answer:- Option C
Explanation:- Starting from left, all the zeroes to the right of a nonzero digit and to the left of decimal point are significant. Hence, first 2 zeroes are significant. All the trailing zeroes in a decimal number are significant. Hence, next 3 zeroes are significant. All the non-zero digits are significant. Hence, both 5s are significant.

15. The ratio of average absolute error to mean reading is called

(A) Average absolute error (B) Absolute error
(C) Relative error (D) Relative error

Answer:- Option C
Explanation:- The ratio of average absolute error to mean reading is called relative error.

16. The digits 1, 2, 3, 4, 5, 6, 7, 8, 9 are

(A) Not significant (B) Sometimes Significant
(C) Always significant (D) All of the above

Answer:- Option C
Explanation:- All non-zero digits are significant digits.

17. 200μF is equal to

(A) 200×10^{-9} F (B) 200×10^{6} F
(C) 200×10^{-6} F (D) 200×10^{9} F

Answer:- Option C
Explanation:- μ = micro = 10^{-6}

18. 65 cm is equal to

(A) 65 x 10^{-2} m (B) 65 x 10^{-3} m

(C) 65 x 10^{-4} m (D) 65 x 10^{2} m

Answer:- Option A

Explanation:- c = centi = 10^{-2}

19. If distance between Mumbai to Pune by train is 90.5km, in this, zero is

(A) Not significant (B) Significant

(C) May be significant (D) May not be significant

Answer:- Option B

Explanation:- All the zeroes to the right of a nonzero digit and to the left of decimal point are significant.

20. The number of significant figure in measurement of 2.34 X 10^{11}

(A) 11 (B) 14

(C) 2 (D) 3

Answer:- Option D

Explanation:- 2, 3, 4 are significant. 10^{11} is not significant.

21. The measured value of a resistance is 10.25 ohm, whereas its value of 10.22 ohm. What is absolute error of the measurement?

(A) 0.01 ohm (B) 0.03 ohm

(C) 15.36 ohm (D) 10.26 ohms

Answer:- Option B

Explanation:- Absolute error = measured value - actual value

22. The percentage error in the distance 100 + 5 cm is

(A) 5% (B) 95%

(C) 100% (D) 105%

Answer:- Option A

Explanation:- + 5 cm is the additional measurement than the actual 100 cm.

23. Temperature can be expressed as a derived quantity in terms of

(A) Length and mass (B) mass and time

(C) Length, mass and time (D) none of these

Answer:- Option D

Explanation:- Temperature is a fundamental (independent) quantity.

24. Which of the following is NOT a characteristic of a good unit?

(A) It is invariable (B) It is reproducible

(C) It is perishable (D) It is easily available

Answer:- Option B

Explanation:- It shall not be perishable (destructible).

25. A physical quantity consists of a

(A) Analogical Magnitude (B) Numerical magnitude
(C) Alphabetical Magnitude (D) Symbolic Magnitude

Answer:- Option B

Explanation:- Physical quantities are measurable ones. They have numerical values.

26. Km is used to measure

(A) Shorter distance (B) Toys
(C) Longer distances (D) bottles

Answer:- Option C

Explanation:- K = kilo = 1000, meter is unit of length. Hence, longer distances - in the order of thousands of meters.

27. Sonya is tall. This observation is

(A) Quantitative (B) qualitative
(C) Both a and b (D) respective

Answer:- Option B

Explanation:- qualitative observation doesn't involve measurements or numbers but instead characteristics.

28. On the basis of dimensional equation, the maximum number of unknown that can be found, is

(A) One (B) Two
(C) Four (D) Three

Answer:- Option D

Explanation:- The number of unknowns that can be found for any physical quantity while performing the dimensional analysis will be the same as that of the number of the physical parameters being used for that particular physical quantity. We normally use three parameters i.e. length, mass and time. **29. Which one of the following is not a derived unit?**

(A) Joule (B) Watt
(C) Kilogram (D) Newton

Answer:- Option C

Explanation:- Unit of a fundamental quantity, mass.

30. The dimensions of Kinetic energy is same as that of

(A) Force (B) Pressure
(C) Work (D) Momentum

Answer:- Option C

31. The surface tension of a liquid is 70 dyne/cm. In MKS system its value is

(A) 70 N/m (B) 7×10^{-2} N/m
(C) 7×10^{2} N/m (D) 7×10^{-3} N/m

Answer:- Option D

Explanation:- 1 dyne/cm = 10^{-3} N/m

32. How many dyes are there in 1 gram weight?

(A) 900 (B) 375

(C) 981 (D) 250

Answer:- Option C

Explanation:- 1 gram weight = 1 x 981 dyne.

33. How many ergs are in 1 Joule?

(A) 10^2(B) 10^4

(C) 10^6(D) 10^7

Answer:- Option D

Explanation:- 1J = 1N x 1m = 1 kg m/s^2 x 1m = (1000g x 100cm/s^2) x 100 cm = 10^7 g-cm^2/s^2 = 10^7 dyne

34. [$L^1M^0T^{-1}$] are the dimensions of the quantity

(A) Acceleration (B) density

(C) Speed (D) area

Answer:- Option C

Explanation:- [$L^1M^0T^{-1}$] => the dimensional formula contains 1 power of L (length) and -1 power of T (time) i.e. the quantity it represents has formula = length^1 x time^{-1} = length / time, which is speed.

35. The SI unit of luminous intensity is

(A) ampere (B) flux

(C) candela (D) weber

Answer:- Option C

Explanation:- The SI unit of luminous intensity is candela

36. Which of the following is not a fundamental unit?

(A) meter (B) kilogram

(C) second (D) newton

Answer:- Option D

Explanation:- newton is the unit of derived quantity, Force (depends on mass, length and time)

37. Length of the table is 3 meters. In this example, 3 is the _and meter is the ___of that quantity (A) Magnitude, standard (B) number, Accuracy

(C) Standard, Magnitude (D) unit, Magnitude

Answer:- Option A

Explanation:- In the measurement of a physical quantity, the numerical part implies the quantity (magnitude) and the alphabetical one implies the unit (standard) of the quantity measured.

38. Which of the following are supplementary physical quantities?

(A) Plane angle, solid angle (B) length, time

(C) mass, current (D) temperature, angle

Answer:- Option A

Explanation:- Plane angle and solid angle are supplementary physical quantities.

39. The unit of force in C.G.S. system is

(A) pound force (B) newton

(C) kg force (D) dyne

Answer:- Option D

Explanation:- C.G.S. The unit of force is dyne.

40. 0.1mm is accuracy of a

(A) Measuring tapes (B) meter ruler

(C) Vernier caliper (D) a and b

Answer:- Option C

Explanation:- The least count (L.C.) of the vernier caliper is $1/10^{th}$ of mm = 0.1 mm

41. Is the branch of science deal with study of matter, energy and their transformation in nature

(A) physics (B) chemistry

(C) biology (D) math

Answer:- Option A

Explanation:- The branch of science deal with study of matter, energy and their transformation in nature is Physics

42. The physical quantities which don't depend on any other quantities for its measurement are called ---

(A) fundamental physical quantities (B) Derived physical quantities

(C) mathematical quantities (D) chemical quantities

Answer:- Option A

Explanation:- The physical quantities which don't depend on any other quantities for its measurement are called fundamental physical quantities

43. The physical quantities which depend on any other quantities for their measurement are called

(A) fundamental quantities (B) Derived physical quantities

(C) mathematical quantities (D) chemical quantities

Answer:- Option

Explanation:- The physical quantities which depend on any other quantities for their measurement are called Derived physical quantities.

44. The unit of fundamental physical quantity is called

(A) fundamental unit (B) Derived unit

(C) magnitude (D) quantity

Answer:- Option A

Explanation:- The unit of fundamental physical quantity is called fundamental unit **45. The unit of derived physical quantity is called**

(A) Derived unit (B) Fundamental unit

(C) Magnitude (D) Quantity

Answer:- Option A

Explanation:- The unit of Derived physical quantity is called Derived unit

46. Length, mass, time are _____quantities

(A) fundamental physical (B) derived physical

(C) mathematical quantities (D) chemical quantities

Answer:- Option A

Explanation:- Length, mass, time are fundamental physical quantities

47. Electric current, thermodynamic temperature, Amount of substance, luminous intensity are _____ quantities

(A) fundamental physical (B) derived physical

(C) mathematical quantities (D) chemical quantities

Answer:- Option A

Explanation:- Electric current, thermodynamic temperature, Amount of substance, luminous intensity are fundamental physical quantities

48. _____, _____are supplementary physical quantities.

(A) Plane angle, solid angle (B) length, time

(C) mass, current (D) temperature, angle

Answer:- Option A

Explanation:- Plane angle and solid angle are supplementary physical quantities

49. Unit of mass in SI system is

(A) second (B) kilogram

(C) ampere (D) candela

Answer:- Option B

Explanation:- Unit of Mass in SI system is kilogram

50. Unit of Time in SI system is

(A) second (B) Kilogram

(C) ampere (D) candela

Answer:- Option A

Explanation:- Unit of Time in SI system is second

51. Unit of Electric current in SI system is

(A) Newton (B) Joule/s

(C) Kilogram- meter (D) ampere

Answer:- Option D

Explanation:- Unit of Electric current in SI system is ampere

52. Unit of thermodynamic temperature in SI system is

(A) newton (B) joule/s

(C) kelvin (D) ampere

Answer:- Option C

Explanation:- Unit of thermodynamic temperature in SI system is kelvin

53. Unit of Amount of substance in SI system is

(A) steradian (B) mole

(C) radian (D) degree

Answer:- Option B

Explanation:- Unit of Amount of substance in SI system is mole

54. Unit of luminous intensity in SI system is

(A) steradian (B) mole

(C) radian (D) candela

Answer:- Option D

Explanation:- Unit of luminous intensity in SI system is candela

55. Unit of Plane angle in SI system is

(A) steradian (B) mole

(C) radian (D) degree

Answer:- Option C

Explanation:- Unit of Plane angle in SI system is radian

56. Unit of solid angle in SI system is

(A) steradian (B) mole

(C) radian (D) degree

Answer:- Option A

Explanation:- Unit of solid angle in SI system is steradian

57. Unit of area in SI system is

(A) square meter (B) square foot

(C) square centimeter (D) acre

Answer:- Option A

Explanation:- Area = Length x Length

Hence, unit of area = m x m = m^2.

58. The quantity measured in kelvin is

(A) length (B) mass

(C) time (D) thermodynamic temperature **Answer:-** Option

Explanation:- The quantity measured in kelvin is thermodynamic temperature.

59. The unit of acceleration in S.I. is

(A) km/h (B) m/s^2

(C) m/s (D) km/h^2

Answer:- Option B

60. The unit of force in C.G.S.is

(A) pound force (B) newton

(C) dyne (D) kg force

Answer:- Option C

Explanation:- The unit of force in C.G.S.is dyne

61. Out of the following which is not a requirement of the standard unit?
(A) it should be same for all quantities (B) it should be universally accepted
(C) it should be well defined (D) it should be fixed with time and place **Answer:-**
Option A
Explanation:- It need not be the same for all quantities.

62. The _____used for measurement of physical quantity is called unit of that quantity.
(A) Quantity (B) dimension
(C) time (D) standard
Answer:- Option D
Explanation:- The standard used for measurement of physical quantity is called unit of that quantity

63. A quantity which can be measured (computed, quantified or enumerated) is known as (A) Fundamental quantity (B) derived quantity
(C) physical quantity (D) mechanical quantity
Answer:- Option C
Explanation:- A quantity which can be measured (computed, quantified or enumerated) is known as physical quantity.

64. Length of the table is 3 meters. In this example, 3 is the _and meter is the __of that quantity. (A) Magnitude, standard (B) number, Accuracy
(C) standard, Magnitude (D) unit, Magnitude
Answer:- Option A
Explanation:- The numerical part in a measurement is called magnitude and the alphabetical part is unit or standard.

65. Which of the following units is a fundamental unit?
(A) mole (B) watt
(C) lumen (D) joule
Answer:- Option A
Explanation:- mole is unit of a fundamental quantity named amount of substance.

66. Which of the following units is a fundamental unit?
(A) lumen (B) watt
(C) meter (D) joule
Answer:- Option C
Explanation:- meter is unit of a fundamental quantity named length.

67. Which of the following units is a fundamental unit?
(A) joule (B) watt
(C) lumen (D) Kg
Answer:- Option D
Explanation:- Kg is unit of a fundamental quantity named mass.

68. Which of the following units is a fundamental unit?
(A) candela (B) watt
(C) lumen (D) newton
Answer:- Option A
Explanation:- candela is unit of a fundamental quantity named luminous intensity.

69. Which of the following unit is a derived unit?
(A) meter (B) mole
(C) ampere (D) watt
Answer:- Option D

70. Which of the following units is a derived unit?
(A) Kg (B) kelvin
(C) coulomb (D) second
Answer:- Option C
Explanation:- coulomb is unit of a derived quantity named charge.

71. Which of the following units is a derived unit?
(A) meter (B) joule
(C) ampere (D) kelvin
Answer:- Option B
Explanation:- joule is unit of a derived quantity named energy.

72. Which of the following units is a derived unit?
(A) meter (B) second
(C) kelvin (D) newton
Answer:- Option D
Explanation:- newton is unit of a derived quantity named force.

73. Which of the following units is a derived unit?
(A) kelvin (B) radian
(C) ampere (D) kg-m/s^2
Answer:- Option D
Explanation:- kg-m/$s^2$is unit of a derived quantity named acceleration.

74. Out of the following the fundamental quantity is
(A) Density (B) pressure
(C) time (D) momentum
Answer:- Option C
Explanation:- Only time is the independent quantity.

74. pascal is the S.I. unit of
(A) Force (B) Pressure
(C) Density (D) Momentum
Answer:- Option B
Explanation:- Pascal is the S.I. unit of pressure.

75. MKS means

(A) micro-kg-sec (B) m-kg-s

(C) milli-kilo-s (D) micro-kilo-s

Answer:- Option B

Explanation:- MKS means meter - kilogram - second.

76. The units of length, mass and time are centimeter, gram and second which are used in the ___ system.

(A) CGS (B) MKS

(C) FPS (D) SI

Answer:- Option A

77. 1 gigahertz (GHz) means _____Hz

(A) 10^6 (B) 10^{12}

(C) 10^9 (D) 10^{15}

Answer:- Option C

Explanation:- giga (G) means 10^9

78. 1 millimeter means

(A) 10^{-7} m (B) 10^{-5} m

(C) 10^{-4} m (D) 10^{-3} m

Answer:- Option D

Explanation:- milli = 10^{-3}

79. 10^{-6} m means

(A) 1 mm (B) 1 cm

(C) 1 nm (D) 1 µm

Answer:- Option D

Explanation:- µ = 10^{-6}

80. $[L^1M^0T^{-2}]$ are the dimensions of the quantity

(A) acceleration (B) density

(C) speed (D) area

Answer:- Option A

81. Dimensions of ___and ____are the same.

(A) pressure, stress (B) work, force

(C) velocity, acceleration (D) Length, mass

Answer:- Option A

Explanation:- Pressure and stress have the same formula.

82. Error is _____in the given measurement

(A) mistake (B) accuracy

(C) uncertainty (D) certainty

Answer:- Option C

Explanation:- Error is the uncertainty in the given measurement

83. _____cannot be eliminated but they can be minimized

(A) errors (B) mistake

(C) accuracy (D) precision

Answer:- Option A

Explanation:- errors cannot be eliminated but they can be minimized.

84. One MB is equal to .....

(A) 10^9 B (B) 10^6 B

(C) 10^{12} B (D) 10^3 B

Answer:- Option B

Explanation:- mega (M) = 10^6

85. joule is the unit of

(A) Temperature (B) Pressure

(C) Impulse (D) Heat

Answer:- Option D

Explanation:- joule is the unit of energy. Heat is a form of energy.

86. Electric current is measure by

(A) Commentator (B) Anemometer

(C) Ammeter (D) Voltmeter

Answer:- Option C

Explanation:- Electric current is measured by Ammeter

87. Kilowatt is a unit to measure

(A) Work (B) Power

(C) Electricity (D) Current

Answer:- Option B

Explanation:- watt is a unit to measure pressure. And kilo is prefixed to it.

88. The dimensions of density is

(A) $[L^3 M^1 T^0]$ (B) $[L^2 M^1 T^0]$

(C) $[L^{-3} M^1 T^{-1}]$ (D) $[L^{-3} M^1 T^0]$

Answer:- Option D

89. A single system on which all scientists all over the world agree for units of measurement is called

(A) SI units (B) International System of units

(C) both a and b (D) universal system

Answer:- Option

Explanation:- A single system on which all scientists all over the world agree for units of measurement is called SI units or International System of units.

90. In SI system unit for speed is written as

(A) meter (B) meter/sec

(C) meter/hour (D) km/sec

Answer:- Option B

Explanation:- In SI system unit for speed is written as meter/sec

91. The dimensions of energy is

(A) $[L^{-1} M^{1} T^{-2}]$ (B) $[L^{1} M^{1} T^{-2}]$

(C) $[L^{2}M^{1} T^{-2}]$ (D) $[L^{2}M^{-1} T^{-2}]$

Answer:- Option C

92. The errors due to sudden change in experimental conditions are called

(A) instrumental errors (B) systematic errors

(C) random errors (D) force errors

Answer:- Option C

Explanation:- The errors due to sudden change in experimental conditions are called random errors.

