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150307 A

Question Booklet Series: **A**

CET – 2015
PAPER – A [Physics & Chemistry]
QUESTION BOOKLET

INSTRUCTIONS

Question Booklet Number: **111206**

Maximum Time Allowed : Two Hours (120 minutes)
Negative Marking : 0.25

No. of Questions: 120
Maximum Marks: 120

Roll Number: | | | | | | | | |

Answer Sheet Number: | | | | | | |

Please read the following Instructions carefully:

1) **Check the Booklet thoroughly**: In case of any defect – Misprint, Missing question(s), Missing page, Blank page, Damaged or Defaced page, or duplication of question(s) / Page(s), get the Booklet changed with the Booklet of the same series from the Room Invigilator. No complaint shall be entertained after the Entrance Test is over.

2) Write your Roll Number and the OMR Answer Sheet Number on the Question Booklet.

3) Check your Roll Number, Question Booklet Number and Question Booklet Series carefully before entering them on the OMR Sheet. Ensure twice that you have made their entries on the OMR Answer Sheet correctly and darken the relevant bubbles on the Answer Sheet and sign at the appropriate place. Your OMR Answer Sheet will be evaluated on the basis of the information given by you in its ovals.

4) If you have made any wrong entry of Roll Number, Booklet Number or Booklet Series Number in the OMR Answer Sheet, you should report it to the Invigilator / Superintendent or report it within three days after the conclusion of the Entrance Test to the BOPEE office, Jammu / Srinagar positively, failing which no complaint / representation will be entertained and the OMR Answer Sheet will be evaluated strictly according to the entries made by you.

5) Strictly follow the instructions given by the Centre Supervisor / Room Invigilator and those given on the Question Booklet.

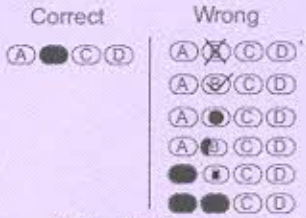
6) Candidates are not allowed to carry any papers, notes, books, calculators, cellular phones, scanning devices, pagers etc. to the Examination Hall. Any candidate found using, or in possession of, such unauthorized material or indulging in copying or impersonation or adopting unfair means / reporting late / without Admit Card will be debarred from the Entrance Test.

7) Please mark the right responses on the OMR Sheet with ONLY a Blue/Black ball point pen. Use of eraser, whitener (fluid) and cutting on the OMR Answer Sheet is NOT allowed.

8) The test is of objective type containing multiple choice questions (MCQs). Each objective question is followed by four responses. You are required to choose the correct/best response and mark your response on the OMR Answer Sheet and NOT on the Question Booklet.

9) There will be 0.25 negative marking for every wrong answer.

10) For marking response to a question, completely darken the CIRCLE so that the alphabet inside the CIRCLE is not visible. Ensure that you darken only one circle in the Answer Sheet. Even a stray mark / faint mark on the Answer Sheet is read by the scanner and will make your answer invalid by reading it as a case of double shading. You have to be very very careful while darkening the bubbles. The CORRECT and the WRONG methods of darkening the CIRCLE on the OMR Answer Sheet are shown below.



11) Please be careful while marking the response to questions. The response once marked cannot be changed and if done shall be treated as a wrong answer.

12) In view of the limited time, do NOT waste your time on a question which you find difficult. Attempt easier questions first and come back to the difficult questions later during the test.

13) DO NOT fold or wrinkle the OMR Answer Sheet.

14) Rough work MUST NOT be done on the OMR Answer Sheet. Use rough page of your Question Booklet for this purpose.

15) Candidates are provided carbonless OMR Answer Sheet having original copy and candidate's copy. After completing the examination, candidates are directed to fold at perforation on the top of the Sheet, tear it to separate original copy and candidate's copy and then hand over the original copy of OMR Answer Sheet to the Room Invigilator and retain candidate's copy.

