1. A galvanometer coil has a resistance 25 Ω. The full–scale deflection current is 500 μA. The galvanometer has to be used as an ammeter with full–scale deflection 20.5 mA. The value of resistance to be connected in parallel is

    (A) 0.625 Ω

    (B) 0.5 Ω

    (C) 6.25 Ω

    (D) 5 Ω

2. The position of a moving particle at any time t is given by ($x = 3t^3$, y = $4t^3$). The speed of the particle at that instant is

    (A) 25 t^2

    (B) 14 t^2

    (C) 28 t

    (D) 15 t^2

3. In a hydrogen atom an electron jumps from the fourth orbit to the second orbit. Assume Rydberg's constant R = 10^7 m^{-1}, the frequency of emitted radiation is

    (A) 9 t

    (B) 14 t^2

    (C) 28 t

    (D) 15 t^2

4. A particle in a circular path covers equal distance in equal intervals of time. The quantity associated with the motion of the particle which remains constant with time is

    (A) speed

    (B) velocity

    (C) torque

    (D) linear momentum

5. In an adiabatic process, the pressure of a gas varies with temperature as $p \propto T^3$. The ratio C_p/C_v of the gas is then

    (A) 3/2

    (B) 2/3

    (C) 4/3

    (D) 5/3

6. A mass M at rest explodes into two pieces of mass m and (M – m) respectively which are then separated by a distance d. The gravitational force between the two parts will be a maximum when the ratio of mass of the two parts is

    (A) 1 : 1

    (B) 1 : 2

    (C) 1 : 3

    (D) 1 : 4

7. Two bodies of equal mass are attached separately at the bottom ends of two vertical springs having spring constants k_1 and k_2 respectively. The bodies are set into vertical oscillations. If the maximum velocities are equal, the ratio of amplitudes is

    (A) $\dfrac{k_1}{k_2}$

    (B) $\sqrt{\dfrac{k_2}{k_1}}$

    (C) $\dfrac{k_1^2}{k_2^2}$

    (D) $\dfrac{k_2}{k_1}$

8. A beaker of height 21 cm is filled with water upto a certain height h. When viewed from the top, the beaker appears to be half–filled. If $\mu = 4/3$ for water, then

(A) h = 14 cm

(B) h = 28/3 cm

(C) h = 63/4 cm

(D) h = 10.2 cm

9. An alternating voltage (in volts) $E = 200\sqrt{2}\ sin100t$ is connected to one $1\mu F$ capacitor through an AC ammeter. The ammeter reading will be

(A) 22 mA

(B) 42 mA

(C) 34 mA

(D) 84 mA

10. A solid metallic cylinder rolls down an inclined plane (of height h) without slipping. When it reaches the bottom of the inclined plane, the speed of the centre of mass of the cylinder becomes

(A) $\sqrt{\dfrac{4}{3}gh}$

(B) $\sqrt{\dfrac{4g}{h}}$

(C) $\sqrt{\dfrac{2}{5}gh}$

(D) $\sqrt{2gh}$

11. The dimensional formula for magnetic flux is

   (A) $[ML^2T^{-2}A^{-1}]$

   (B) $[MLT^{-2}A^{-1}]$

   (C) $[ML^{-1}T^{-2}A^{-1}]$

   (D) $[ML^1T^{-1}A^{-2}]$

12. When a proton is accelerated through 1 Volt, then its kinetic energy will be

   (A) 13.6 eV

   (B) 1 eV

   (C) 0.54 eV

   (D) 1840 eV

13. A charged particle of mass m and charge q is released from rest in an electric field of constant magnitude E. The kinetic energy attained by the particle after a time t is

   (A) $\dfrac{2E^2t^2}{mq}$

   (B) $\dfrac{Eq^2m}{2t^2}$

   (C) $\dfrac{E^2q^2t^2}{2m}$

   (D) $\dfrac{Eqm}{2t}$

14. Two inductance coils are placed close to each other. The mutual inductance of the pair of coils depends on

   (A) the currents flowing in the two coils

   (B) distance and orientation of the two coils

   (C) rates at which currents are changing in two coils

   (D) materials of the two coils

15. In some space there are N number of gas molecules per unit volume. The temperature of the gas is T. The pressure of the gas will be