93. Requirement of a good unit is …….

(A) Internationally accepted (B) Invariable

(C) Easily converted and reproducible (D) All of the above

Answer:- Option D

Explanation:- Option A, B and C all are the requirements of a good unit.

94. Instrument which can be used to measure length includes

(A) measuring tapes (B) meter ruler

(C) Vernier caliper (D) all of them

Answer:- Option D

Explanation:- Measuring tapes, meter ruler, vernier caliper all are used to measure length.

95. A physical quantity consists of a

(A) Analogical Magnitude (B) Numerical magnitude

(C) Alphabetical Magnitude (D) Symbolic Magnitude

Answer:- Option B

Explanation:- All physical quantities are measured in values which are expressed in numbers.

96. Dimensional formula of pressure is …..

(A) $[L^{-1} M^{1} T^{-2}]$ (B) $[L^{-1} M^{1} T^{-1}]$

(C) $[L^{1} M^{1} T^{-2}]$ (D) $[L^{-1} M^{0} T^{-2}]$

Answer:- Option A

97. Minimum length an instrument can measure is called its

(A) accuracy (B) estimate

(C) precision (D) limitations

Answer:- Option C

Explanation:- Minimum length an instrument can measure is called its **precision or Least Count.**

98. Dimensional formula of momentum is …..

(A) $[L^{-1} M^{1} T^{-1}]$ (B) $[L^{1} M^{1} T^{-1}]$

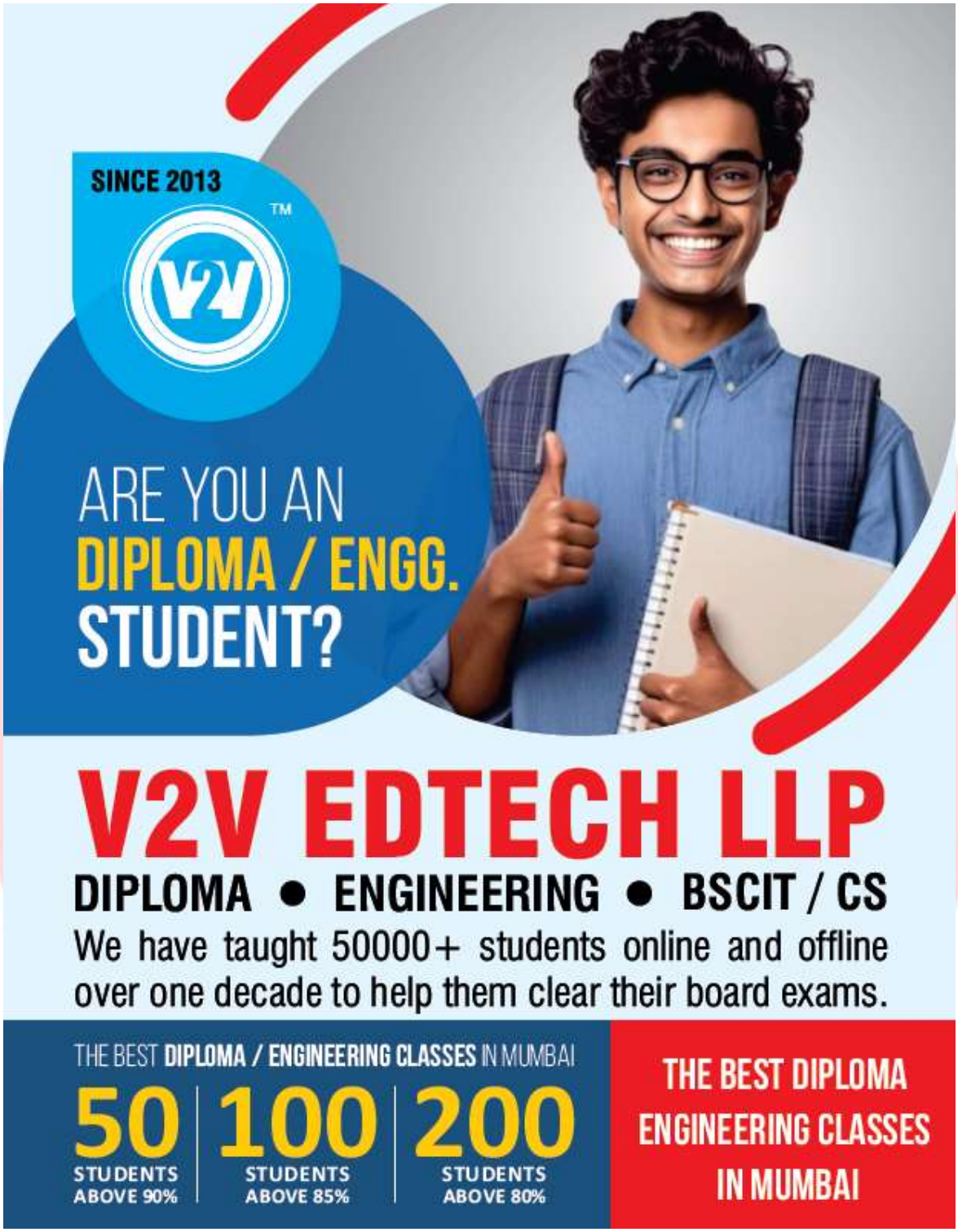
(C) $[L^{1} M^{1} T^{-2}]$ (D) $[L^{-1} M^{1} T^{-2}]$

Answer:- Option B

99. The ratio of mean absolute error in the measurement of physical quantity to mean value is called (A) absolute error (B) relative error
(C) random error (D) experimental error

Answer:- Option B

Explanation:- The ratio of mean absolute error in the measurement of physical quantity to mean value is called relative error



YouTube live Session Link :
https://www.youtube.com/live/wEBWHLy-stY?si=giD3SAqgk_YPrfwd

Question Bank for Multiple Choice Questions

Program: All Programs of Diploma in Engineering	**Program Code:- EE / CO / EJ / CE / ME**
Scheme:- K	**Semester:- 1**
Course:- Physics	**Course Code:- 311305**

Electricity, Magnetism, and Semiconductors	**Marks:-16**

Content of Chapter:-

2.1 Concept of charge, Coulomb's inverse square law, Electric field, Electric field intensity, potential and potential difference.

2.2 Magnetic field and magnetic field intensity and its units, magnetic lines of force, magnetic flux 2.3 Electric current, Ohm's law, specific resistance, laws of series and parallel combination of resistance, heating effect of electric current

2.4 Conductors, Insulators and Semiconductors, Energy bands, intrinsic and extrinsic semiconductors. 2.5 P-N junction diode, I-V characteristics of P-N junction diode, applications of P-N junction diode.

1. The unit of electric field intensity is

(A) C/N (B) N/C

(C) NC (C) ohm/m

Answer:- Option B

Explanation:- Electric intensity = Force/Charge

2. When a number of resistances are connected in series then effective resistance

..... (A) Decreases (B) Increases

(C) Remains same (D) none of these

Answer:- B

Explanation:- Series connection of resistors

3. Which of the following is acceptor impurity?

(A) Gallium (B) Antimony

(C) Arsenic (D) None of these

Answer:- A

Explanation:- Gallium is trivalent impurity.

4. Barrier potential for silicon is

(A) 0.7V (B) 0.3V

(C) 1.11V (D) None of these

Answer:- A

Explanation:- Barrier potential for silicon is 0.7V

5. The specific resistance of a wire 6 m in length, 0.4 mm in diameter and having a resistance of 30Ω
(A) 62.8×10^{-8} Ω-m (B) 6.28×10^{-7}Ω-m
(C) Both A and C (D) None of these
Answer:- C

6. If two resistors are connected in series the which of the following parameter will remain same through each resistor
(A) Voltage (B) Resistance
(C) Current (D) None of these
Answer:- C
Explanation:- Series connection of resistors.

7. In P region of PN junction diode which of the following are majority carriers
(A) electrons (B) holes
(C) Both A and B (D) None of the above
Answer:- Option B
Explanation:- In P region of PN junction diode holes are majority carriers.

8. Electric potential is
(A) Vector quantity (B) Tensor
(C) None of these (D) Scalar quantity
Answer:-Option D
Explanation:- Electric potential is scalar quantity.

9. SI unit of magnetic flux is
(A) weber (B) ampere
(C) maxwell (D) volt
Answer:- Option A
Explanation:- SI unit of magnetic flux is weber.

10. Relationship between Magnetic induction and Magnetic field intensity is
(A) B = μH (B) B = μ/H
(C) $B = H^2\mu$ (D) None of these
Answer: Option A
Explanation:- B = μH

11. When body loses electrons it acquires
(A) Negative charge (B) Positive charge
(C) No charge (D) None of these
Answer:- Option B

12. SI unit of magnetic induction is
(A) tesla (B) weber/$meter^2$
(C) both a and b (D) none of these
Answer:- Option C
Explanation:-SI unit of magnetic induction

13. Three resistors which are connected in series which are having resistances 10Ω each, the equivalent resistance
(A) 30Ω (B) 3Ω
(C) 300Ω (D) None of these
Answer:- Option A

14. In which combination of resistors equivalent resistance is maximum (A) In series combination (B) In parallel combination (C) Both A and B (D) None of the above
Answer:- Option A
Explanation:- Series combination of resistors

15. SI unit of electromotive force (EMF) is
(A) volt (B) N
(C) none of these (D) Both (B) and (A)
Answer:- Option A
Explanation:- SI unit of electromotive force (EMF) is volt.

16. A battery of emf 12 volt is connected across a resistance of 10 Ω the current flowing through the resistance is
(A) 1.2 Ω (B) 1.2 A
(C) 12 A (D) none of these
Answer:- Option B
Explanation:- V = IR

17. Which of the following is semiconductor?
(A) Iron (B) Aluminum
(C) Germanium (D) none of these
Answer: Option C
Explanation:- Germanium is a semiconductor.

18. In case of conductor band gap is
(A) 0 eV (B) greater than 5 eV
(C) 1.1 eV (D) none of these
Answer:- Option A
Explanation:- For conductor band gap is 0 eV.

19. Valency of silicon is
(A) 4 (B) 2
(C) 3 (D) 0
Answer:- Option A
Explanation:- Valency of silicon is 4.

20. For semiconductors temperature coefficient of resistance is
(A) Negative (B) Positive
(C) both A and B (D) None of these
Answer:- Option A

21. Magnetic intensity is

(A) Scalar (B) Vector
(C) Tensor (D) None of these

Answer:- Option B
Explanation:- Magnetic intensity is vector.

22. Which of the following is not a property of magnetic lines of force

(A) They start from the north pole and end in the south pole outside the magnet.
(B) They never intersect each other
(C) Magnetic lines of force are affected by non-magnetic material
(D) Magnetic lines of force form a closed loop.

Answer:- Option C
Explanation:- Properties of magnetic lines of force.

23. The resistance of conductor is inversely proportional to

(A) Area (B) Volume
(C) length (D) distance
Answer:- Option C
Explanation:-The resistance of conductor is inversely proportional to length.

24. The length and cross-sectional area of wire is halved. Its resistance will be …

(A) Halved (B) Doubled
(C) Unchanged (D) Four times
Answer:- Option C
Explanation :- Definition of resistivity.

25. When small amount of trivalent impurity is added to a pure semiconductor, is known as

(A) N-type semiconductor (B) P- type semiconductor
(C) donor as well as acceptor (D) None of these
Answer:- Option B
Explanation :- Definition of P type semiconductor.

26. Rectifier is a device which converts

(A) AC to DC (B) DC to AC
(C) AC to AC (D) DC to DC
Answer:- Option A
Explanation :- Rectifier is a device which converts AC to DC.

27. The dielectric constant of for air

(A) less than one (B) zero
(C) one (D) None of these
Answer:- Option C
Explanation :- The dielectric constant for air is 1.

28. As distance between two electric charges decreases, the electrostatic force between them
(A) increases (B) decreases
(C) remains constant (D) None of these
Answer:- Option A
Explanation :- Coulomb's law in electrostatics.

29. As distance between two electric charges decreases, the electrostatic force between them
(A) increases (B) decreases
(C) remains constant (D) None of these
Answer:- Option A
Explanation :- Coulomb's law in electrostatics.

30. A battery of emf 6V is connected across a resistance of 12Ω, calculate the current flowing through the resistance.
(A) 72 A (B) 0.2 A
(C) 0.5A (D) 2A
Answer :- Option C
Explanation :- V = IR therefore I= = = 0.5A

31. Heat generated in a conductor carrying current depends on _____
(A)Current (B)Resistance of conductor
(C)Time (D)All of these
Answer :- Option D
Explanation :- $H = I^2RT$

32. An electron is placed in an electric field of intensity 1000N/C. Calculate the force acting on electron _____

(A) 1.6×10^{-19} N (B) 1.6×10^{-16} N

(C) 1.6×10^{-22} N (D) 0.65×10^{22} N
Answer :- Option B
Explanation :- $F = QE = 1.6 \times 10^{-19} \times 1000 = 1.6 \times 10^{-16}$ N

33. The energy possessed by is known as Valence band.

(A) Amount, electrons (B) range, atoms

(C) Value, atoms (D) range, Valence electrons
Answer:- Option D
Explanation :- The range of energies possessed by valence electrons is known as Valence band.

34. At 0^0K, pure Silicon acts as,

(A) Conductor (B) Insulator
(C) Semiconductor (D) None of these
Answer:- Option B
Explanation :- At 0 K, pure Silicon acts as, insulator.

35. The border where P region meets with N region in a PN junction diode is known as,
(A) Junction (B) Border
(C) Boundary (D) None of these
Answer:- Option A

36. The leakage current in reverse bias diode is due to flow of
(A) majority carriers (B) minority carriers
(C) electrons only (D) None of these
Answer:- Option B
Explanation:- The leakage current in reverse bias diodes is due to flow of minority carriers.

37. The electrical resistance of PN junction diode is during forward bias
(A) Maximum (B) Minimum
(C) Doesn't change (D) None of these
Answer:- Option B

38. Pure Silicon & Germanium is known as_____semiconductor.
(A) Extrinsic (B) Doped
(C) Intrinsic (D) None of these
Answer:- Option C
Explanation:- Pure Germanium and Silicon are intrinsic semiconductors.

39. _____Impurities form p-type semiconductors.
(A) Donor (B) Acceptor
(C) Both donor and acceptor (D) None of these
Answer:- Option B
Explanation :- Acceptor impurities form p-type semiconductor.

40. The force of attraction or repulsion between two electric charges is known as,
(A) Electric force (B) Magnetic force
(C) Muscular force (D) None of these
Answer:- Option A
Explanation :- The force of attraction or repulsion between two electric charges is electric force.

41. Dielectric constant of a medium w.r.t. vacuum is the
(A) ratio of permittivity of vacuum to permittivity of medium.
(B) ratio of permittivity of medium to permittivity of vacuum.
(C) product of permittivity of vacuum to permittivity of medium.
(D) None of these.
Answer:- Option B

42. The space around an electric charge in which force of attraction or repulsion is effective is known as,
(A) Electric field (B) Magnetic field
(C) Gravitational field (D) None of these
Answer:- Option A
Explanation:- Definition of electric field.

43. If four resistances of 1 Ω are connected in parallel and 1 Ω is connected in series with combination then what will be the effective resistance?
(A) 1 (B) Magnetic force
(C) Muscular force (D) None of these
Answer:- Option A
Explanation:- The force of attraction or repulsion between two electric charges is electric force.

44. If four resistances of 1 Ω are connected in parallel and 1 Ω is connected in series with combination then what will be the effective resistance?
(A) 1Ω (B) 1.25Ω
(C) 0.75Ω (D) None of these
Answer:- Option B

45. A battery of e.m.f 6 V is connected across a resistance of 10 Ω Calculate the current flowing through a resistance.
(A) 0.6A (B) 60 A
(C) 1.66 A (D) 6 A
Answer:- Option A

46. 4.8×10^{-20} eV is equal to
(A)76.8×10^{-39} J (B) 7.68×10^{-39}J
(C) 0.768×10^{-39} J (D) none of these
Answer:- Option C
Explanation:-1 eV =1.6×10^{-19}J therefore 46.4.8×10^{-20} eV = 7.68×10^{-39}J

47.The total number of magnetic lines of force passing normally through a given area is called as
(A) electric lines of force (B) magnetic flux
(C) magnetic flux density (D) none of these
Answer :- Option B
Explanation:- It is a definition of magnetic flux.

48. 1 weber = _____maxwell
(A) 10^{-6}(B) 10^{6}
(C) 10^{8}(D) none of these
Answer :- Option C

49. A force of 4.5 N acts on a charge of 7.5 × 10-4 C. Calculate the electric field at that point.
(A) 3000N/C (B) 33.75×10^{-4} N/C
(C) 6000 N/C (D) none of these
Answer :- Option C

50. The magnetic lines of forces are crowded in a region where the magnetic field is _____
(A) zero (B) absent
(C) large (D) none of these
Answer :- Option C
Explanation:- The magnetic lines of forces are crowded in a region where the magnetic field is large.

51. The electrical conductivity of a semiconductor at absolute zero is _____
(A) infinite (B) zero
(C) large (D) none of these
Answer :- Option B
Explanation:- The electrical conductivity of a semiconductor at absolute zero is zero.