DO NOT OPEN THE SEAL OF THIS BOOKLET UNTIL TOLD TO DO SO

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Section 1 - Physics

1. The dimension of magnetic flux is:
   (A) $MLT^{-1}A^{-1}$
   (B) $ML^{-1}TA^{-2}$
   (C) $ML^{-2}T^{2}A^{-2}$
   (D) $ML^{2}T^{-2}A^{-1}$

2. The carbon resistor has the color band sequence of green, orange, blue and silver. The value of resistance will be :
   (A) $64x10^{7} \pm 20\%\ \Omega$
   (B) $53x10^{6} \pm 20\%\ \Omega$
   (C) $64x10^{7} \pm 10\%\ \Omega$
   (D) $53x10^{6} \pm 10\%\ \Omega$

3. Newton's law of cooling applies when a body is losing heat to its surroundings by
   (A) conduction
   (B) convection
   (C) radiation
   (D) conduction as well as radiation

4. Consider an electric dipole placed in a region of non-uniform electric field. Choose the correct statement out of the following options:
   (A) The dipole will experience only a force
   (B) The dipole will experience only a torque
   (C) The dipole will experience both force and the torque
   (D) The dipole will neither experience a force nor a torque

5. A block of mass 3 kg starts from rest and slides down a curved path in the shape of a quarter-circle of radius 2 m and reaches the bottom of path with a 4 m/s speed. If '*g*' is 10 m/s^2, the amount of work done against friction is
   (A) 60 J
   (B) 36 J
   (C) 24 J
   (D) 12 J

6. In an *n-p-n* transistor, '*p*' is
   (A) intrinsic semiconductor
   (B) emitter
   (C) collector
   (D) base

7. A magnet makes a single pass through a coil. Then across the ends of the coil it produces
   (A) d.c. voltage
   (B) sinusoidal voltage
   (C) single voltage pulse
   (D) two voltage pulses

8. Conductivity of semiconductors
   (A) is maximum at 0 K
   (B) decreases with increase in temperature
   (C) increases with increase in temperature
   (D) is maximum at 300K

9. Values for Brewster's angle can be
   (A) only less than 45°
   (B) only greater than 45°
   (C) any value in the range 0° to 90° except 45°
   (D) any value in the range 0° to 90° including 45°

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10. Consider a region of uniform magnetic field directed along positive x-axis. Now a positive test charge Q, located at origin O (0, 0) inside the field, is released from rest position. The particle will

(A) remain stationary at origin O

(B) move along positive x-axis

(C) move along negative x-axis

(D) undergo a circular motion in the x-y plane

11. Radius of Earth is 6400 km and that of Mars is 3200 km. Mass of Mars is 0.1 that of Earth's mass. Then the acceleration due to gravity on Mars is nearly

(A) 1 m/s^2

(B) 2.5 m/s^2

(C) 4 m/s^2

(D) 5 m/s^2

12. The ratio of mass defect of the nucleus to its mass number is maximum for

(A) U^{238}

(B) N^{14}

(C) Si^{28}

(D) Fe^{56}

13. Un-polarized light is travelling from a medium of refractive index 2 to a medium of index 3. The angle of incidence is 60°. Then

(A) reflected light will be partially polarized

(B) reflected light will be plane polarized in a plane perpendicular to plane of incidence

(C) refracted light will be plane polarized in a plane perpendicular to plane of incidence

(D) refracted light will be plane polarized in a plane parallel to plane of incidence

14. A series LCR circuit is connected to an a.c. source and is showing resonance. Then

(A) $V_R = 0$

(B) $V_L = V_R$

(C) $V_C = V_R$

(D) $V_L = V_C$

15. The path of a charge particle after it enters a region of a uniform electrostatic field with velocity perpendicular to the field will be:

(A) Straight line

(B) Circular

(C) Helical

(D) Parabolic

16. An ideal gas is heated at constant volume until its pressure doubles. Which one of the following statements is correct?

(A) The mean speed of the molecules doubles

(B) Root mean square speed of the molecules doubles

(C) Mean square speed of the molecules doubles

(D) Mean square speed of the molecules remains unchanged

17. In the fringe pattern of a Young's double slit experiment the ratio of intensities of maxima and minima is 25: 9. Then the ratio of the amplitudes of interfering waves is

(A) 4 : 1

(B) 5 : 3

(C) 4 : 3

(D) 25 : 9

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18. A ball is projected up at an angle θ with horizontal from the top of a tower with speed 'v'. It hits ground at point A after time t_A with speed v_A. Now this ball is projected at same angle and speed from the base of the tower (located at point P) and it hits ground at point B after time t_B with speed v_B. Then