(A) $\dfrac{NT}{R}$

(B) $\dfrac{NT}{k}$

(C) NKT

(D) NRT

16. An ideal heat engine absorbs 650 J of heat from the source. The temperature of the source and sink are respectively 450 °K and 225 °K. Then the amount of heat released at the sink is

(A) 325 J

(B) 450 J

(C) 350 J

(D) 225 J

17. A proton is projected into a magnetic field in such a way that the velocity of projection of the proton is along the direction of the magnetic field. Then the proton will undergo

(A) retardation

(B) acceleration

(C) deflection

(D) no change in velocity

18. A planet revolves around the Sun of mass M in an elliptical orbit of semi–major axis of a. When the planet is at a distance of r, the speed of the planet is

   (A) $\sqrt{[GM(1/r - 1/a)]}$

   (B) $\sqrt{[GM(1/r - 2/a)]}$

   (C) $\sqrt{[GM(2/r - 1/a)]}$

   (D) $\sqrt{[GM(1/r - 1/2a)]}$

19. The wavelength of 1 keV photon is 1.24×10^{-9} m. The frequency of 1 MeV photon is

   (A) 1.24×10^{15} Hz

   (B) 1.24×10^{20} Hz

   (C) 2.4×10^{15} Hz

   (D) 2.4×10^{20} Hz

20. The current gain of a common base transistor circuit is 0.98. If the emitter current changes by 5 mA, the change in the collector current is

   (A) 4.9 mA

   (B) 5.1 mA

   (C) 0.196 mA

   (D) 2.45 mA

21. A travelling wave of frequency 500 Hz is moving along x–direction with a velocity of 300 m/s. The phase difference between two points x_1 and x_2 is 60°. Then the minimum separation between the points x_1 and x_2 is

   (A) 10 cm

   (B) 1 cm

   (C) 1 m

   (D) 1 mm

22. Two vectors P and Q are such that P.Q= P×Q, then the angle between P and Q is
    (A) 135°
    (B) 90°
    (C) 60°
    (D) 45°

23. A string of length 15 cm is fixed at the two ends and set into transverse vibration with four nodes. The velocity of the transverse waves in the string is 2m/s. The frequency at which the string vibrates is
    (A) 20 Hz
    (B) 22 Hz
    (C) 15 Hz
    (D) 30 Hz

24. In a double–slit diffraction experiment using a monochromatic light of wavelength 5400 Å the fringe width is measured to be 3 mm on a screen placed at a certain distance from the slits. If the monochromatic light source is replaced by another monochromatic source of wavelength 6300 Å, the fringe width becomes 3.5 mm. Then slit separation is
    (A) 7/6 mm
    (B) 3.1 mm
    (C) 1.37 mm
    (D) 0.18 mm

25. Two plane mirrors are inclined to each other at an angle of 60°. The number of images formed is
    (A) 3
    (B) 6
    (C) 4
    (D) 2

26. In which of the following phenomena, the heat waves travel along a straight line with the speed of light ?

(A) Thermal conduction

(B) Forced convection

(C) Natural convection

(D) Thermal radiation

27. A body falls from rest. In the last second of its fall, the body covers half of its total distance. If g in that place is 9.8 m/s^2, then the total time of its fall is

(A) $2\sqrt{2}-1$ sec

(B) $2 - \sqrt{2}$ sec

(C) $2 + \sqrt{2}$ sec

(D) $2\sqrt{2} +1$ sec

28. If the bandgap between valence band and conduction band in a material is 5.0 eV, then the material is

(A) semiconductor

(B) good conductor

(C) superconductor

(D) insulator

29. The electron energy levels in an atom are discrete. This was first demonstrated by the

(A) Frank & Hertz experiment

(B) Rutherford's α–particle scattering experiment

(C) Milikan's oil–drop experiment

(D) Thompson's experiment

30. An electromagnetic wave is propagating in the x–y plane along a direction that makes an angle θ with x axis. Which one of the following represents the electric field of the wave ?