52. Forbidden energy gap is large _____
(A) conductors (B) insulators
(C) semiconductors (D) none of these
Answer :- Option B
Explanation:- Forbidden energy gap is large in insulators.

53. As temperature increases, the conductivity of conductor _____
(A) increases (B) decreases
(C) does not change (D) none of these
Answer :- Option B

54. As temperature increases, the resistance of conductor _____
(A) increases (B) decreases
(C) does not change (D) none of these
Answer :- Option A
Explanation:- As temperature increases, the resistance of the conductor increases.

55. As temperature increases, the conductivity of insulator _____
(A) increases (B) decreases
(C) does not change (D) none of these
Answer :- Option A
Explanation:- As temperature increases, the conductivity of the insulator increases.

56. The knee voltage for Si diode is _____and for Ge diode is _____
(A) 0.7V, 0.3V (B) 1.1V,0.5V
C) 1.5V,0.8V (D) none of these
Answer :- Option A

Explanation:- The knee voltage for Si diode is 0.7V and for Ge diode is 0.3V.

57. The p-n junction diode is used in _____
(A) switch (B) clipping circuits
(C) demodulator circuit (D) all of these
Answer :- Option D
Explanation:- These are applications of p-n junction diodes.

58. Direction of flow of conventional current in electric circuit is from _____
(A) Higher potential to lower potential
(B) Lower potential to higher potential
(C) Cannot be determined
(D) None of these
Answer:- Option A
Explanation:- In electrical circuits conventional current flows from higher potential to lower potential.

60. Which of the following has a large number of free electrons?
(A) Insulators (B) Semiconductors
(C) Conductors (D) None of these
Answer:- Option C
Explanation:- Conductors do have a large number of free electrons.

61. Direction of flow of free electrons in electric circuit is from _____
(A) Higher potential to lower potential
(B) Lower potential to higher potential
(C) Cannot be determined
(D) None of these
Answer:- Option B
Explanation:- In electrical circuits electrons flow from lower potential to higher potential.

64. Resistance of conductor depends on _____
(A) length of conductor
(B) area of cross section of conductor
(C)Temperature
(D) All of these
Answer:- Option D

65. SI unit of resistance is _____
(A) ohm (B) ampere
(C) volt (D) none of these
Answer:- Option A
Explanation:- SI unit of resistance is ohm.

66. CGS unit of magnetic flux is _____
(A) maxwell (B) ampere
(C) volt (D) none of these
Answer:- Option A

Explanation:- CGS unit of magnetic flux is Maxwell.

67. Calculate resistivity for conductor having area of cross section $1m^2$, length 10cm and resistance 27 ohm.

(A) 270Ωm (B) 27 Ωm

(C) 2.70Ωm (D) none of these

Answer:- Option A

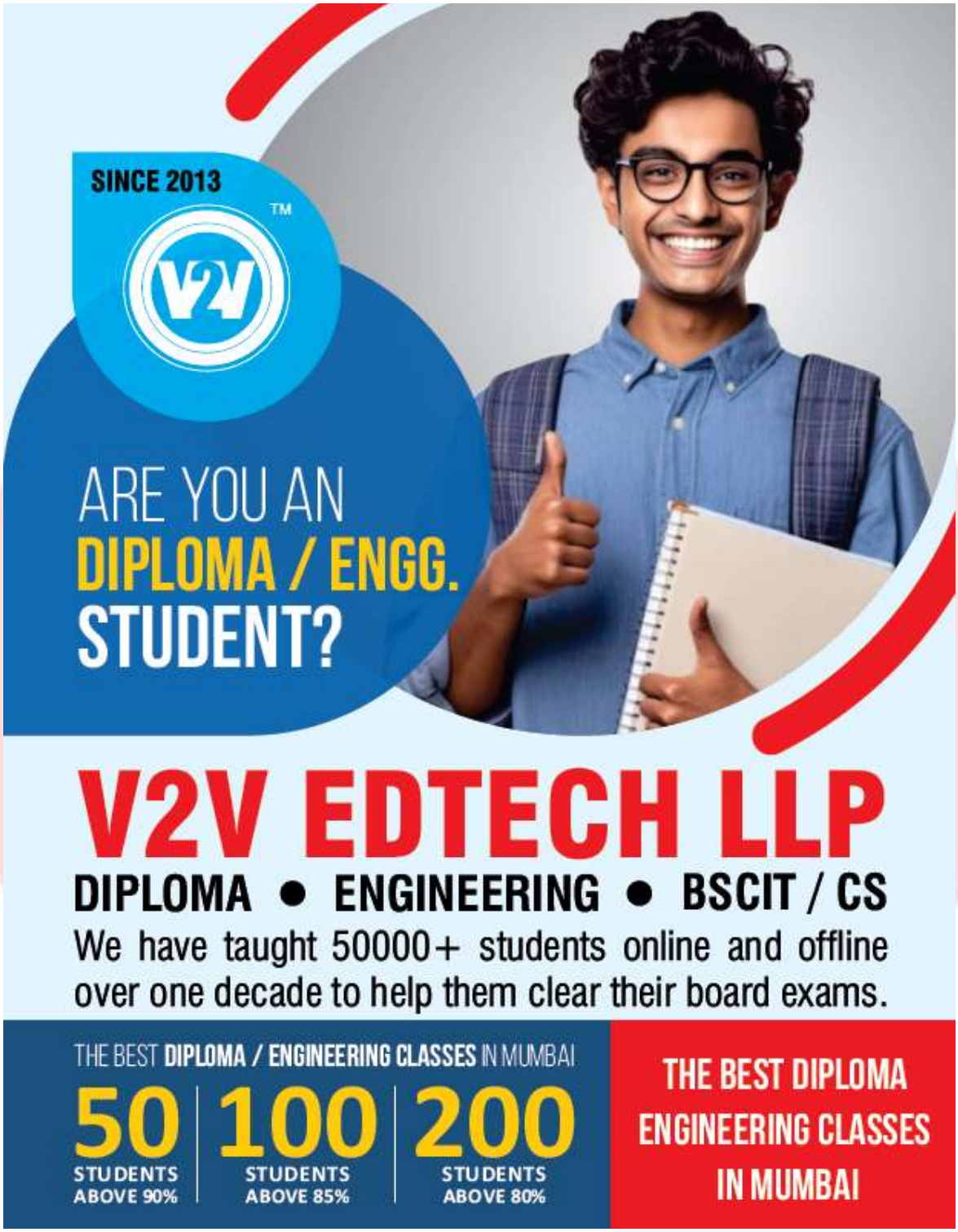
Explanation:-

68. A conductor having resistance 25 ohm then is conductance will be _____

(A) 0.4 siemens (B) 0.04 siemens

(C) 10 volt (D) both (A) and (B)

Answer:- Option B



YouTube live Session Link :

https://www.youtube.com/live/wEBWHLy-stY?si=giD3SAqgk_YPrfwd

Question Bank for Multiple Choice Questions

Program: All Programs of Diploma in Engineering	**Program Code:- EE / CO / EJ / CE / ME**
Scheme:- K	**Semester:- 1**
Course:- Physics	**Course Code:- 311305**

Heat and Optics	**Marks:- 14**

Content of Chapter:-

3.1 Heat, temperature, temperature scales
3.2 Modes of transfer of heat, good and bad conductors of heat, law of thermal conductivity 3.3 Boyle's law, Charle's law, Gay Lussac's law, perfect gas equation
3.4 Specific heat of gas at constant pressure and volume (Cp and CV), ratio of specific heats 3.5 Reflection, refraction, laws of refraction, total internal reflection
Optical fiber: Principle, construction and path of light through optical fiber, applications of optical fibers.

1. For Boyle's law, which is true ----

(A) P and V Changes, but T is constant (B) P and T Changes, but V is constant
(C)T and V Changes, but P is constant (D) All P, V, T are changing

Answer:- Option A

Explanation:- According to Boyle's law statement

2. Temperature at NTP condition is ---------

(A) 0 ^{0}C (B) 0 K
(C) 25 ^{0}C (D) 100 ^{0}C

Answer:- Option A

Explanation:- At NTP values are constant.

3. For fixed mass of gas if its temperature (^{0}C) is doubled without changing its volume, what is its pressure ---------

(A) it is doubled (B) it remains same
(C) no change (D) it is halved

Answer:- Option D

4. Gas has-----specific heats.

(A) two (B) three
(C) one (D) none of the above

Answer:- Option A

Explanation:- Gases are very much sensitive for their changes in pressure, volume and temperature as compare to solids and liquids so

5. When gas is heated at constant pressure and constant volume, amount of heat required to increase temperature by 1^0C is

(A) different (B) same
(C) less (D) none of the above

Answer:- Option A
Explanation:- In case of gas heated at constant pressure some additional heat is required to increase temperature f by 1^0C for expansion

6. If $C_p - C_v$ = 140 Joules/ kg k and ratio of two specific heats is 1.2 then values of C_p and C_v are-

(A) 840 J/Kg K and 700 J/Kg K (B) 700 J/Kg K and 560 J/Kg K
(C) 900 J/Kg K and 840 J/Kg K (D) none of the above

Answer:- Option A
Explanation:- The relation between C_p and C_v is (C_p-C_v = γ)

7. 1 cal = ----------J

(A) 6.63 (B) 4.184
(C) 4184 (D) 1484

Answer:- Option B
Explanation:- Relation between calorie and joule

8. When light ray travels from rarer medium to denser medium then

(A) angle of incidence = angle of refraction (B) angle of incidence ‹ angle of refraction (C) angle of incidence > angle of refraction (D) none of the above

Answer:- Option C
Explanation:- Because ray bends towards normal and angle of refraction decreases

9. For total internal reflection in optical fiber core refractive index (μ_1) andcladding refractive index (μ_2) should maintain the relation

(A) $\mu_1 < \mu_1$ (B) $\mu_1 = \mu_2$

(C) $\mu_1 > \mu_2$ (D) none of the above

Answer:- Option C
Explanation:- The condition for T.I.R. is that refractive index of core should be greater than refractive index of cladding

10. If velocity of light in air is $3x10^8$ m/sec and refractive index of medium is 1.5 then the velocity of light in medium is

(A) 200 x 10^8 m/sec

(B) 3 x 10^8 m/sec

(C) 20 x 10^8 m/sec

(D) 2 x 10^8 m/sec

Answer:- Option (D)

Explanation: According to formula μ=velocity of light in air/ velocity of light in that medium.

11. When light ray makes incidence normally, then the angle of refraction is……

(A) 90 ^{0}(B) acute

(C) obtuse (D) zero

Answer:- Option D

Explanation:- According to law of refraction

12. Pen dropped vertically in water appears bends due to

(A) Reflection (B) Refraction

(C) T.I.R. (D) Dispersion

Answer:- Option B

Explanation:- Bending of light is known as refraction

13. If angle of incidence is equal to critical angle, then angle of refraction is equal to-----

(A) 180^0(B) zero

(C) 45^0 (D) 90^0

Answer:- Option D

Explanation:- The critical angle is the angle of incidence at which angle of refraction is 90 ^{0}

14. If core refractive index (μ1) and cladding refractive index (μ2) for given optical fiber is given to be 1.54 and 1.42 then its acceptance angle is --- --.

(A) 29.33 ^{0} (B) 32 ^{0}

(C) 25^0(D) 40 ^{0}

Answer:- Option D

Explanation:- According to formula of acceptance angle

15. The advantages of optical fiber over routine cable are

(A) Low cost (B) low signal loss

(C) wide band width (D) all the three

Answer:- Option D

Explanation:- Properties of optical fiber-lighter weight, low cost, low signal loss, large band width, flexible.

16. In optical fibers the propagation of light is due to

(A) Diffraction (B) total internal reflection
(C) Reflection (D) refraction

Answer:- Option B

17. When the light gets refracted, there is change in it's

(A) Velocity (B) direction
(C) both velocity and direction (D) none of the above

Answer:- Option C
Explanation:- This is property of light

18. Velocity of light in vacuum is ……..

(A) 3×10^{8} m/sec
(B) 3×10^{-8} m/sec
(C) 300 m/sec
(D) 380 m/sec

Answer:- Option A
Explanation:- This is constant value

19. For total internal reflection angle of incidence should be ……

(A) equal to critical angle (B) less than critical angle
(C) greater than critical angle (D) equal to angle of reflection

Answer:- Option C
Explanation:- Condition of T.I.R.

20. Optical fiber works on the principle of ……

(A) reflection (B) refraction
(C) dispersion (D) total internal reflection

Answer:- Option D
Explanation:- Because of T.I.R. the light beam will continue to propagate through the fiber even though it is bent number of times

21. Mode of transfer of heat through bodily movement of particles is

(A) Conduction (B) convection
(C) radiation (D) none of above

Answer:- Option B
Explanation:- By definition of convection

22. On providing heat to the body, if it does not increase its internal energy then body is said to be in the state of ---------

(A) Standard state (B) Normal state
(C) Steady state (D) None of above

Answer:- Option C

Explanation:- The state in which the temperature of the body remains constant is called steady state.

23. Liquid nitrogen has temperature -180 ^{0}C then its temperature in Kelvin is---

(A) 180 K (B) 93 K (C) -93 K (D) 453 K

Answer:- Option B

Explanation:- Because K= 0 ^{0}C+273

24. Average measure of Kinetic energy of all particles within body is known as ---------

(A) temperature (B) heat
(C) power (D) none of above

Answer:- Option A

Explanation:- By definition of temperature

25. SI Unit of heat is ---------

(A) Kcal (B) cal
(C) joule (D) watt

Answer:- Option C

Explanation:- S.I. unit is joule and MKS unit is Kcal

26. SI Unit of temperature is ----------

(A) Celsius (B) Kelvin
(C) Fahrenheit (D) none of above

Answer:- Option B

Explanation:- S.I. unit is Kelvin and other units are degree Celsius, degree Fahrenheit

27. If temperature difference between opposite faces of the rod of length 100 cm is100 ^{0}C, then temperature gradient is ----------

(A) 100 ^{0}C/m (B) 10000 ^{0}C/m
(C) 1 ^{0}C/m (D) none of the above

Answer:- Option A

Explanation:- Because T.G.=Θ1-Θ2/d

28. Zero Kelvin is equals to-------

(A) 0 ^{0}C (B) 273 ^{0}C
(C) - 273 ^{0}C (D) -100 ^{0}C

Answer:- Option C

Explanation:- Because 0 K=0 ^{0}C+273

29. Zero degree Celsius is equals to ------

(A) 32 ^{0}F (B) 273^{0}F

(C) -32 ^{0}F (D) none of above

Answer:- Option A

Explanation:- Because ^{0}C=^{0}F-32/1.8

30. SI Unit of temperature gradient is------

(A) ^{0}C / m (B) C/ cm

(C) K/m (D) K

Answer:- Option C

Explanation:- S.I. unit is K/m and MKS unit is ^{0}C/ m.

31. In step index optical fiber, the R.I. of,

(A) Core is uniform throughout the fiber same (B) Core & cladding is

(C) Core is changing from axis to boundary (D) None of these

Answer:- Option A

Explanation:- If we see radially outward from the core axis, there is a step (sudden) change in R.I. at the core cladding interface.

32. Based on variation of R.I of core, the two types of optical fiber are,

(A) Step index and single mode (B) Step index and Graded index

(C) Graded index and multimode (D) Single mode and multimode

Answer:- Option B

Explanation:- These are the types of optical fiber based on variation of refractive index of core

33. In single mode step index optical fiber, forlight

(A) There are many zigzag paths (B) There is only one zigzag path

(C) There are many curved paths (D) There is only one curved path

Answer:- Option B

Explanation:- As the name suggest there is only one zigzag path

34. The light gathering power of optical fiber is called as

(A) Acceptance angle (B) Numerical aperture

(C) Acceptance cone (D) All of these

Answer:- Option B

Explanation:- Numerical aperture measures the light gathering capacity of the optical fiber

35. As per Snell's law for a given pair of media, the ratio of sine of angle of incidence to the sine of angle of refraction-----

(A) Increases (B) decreases

(C) remains constant (D) Increases then decreases

Answer:- Option C **Explanation:-** According to Snell's law of refraction

36. Refractive index of air or vacuum is--------

(A) zero (B) One
(C)Two (D) Three

Answer:- Option B
Explanation:- This is constant value

37. Heating produces____of body

(A) Solidification (B) Expansion
(C) Contraction (D) None of above

Answer:- Option B
Explanation:- Heating produces expansion of the body.

38. Which of the following is a correct statement

(A) Temperature is a cause and Heat is its effect
(B) Heat and temperature both are causes
(C) Heat and temperature both are effects
(D) Heat is a cause and Temperature is its effect
Answer:- Option D

39. The fastest process of heat transfer is

(A) Conduction (B) Convection
(C) Radiation (D) Refraction

Answer:- Option C
Explanation:- Radiation is the fastest process because in this case the transfer of heat takes place at the speed of light.

40. A metal rod 19cm long, of area 0.79cm^2 has a temperature difference of 70^{0}C.Calculate the heat flowing in 5 minute (Given K=380W/m^{0}K)

(A) 790 cal (B) 890 cal
(C) 789 cal (D) 629 cal

Answer:- Option A

41. Unit of temperature gradient is,

(A) m / ^{0}C (B) Sec / ^{0}C
(C) ^{0}C / m (D) ^{0}C / sec

Answer:- Option C

42. The state in which temperature of substance goes on increasing w.r.t time is called

(A) Variable state (B) Steady state
(C) Normal state (D) Critical state

Answer:- Option A
Explanation:- The state in which temperature of substance goes on increasing w.r.t time is called as, variable state.