(A) PA = PB

(B) $t_A < t_B$

(C) $v_A > v_B$

(D) ball A hits the ground at an angle $(-\theta)$ with horizontal

19. A parallel narrow-beam of light is falling normally on a glass sphere. It will come to a focus

(A) inside the sphere (except at its center)

(B) on the surface of the sphere

(C) outside the sphere

(D) exactly at the center of the sphere

20. Red, blue, green and violet color lights are one by one made incident on a photocathode. It is observed that only one color light produces photo-electrons. That light is

(A) Red

(B) Blue

(C) Green

(D) Violet

21. Consider a bi-convex lens and a plano-convex lens, with radii of curvature of all the curved surfaces being same. If 'f' is focal length of bi-convex lens then the focal length of the plano-convex lens is

(A) 4 f

(B) 2 f

(C) f

(D) 0.5 f

22. Consider a ray of light travelling from a denser to a rarer medium. If it is incident at the critical angle then

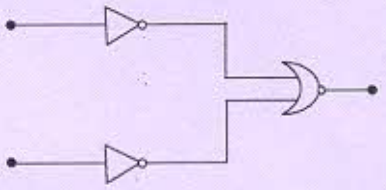
(A) it will emerge out into the rarer medium

(B) it will undergo total internal reflection

(C) it will travel along the interface separating the two media

(D) it will retrace its path

23. The combination of gates as shown in the figure forms the



(A) AND gate

(B) OR gate

(C) NOR gate

(D) NOT gate

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24. A body is travelling east with a speed of 9 m/s and with an acceleration of 2 m/s^2 acting west on it. The displacement of the body during the 5th second of its motion is

(A) 0.25 m

(B) 0.5 m

(C) 0.75 m

(D) zero

25. Bulk modulus is defined by

(A) increase in length per unit length per unit applied stress

(B) increase in volume per unit volume per unit applied stress

(C) lateral displacement per unit length per unit applied stress

(D) change in cross-sectional area per unit area per unit applied stress

26. A concave mirror has focal length '*f*'. A convergent beam of light is made incident on it. Then the image distance 'v' is

(A) zero

(B) less than '*f*'

(C) equal to '*f*'

(D) more than '*f*'

27. A ball is dropped from the top of 80 m high tower. If after 2 sec of fall the gravity (g = 10 m/s^2) disappears, then time taken to reach ground since the gravity disappeared is

(A) 2 sec

(B) 3 sec

(C) 4 sec

(D) 5 sec

28. Assuming density '*d*' of a planet to be uniform, we can say that the time period of its artificial satellite is proportional to

(A) d

(B) $\sqrt{d}$

(C) $1/\sqrt{d}$

(D) 1/d

29. The wave nature of electrons is demonstrated by the

(A) Photoelectric effect

(B) Rutherford's experiment

(C) Doppler's effect

(D) Davisson and Germer experiment

30. A charge particle having charge $1x10^{-19}$C revolves in an orbit of radius 1 Å such that the frequency of revolution is 10^{16} Hz. The resulting magnetic moment in SI units will be:

(A) $1.57x10^{-21}$

(B) $3.14x10^{-21}$

(C) $1.57x10^{-23}$

(D) $3.14x10^{-23}$

31. In a transformer the number of primary turns is four times that of the secondary turns. Its primary is connected to an a.c. source of voltage V. Then

(A) current through its secondary is about four times that of the current through its primary

(B) voltage across its secondary is about four times that of the voltage across its primary

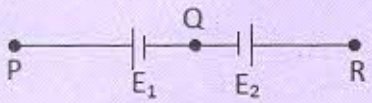
(C) voltage across its secondary is about two times that of the voltage across its primary

(D) voltage across its secondary is about $1/(2\sqrt{2})$ times that of the voltage across its primary

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32. Consider the two cells having *emf* E_1 and E_2 ($E_1 > E_2$) connected as shown in the figure. A potentiometer is used to measure potential difference between P and Q, and the balancing length of the potentiometer wire is 0.8 m. Same potentiometer is then used to measure potential difference between P and R, and the balancing length is 0.2 m. Then the ratio E_1/E_2 is