(A) $E = E_0 \cos(\omega t - kx \sin\theta - ky \cos\theta)$

(B) $E = E_0 \cos(\omega t + kx \cos\theta + ky \sin\theta)$

(C) $E = E_0 \cos(\omega t + kx \sin\theta + ky \cos\theta)$

(D) $E = E_0 \cos(\omega t - kx \cos\theta - ky \sin\theta)$

31. In hydrogen atom spectra, the wavenumber of a spectral line of Brakett series is $9R/400$, where R is Rydberg's constant. From which state the transition is taking place ?

(A) $n = 5$

(B) $n = 4$

(C) $n = 7$

(D) $n = 6$

32. The rate of decay of a radioactive sample is 5000 disintegrations/minute. After 5 minutes time, the rate of decay becomes 1250 disintegrations/minute. The decay constant of the sample is

(A) $0.4 \ln 2$

(B) $0.2 \ln 3$

(C) $0.3 \ln 2$

(D) $0.5 \ln 2$

33. A car is moving towards a wall with a velocity of 50 m/s and blowing a horn of frequency 1.2 kHz. The speed of sound in air is 350 m/s. The frequency of the horn after reflection by the wall as heard by the driver of the car is

(A) 1.2 kHz

(B) 1.6 kHz

(C) 2.4 kHz

(D) 0.9 kHz

34. A hollow cylinder of radius 40 cm and mass 3 kg is kept suspended such that it can rotate about its axis. A rope is wound round the cylinder and pulled with a force of 30 N. Then the angular acceleration of the cylinder will be

(A) 12 rad/s^2

(B) 15 rad/s^2

(C) 20 rad/s^2

(D) 25 rad/s^2

35. X–rays do not exhibit

(A) diffraction

(B) polarization

(C) transverse wave nature

(D) longitudinal wave nature

36. In a place, the horizontal component of earth's magnetic field is 0.5 oersted. The angle of dip at that place is 30°. The earth's total magnetic field in that place is

(A) $\sqrt{3}$ oersted

(B) $\dfrac{1}{\sqrt{3}}$ oersted

(C) $\dfrac{\sqrt{3}}{2}$ oersted

(D) 1 oersted

37. A 100 μF capacitor is used to operate a flash lamp. The capacitor has to be charged such that its energy becomes 50 J. The voltage required to charge the capacitor is

(A) 2000 V

(B) 1500 V

(C) 1000 V

(D) 500 V

38. A force of $5\sqrt{3}$ N acts on a particle and the particle is displaced through a distance of 6 m along a straight line. If the work done by the force is 45 J, then the angle between the direction of force and displacement is

(A) 15°

(B) 30°

(C) 22.5°

(D) 45°

39. A gas undergoes a thermodynamic process but the volume of the gas does not change. The process is

(A) isobaric

(B) isochoric

(C) isothermic

(D) adiabatic

40. A solid sphere rolls down an inclined plane. The plane makes an angle of 30° with the horizontal. At the end of the plane the sphere has a linear acceleration

(A) 2g/3

(B) 5g/7

(C) 5g/14

(D) g/3

41. In Faraday's law of electromagnetic induction which one of the following is true ?

(A) Conservation of energy

(B) Conservation of magnetic flux

(C) Conservation of charge

(D) Newton's law of 'action–reaction'

42. A body floats in water with 10% of its volume outside water. When the same body floats in an oil, 30% of its volume remains outside oil. The relative density of oil is

(A) 1.5

(B) 2.0

(C) 3.0

(D) 0.33

43. The energy of the electron in the first Bohr orbit of hydrogen atom is –13.6 eV. The energy of the electron in fourth Bohr orbit is

(A) – 1.51eV

(B) – 3.40 eV

(C) – 0.85 eV

(D) – 4.53 eV

44. A particle is executing SHM with amplitude A. At a displacement $A/\sqrt{2}$ of the particle what is true about the particles energy ?