43. Heat absorbed by the material > Heat given out by the material is concerned with, (A) Normal state (B) Critical state
(C) Variable state (D) Steady state

Answer:- Option C

44. Heat absorbed by the material=Heat given out by the material is concernedwith,
(A) Normal state (B) Critical state
(C) Variable state (D) Steady state

Answer:- Option D

45. Heat flowing through material of rod of unit area, in 1 sec for unit temperature gradientat steady state is known as,
(A) Conductivity (B) Heat Constant
(C) Coefficient of thermal conductivity (D) Thermal constant

Answer:- Option C
Explanation:- By definition of Coefficient of thermal conductivity

46. As per law of thermal conductivity, amount of heat flowing through the rod is (A) Directly proportional to cross sectional area (B) Directly proportional to temperature gradient (C) Directly proportional to time (D) All of these
Answer:- Option D

47. The SI unit of coefficient of thermal conductivity is,
(A) Watt-m-K (B) Watt/m-K
(C) mK/Watt (D) m/watt-K
Answer:- Option B
Explanation:- The SI unit of coefficient of thermal conductivity is, Watt/m-K

48. The coefficient of thermal conductivity of good conductors of heat is,
(A) Low (B) Medium
(C) High (D) None of these

Answer:- Option C
Explanation:- The coefficient of thermal conductivity of good conductors of heat is high and for bad conductors low.

49. Which of the following materials is not a bad conductor of heat?
(A) Plastic (B) Wood
(C) Mica (D) Plastic & mica both

Answer:- Option C

Explanation:- Mica is good conductor of heat but bad conductor of electricity.

50. Which of the following material is not a good conductor ofheat?

(A) Thermocole (B) Mica
(C) Thermocole & mica both (D) Copper

Answer:- Option A

Explanation:- Thermocole is bad conductor of heat

51. Thermal resistor is - the thermal conductivity.

(A) Reciprocal of (B) Equal to
(C) Addition of (D) None of these

Answer:- Option A

Explanation:-R α 1/k

52. Which type of material is used as a heat sink in electronic circuits?

(A) Bad conducting (B) Conducting
(C) Semiconducting (D) All of these

Answer:- Option **B**

Explanation:- Good conducting material is used as a heat sink in electronic circuits.

53. Condenser coil in refrigerator is ideally made up of,

(A) Bad conductor (B) Insulator
(C) Semiconducting (D) Good Conductor

Answer:- Option D

Explanation:- Condenser coil in the refrigerator is ideally made up of copper (good conductor).

54. Davy's safety lamp is covered by,

(A) Insulating material (B) Good conducting material (C) Semiconducting material (D) None of these

Answer:- Option B

55. Which material is used in Ice box?

(A) Bad conducting material (B) Good conducting material (C) Semiconducting material (D) None of these

Answer:- Option A

Explanation:- A bad conducting material is used in an ice box.

56. Handle of cooker is made up of,

(A) Good conducting material (B) Semiconducting material (C) Aluminum
(D) Bad conducting material

Answer:- Option D

Explanation:- Handle of cooker is made up of bad conducting material

57. Room ventilation, Formation of trade winds, sea breeze are the application of

(A) Conduction (B) Convection
(C) Radiation (D) All of the above

Answer:- Option B

Explanation:- All are applications of convection.

58. Heat radiations in car, use of white clothes in summer are application of

(A) Conduction (B) Convection
(C) Radiation (D) All of the above

Answer:- Option C

Explanation:- Heat radiations in car, use of white clothes in summer are application of radiation.

59. Radiation can

(A) Travel through vacuum (B) Travel with speed of light
(C) Reflect, Refract (D) All of these

Answer:- Option D

Explanation:- As radiant energy is electromagnetic in nature.

60. For a fixed mass of gas, Temperature of gas remaining constant, Its pressure is inversely proportional to its volume is,

(A) Boyle's law (B) Charle's Law
(C) Gay Lussac's law (D) Newton's law

Answer:- Option A

Explanation:- According to Boyle's law statement.

61. For a fixed mass of gas, pressure of gas remaining constant, Its Volume isdirectly proportional to its absolute temperature is,

(A) Boyle's law (B) Charle's Law
(C) Gay Lussac's law (D) Newton's law

Answer:- Option B

Explanation:- According to Charle's Law statement.

62. For a fixed mass of gas, volume of gas remaining constant, its pressure is directlyproportional to its absolute temperature is,

(A) Boyle's law (B) Charle's Law
(C) Gay Lussac's law (D) Newton's law

Answer:- Option C

Explanation:- According to Gay Lussac's law statement

63. A hot air balloon is an example of,

(A) Boyle's law (B) Charle's Law
(C) Gay Lussac's law (D) Newton's law

Answer:- Option B

Explanation:- When gas is heated the gas expands.so when air inside the balloon expands, it becomes less dense and provides the lift for the hot air balloon.

64. If temperature of gas remains constant then the pressure of gas willbe

(A) Increase with increase in volume (B) Decrease with decrease in volume
(C) Increase with decrease in volume (D) None of these

Answer:- Option C

Explanation:- Temperature of gas remaining constant, Its pressure is inversely proportional to its volume this is Boyle's law.

65. If pressure of a gas remains constant, then volume of gas will

(A) Increase with temperature (B) Decrease with temperature
(C) Increase with decrease in temperature (D) Decrease with increase in temperature

Answer:- Option A

Explanation:- According to Charle's Law statement

66. The general gas equation is given by,

(A) V=PRT (B) PT=VR
(C) P=VRT (D) PV=RT

Answer:- Option D

Explanation:- The general gas equation is PV=RT

67. Ideal gas equation is given by,

(A) V=PKT (B) PT=VK
(C) P=VKT (D) PV=KT

Answer:- Option D

Explanation:- Ideal gas equation is PV=KT

68. At N.T.P normal temperature =

(A) 273^0C (B) -273^0C
(C) 273 K (D) 0 K

Answer:- Option C

Explanation:- At N.T.P condition, normal temperature is 273^0K or $.0^0$C

69. At N.T.P normal temperature =

(A) 273^0C (B) -273^0C
(C) 0^0C (D) 0 K

Answer:- Option C

Explanation:- At N.T.P condition normal temperature is 273^0K or $.0^0$C

70. At N.T.P, pressure P =

(A) 1cm of Hg (B) 76cm of Hg
(C) $1N/m^2$(D) 76 atmosphere

Answer:- Option B

Explanation:- At N.T.P condition normal pressure is76cm of Hg or 1 atmosphere.

71. At N.T.P, pressure P =

(A) 1cm of Hg (B) 1 atmosphere
(C) $1N/m^2$(D) 76 atmosphere

Answer:- Option B

Explanation:- At N.T.P condition, normal pressure is 76cm of Hg or 1 atmosphere.

72. Specific heat of gas at constant pressure Cp is always specific heat of gas at constant volume Cv.

(A) Equal to (B) Greater than
(C) Less than (D) Same as

Answer:- Option B

Explanation:- In case of Cp some additional heat is required for expanding the gas.

73. Cooking becomes faster in pressure cooker because the increase in vapourpressure

(A) Increases specific heat (B) Decreases specific heat
(C) Decreases boiling point (D) Increases boiling point

Answer:- Option D

Explanation:- Because trapped steam increases the pressure inside the cooker. At that pressure boiling point of water increased and this higher temperature cooks food faster.

74. For 1 kg mole of a gas, the value of universal gas constant R in equation, PV=RTis,

(A) 83.149 J/K kg mole (B) 0.83149 J/K kg mole
(C) 8314.91 J/K kg mole (D) 4200 J/K kg mole

Answer:- Option C

Explanation:- The value of R is constant.

75. Specific heat at constant pressure C_p & at constant Volume C_v are related as,

(A) $C_p - C_v = R/M$ (B) $C_p / C_v = \gamma$

(C) Both A & C (D) None of these

Answer:- Option C

76. Difference between the specific heat Cp and Cv is,

(A) Less than zero (B) constant.

(C) Both a & b (D) Greater than zero

Answer:- Option B

Explanation:- because $C_p - C_v = R/M$

77. Ratio of the specific heat C_p to C_v is,

(A) Less than 1 (B) Greater than 1

(C)Between a & b (D) None of these

Answer:- Option B

Explanation:- $C_p / C_v > 1$, because $C_p > C_v$.

78. Thickness of a plate is 10cm, the temperature of two faces are 90^0C and 60^0C. Find the temperature gradient

(A) 30^0C/cm (B) 3^0C/cm

(C) 1^0C/cm (D) 7^0C/cm

Answer:- Option B

79. Thickness of a plate is 8 cm. the temperature of two faces are 100^0C and -20^0C. Find the temperature gradient.

(A) 10^0C/cm (B) 20^0C/cm

(C) 25^0C/cm (D) 15^0C/cm

Answer:- Option D

80. A nickel plate of thickness 4mm has a temperature difference of 32 ^{0}C between its faces .It transmits 200 Kcal per hour through an area of 5 cm^2.Calculate the conductivity of nickel.

(A) 0.0139 Kcal/m^0Csec (B) 2.0139 Kcal/m^0Csec

(C) 2.4139 cal/m^0Csec (D) None of these

Answer:- Option A

81. The difference between two specific heats of a gas is 1500 & their ratio is 1:6. Find Cp & Cv

(A) 1800 ,300 units (B) 1900, 400 units
(C) 1720,220 units (D) 2000,500 units

Answer:- Option A

82. A glass bulb contains air at a pressure of 76 cm of Hg at 27 ^{0}C when its volume is100cc.It is placed in oil at a temperature of 57^{0}C. What will be the pressure inside, when the volume of the bulb becomes 125cc?

(A) 120 cm of Hg (B) 66.88 cm of Hg
(C) 100 cm of Hg (D) 101 cm of Hg
Answer:- Option B

83. Speed of light in Quartz is 1.98 X 10^{8}m/s. Calculate R.I of quartz.

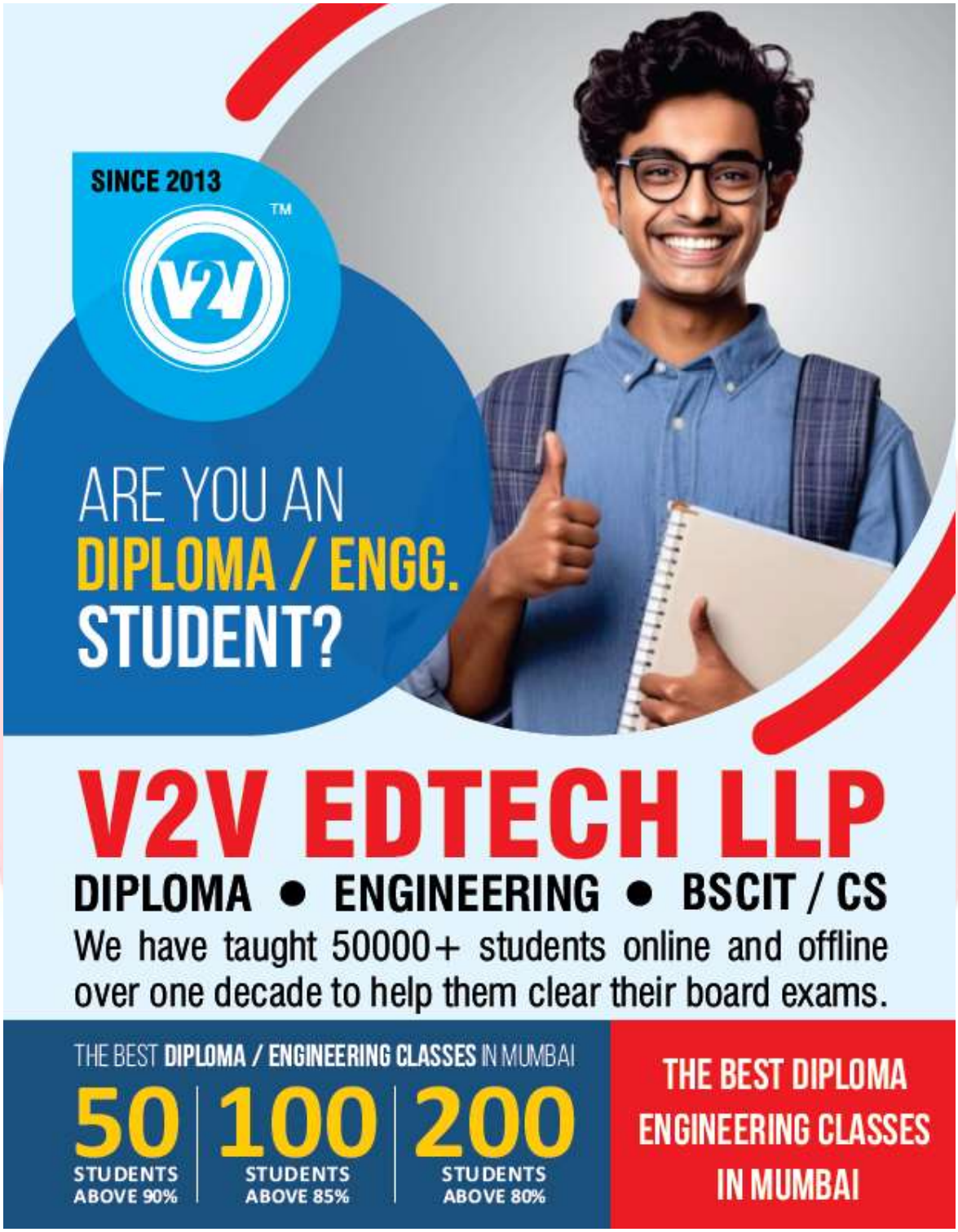
(A) 1.3 (B) 1.51
(C) 1.4 (D) 1.2
Answer:- Option B

84. An example for non-luminous object is,

(A) Candle (B) The sun
(C) An Electric Bulb (D) The moon
Answer:- Option D
Explanation:- The light emitted by an object is called a luminous object.

85. Light is a form of energy produced by a

(A) Luminous object (B) Transparent object
(C) Non-luminous object (D) Opaque object
Answer:- Option A
Explanation:- The light emitted by object is called luminous object



YouTube live Session Link :

https://www.youtube.com/live/Zu_JrdAyZWw?si=niSdNK59T8v5PxZf

Question Bank for Multiple Choice Questions

Program: All Programs of Diploma in Engineering	**Program Code:- EE / CO / EJ / CE / ME**
Scheme:- K	**Semester:- 1**
Course:- Basic Chemistry	**Course Code:- 311305**

04 – CHEMICAL BONDING AND CATALYSIS	**Marks:-09**

Content of Chapter:-

4.1 - Electronic theory of valency: chemical bonds: types and characteristics, electrovalent bond, covalent bond, Coordinate bond, hydrogen bond, metallic bond, metallic properties, Intermolecular force of attraction. 4.2 - Molecular arrangement in solid, liquid and gasses.

4.3- Structure of solids: crystalline and amorphous solid, Properties of metallic solids-, unit cell- of simple cubic, body centre cubic, Face centre cubic, hexagonal close pack crystals.

4.4 - Catalysis: Types of catalysis, Catalyst, Types of Catalyst, Positive Catalyst, Negative Catalyst, Autocatalyst, Catalytic Promoter and Catalytic inhibitor, Industrial Application of Catalyst.

Q 1. Metals lose electrons from their lattice to become .....

A. Positive ions B. Negative ions

C. Alkalies D. Non-metals

Answer: - Option A

Explanation: - Metal losses electrons and become positive charged ion.

Q 2. Dative Covalent bond is found in .....

A. Ammonia B. Ammonium ion

C. Urea D. Nitrogen

Answer: - Option B

Explanation: - Ammonium ion contains dative bond (NH_4^+)

Q 3. Charge on any ion depends upon gain or loss of .....

A. Electrons B. Protons

C. Neutrons D. Nucleons

Answer: - Option A

Explanation: - When an atom losses or gains electrons, it will convert into charged ions.

Q 4. Metals and Non- metals combine to give electronic configuration of .....

A. Alkalies B. Noble gases

C. Metalloids D. Acids

Answer: - Option B

Explanation: - When metals and non- metals loss and gain electrons respectively, their electronic configuration will become as noble gases.

Q 5. Noble gases exist as .....

A. Monoatomic B. Diatomic

C. Polyatomic D. None of these

Answer: - Option A

Explanation: - Noble gases are stable so they exist as monatomic.

Q 6. When magnesium reacts with oxygen, the nature of the bond formed is ..... A. Ionic B. Covalent

C. Metallic D. Dative

Answer: - Option A

Explanation: - Magnesium Oxide (MgO) has ionic bond.

Q 7. Metals are good conductors due to .....

A. Ionic lattice B. Crystalline lumps

C. Mostly solids D. Delocalized electrons.

Answer: - Option D

Explanation: - Metals are good conductors due to delocalized electrons means moving electrons.

Q 8. When a covalent bond is formed between a hydrogen atom and a very electronegative atom, then it is known as……

A. Ionic bond B. Hydrogen bond

C. Co-ordinate bond D. All of the above

Answer: - Option B

Explanation: - Bond formed between hydrogen and very electronegative atom (O, N, F) is known as hydrogen bonding

Q.9. Molecules which have permanent dipole are known as.....