(A) 4/3

(B) 5/4

(C) 5/3

(D) 4/1

33. Metal alloys are used for making standard resistance coils because

(A) they have high thermal conductivity

(B) their resistance depend weakly on temperature

(C) they have low thermal conductivity

(D) their resistance depend strongly on temperature

34. Smallest division on the main scale of given vernier calipers is 0.5 mm. Vernier scale has 25 divisions and these coincide with 24 main scale divisions. The least count of vernier calipers is

(A) 0.001 cm

(B) 0.002 cm

(C) 0.01 cm

(D) 0.02 cm

35. A particle is undergoing uniform circular motion with angular momentum '*L*'. While moving on the same path if its kinetic energy becomes four times, then its angular momentum will be

(A) L/4

(B) L/2

(C) L

(D) 2L

36. The 220 V a.c. line voltage that we receive in our homes is

(A) rms value

(B) peak value

(C) average value

(D) none of the above

37. Two copper spheres having same radii, one solid and other hollow, are charged to the same potential. Which of the following statements is correct?

(A) Hollow sphere will hold more charge

(B) Solid sphere will hold more charge

(C) Solid sphere will have uniform volume charge density

(D) Both spheres will hold same charge

38. Dimensions of Planck's constant are

(A) ML^2T^{-1}

(B) ML^2T^{-3}

(C) MLT^{-1}

(D) ML^3T^{-3}

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39. If R is Rydberg's constant, the series limit of the wavelength of Balmer series for hydrogen atom is given by

(A) 1/R

(B) 4/R

(C) 9/R

(D) 16/R

40. A person is standing on a weighing-scale and observes that the reading is 60 kg. He then suddenly jumps up and observes that reading goes to 70 kg. Then his maximum upward acceleration is

(A) zero

(B) 1.4 m/s^2

(C) 1.63 m/s^2

(D) 9.8 m/s^2

41. Two pendula oscillate with a constant phase difference of 45° and same amplitude. If the maximum velocity of one of them is 'v' and that of other is 'v+x', then the value of 'x' will be

(A) 0

(B) v/2

(C) $v/\sqrt{2}$

(D) $(\sqrt{2})$ v

42. A bullet fired from a rifle loses 20% of its speed while passing through a wooden plank. Then minimum number of wooden planks required to completely stop the bullet is

(A) 3

(B) 5

(C) 15

(D) 25

43. In which of the following both transverse and longitudinal waves propogate?

(A) Heat transfer

(B) Elastic wave motion in a solid

(C) Microwave communication

(D) X- ray motion

44. Consider boiling water converting into steam. Under this condition, the specific heat of water is

(A) less than zero

(B) zero

(C) slightly greater than zero

(D) infinite

45. The length of antenna to transmit waves of 1 MHz will be

(A) 3 m

(B) 15 m

(C) 30 m

(D) 300 m

46. In a cyclic process, the change in the internal energy of a system over one complete cycle

(A) depends on the path

(B) is always negative

(C) is always zero

(D) is always positive

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47. Which of the following is incorrect about sky waves?
(A) Sky waves are not used in long distance communication
(B) Their propagation takes place by total internal reflection
(C) Sky waves support the so-called AM band
(D) The frequency of sky waves ranges typically from 3 MHz to 30 MHz

48. An observer standing near the sea-coast counts 48 waves per min. If the wavelength of the wave is 10 m, the velocity of the waves will be
(A) 8 m/s
(B) 12 m/s
(C) 16 m/s
(D) 20 m/s

49. The electric field of an electric dipole at a point on its axis at a distance 'd' from the center of the dipole varies as
(A) $1/d$
(B) $1/d^2$
(C) $1/d^3$
(D) $1/d^{3/2}$

50. A solid sphere is rolling down an inclined plane. Then the ratio of its translational kinetic energy to its rotational kinetic energy is
(A) 2.5
(B) 1.5
(C) 1
(D) 0.4

51. A person carrying a whistle emitting continuously a note of 272 Hz is running towards a reflecting surface with a speed of 18 km/h. If the speed of sound is 345 m/s, the number of beats heard by him are
(A) 4
(B) 6
(C) 8
(D) 10

52. If the forward bias voltage in a *p-n* diode is decreased, the length of depletion region will
(A) increase
(B) decrease
(C) not change
(D) initially increase and then decrease

53. Which of the following is NOT an electromagnetic wave?
(A) Sound wave
(B) Thermal radiation
(C) Microwave
(D) Gamma ray

54. What amount of original radioactive material is left after 3 half-lives?
(A) 6.5%
(B) 12.5%
(C) 25.5%
(D) 33.3%

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55. Which of the following is NOT an example of primary cell?