(A) KE = PE

(B) KE = 2 PE

(C) PE = 2 KE

(D) PE = $\sqrt{2}$ KE

45. In a container, a cubic shaped wooden block is floating in a liquid such that half of its volume is inside the liquid. If the container now moves vertically upwards with an acceleration a = g/3 m/s², the percentage of volume inside the liquid becomes

(A) 67 %

(B) 87%

(C) 60%

(D) 50%

46. Two isotopes P and Q have the mass numbers 14 and 16 respectively. Atom P has 7 electrons. The number of neutrons in the nucleus of Atom Q will be

(A) 16

(B) 9

(C) 2

(D) 7

47. In the circuit shown below, the value of the current flowing through it will be
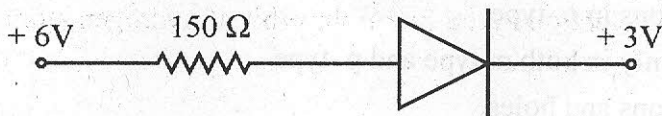
(A) zero

(B) 0.02 Amp

(C) 1.0 Amp

(D) 0.35 Amp

48. A quantity is measured in the unit of $W \cdot K^{-1}$, where W is in Watt and K in °C. The quantity is

(A) thermal conductance

(B) thermal conductivity

(C) coefficient of thermal linear expansion

(D) electrical conductivity

49. A particle executes a uniform circular motion with an angular momentum L. If the frequency of revolution is doubled and its kinetic energy is halved, then the angular momentum becomes

(A) 0.25 L

(B) 0.5 L

(C) 4 L

(D) 2 L

50. The surface energy of a small drop of a liquid is E. 1000 such small drops combine to form a big drop whose surface energy is E_1. Then the ratio $E : E_1$ is

(A) $1 : 100$

(B) $1 : 10$

(C) $1 : 1000$

(D) $10 : 1$

51. A semiconductor conducts electricity. The conduction is due to flow of

(A) only electrons in n–type

(B) electrons only in both n–type and p–type

(C) both electrons and holes

(D) holes in p–type

52. Shown below an AC circuit where R is the resistance and X is an unknown circuit element. When an AC voltage is applied across A and C, it is found that $V_{AB} = V_{AC}$. Then X is a
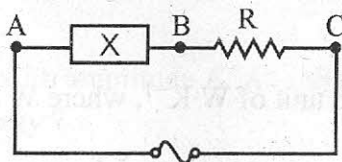

(A) pure capacitance

(B) pure inductance

(C) pure resistance

(D) a series inductance–capacitance at resonance

53. A force of 5N imparts an acceleration of 8 m/s^2 to a mass m_1. The same force 5N imparts an acceleration of 24m/s^2 to a mass m_2. When both the masses are tied together, the acceleration caused by the force 5N is

(A) 6 m/s^2

(B) 16 m/s^2

(C) 32/5 m/s^2

(D) 12 m/s^2

54. A bridge circuit consists of four resistances as shown in the figure. A current 2A flows through the bridge as shown. The voltage difference between the points B and D is
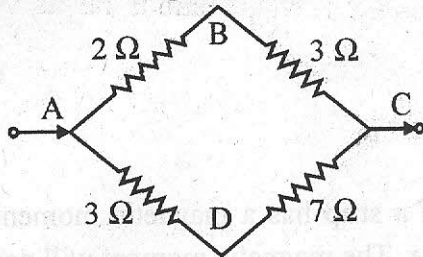
(A) 10/3 V
(B) – 2/3 V
(C) – 8/3 V
(D) 20/3 V

55. A metal wire has a cross–section of 4 mm². When a mass m is attached at the bottom end of the wire, the wire is stretched by 0.1 mm. When this mass m is attached to the bottom end of another wire of same material having a cross–section of 8 mm², the wire is then stretched by

(A) 0.5 mm
(B) 1.0 mm
(C) 0.05 mm
(D) 0.06 mm

56. In the circuit all inductances are of value 1.0 H. The equivalent inductance between A and B is
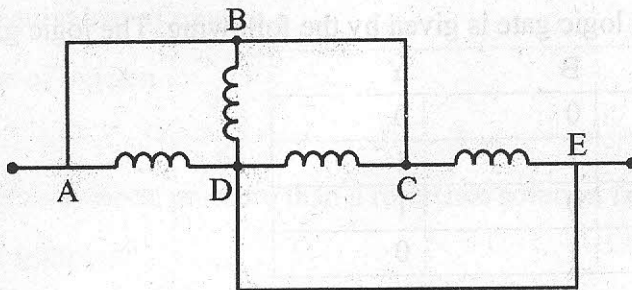
(A) 0.8 H
(B) 16 H
(C) 4 H
(D) 1.0 H