A. Polar B. Dipole

C. Non-polar D. Tripolar

Answer: - Option A

Explanation: - Molecules which have permanent dipole are known as polar like H-Cl, H-F

. Q 10 .Electrovalent bond is another name of .....

A. Metallic bond B. Covalent bond

C. Ionic bond D. Co-ordinate bond

Answer: - Option C

Explanation: - Electrovalent bond is another name of Ionic bond.

Q.11. Covalent compounds are .....

A. Good conductors of electricity B. Non-conductors of electricity

C. Poor conductors of electricity D. None of the above

Answer: - Option B

Explanation: - Covalent compounds don't split into ions when dissolved due that covalent compounds are non-conductors of electricity.

Q.12. Crystal lattice is actually .....

A. Sum of points B. Array of points

C. Lines of points D. triangles of points

Answer: - Option A

Explanation: - Crystal lattice is array of points due to the ordered internal arrangement of atoms in a crystal structure

Q.13. Unit cell is the smallest building unit of .....

A. Crystal lattice B. Liquids

C. Gases D. None of the above

Answer: - Option A

Explanation: - Unit cell is the smallest building unit of crystal lattice.

Q.14. Which of the following is an amorphous solid?

A. Diamond B. Glass

C. Sodium chloride D. None of the above

Answer: - Option B

Explanation: - Glass is an amorphous solid because Silicon dioxide molecules are not packed in a crystal lattice

Q.15. The co-ordinate number of the FCC structure is.....

A. 4 B. 8

C. 2 D.12

Answer: - Option D 12

Q.16. The lattice site in a pure crystal cannot be occupied by .....

A. Molecule B. Ion

C. Electron D. Atom

Answer: - Option C

Explanation: - The lattice site in a pure crystal can be occupied by molecule, ion or atom.

Q.17. Substance which alter the rate of chemical reaction without undergoing any chemical change are called as .....

A. Polymers B. catalysts

C. Products D. None of the above

Answer: - Option B

Explanation: - Substances which alter the rate of chemical reaction without undergoing any chemical change are called catalysts.

Q.18. The substance that reduce the effectiveness of a catalyst are called .....

A. Promoters B. Autocatalysts

C. Inhibitors D. None of the above.

Answer: - Option C

Explanation: - The substance that reduce the effectiveness of a catalyst are called inhibitors.

Q.19. When catalyst and reactant are in the same phase then it is called.....

A. Heterogenous catalysis B. Homogenous catalysis

C. Autocatalysis D. None of these

Answer: - Option B

Explanation: - When catalyst and reactant are in the same phase then it is called homogeneous catalysis.

Q.20. When a product acts as a catalyst then it is called as .....

A. Self-catalysis B. Positive catalysis

C. Autocatalysis D. Negative catalysis

Answer: - Option C

Explanation: - Single chemical reaction is said to be autocatalytic if one of the reaction products is also a catalyst for the same or a coupled reaction.

Q.21. Complete transfer of one or more electrons between atoms constituting in forming.....

A. Ionic Bond B. Covalent bond

C. Co-ordinate Bond D. Dative Bond

Answer: - Option A

Explanation: - Ionic bond is formed by complete transfer of one or more electrons.

Q.22. When a single atom provides both electrons which are needed for completion of covalent bond then it leads to.....

A. Ionic Bond

B. Covalent bond
C. Co-ordinate Bond
D. None

Answer: - Option C

Explanation: - A coordinate bond (also called a dative covalent bond) is a covalent bond (a shared pair of electrons) in which both electrons come from the same atom.

Q.23. In ammonia ion, electrons required between hydrogen ion and nitrogen ion are.....

A. 1 B. 2
C. 3 D. 4

Answer: - Option B

Q.24. Pairs of outer shell electrons not used in bonding are called as.....

A. Valence electrons B. Donor electrons
C. Electrovalent electrons D. Lone pairs

Answer: - Option D

Explanation: - A lone pair is an electron pair in the outermost shell of an atom that is not shared or bonded to another atom.

Q.25. Bond formed by sharing four electrons is called.....

A. Covalent bond B. Electrovalent bond
C. Dative covalent bond D. Double covalent bond

Answer: - Option D

Explanation: - A bond formed by sharing four electrons is called a double covalent bond. (E.g. O_2, CO)

Q.26. For dative covalent bonding, one atom having a lone pair of electrons combines with ...

A. An electron deficient compound B. An expanded octet
C. A proton of other atom D. A neutron of other atom

Answer: - Option A

Q.27. When the bond is formed by sharing of two pairs of electrons by atoms, then the bond is called as.....

A. Single covalent bond B. Double covalent bond
C. Triple covalent bond D. Ionic bond

Answer: - Option B

Explanation: - When the bond is formed by sharing of two pairs of electrons by atoms, then the bond is called as double covalent bond. (E.g. O_2, CO)

Q.28. Neither ions nor electrons are free to move in.....

A. Liquids B. Metals
C. Ionic solids D. All of the above

Answer: - Option C
Explanation: - Neither ions nor electrons are free to move in ionic solids.

Q.29. Weak forces between molecules are called as.....

A. Molecular forces B. Intermolecular forces
C. Intramolecular forces D. Extramolecular forces

Answer: - Option B
Explanation: - Weak forces between molecules are called Intermolecular forces.

Q.30. Electrons are usually lost by.....

A. Metals B. Non-metals
C. Inert gases D. All of the above

Answer: - Option A
Explanation: - Electrons are usually lost by Metal.

Q.31. In nitrogen molecule, the number of electrons required by each nitrogen atom in outer shell are.....

A. 1 B. 2
C. 3 D. 4

Answer: - Option C
Explanation: - Nitrogen atom has electronic configuration like (2, 5). So numbers of electrons required by each nitrogen atom in outer shell are 3.

Q.32. Conduction of electricity in metallic bonding is due to the presence of... .....A.
Protons B. Lattice
C. Delocalized electrons D. Nucleus

Answer: - Option C
Explanation: - Conduction of electricity in metallic bonding is due to the presence of delocalized electrons.

Q.33. Metal atoms.....

A. Lose their outer electrons B. Become positively charged
C. Become negatively charged D. Both (A) & (B)

Answer: - Option D
Explanation: - Metal losses electrons and become positive charged ion.

Q.34. Nitrogen molecule is an example of .....

A. Single covalent bond B. Double covalent bond

C. Triple covalent bond D. Single co-ordinate bond

Answer: - Option C

Explanation: - Nitrogen molecule is formed by sharing of three electron pairs.

Q.35. Regular arrangement in which atoms are closely packed together is called a .....

A. Tetrahedral structure B. Lattice

C. Crystal lattice D. Ionic bond

Answer: - Option C

Explanation: - Regular arrangement in which atoms are closely packed together is called a Crystal lattice.

Q.36. Resulting a loss of electrons forms .....

A. Anodes B. Cathodes

C. Negative ions D. Positive ions

Answer: - Option D

Explanation: - When an atom losses electrons form positive ions.

Q.37. Representation of bond by single, double or triple line is done in.....

A. Metallic bond B. Co-ordinate bond

C. Covalent bond D. Ionic bond

Answer: - Option C

Explanation: - Covalent bonding has three types of bonding like single ,double & triple covalent bond.

Q.38. Which of the following characteristics does not possess by the metal? A. Luster B. Ductility

C. Increase in conductance by increase in temperature D. Malleability

Answer: - Option C

Explanation: - Increase in conductance by increase in temperature. For metals, the thermal conductivity is mainly a function of the motion of free electrons.

Q.39. On which factor, conductance of metals is responsible?

A. Ions B. Delocalized electrons

C. Atomic kernel D. Number of atoms

Answer: - Option B

Explanation: - For metals, the thermal conductivity is mainly a function of the motion of free electrons i.e. delocalized electrons.

Q.40. The difference between the number of atoms in a unit cell of a BCC crystal and an FCC crystal is …….

A. 1 B. 2
C. 4 D. 6

Answer: - Option B

Explanation: - The number of atoms in a unit cell of a BCC crystal is 2 and an FCC crystal is 4. So the difference between the two is 2.

Q.41. When the partial positive end of one molecule is attracted weakly to partial negative end , then the force between them is……

A. Electrostatic force B. Dipole - dipole interaction
C. Ionic bond D. None of the above

Answer: - Option B

Explanation: - partial positive end of one molecule is attracted weakly to partial negative end , then the force between them is dipole - dipole interaction

Q.42. Tendency of atoms to acquire eight electrons in their valence shell is…… …

A. Octet rule B. Duplet rule
C. Triplet rule D. All of the above

Answer: - Option A

Q.43. In the formation of Mg++ ion. Which one is the correct reaction in the following?

A. $Mg \rightarrow Mg^{++} + 4e^-$ B. $Mg \rightarrow Mg^{++} + 2e$
C. $Mg \rightarrow Mg^{++} + 3e^-$ D. $Mg \rightarrow Mg^{++} + 1e$

Answer: - Option B

Q.44. What type of bond form between hydrogen & oxygen atom in the given structure?

A . Hydrogen Bond B. Metallic Bond
C. Non-metallic Bond D. Oxygen Bond

Answer: - Option A

Explanation: - The hydrogen bond is an attractive interaction between a hydrogen atom from a molecule or a molecular fragment X-H in which X is more electronegative atom like O, N, F.

Q.47. The catalyst used in the lead chamber process of sulphuric acid manufacturing

A. Platinum B. Oxide of nitrogen
C. Nickel D. Vanadium compound

Answer: - Option B

Explanation: - Lead-chamber Process, method of producing sulfuric acid by oxidizing sulfur dioxide with moist air, using gaseous nitrogen oxides as catalysts, the reaction taking place primarily in a series of large, boxlike chambers of sheet lead.

Q.48. An example of an autocatalytic reaction is …

A. The decomposition of nitroglycerine B. Thermal decomposition of $KClO_3$ & MnO_2 mixture C. Break down of $_6C^{14}$ D. Hydrogenation of vegetable oil using nickel catalysts

Answer: - Option A

Explanation: - N_2 is one of the product of decomposition of nitroglycerine that plays the role of an autocatalyst.

Q.49. The coordination number of a metal crystallizing in a hexagonal close packing (HCP) structure is

A. 6 B. 7

C. 8 D. 12

Answer: - Option D

Explanation: - The number of the nearest atoms surrounded by an atom is called the coordination number of that lattice. The coordination number of the hexagonal close-packed structure is 12.

Q.50. Which of the following compounds possess covalent bond?

A. $CaCl_2$ B. $BaCl_2$

C. $AlCl_3$ D. H_2O

Answer: - Option D

Explanation: - H_2O has single covalent bond

Q.51. Proton accelerate the hydrolysis of ester. This is an example of ……

A. A Heterogenous catalysis B. An acid-base catalysis

C. A promoter D. A negative catalyst

Answer: - Option B

Q.52. Which of the following processes does not involve a catalyst?

A. Haber's process B. Thermite process

C. Ostwald process D. Contact process

Answer: - Option B

Q.53. Which of the following reactions is catalyzed by enzyme maltase?

A. Starch to maltose B. Maltose to Glucose

C. Lactose to maltose D. Maltose to glucose + Fructose

Answer: - Option B

Explanation: - The enzyme which converts maltose to glucose is maltase.

Q.54. The transition metal used as a catalyst is…..

A. Nickel B. Platinum

C. Cobalt D. All of these

Answer: - Option D

Explanation: - The transition metals used as a catalyst are Ni, Co, Pt, Cd etc

Q.55. In the Ostwald's process for the manufacture of HNO_3, the catalyst used is.....
A. Mo B. Fe
C. Ni D. Pt
Answer: - Option D
Explanation: - In the Ostwald's process for the manufacture of HNO_3, the catalyst used is Pt.

Q.56. Adam's catalyst is ...
A. Platinum B. Iron
C. Molybdenum D. Nickel
Answer: - Option A
Explanation: - Adam's catalyst, also known as platinum dioxide, is usually represented as Platinum(IV) oxide hydrate, PtO2•H2O.

Q.57. Which of the following is not a category of catalysis?
A. Homogeneous B. Heterogeneous
C. Artificial D. Enzymatic
Answer: - Option C
Explanation: - Homogeneous, Heterogeneous and Enzymatic are categories of catalysis.

Q.58. Which of the following is an example of homogeneous catalysis ?
A. Enzyme catalysis B. Hardening of animal and vegetable oils
C. Haber's process D. Cracking of heavy oils for synthesis of gasoline
Answer: - Option A

Q.59. Which of the following statements is incorrect about the adsorption theory?
A. The catalyst is more efficient in finely divided state
B. Action of promoters is not explained
C. Enhanced activity of a rough surface catalyst is explained
D. Specific action of catalyst is explained
Answer: - Option B

Q.60. Which of the following processes are used for preparation of sulphuric acid? A. Ostwald;s process B. Bergius process
C. Deacon's process D. Chamber process
Answer: - Option D
Explanation: - Both Chamber process and Contact process are used for preparation of sulphuric acid.

Q.61. Select the catalyst which is used for manufacturing of ethanol from glucose

A. Maltose B. Pt/V_2O_5

C. Zymase D. Fe_2O_3

Answer: - Option C

Explanation: - Glucose is converted to ethanol by the action of yeast Zymase.

Q.62. Which of the following processes is used for the preparation of Chlorine gas?

A. Deacon's process B. Bergius process

C. Ostwald's process D. Haber's process

Answer: - Option A

Q.63. Name the catalyst which is used For manufacture of glucose from cane sugar.

A. Maltase B. Zymase

C.$CuCl_2$ D. CuCl **Answer:**

- Option A

Explanation: - Glucose is converted to cane sugar by the action of maltase.

Q.64. Name the metal which increases the activity of iron metal when added in small amounts.

A. Cu B. Mo

C. Al D. Mn

Answer: - Option B

Explanation: - Mo increases the activity of iron metal when added in small amount.

Q.66. The adsorption theory is applicable to …

A. Homogeneous catalysis B. Heterogeneous catalysis

C. Catalysis D. None of the above

Answer: - Option B

Explanation: - Adsorption theory is applicable for solid catalysts which show heterogeneous catalysis. According to this theory, the gaseous reactants are adsorbed in the surface of the solid catalyst.

Q.67. Water accumulates in cells of animals and plants due to presence of …

A. Covalent bond B. Co-ordinate bond

C. Hydrogen bond D. Electrovalent bond

Answer: - Option C

Explanation: - Water accumulates in cells of animals and plants due to presence of Hydrogen bond.

Q.68. Solid CO_2 is an example of.....

A. Molecular crystal B. Ionic crystal

C. Covalent crystal D. Metallic crystal

Answer: - Option A

Explanation: - Solid CO2 is an example of Molecular crystal. They have relatively weak intermolecular binding.

Q.69. Which of the following is Amorphous?

A. Polystyrene B. Table salt

C. Silica D. Diamond

Answer: - Option C

Explanation: - The amorphous form of silica has been used as a photovoltaic solar cell because this is lightweight & flexible.

Q.70. The property of crystalline solid is not

A. Anisotropic B. Isotropic

C. Hard D. Dense

Answer: - Option B

Explanation: Isotropic materials are materials whose properties remain the same when tested in different directions. The crystalline solids are anisotropic in nature, this means that the physical properties do change with the change in direction.

Q.71. Characteristics features of solids are

A. Definite shape B. Definite size

C. Definite shape and size D. definite shape and rigidity

Answer: - Option D

Explanation: - Definite shape and rigidity are the characteristics features of solids.

Q.72. Diamond is an example of

A. Solid with hydrogen bonding B. Electrovalent solid

C. Covalent solid D. Glass

Answer: - Option C

Explanation: - Diamond is a covalent solid and yet has a high melting point mainly due to its interlinked structure.

Q.73. Which solid will have the weakest intermolecular forces?

A. Ice B. Phosphorus

C. Naphthalene D. Sodium Fluoride

Answer: - Option A

Explanation: - Ice has the lowest melting point out of the given solids , hence it has the weakest intermolecular forces.

Q.74. Which of the following example of metallic crystal solid

A. C

B. Si

C. W

D. AgCl

Answer: - Option A

Q.75. Lead is a metallic crystal having a _____structure.

A. FCC B. BCC

C. HCP D. TCP

Answer: - Option A

Explanation: - Crystalline solids are classified as either metallic or non-metallic. Pb, along with Cu, Ag, Al, and Ni, has a face-centered cubic structure.

Q.76. Which of the following has a HCP crystal structure?

A. W B. Mo

C. Cr D. Zr

Answer: - Option D

Q.77. Amorphous solids have _____structure.

A. Regular B. Linear

C. Irregular D. Dendritic

Answer: - Option C

Explanation: - Materials in which the molecule is the basic structural solid and has an irregular structure is known as amorphous solid. Crystalline solids, on the other hand, usually are arranged in a regular manner.

Q.78. Bravais lattice consists of _____space lattices.

A. Eleven B. Twelve

C. Thirteen D. Fourteen

Answer: - Option D

Explanation: - Materials in which the molecule is the basic structural solid and has an irregular structure is known as amorphous solid. Crystalline solids, on the other hand, usually are arranged in a regular manner.