(A) Voltaic cell

(B) Lead-acid cell

(C) Daniel cell

(D) Leclanche cell

56. Which of the following is correct statement about the magnitude of the acceleration 'a' of the particle executing simple harmonic motion?

(A) 'a' will be maximum at the equilibrium position

(B) 'a' will be maximum at the extreme position

(C) 'a' will be always constant

(D) 'a' will always be zero

57. A block of mass '*m*' is placed on an inclined plane having coefficient of friction 'm'. The plane is making an angle q with horizontal. The minimum value of upward force acting along the incline that can just move the block up is

(A) mg cos q

(B) mmg cos q

(C) mg sin q

(D) mmg sin q

58. The dielectric constant of a perfect conductor is

(A) +1

(B) 0

(C) infinite

(D) –1

59. The energy per mole per degree of freedom of an ideal gas is

(A) $(3/2)k_BT$

(B) $(1/2)\ k_BT$

(C) (3/2)RT

(D) (1/2)RT

60. A 1 m long solenoid containing 1000 turns produces a flux density of 3.14×10^{-3} T. The current in the solenoid will be

(A) 2.0 A

(B) 2.5 A

(C) 3.0 A

(D) 3.5 A

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Section 2 - Chemistry

61. In an acidified aqueous solution of Mn^{2+}, Ni^{2+}, Cu^{2+} and Hg^{2+} ions, H_2S gas was passed. Precipitates are

(A) MnS and CuS

(B) NiS and HgS

(C) MnS and NiS

(D) CuS and HgS

62. For ion O_2^-, the bond order is

(A) 2

(B) 1.5

(C) 2.5

(D) 0

63. Nylon is a

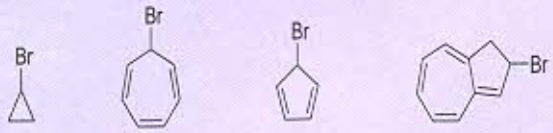
(A) Polyamide

(B) Carbonate

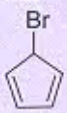
(C) Ester

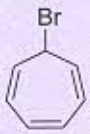
(D) Polycarboxylic acid

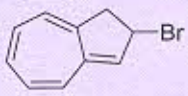
64. Which one of the following will quickly react with $AgNO_3$?



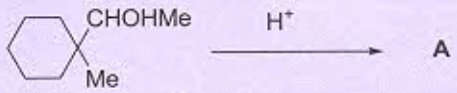
(A) 

(B) 

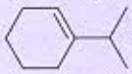
(C) 

(D) 

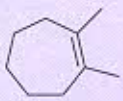
65. The following alcohol after treatment with acid gives compound A. Ozonolysis of A gives nonane-2, 8-dione. The compound A is



(A) 

(B) 

(C) 

(D) 

66. 30 ml of 0.02 M ammonium hydroxide is mixed with 15 ml of 0.02 M HCl, what will be the pH of the solution (pKb =4.0)

(A) 4

(B) 8

(C) 7

(D) 10

67. HA is a weak acid. At 25 °C, the molar conductivity of 0.02 M HA is 150 $\Omega^{-1}cm^2mol^{-1}$. If its Λ_m^0 is 300 $\Omega^{-1}cm^2mol^{-1}$, the equilibrium constant of HA dissociation is

(A) 0.001

(B) 0.005

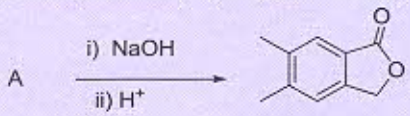
(C) 0.01

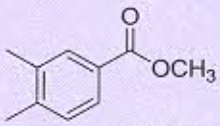
(D) 0.02

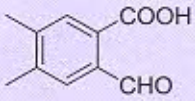
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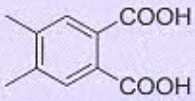
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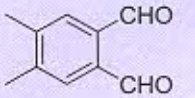
68. Identify reactant (A) for the following reaction.