57. In front of convex mirror of focal length 20 cm, an object is placed at a distance of 10 cm. The distance of the image from the mirror is

(A) 10/3 cm

(B) 20/3 cm

(C) 40/3 cm

(D) 10 cm

58. A magnet in the form of a strip has a magnetic moment M. The strip is bent to form a semicircular arc of radius r. The magnetic moment will now be

(A) M

(B) M/π

(C) $2M/\pi$

(D) $4M/\pi$

59. A travelling wave $y = A_0 sin(\omega t - kx)$ propagates towards a rigid wall and gets reflected. The reflected wave contains 64% amplitude of the incident wave. The equation of the reflected wave is

(A) $y = 0.64 A_0 sin(\omega t - kx)$

(B) $y = 0.64 A_0 sin(\omega t + kx)$

(C) $y = 0.8 A_0 sin(\omega t + kx)$

(D) $y = A_0 sin(\omega t - 0.64kx)$

60. The truth table of a logic gate is given by the following. The logic gate corresponds to

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

(A) AND

(B) XOR

(C) OR

(D) NAND

61. In dilute aqueous solutions, if the H_3O^+ ion activity is 10^{-4}, the reaction of the solution is

   (A) acidic

   (B) basic

   (C) neutral

   (D) amphoteric

62. That the equivalent ionic conductance at infinite dilution, of an electrolyte is $\lambda_0 = \lambda_0^+ + \lambda_0^-$ was stated by

   (A) Kohlrausch

   (B) Hittorf

   (C) Ostwald

   (D) Arrhenius

63. In the electrolysis of water, 1 Faraday of electrical energy evolves

   (A) one mole of oxygen

   (B) one atom of oxygen

   (C) one gram equivalent of oxygen

   (D) one volume of oxygen

64. A solution of higher osmotic pressure than a reference solution is known as

   (A) hypertonic solution

   (B) isotonic solution

   (C) isosmotic solution

   (D) hypotonic solution

65. A proton donor in the Lowry-Bronsted Theory is called

    (A) base

    (B) acid

    (C) salt

    (D) ion producer

66. The relative lowering of vapour pressure of a solution is equal to the mole fraction of the solute in solution. This is known as

    (A) Dulong and Petit's law

    (B) Law of osmotic pressure

    (C) Raoult's law

    (D) Dalton's law

67. Which of the following species is not a pseudo halide ion ?

    (A) CNO^-

    (B) $RCOO^-$

    (C) OCN^-

    (D) NNN^-

68. A buffer contains equal concentration of a weak base B and its conjugate acid BH^+. If the values of K_b for B is 1.0×10^{-9} M, the pH of the buffer is

    (A) 1

    (B) 7

    (C) 13

    (D) 5

69. Which of the following ores is an oxide ?
   (A) Malachite
   (B) Haematite
   (C) Zinc–blende
   (D) Copper–glance

70. The relationship between the solubility in water (S) and K_{sp} for the ionic solid $Fe(OH)_3$ is
   (A) $27 S^4$
   (B) $3 S^4$
   (C) $9 S^4$
   (D) $3 S^2$

71. The projectile used to bombard $^{17}N_7$ to get $^{17}O_8$ and a proton is
   (A) α–particle
   (B) neutron
   (C) proton
   (D) deuteron

72. Milk is an example of
   (A) sol
   (B) gel
   (C) emulsion
   (D) suspension

73. A radioactive element X emits 3α, 1β and 1γ particles and forms $_{76}Y^{225}$, the element X is
   (A) $_{81}X^{237}$
   (B) $_{80}X^{237}$
   (C) $_{81}X^{236}$
   (D) $_{80}X^{236}$

74. The unit of molality is
    (A) $mol\ dm^3$
    (B) $mol\ L^{-1}$
    (C) $mol\ kg^{-1}$
    (D) $mol \times 10^3\ m^{-3}$