Q.82. The coordination number of a metal crystal in a Simple Cubic (SC) structure is

A. 6
B. 7
C. 8
D. 12

Answer: - Option A

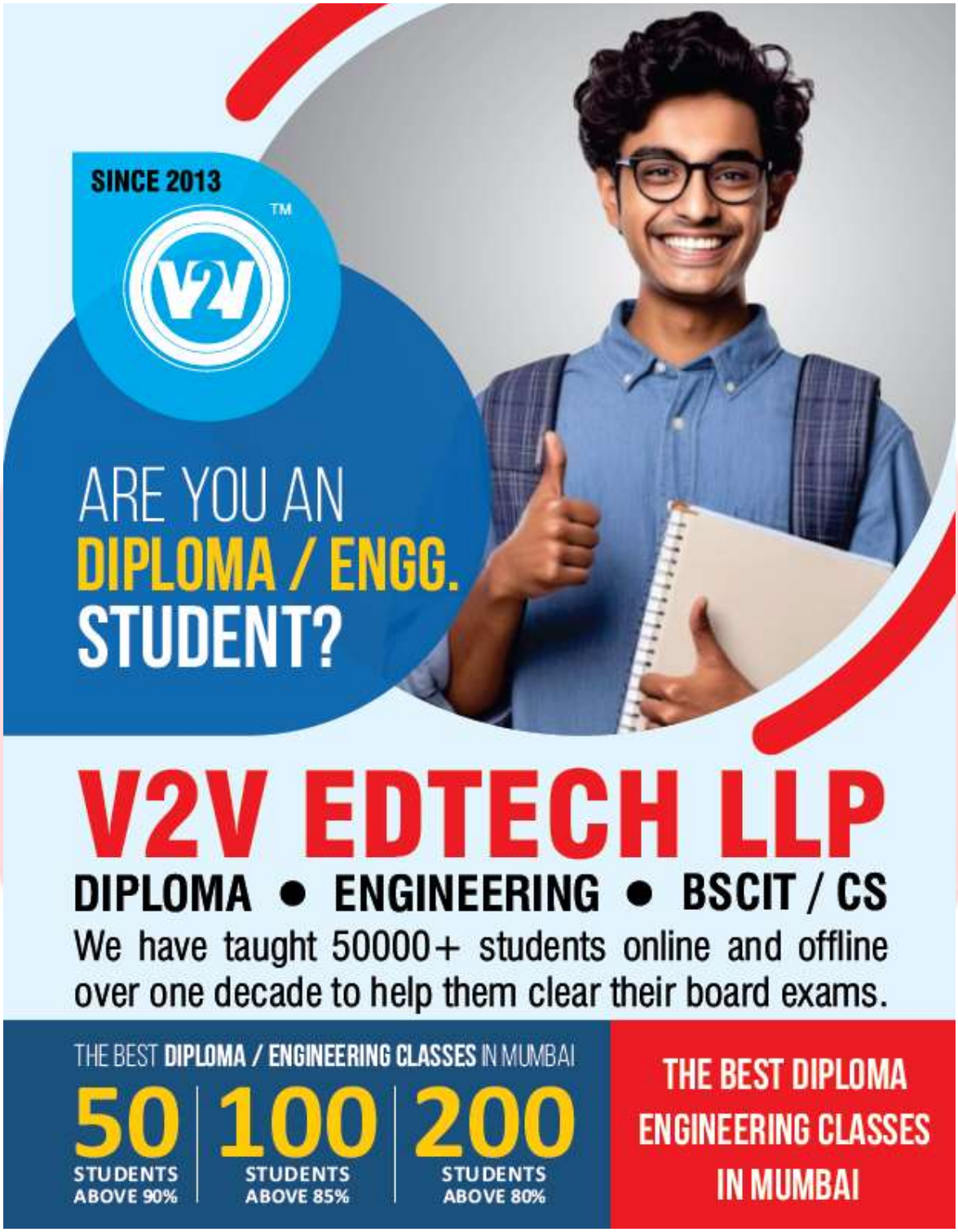
Explanation: - The number of the nearest atoms surrounded by an atom is called the coordination number of that lattice. The coordination number of the simple cubic structure is 6.

Q.83. The coordination number of a metal crystal in a Body centered cubic (BCC) structure is

A. 6 B. 7
C. 8 D. 12

Answer: - Option C

Explanation: - The number of the nearest atoms surrounded by an atom is called the coordination number of that lattice. The coordination number of the body centered cubic structure is 8.



YouTube live Session Link :
https://www.youtube.com/live/Zu_JrdAyZWw?si=niSdNK59T8v5PxZf

Question Bank for Multiple Choice Questions

Program: All Programs of Diploma in Engineering	**Program Code:- EE / CO / EJ / CE / ME**
Scheme:- K	**Semester:- 1**
Course:- Basic Chemistry	**Course Code:- 311305**

05 – METAL CORROSION, ITS PREVENTION AND ELECTROCHEMISTRY	**Marks:-12**

Content of Chapter:-

5.1- Corrosion: Types of corrosion- Dry corrosion, Wet corrosion. Oxidation corrosion (Atmospheric corrosion due to oxygen gas), mechanism, Types of oxide film, Wet corrosion mechanism (Hydrogen evolution in acidic medium).

5.2- Concentration cell corrosion -oxygen absorption mechanism in neutral or alkaline medium, Pitting corrosion, Waterline corrosion, Crevice corrosion.

5.3- Factors affecting the rate of corrosion control: Modification of environment, Use of protective coatings coating of less active metal like Tin (Tinning), coating of more active metal like Zinc (Galvanizing), Anodic and cathodic protection Choice of material-using pure metal and using metal alloys.

5.4- Electrolyte- strong and weak, Non- Electrolyte, Electrolytic cell and Electrochemical cell, Cathode, Anode, Electrode potential- oxidation and reduction Construction and working of Daniel cell, Ionization and dissociation Daniel cell , Ionization and dissociation.

5.5- Faradays first and second law.

5.6- Primary cell and secondary cell Electrolysis- Mechanism, Electroplating and electro-refining of copper.

Q.1. The metal which is commonly used as a coating metal during electroplating of imitation jewellry is

A. Silver B. Gold

C. Alluminium D. Rhodium

Answer: - Option D

Explanation: - Rhodium is often used to give a good white colour to white gold jewellery (which is often not a good white colour) or is used selectively on yellow gold jewellery to give local areas of whiteness.

Q.2. The process due to which water splits into hydrogen ions and hydroxyl ions is

A.Tinning B. Galvanizing

C. Electrolysis D. Ionization

Answer: - Option D

Q.3. The method of electrolysis which is used to improve corrosion resistance of any metal

A. Oxidation B. Electroplating

C. Tinning D. Redox reaction

Answer: - Option B

Explanation: - Electroplating is mainly done for avoiding corrosion of metals and for decorative purposes.

Q.4. During electro refining of blister copper, anode and cathode respectively made up of

A. Pure Zn and impure Zn B. Impure Cu and pure Cu

C. Pure Mg and impure Mg D. Pure Cu and impure Cu

Answer: - Option B

Explanation: - During electro refining of blister copper, anode and cathode respectively made up of Impure Cu and pure Cu.

Q.5. Which type of oxide film is formed on the surface of alkali and alkaline earth metal?

A. Unstable oxide film B. Non porous oxide film

C. Porous oxide film D. Volatile oxide film

Answer: - Option C

Explanation: - Porous oxide film is formed on the surface of alkali and alkaline earth metal like beryllium (Be), magnesium (Mg), calcium (Ca), strontium (Sr), barium (Ba), and radium (Ra).

Q.6. Identify the substance, which form physical barrier between metal and corroding medium and reduce the corrosion

A. Promoters B. Semipermeable membrane

C. Inhibitors D. Salt bridge

Answer: - Option C

Explanation: - A corrosion inhibitor is a chemical compound that, when added to a liquid or gas, decreases the corrosion rate of a material, typically a metal or an alloy that comes into contact with the fluid.

Q.7. The process used for repairing broken or worn out parts of machine is called

A. Electroplating B. Electro refining

C. Electrometallurgy D. Tinning

Answer: - Option A

Explanation: - The process used for repairing broken or worn out parts of machine is called electroplating.

Q.8. The organic or inorganic substances, which when added in small quantity to the corrosive environment, effectively minimize the corrosion of metal are called as

A. Inhibitor B. Negative catalyst

C. Promoter D. None of the above

Answer: - Option A

Explanation: - The organic or inorganic substances, which when added in small quantity to the corrosive environment, effectively minimize the corrosion of metal are called as Inhibitor.

Q.9. On which part of any metal, differential aeration type of corrosion will occur

A. More oxygenated part B. Less oxygenated part

C. Both A and B D. None of the above

Answer: - Option B

Explanation: - Less oxygenated part acts as anode due to that differential aeration type of corrosion occur at anodic area.

Q.10. Electro chemical equivalent of a metal is Y gm/coulomb. The equivalent weight of a metal is

A. Y/96500 B. Y+96500

C. 96500/Y D. 96500*Y

Answer: - Option D

Explanation: - Equivalent weight = 96500* Electro chemical equivalent

Q.11. Name the type of corrosion in the given situation copper sheets joint by iron nails and is exposed to humid environment

A. Atmospheric corrosion B. Immersed corrosion

C. Both A and B D. None of the above

Answer: - Option B

Explanation: - Immersion corrosion is a simple method of determining the rate of corrosion in aqueous solutions.

Q.12. In electrochemical cells two half cells are in contact with each other by

A. Salt bridge B. Water bath

C. Sand bath D. None of the above

Answer: - Option A

Explanation: - The main function of a salt bridge is to help maintain the electrical neutrality within the internal circuit. It also helps in preventing the cell from taking its reaction to equilibrium.

Q.13. In Zn/Zn++//Cu++/Cu cell, electrical energy is generated at the cost of

A. Electrical energy B. Thermal energy

C. Chemical energy D. Potential energy

Answer: - Option C

Q.14. One of the method of preventing corrosion of metal by applying protective coating is

A. Electro metallurgy B. Fusion

C. Electroplating D. Electro refining

Answer: - Option C

Q.15. Select the volatile oxide film from the given option

A. $FeCl_3$ B. $AlCl_3$

C. MoO_3 D. None of the above

Answer: - Option C

Explanation: - The volatile oxide film is MoO_3

Q.16. Tin coated metal can be used for

A. Cutlery B. Food industries

C. Machine preparation D. None of the above

Answer: - Option B

Explanation: - Tin metal does not form any poisonous compound with acidic food content hence it is used for food industries.

Q.17. Aqueous $CuSO_4$ solution conducts electricity due to presence of

A. Crystals B. Atoms

C. Ions D. Salts

Answer: - Option C

Explanation: - In aqueous CuSO4 solution, CuSO4 splits into charged ions. Ions are responsible for the conductance of electricity.

Q.18. The process of decomposition of electrolyte in presence of electric current is called

A. Electroplating B. Galvanizing

C. Electro refining D. Electrolysis

Answer: - Option D

Explanation: - The process of decomposition of electrolyte in presence of electric current is called electrolysis.

Q.19. The aluminum metal is corrosion resistance because of formation of oxide film which is

A. Volatile B. Unstable

C. Porous D. Non porous

Answer: - Option D

Q.20. The best suitable alloying metal for iron or steel in cutlery is

A. Mg
B. Al
C. Cr
D. Cu

Answer: - Option C

Explanation: - Chromium (Cr) increases corrosion resistance property of steel, So Cr is used as an alloying element in Steel.

Q.21. Under the humid conditions, the reaction that occur at cathode when iron hinges plated with copper is

A. Catalysis B. Reduction
C. Redox reaction D. Oxidation

Answer: - Option B

Explanation: - In electrochemical cells cathode undergoes reduction that means cathode gains electrons from anode.

Q.22. Name the metal used to protect the metal from corrosion by sacrificial anodic protection

A. Fe B. Mn
C. Zn D. Co

Answer: - Option C

Explanation: - In electrochemical series Zn is placed at the top of Fe, Mn and Co. Zn will oxidize easily , so Zn used to protect base metal from corrosion.

Q23.The reaction taking place in oxygen absorption mechanism of iron in presence of neutral aqueous solution in excess supply of oxygen is

A. $Cu^{++} + 2e- \square Cu$ B. $FeSO_4 \square Fe^{++} + SO_4- -$

C. $Cu \square Cu^{++} + 2e-$ D. $Fe^{++} + 2(OH)^- \square Fe(OH)_2$

Answer: - Option D

Explanation: - In electrochemical series Zn is placed at the top of Fe, Mn and Co. Zn will oxidize easily , so Zn used to protect base metal from corrosion.

Q.24. The product obtain at cathode during electrolysis of aqueous CuSO4 solution using platinum electrode is

A. Deposition of SO4-- B. Deposition of Cu
C. Deposition of Mg D. Deposition of Zn

Answer: - Option B

Q.25. The metal used in galvanizing to form protective coating on iron sheet is

A. Cu
B. Mg
C. Zn
D. Al

Answer: - Option C

Explanation: - In the galvanizing process Zn metal is used as a coating material on iron sheet.

Q.26. One of the method used for the prevention of metal from corrosion by modification of environment is

A. Addition of inhibitor B. Removal of corrosion stimulant
C. Removal of inhibitor D. Addition of stimulant

Answer: - Option B

Explanation: - We can minimize corrosion by removal of corrosion stimulants like humidity, acidic and basic medium from the environment.

Q.27. In Daniel cell, anode and cathode respectively are made up of

A. Zn and Cu B. Cu and Zn
C. Al and Mg D. Al and Cu

Answer: - Option A

Explanation: - In Daniel cell Zn acts as anode while Cu acts as cathode.

Q.28. Name the reaction taking place at anode in Daniel cell

A. Oxidation B. Reduction
C. Redox reaction D. None of above

Answer: - Option A

Q.29. Several blocks of Mg are fixed to the bottom of the ship to avoid

A. Weight B. Corrosion
C. Both A and B D. None of above

Answer: - Option B

Explanation: - Mg blocks act as anode and protect ship from corrosion.

Q.30. Reduction potential is the measure of tendency of electrode to

A. Loss of proton
B. Loss of electron
C. Gain of proton
D. Gain of electron

Answer: - Option D

Q.31. Relation between chemical equivalent and electrochemical equivalent is

A. C.E.=96500*E.C.E. B. 96500*C.E.=E.C.E.

C. C.E.=E.C.E./2 D. C.E.=E.C.E.

Answer: - Option A

Explanation: - Chemical Equivalent = 96500* Electrochemical Equivalent

Q.32. During electro refining of blister copper 1% H_2SO_4 is added to electrolyte

A. To decrease ionization B. To increase ionization

C. To improve its conductivity D. None of the above

Answer: - Option C

Q.33. Ammonium hydroxide considered as a weak electrolyte as in the aqueous solution it

A. Weakly ionizes B. Dissolved completely

C. Never ionizes D. Highly ionizes

Answer: - Option A

Explanation: - NH_4OH is a weak electrolyte, which ionizes

Q.34. Which of the following is nonelectrolyte?

A. Aq. $ZnSO_4$ B. Aq. $CuSO_4$

C. Aq. $AlCl_3$ D. Ethanol, Glucose, CCl_4, kerosene

Answer: - Option D

Explanation: - Ethanol, Glucose, CCl_4, kerosene are nonelectrolyte as they are insoluble in solvent.

Q.35. When aqueous solution of silver nitrate is used as an electrolyte during electrolysis then the ions which moves towards the cathode is

A. Ag^+ B.NO_3^-

C. Zn^{++} D. Cu^{++}

Answer: - Option A

Q.36. 1 Faraday =

A. 900 coulomb B. 96500 coulomb

C. 9650 coulomb D. 9500 coulomb

Answer: - Option B

Explanation: - 1 Faraday = 96500 Coulomb

Q.37. The substance which in their aqueous/molten state produces ions & allow the electric current to pass through them are known as

A. Non electrolyte B. Cathode

C. Electrolyte D. Electrode

Answer: - Option C

Q.38. The metal which is placed at the top of the electrochemical series is

A. Undergoes electrolysis B. Undergoes oxidation
C. Undergoes reduction D. None of the above

Answer: - Option B

Explanation: - According to electrochemical series, the metal which is placed at the top of electrochemical series has more tendency to lose electrons easily due to that it undergoes oxidation.

Q.39. Due to the passage of electric current, the electrolyte undergoes

A. Deposition B. Oxidation
C. Reduction D. Redox reaction

Answer: - Option A

Explanation: - The Electrolyte which in their aqueous/molten state produces ions & after passing electric current ions deposit on respective electrode.

Q.40. The aqueous $CuSO_4$ solution allows electric current to pass through it, hence it is called

A. Electrolyte B. Solute
C. Non electrolyte D. Solution

Answer: - Option A

Explanation: - The aqueous $CuSO_4$ solution produces ions like Cu^{++} and SO_4^{--} & after passing electric current ions deposit on respective electrode. Hence it is called electrolyte.

Q.41. During electrolysis, the ions moving towards the anode are

A. Anions B. Cations
C. Catalyst D. Inhibitors

Answer: - Option A

Explanation: - Anode is positively charged electrode and Anions are negatively charged ions and anions move towards the anode which is oppositely charged electrode.

Q.42. Pitting corrosion in stainless steel can be reduced by adding

A. 10% Cu B. Pb
C. Al D. 3-4% Mo

Answer: - Option D

Explanation: - Stainless steel is an alloy of Fe with composition of C and 3-4% Mo. Mo helps to improve corrosion resistance property of stainless steel.