(A) 

(B) 

(C) 

(D) 

69. The **wrong** statement among the following is

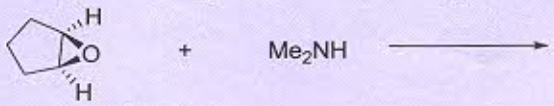
(A) Acid rain is mostly because of oxides of nitrogen and sulphur

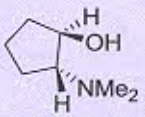
(B) Green house effect is responsible for global warming

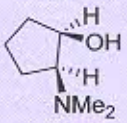
(C) Ozone layer does not permit infrared radiation from the sun to reach earth

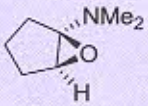
(D) Chlorofluorocarbons are responsible for ozone layer depletion

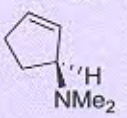
70. Identify the correct product of the following reaction.



(A) 

(B) 

(C) 

(D) 

71. When a dilute solution of ammonia is saturated with H_2S it gives

(A) $(NH_4)_2S$

(B) NH_4HS

(C) $(NH_3)_2H_2S$

(D) $NH_3.H_2S$

72. Molar enthalpy change for melting of ice is 6 kJ/mol. Then the internal energy change (in kJ/mole) when 1 mole of water is converted into ice at 1 atm at 0 °C is

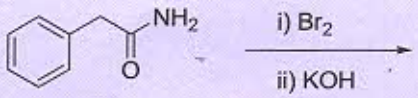
(A) RT /1000

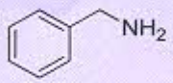
(B) 6

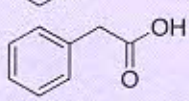
(C) 6 – (RT /1000)

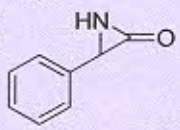
(D) 6 + (RT /1000)

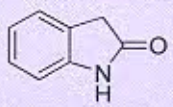
73. When the following amide is treated with Br_2/KOH, it gives



(A) 

(B) 

(C) 

(D) 

74. Milk is an example of

(A) Emulsion

(B) Sol

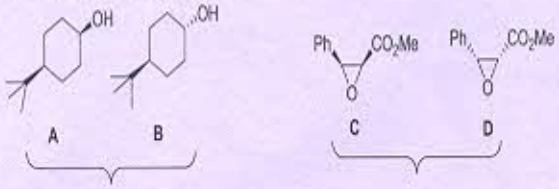
(C) Gel

(D) Foam

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75. Identify the correct statement about the following pairs of compounds.



(A) A and B diastereomer; C and D diastereomer

(B) A and B enantiomer; C and D diastereomer

(C) A and B diastereomer; C and D enantiomer

(D) A and B enantiomer; C and D enantiomer

76. Which one of the following does NOT have sp^3 hybridization?

(A) CH_4

(B) XeF_4

(C) H_2O

(D) NH_3

77. In He_2, the electrons in bonding and anti-bonding orbitals are

(A) 2,2

(B) 4,2

(C) 4,0

(D) 2,4

78. Extraction of mercury from cinnabar is achieved by

(A) Heating it in air

(B) Electrolytic reduction

(C) Roasting followed by reduction with carbon

(D) Roasting followed by reduction with another metal

79. Energy of activation of forward reaction for an endothermic process is 90 kJ. If enthalpy change for the reaction is 50 kJ then activation energy for backward reaction will be

(A) 40 kJ

(B) 140 kJ

(C) 90 kJ

(D) 50 kJ

80. The IUPAC name of the coordination compound $[Co(H_2O)_2(NH_3)_4]\ Cl_3$ is

(A) Tetraamminediaquacobalt (III) chloride

(B) Cobalt (III) tetraamminediaqua chloride

(C) Diaquatetraammine cobalt (III) chloride

(D) Tetraamminediaquacobalt (II) chloride

81. $HClO_4 .2H_2O$ after reaction with fuming sulfuric acid generates

(A) $ClO_2 + H_2SO_4$

(B) $Cl_2O_7 + H_2SO_4$

(C) $HClO_4 + H_2SO_4$

(D) $Cl_2O_6 + H_2SO_4$

82. A unit cell with edge length $a \neq b \neq c$ and axial angles $\alpha = \beta = \gamma = 90^0$ is called

(A) Cubic

(B) Tetragonal

(C) Orthorhombic

(D) Hexagonal

83. A gas at high temperature is cooled. The highest temperature at which liquefaction of gas first occurs is called

(A) Boyle temperature

(B) Critical temperature

(C) Boiling temperature

(D) Freezing temperature

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84. One of the following complexes shows geometrical isomerism. The complex is