75. In exothermic reaction,
    (A) $H_R = H_P$
    (B) $H_R > H_P$
    (C) $H_R < H_P$
    (D) $H_R \sim H_P$

76. In which of the following cases, does the reaction go farthest to completion ?
    (A) $K = 10^2$
    (B) $K = 10^{-2}$
    (C) $K = 10$
    (D) $K = 1$

77. The specific rate constant of a first order reaction, depends on the
    (A) concentration of the reactant
    (B) concentration of the product
    (C) time
    (D) temperature

78. At the freezing point of a solvent,
    (A) the solid and the liquid are at equilibrium
    (B) the solid and the liquid are not at equilibrium
    (C) the solid and liquid have unequal vapour pressure
    (D) the solid that separates out is never pure

79. In electrolytic refining
    (A) the cathode is impure metal and the anode is pure metal
    (B) the anode is impure metal and the cathode is pure metal
    (C) both anode and cathode are impure metals
    (D) both anode and cathode are pure metals

80. The standard potentials at 25°C for the following half cell reactions are given against them

    $Zn^{2+} + 2e^- \rightarrow Zn$, $E^0 = -0.762$ V

    $Mg^{2+} + 2e^- \rightarrow Mg$, $E^0 = -2.37$ V

    When Zn–dust is added to a solution of $MgCl_2$,

    (A) no reaction will take place
    (B) $ZnCl_2$ is formed
    (C) Zn dissolves in solution
    (D) Mg is precipitated

81. The correct nomenclature for $K_3[Fe(CN)_6]$ is ,

    (A) potassium hexacyanoferrate(II)
    (B) potassium hexacyanoferrate(III)
    (C) tripotassium iron(III) hexacyanide
    (D) hexacyanoferrate (III) potassium

82. Mohr's salt is
    (A) normal salt
    (B) acid salt
    (C) basic salt
    (D) double salt

83. The oxidation state of iron in $[Fe(H_2O)_5NO^+]SO_4$ is
   - (A) 0
   - (B) 1
   - (C) 2
   - (D) 3

84. The hydride of nitrogen which is acidic is
   - (A) NH_3
   - (B) N_2H_4
   - (C) N_2H_2
   - (D) N_3H

85. Amongst the trihalides of nitrogen, which one is the least basic ?
   - (A) NF_3
   - (B) NCl_3
   - (C) NBr_3
   - (D) NI_3

86. Duralumin is an alloy of
   - (A) Al, Mg and Ni
   - (B) Al and Mg
   - (C) Al, Mg, Mn and Cu
   - (D) Al and Ni

87. Which one of the following is not a periodic property ?
   - (A) Atomic mass
   - (B) Covalent radii
   - (C) Atomic volume
   - (D) Electronegativity

88. The compound that shows highest ionization in water is

(A) $CH_2(Cl)CH_2CH_2COOH$

(B) $CH_3CH(Cl)CH_2COOH$

(C) $CH_3CH_2CH(Cl)COOH$

(D) $CH_3CH_2CCl_2COOH$

89. Propyne on ozonolysis forms

(A) ethanoic acid

(B) methanoic acid

(C) both (A) and (B)

(D) none of the above

90. Which acid reduces ammoniacal $AgNO_3$ solution ?

(A) Formic acid

(B) Acetic acid

(C) Oxalic acid

(D) Lactic acid

91. Aniline reacts with excess of Br_2 to give

(A) 2-bromo aniline

(B) 4-bromo aniline

(C) 2, 4-dibromo aniline

(D) 2, 4, 6-tribromo aniline

92. Which of the following compounds on warming with I_2 and aqueous NaOH forms a yellow precipitate ?

(A) $C_2H_5OC_2H_5$

(B) $CH_3OCH_2CH_2CH_3$

(C) $CH_3CH_2CH_2CH_2OH$

(D) $CH_3CH_2CH(OH)CH_3$

93. An alkyl halide may be converted into alcohol by

(A) addition

(B) elimination

(C) substitution

(D) hydrogenation

94. IUPAC name of the compound $CH_3CH_2OCH(CH_3)_2$ is

(A) ethylpropyl oxide

(B) ethoxypropane

(C) 2-ethoxypropane

(D) 2-propoxyethane

95. Which of the following reducing agents reduce $=CO$ group to $=CH_2$?

(A) Na-amalgam and ethanol

(B) Zn–amalgam and HCl

(C) LiAlH$_4$

(D) NaOH and Zn

96. Cannizzaro reaction is not given by
    (A) trimethyl acetaldehyde
    (B) acetaldehyde
    (C) benzaldehyde
    (D) formaldehyde