Q.43. Galvanized container are not used for storing food products because

A. Not reacts with Zn B. Galvanized container are costly

C. Poisonous products are formed D. All of above

Answer: - Option C

Explanation: - In galvanization process Zinc is coated on the surface of steel or iron metal. Here Zinc reacts with acidic food content and form poisonous products which are hazardous to human.

Q.44. Select the inert electrode from the following

A. Copper B. Zinc

C. Aluminum D. Platinum

Answer: - Option D

Explanation: - Inert means it is not reactive. An inert electrode is needed to conduct the electrons but it is not part of the redox reaction. Examples of inert electrode are Platinum (Pt) and Carbon.

Q.45. Name the weak electrolyte from the following

A. KOH B. NH_4Cl

C. NaOH D. HCl

Answer: - Option B

Explanation: - NH_4Cl is a weak electrolyte, which ionizes weakly in solution.

Q.46. The non-rechargeable cells are called

A. Secondary cell B. Ni-Cd cell

C. Lead storage cell D. Primary cell

Answer: - Option D

Explanation: - A primary cell is a battery (a galvanic cell) that is designed to be used once and discarded, and not recharged with electricity and reused like a secondary cell (rechargeable battery).

Q.47. A piece of gold not react spontaneously with 1.0 M HCl select the correct statement

A. Gold is at the top in E.C.S. than H+ B. Gold is very active metal

C. Gold is at the bottom in E.C.S. than H+ D. None of the above

Answer: - Option C

Q.48. During electrolysis 2 ampere of current is passed through $CuSO_4$ & $ZnSO_4$ solution which are connected in series, if amount of Cu deposited is 3.17 gm, calculate the amount of Zn deposited, Given C.E. of Cu is 31.75 & C.E. of Zn is 32.5

A. 32.4 gm B. 324 gm
C. 3.24 gm D. 0.324 gm

Answer: - Option C

Explanation: -Faraday's Second law of electrolysis =

Q.49. Calculate the weight of a substance deposited when current of 1.5 ampere is passed through solution for 30 minutes, given: E.C.E. =0.000337

A. 83.3 gm B. 87.9 gm
C. 0.891 gm D. 89.9 gm

Answer: - Option C
Explanation: - Faraday's First law of electrolysis W= zct. Where z is electrochemical equivalent i.e. E.C.E.

Q.50. Calculate the equivalent weight of substance if its electrochemical equivalent is 0.00032 gm

A. 30.88 gm B. 0.31 gm
C. 0.308 gm D. 0.32 gm

Answer: - Option A
Explanation: - Chemical Equivalent = 96500* Electrochemical Equivalent

Q.51. Choose the electrode at which oxidation takes place in electrochemical cell

A. Cathode B. Anode
C. Pt D. Inert electrode

Answer: - Option B
Explanation: - In electrochemical cell oxidation takes place at anode.

Q.52. Calculate the time in minutes, when 0.921 gm substance is deposited by passing current of 2.5 ampere through ZnSO4 solution for given ECE of Zn=0.000304

A. 20.19 minutes B. 1211.84 minutes
C. 1112.2 minutes D. None of above

Answer: - Option A
Explanation: - Faraday's First law of electrolysis is W= zct. Where z is electrochemical equivalent i.e. E.C.E

Q.53. Underground part of buried electric pole undergoes corrosion due to

A. Cathodic protection B. Sacrificial anodic method

C. Differential aeration principle D. None of above

Answer: - Option C

Explanation: - Differential aeration corrosion is a type of corrosion that occurs when oxygen concentrations vary across a metal's surface. The varying concentration of oxygen creates an anode and a cathode on the metal's surface.

Q.54. Calculate the chemical equivalent of Zn ,when CuSO4 & ZnSO4 solutions are electrolyzed in series, the weight of a Cu & Zn deposited are 6.35 gm and 6.5 gm respectively.(given :atomic wt. of Cu=63.5 gm)

A. 0.325 gm B. 32.5 gm

C. 325 gm D. 0.30 gm

Answer: - Option B

Q.55. The electrolytic solution is

A. Electrically negative B. Electrically neutral

C. Electrically positive D. None of the above

Answer: - Option B

Explanation: - The dissolved electrolyte separates into cations and anions, which disperse uniformly through the solvent. Electrically, such a solution is neutral.

Q.56. The process of attaching more active metal to an iron object for preventing from corrosion is

A. O_2 absorption B. H_2 evolution

C. Sacrificial anode D. Cathodic protection

Answer: - Option D

Explanation: - Cathodic protection is a technique used to control the corrosion of a metal surface by making it the cathode of an electrochemical cell. Simple method of protection connects the metal to be protected to a more easily corroded "sacrificial metal" to act as the anode.

Q.57. If 96500 coulomb of charge deposited 108 gm of silver, calculate the weight of silver deposited when 9650 coulomb of charge is passed

A. 110 gm B. 118 gm

C. 11.8 gm D. 10.8 gm

Answer: - Option D

Q.58. In which state the common salt does not conduct electricity?

A. Liquid B. Gaseous

C. Solid D. None of the above

Answer: - Option C

Explanation: - We require free ions for electrical conductivity. Because of that solid material does not conduct electricity.

Q60.Coating of which metal is anodic on steel according to galvanic cell

A. Co B. Mg

C. Both A and B D. None of the above

Answer: - Option B

Explanation: - In electrochemical series Mg present above the iron (Fe) metal. Due to this, coating of Mg metal is anodic on steel according to galvanic cell.

Q.61. The weight of a substance liberated/deposit by passing one faraday of electricity is equal to,

A. 96500 coulomb B. Two gram equivalent of substance

C. 96500 gm D. one gram equivalent of substance

Answer: - Option D

Explanation: - The weight of a substance liberated/deposit by passing one faraday of electricity is equal to, one gram equivalent of substance.

Q.62. Calculate E.C.E. of Cu, if atomic weight of Cu is 63.5

A. 3.3 g/c B. 0.00033 g/c

C. 0.00 D. 0.033 g/c

Answer: - Option B

Explanation: - Chemical Equivalent = 96500* Electrochemical Equivalent

Q.63. The chemical reaction in primary cell is

A. Slow B. Irreversible

C. Reversible D. Fast

Answer: - Option B

Explanation: - A primary cell is a battery (a galvanic cell) that is designed to be used once and discarded, and not recharged with electricity and reused like a secondary cell (rechargeable battery). Primary cells are those batteries in which irreversible chemical reactions are used to generate electrical energy.

Q.64. In galvanizing process NH_4Cl flux is used for avoid----------

A. Oxidation B. Reduction

C. Redox reaction D. None of the above

Answer: - Option A

Explanation: - In galvanizing process NH_4Cl flux is used for avoid oxidation of molten zinc metal.

Q.65. Name the mechanism of corrosion in given situation-A metallic structure with two dissimilar metals built in river, polluted with acidic waste from nearby industry -- A. Cathodic protection B. Sacrificial anodic method

C. H_2 evolution D. None of the above

Answer: - Option C

Explanation: - H_2 evolution mechanism takes place in presence of acidic medium.

Q.66. NaOH is strong electrolyte, as in the aqueous solution it ----------

A. Not ionizes B. Highly ionizes

C. Feebly ionizes D. None of the above

Answer: - Option B

Explanation: - NaOH is strong electrolyte, as in the aqueous solution it highly ionizes or completely ionizes.

Q.67. Electrolyte conduct electricity due to presence of

A. Atoms B. Electrons

C. Ions D. Crystals

Answer: - Option C

Explanation: - Electrolyte conduct electricity due to presence of ions.

Q.68. Solid NaCl does not undergo electrolysis due to

A. Cations B. Absence of ions

C. Presence of ions D. Anions

Answer: - Option B

Explanation: - Solid-state does not allow the movement of ions and unsuitable for electrolysis.

Q.69. The metal that form unstable oxide film is

A. Zn B. Fe

C. Ag D. Cu

Answer: - Option C

Explanation: - Unstable oxide film:- The metal oxide film immediately decomposes to metal & O2 as soon as it is formed, hence further oxidation doesn't take place. E.g. Pt, Au, Ag.

Q.70. According to faraday's second law "the weight of a substance deposited /liberated at a particular electrode is directly proportional to its

A. Chemical equivalent B. Equivalent weight

C. Both a and b D. Molecular weight

Answer: - Option C

Explanation: - The weight of a substance deposited /liberated at a particular electrode is directly proportional to its chemical equivalent or equivalent weight.

Q.71. A team of engineers on inspection of bridge observed that the part of metallic bridge under water is more corroded than one which is above the sea level, the type of corrosion takes place in this case is

A. O_2 absorption B. H_2 evolution

C. Sacrificial anodic method D. Concentration cell

Answer: - Option D

Explanation: - A concentration cell is a type of galvanic cell in which two electrodes are made up of same material and are dipped into the same electrolyte of same composition but different concentrations.

Q.72. Identify the secondary cell in the following

A. Ni-Cd cell B. Daniel cell

C. Dry cell D. None of the above

Answer: - Option A

Explanation: - Lead storage battery and nickel - cadmium storage cells are the examples of secondary cells.

Q.73. During electro refining of blister copper, anode mud obtain is consist of

A. Fe, Sn B. Au,Ag

C. Zn D. Cu

Answer: - Option B

Explanation: - During electro refining of blister copper, anode mud obtain is consist of Au, Ag

Q.74. When two dissimilar metals are electrically connected, then the more active metal becomes,

A. Anode B. Anode and cathode

C. Cathode D. None of the above

Answer: - Option A

Explanation: - When two dissimilar metals are electrically connected, then the more active metal becomes anode and undergoes oxidation.

Q.75. The electrolyte used for electroplating of iron spoon with silver is

A. $K(Ag(CN)_2)$

B. $Ag(OH)_2$

C. $AlCl_3$

D. None of above

Answer: - Option A

Explanation: - The electrolyte used for electroplating of iron spoon with silver is $K(Ag(CN)_2)$

Q.76. In Daniel cell, the reactions are----------

A. Reversible B. Fast

C. Slow D. Irreversible

Answer: - Option D

Explanation: - Daniel cell is a primary cell hence reactions are irreversible.

Q.77. Ionic compounds when dissolved in solvent like water produces

A. Anions B. Ions

C. Cations D. None

Answer: - Option B

Explanation: - Ionic compounds when dissolved in solvent like water produces ions . E.g. NaCl produces Na+ and Cl-.

Q.78. In electro refining of blister Cu, the electrolyte is

A. CuSO4 B. NaCl

C. FeCl3 D. ZnSO4

Answer: - Option A

Explanation: - In electro refining of blister Cu, the electrolyte is $CuSO_4$.

Q.79. The metal used to coat copper wire to protect it from the attack of sulphur before its insulation by rubber is

A. Al

B. Zn

C. Cu

D. Sn

Answer: - Option D

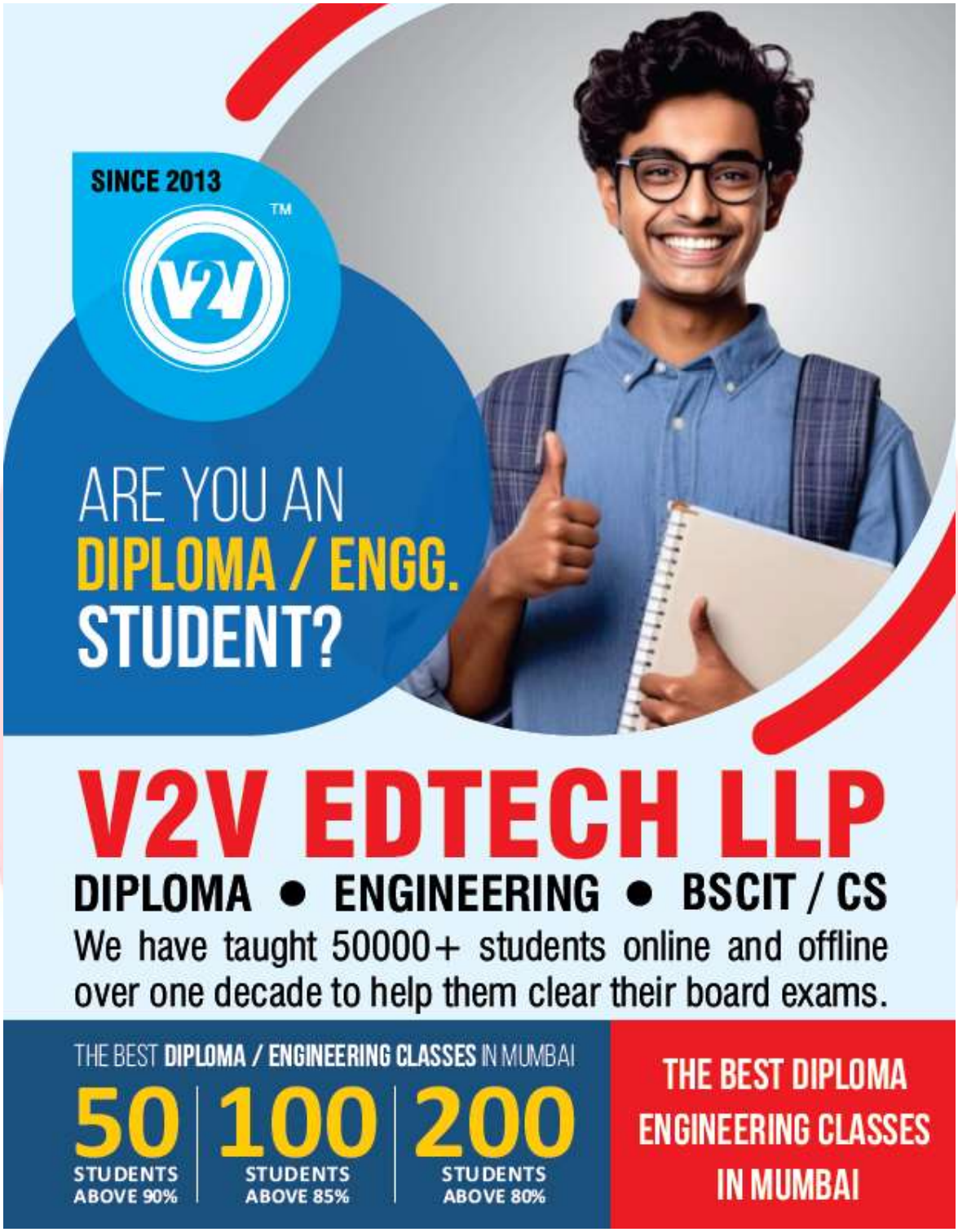
Explanation: - Sn metal used to coat copper wire to protect it from the attack of sulphur before its insulation .

Q.80. Electrochemical equivalent is defined as the weight of a substance deposited/liberated by passing ---------- electricity.

A. 35 coulomb B. 1 coulomb

C. 10 coulomb D. 96500 coulomb

Answer: - Option B



YouTube live Session Link :
https://www.youtube.com/live/Zu_JrdAyZWw?si=niSdNK59T8v5PxZf

Question Bank for Multiple Choice Questions

Program: All Programs of Diploma in Engineering	**Program Code:- EE / CO / EJ / CE / ME**
Scheme:- K	**Semester:- 1**
Course:- Basic Chemistry	**Course Code:- 311305**

06– PAINTS, VARNISHES, INSULATORS, POLYMERS, ADHESIVE AND LUBRICANTS	**Marks:-14**

Content of Chapter:-

6.1 – Paints: Purpose of applying paint, characteristics of paint, and ingredients of paints, functions and examples of each ingredient.
6.2 - Varnish: Types, difference between paints and varnishes.
6.3- Insulators: Characteristics, Classification, Properties and applications of glass wool, thermocole. 6.4 - Polymer and Monomer: Classification on the basis of molecular structure, On the basis of monomers, On the basis of thermal behavior.
6.5 - Types of polymerization reaction: Addition polymerization, Condensation polymerization, Synthesis , properties and applications of polythene, Polyvinyl chloride, Teflon, Polystyrene, Phenol formaldehyde,Epoxy resin.
6.6- Adhesives: Characteristics, Classification and their uses.
6.7- Lubricants: Classification, Properties and Application.

Q 1. An example of plasticizer used in paints is

A. Tributyl phosphate B. Triphenyl phosphate
C. Tricresyl phosphate D. All of these

Answer: - Option D

Explanation: - All impart flexibility to the resin, thus minimizing film cracking.

Q 2. Select the option which is not a constituent of paint

A. Pigment B. Plasticizer
C. Driers D. Resin

Answer: - Option D

Explanation: - Remaining all constituents possesses physical characteristics to the paint.

Q.3 An example of low thermal insulator

A. Cork B. Glass wool

C. Asbestos D. All of the above

Answer: - Option D

Explanation: - All materials are poor conductor of thermal energy.

Q 4. Phenol formaldehyde adhesive find application in manufacturing

A. Card boxes B. Furniture

C. Conveyor belts D. Laminates

Answer: - Option D

Explanation: - Phenol formaldehyde resins are synthetic polymers used to manufacture high pressure laminates and adhesives.

Q 5. A solution of resin in alcohol is example of

A. Paint B. Emulsion

C. None of these D. Spirit varnish

Answer: - Option D

Explanation: - Most resin or gum varnishes consist of a natural, plant- or insect-derived substance dissolved in a solvent, called spirit varnish or solvent varnish. The solvent may be alcohol, turpentine, or petroleum-based. Some resins are soluble in both alcohol and turpentine.