97. A nucleophile must necessarily have
    (A) an overall positive charge
    (B) an overall negative charge
    (C) an unpaired electron
    (D) a lone pair of electrons

98. Optical isomerism is shown by
    (A) butanol-1
    (B) butanol-2
    (C) butene-1
    (D) butane-2

99. The total number of isomers for the compound of formula $C_4H_{10}O$ are
    (A) 7
    (B) 6
    (C) 3
    (D) 4

100. The number of monosaccharide units that can be formed by hydrolysis of sucrose will be
    (A) 1
    (B) 2
    (C) 3
    (D) none, since no hydrolysis is possible

101. The type of linkage present in polysaccharides is

(A) amide

(B) glycosidic

(C) ether

(D) ester

102. The simplest of the amino acids is

(A) leucine

(B) alanine

(C) glycine

(D) valine

103. The first antibiotic discovered was

(A) streptomycin

(B) penicillin

(C) tetracycline

(D) chloramphenicol

104. Neoprene is a polymer of

(A) isoprene

(B) chloroprene

(C) propene

(D) isobutene

105. Hemoglobin, the red colouring matter of blood contains

(A) potassium

(B) magnesium

(C) iron

(D) calcium

106. Which of the following is an iso-electronic pair ?
   (A) H^- , He^+
   (B) Na , Mg^{+2}
   (C) Cl^- , Ne
   (D) Li , Be^+

107. An atom with 8 electrons in its outer shell has a tendency
   (A) to gain electrons
   (B) to lose electrons
   (C) neither to lose nor gain electrons
   (D) more than one of these

108. The molecular formula of aluminium nitride is
   (A) AlN_3
   (B) Al_2N
   (C) Al_3N_2
   (D) AlN

109. An element is a substance
   (A) containing only one kind of atom
   (B) containing two or more kinds of atoms
   (C) with constant boiling point
   (D) with a definite melting point

110. The electron occupies the available orbital singly before pairing in any one orbital occurs. This is called
   (A) Pauli's exclusion principle
   (B) Hund's rule
   (C) Heisenberg's principle
   (D) Prout's hypothesis

111. All the species below except one are iso–electronic. This one is
   (A) CO
   (B) O_2
   (C) CN^-
   (D) NO^+

112. Which of the following contains multiple covalent bonds ?
   (A) Br_2
   (B) H_2
   (C) N_2
   (D) Cl_2

113. In a rock salt type crystal structure, the co–ordination number of each ion is
   (A) 2
   (B) 4
   (C) 6
   (D) 8

114. The % of free space in a body centered cubic crystal structure is
   (A) 74
   (B) 68
   (C) 37
   (D) 25

115. The bonds between carbon atom(1) and carbon atom(2) in compound $N\equiv C^1-C^2H=CH_2$ is
   (A) sp^2 and sp^2
   (B) sp^3 and sp
   (C) sp and sp^2
   (D) sp and sp

116. The pair of compounds which can form a stable co-ordinate bond is

   (A) H_2O and $NaCl$

   (B) HCl and HBr

   (C) BF_3 and BCl_3

   (D) BF_3 and NH_3

117. If the electronegativities of two elements are low, the bond between the two is likely to be

   (A) ionic

   (B) covalent

   (C) co-ordinate

   (D) metallic

118. Which species listed below cannot have a stable existence according to the M.O. Theory ?

   (A) H_2^+

   (B) He_2

   (C) H_2

   (D) H_2^-

119. If a molecule X_2 has a triple bond, then X will have the electronic configuration

   (A) $1s^2\, 2s^1$

   (B) $1s^2\, 2s^2\, 2p^1$

   (C) $1s^2\, 2s^2\, 2p^5$

   (D) $1s^2\, 2s^2\, 2p^3$

120. Which of the following bonds is most ionic ?

   (A) Cs–Cl

   (B) Al–Cl

   (C) C–Cl

   (D) H–Cl