Q 6. Name the adhesive which is used in aircraft industry

A. Wax B. Starch

C. Asphalt D. Araldite

Answer: - Option D

Explanation: - It has very high shear strength even at temperatures up to 70°C and good peel strength.

Q 7. Predict the adhesive which is used in the sealing operation in food industry

A. Acrylics B. Cellulose

C. Polyesters D. Polyvinyl.

Answer: - Option D

Explanation: - It show very good adhesion to various substrates, high mechanical strength, as well as good flexibility and chemical resistance.

Q 8. Select an In-organic thermal insulator

A. Rubber B. Glass wool

C. Silk D. Wool

Answer: - Option B

Explanation: - Thermal insulation materials are classified as either organic or inorganic. Silk, wool, wood pulp, and sawdust are a few examples of organic materials. Some common inorganic insulating materials are glass wool, slag, charcoal, and coke powder.

Q.9. Identify the non-insulating material

A. Asbestos B. Thermocole

C. Copper D. Glass wool

Answer: - Option C

Explanation: - As the body of pots and pans used in the kitchen are made of metals like copper and aluminium, they will be good conductors of electricity and therefore will be categorized as "not an insulator".

Q.10. The function of pigment is

A. To improve drying quality B. To give adhesion

C. To give strength to paint film D. To suspend pigments

Answer: - Option C

Explanation: - Pigments are finely ground natural or synthetic, insoluble particles used to impart color when added to paints and coatings formulations. They are also used to impart bulk or a desired physical and chemical property to the wet or dry film.

Q.11. In oil varnish role of oil is

A. Protect the film from cracking B. Reduces brittleness of resin film

C. Both a and b D. None of the above

Answer: - Option C

Explanation: - Varnishes provide protective coatings for wooden surfaces, paintings, and various decorative objects. Varnish protects and enhances the appearance of wooden floors, interior wood paneling and trim, and furniture.

Q.12. An example of gaseous insulators

A. CCl2F2 B. CO2

C. N2 D. All of these

Answer: - Option D

Explanation: - A dielectric gas is also called as an insulating gas. It is a dielectric material in gaseous state which can prevent electrical discharge.

Q.13. Viscosity of oil is measured by using

A. Viscometer B. Cleveland open cup apparatus

C. Redwood viscometer D. Both B and C

Answer: - Option C

Explanation: - Redwood Viscometer is normally used for the determination of the viscosity of petroleum products. 'Redwood Viscometer' determines the viscosity in terms of seconds.

Q.14. An example of natural, adhesive used for stamps and envelops

A. Epoxy resin B. Starch adhesive

C. Acrylics D. Animal glue

Answer: - Option B

Explanation: -Starch adhesive is the substance applied to the back of a stamp to enable it to adhere to a letter or other mailed item.

Q.15. Select the pigment which gives white colour to the paint

A. Zinc oxide B. Titanium oxide
C. Ferrous oxide D. Both A and B

Answer: - Option D

Explanation: - It is the whitest and brightest of known pigments, with reflective qualities; it can also both scatter and absorb UV rays.

Q.16. Paint is a mechanical dispersion mixture of one or more

A. Pigments in drying oil B. Extender in drying oil
C. Plasticizer in drying oil D. Atom

Answer: -Option A

Explanation: - Drying oil, unsaturated fatty oil, either natural (such as linseed oil) or synthetic, that when spread into a thin film becomes hard, tough, and elastic upon exposure to the air.

Q.17. The main film forming constituents of paint are

A. Thinner B. Plasticizer
C. Pigment D. Vehicle

Answer: - Option D

Explanation: - Paint is a Mechanical dispersion of one or more pigment in a *vehicle*. The *vehicle* is liquid consisting of nonvolatile *film forming* material.

Q.18. Special anti-fouling paints can be applied on the surface of ship to protect it from

A. Destruction B. Breaking
C. Corrosion D. None of these

Answer: - Option C

Explanation: - Antifouling paint, applied to the underwater hull of ships, discourages or prevents the growth of organisms that attach to the hull. Its self-polishing resin and biocide, such as cuprous oxide along with a booster biocide, help to prevent bio fouling organisms.

Q.19. Name of the constituents present in paint normally not present in a varnish

A. Plasticizer B. Drying oil
C. Pigment D. Resin

Answer: - Option C

Explanation: - paint normally contains a pigment while a varnish usually contains a resin. In a paint, pigment is dispersed in a vehicle while in a varnish, a resin is dispersed in oil or thinner.

Q.20. A solution of resin in alcohol

A. Spirit varnish B. Varnish
C. None of these D. Oil varnish

Answer: - Option A

Explanation: - Most resin or gum varnishes consist of a natural, plant- or insect-derived substance dissolved in a solvent, called spirit varnish or solvent varnish. The solvent may be alcohol, turpentine, or petroleum-based. Some resins are soluble in both alcohol and turpentine.

Q.21. A volatile organic constituents of paint is

A. Pigment B. Thinner

C. Drying oil D. All of these

Answer: - Option B

Explanation: - Volatile organic constituents are solvents that get released into the air as the paint dries.

Q.22. Opacity and desired colour of paints are provided by

A. Thinner B. Pigment

C. Resin D. Extender

Answer: - Option B

Explanation: - All inorganic pigments have high refractive indices, and hence, when used to color paint give high opacity.

Q.23. In paint the role of thinner is

A. Improve drying quality B. Reducethe cos

C. Provide water proofness D. Reduce viscosity or to reduce consistency

Answer: - Option D

Explanation: - Paint thinners are solvents that can dissolve paint and reduce viscosity of paint.

Q.24. A glass is good insulator because of

A. Low electrical conductivity B. Non-combustible and fire proof C. Low thermal conductivity D. All of these

Answer: - Option D

Explanation: - a material like glass has no free electrons and in the absence of free or delocalized electrons, it is unable to conduct electricity. We can also say that all the electrons are tightly bound around the atoms in the case of glass.

Q.25. Important characteristics of adhesive

A. To form film having greater tensile strength B. Joints to parts together C. Suitable surface tension and low viscosity D. All of these

Answer: - Option D

Explanation: - Adhesives are designed for specific applications. Besides their role in the adhesion process, they can be used for other purposes, such as sealing agents, in order to eliminate the effect of self-loosening caused by dynamic loads, sealing of areas to prevent oxidation and corrosion, waterproofing, etc.

Q.26. Turpentine oil in paint is used as a

A. Extender B. Plasticizer

C. Thinner D. Pigment

Answer: - Option C

Explanation: - Turpentine is used for thinning oil-based paints, for producing varnishes and as a raw material for the chemical industry.

Q.27 Constituents which reduce viscosity of paint is

A. Thinner B. Resin
C. Pigment D. Plasticizer

Answer: - Option A

Explanation: - Paint thinners are solvents that can dissolve paint and reduce viscosity of paint.

Q.28. Red pigment is

A. Ferric oxide B. Red lead
C. Chrome red D. All of these

Answer: - Option D

Explanation: - Pigment is the actual coloring substance of paint. Pigment has body in contradistinction to purely visual color

Q.29. A constituents which increase the random arrangement of pigment in paint is

A. Plasticizer B.Thinner
C. Extender or filler D. Resin

Answer: - Option C

Explanation: - component whose purpose is to reduce the cost of the ink, by increasing the area covered by a given weight of pigment.

Q.30. In spirit varnish small amount of plasticizer is added to avoid

A. To give high hiding power B. Transparent finish
C. To avoid Cracking of paint film D. None of these

Answer: - Option C

Explanation: - Plasticizer is a substance that is added to a material to make it softer and more flexible, to increase its plasticity, to decrease its viscosity, or to decrease friction during its handling in manufacture.

Q.31. Identify the constituents which are used to fill the voids or pores in the paints

A. Driers B. Thinner
C. Extender or filler D. Plasticizer

Answer: - Option C

Explanation: - Extenders are natural or synthetic materials finely distributed into paint. Extender /filler pigments, which are essential for properties like filling, sanding, flow and durability; in general, less binder is used in undercoats.

Q.32. Chloroform is used as anesthetic 2% ethanol is added

A. To prevent formation of phosgene gas B. To prevent reduction
C. To prevent oxidation D. None of these

Answer: - Option A

Explanation: - When chloroform is exposed to atmospheric oxygen, it gets converted to phosgene gas. To prevent this, little ethanol is added to chloroform bottle. Ethanol converts this phosgene to ethyl carbonate.

Q.33. In paint toluene is used as

A. Thinner B. Solvent
C. Driers D. Extender

Answer: - Option B

Explanation: - Toluene is a colorless, flammable liquid with a sweet pungent odor. Toluene has numerous commercial and industrial applications: it is a solvent in paints, lacquers, thinners, glues, correction fluid, and nail polish remover, and is used in the printing and leather tanning processes.

Q.34. Glass wool & Thermocole are used as an insulator

A. Laptop B. Fridge and microwave oven C. Furnace D. None of these

Answer: - Option B

Explanation: - Glass wool is an insulating material made from fibres of glass arranged using a binder into a texture similar to wool.

Q.35. An example of plasticizer used in paints is

A. Tributyl phosphate B. Triphenyl phosphate
C. Tricresyl phosphate D. All of these

Answer: - Option D

Explanation: - A plasticizer is a substance that is added to a material to make it softer and more flexible, to increase its plasticity, to decrease its viscosity, or to decrease friction during its handling in manufacture.

Q.36. The alternative name of Teflon is

A. Polytetrafloro methyl B. Poly tetra fluro benzene C. Polytetra fluro ethylene D. Polytetra fluro ethylene

Answer: - Option D

Explanation: - Polytetrafluoroethylene (PTFE), a strong, tough, waxy, nonflammable synthetic resin produced by the polymerization of tetrafluoroethylene.

Q.37. The lubricant used for cutting tools is

A. Water B. Oil
C. Petrol D. None of these

Answer: - Option A

Explanation: - Cutting fluid is a fluid that is mainly used to remove the heat produced during the metal cutting and other machining processes. It is also used as a lubricant in some cases. They are also used for improving the cutting condition and also the tool life.

Q.38. Greases are not used to lubricant

A. Scissor B. Sewing machine
C. All of these D. None of these

Answer: - Option B

Explanation: - Grease is sometimes used to describe lubricating materials that are simply soft solids or high viscosity liquids, but these materials do not exhibit the shear-thinning properties characteristic of the classical grease.

Q.39. The process of polymerization in which there is no elimination of by product is

A. Addition polymerisation B. Condensation polymerisation C. Both are correct D. None

Answer: - Option A

Explanation: - In addition polymerization, monomers react to form a polymer without the formation of by products. Addition polymerizations usually are carried out in the presence of catalysts

Q.40. Important characteristics of adhesive

A. resistant to heat B. Non Resistant to heat C. Both are correct D. None

Answer: - Option B

Explanation: - Adhesive has rapid bonding at room temperature, which can be further accelerated by an increase in the temperature or the use of accelerators

Q.41. Degree of tackiness rapidly of bonding, durability is the properties

A. Polythene B. Plastic
C. Rubber D. None

Answer: - Option C

Explanation: Adhesive bonding is an efficient, economical, and durable method is a property called tackiness.

Q.42. Important characteristics of adhesive

A. resistant to heat B. Non Resistant to heat
C. Both are correct D. None

Answer: - Option B

Explanation: - A polymer having predominantly weak bonds between atoms should not be used for high temperature applications.

Q.43. In steam turbine solid lubricants are used because

A. at high pressure B. Only high temperature
C. High temperature and pressure D. None of these

Answer: - Option C

Explanation: - In steam turbine solid lubricants are used because to reduce the friction.

Q.44. Axle greases are prepared by

A. Polymer added B. Adding soda C. Adding lime or any heavy metal hydroxide to resin & fatty oils D. None

Answer: - Option C

Explanation: - Greases are prepared by saponification of fat with alkali followed by adding hot lubricating oil while under agitation.

Q.45. Free radical mechanism is involved in

A. Chain reaction B. Addition reaction
C. Condensation reaction D. None

Answer: - Option A

Explanation: - A radical substitution reaction is a reaction which occurs by a free radical mechanism and results in the substitution of one or more of the atoms or groups present in the substrate by different atoms or groups. The initiation step in a radical chain reaction is the step in which a free radical is first produced.

Q.46. Monomer of same type is starting material to make polymer under

A. Chain reaction B. Addition polymer
C. Condensation reaction D. None

Answer: - Option B

Explanation: - Monomers are small molecules which may be joined together in a repeating fashion to form more complex molecules called polymers.

Q.47. Machines operating under high temperature & load are lubricant by

A. Silicone B. Graphite, soap stone, Molybdenum disulphide C. Condensation reaction D. None

Answer: - Option B

Explanation: - Materials such as graphite and molybdenum disulfide, commonly called molysulfide, have a crystal lattice structure arranged in layers. Strong bonds between atoms within a layer and relatively weak bonds between atoms of different layers allow the lamina to slide on one another.

Q.48. The reaction given below indicates the synthesis of polymer nCH2=CHCL----------Product (in presence of benzoyl peroxide)

A. RVC B. PVC

C. WBC D. MVC

Answer: - Option B

Explanation: - Polyvinyl chloride is produced by polymerization of the vinyl chloride monomer (VCM).

Q.49. On the basis of thermal behavior polymer are classified

A. Thermoplastic & thermosetting B. Only thermoplastic

C. Only thermosetting D. None

Answer: - Option A

Explanation: - Based on the thermal behavior, polymers are classified into thermoplastic polymers and thermosetting polymers.

Q.50. By product is liberated during the manufacturing of

A. Condensation reaction B. Addition reaction

C. Both the reaction D. None of these

Answer: - Option A

Explanation: - In organic chemistry, a condensation reaction is a type of chemical reaction in which two molecules are combined to form a single molecule, usually with the loss of a small molecule such as water.

Q.51. On the basis of structure the polymer are classified as

A. Cross linked polymer B. Linear chain polymer C. Both the polymer D. None

Answer: - Option C

Explanation: - Polymers can be classified into three main types based on structure. These are linear polymers, branched chain polymers and cross- linking polymers. Linear polymers are formed of long, straight chains and branched chain polymers contain of linear chains having branches.

Q.52. Lubricants used in machines working at low temp should posses

A. Low pour point B. High pour point
C. Low temperature D. High temperature

Answer: - Option A

Explanation: - Pour point depressants are polymers that allow oil and lubricants to flow at very low wintertime temperatures without heavy wax formation at these cold temperatures and enable the oil to remain pumpable (flowable).

Q.53. Select the thermosetting synthetic adhesives from the following

A. Polythene B. Acetylene
C. Resin D. Polyurethane

Answer: - Option D

Explanation: - Thermoset adhesives are thermosetting polymers that are used to bond metallic or non metallic substrates. They are cured using heat, pressure, or a combination of both. There exist several types of thermoset adhesives, and they are typically classified based on their chemical composition or polymer system. Polyurethane remains one of the most widely used types for several applications.

Q.54. Handle of hot pans & heaters are made up of

A. Carbon B. Polymer
C. Bakelite D. None

Answer: - Option C

Explanation: - Bakelite is a good insulator used in non-conducting parts of radio and electric devices like switches, automobile distribution caps, insulation of wires, Sockets, etc.

Q.55. The necessity of lubricants is

A. High viscosity B. Low viscosity
C. High & low viscosity D. None

Answer: - Option A

Explanation: - The thickness of the oil, is important because it determines the lubricant's film strength and efficiency in preventing friction between moving parts.

Q.56. The insulating material which is used in air filter as a dust filtering

A. Fibrous insulating material B. Non fibrous material C. Both of these D. None of these

Answer: - Option A

Explanation: - Fibrous materials capture the air within the fibres: this prevents heat transmission by convection and limits gaseous heat conduction by minimizing collisions between gas molecules.

Q.57. The selection of suitable lubricant for a specific purpose is made on the basis of A. Low emulsification value B. Low acidity, low viscosity, low emulsification value C. Low viscosity D. None of these

Answer: - Option B

Explanation: - Low acidity, low viscosity, low emulsification value are most important properties of lubricants which are of prime importance in lubrication. In order to get efficient lubrication, there should be no change in these properties during lubrication

Q.58. Epoxy resins are obtained from

A. Phenol+Phenol B. Acetone + Phenol C. Bisphenol +epichlorohydrin D. Benzene +Phenol

Answer: - Option C

Explanation: - Most common epoxy resins are produced from a reaction between epichlorohydrin (ECH) and bisphenol-A (BPA).

Q.59. The monomer tetra-fluro ethylene can be used for the preparation

A. Polystyrene B. Teflon
C. PVC D. Polythene

Answer: - Option B

Explanation: - Teflon is not a product on its own, but a brand name of a product. It refers to a chemical coating known as polytetrafluoroethylene (PTFE). It's a type of plastic sprayed on various items and then baked to create a nonstick, waterproof, noncorrosive, and nonreactive surface.

Q.60. On the basis of types of monomer the polymer are classified as

A. Homopolymer B. Homopolymer & Copolymer C. Copolymer D. None

Answer: - Option B

Explanation: - If a polymer consists of only one kind of monomer then it is called a homopolymer, while a polymer which consists of more than one kind of monomers is called a copolymer.

All The Best
From team V2V