(A) $PtCl_4$

(B) $Pt(NH_3)_2Cl_2$

(C) $Pt(NH_3)_3Cl$

(D) $Ni(NH_3)_3Cl$

85. K_p/K_C for the reaction $A(g) + 2B(g) \leftrightarrow AB_2(g)$ is

(A) RT

(B) $(RT)^2$

(C) 1/RT

(D) $1/(RT)^2$

86. For a reaction $2A \rightarrow 3B$, if the rate of formation of B is x mole/l, the rate of consumption of A is

(A) x

(B) 3x/2

(C) 2x/3

(D) 3x

87. Siderite is mainly ore of

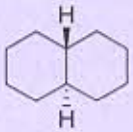
(A) Zn

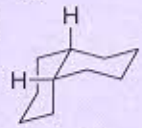
(B) Fe

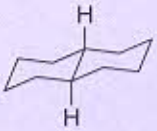
(C) Cd

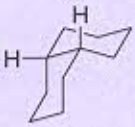
(D) Ru

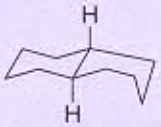
88. A highly stable conformation for the following compound is



(A) 

(B) 

(C) 

(D) 

89. When powdered plaster of paris is mixed with correct amount of water it sets into a solid mass of

(A) $CaSO_4.5H_2O$

(B) $CaSO_4.3H_2O$

(C) $CaSO_4.2H_2O$

(D) $CaSO_4.1/2H_2O$

90. The number of tetrahedral and octahedral void per unit cell of cubic closed packed structure is

(A) 4,8

(B) 4,4

(C) 8,4

(D) 8,8

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91. If a homogeneous colloid placed in dark is observed in the direction of light, it appears clear and if it is observed from a direction at right angles to the direction of light beam, it appears perfectly dark. This is known as

(A) Brownian effect

(B) Hardy-Schulz effect

(C) Einstein effect

(D) Tyndall effect

92. If $E^{\theta}_{M^+/M} = -1.2\,V$, $E^{\theta}_{X_2/X^-} = 1.1\,V$ and $E^{\theta}_{O_2/H_2O} = 1.23\,V$, then on electrolysis of aqueous solution of salt MX, the products obtained are:

(A) M, X_2

(B) H_2, X_2

(C) H_2, O_2

(D) M, O_2

93. Shape of SF_4 is

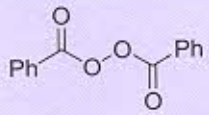
(A) Tetrahedral

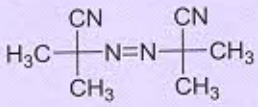
(B) Square planar

(C) Trigonal pyramid

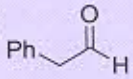
(D) See-Saw

94. The species which cannot serve as an initiator for the free radical polymerization

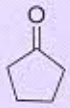
(A) 

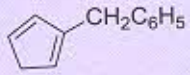
(B) 

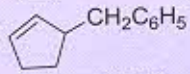
(C) 

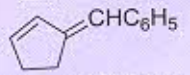
(D) 

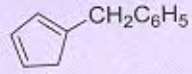
95. The product of the following reaction is



(A) 

(B) 

(C) 

(D) 

96. Among second period elements, the correct order for first ionization enthalpy is

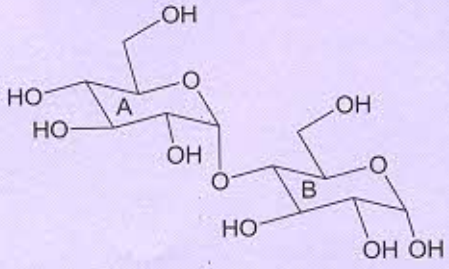
(A) Li < Be < B < C < N < O < F < Ne

(B) Li < B < Be < C < O < N < F < Ne

(C) Li > Be > B > C > N > O > F > Ne

(D) Li > B > C > Be > O > N > F > Ne

97. In the following disaccharide



(A) Ring (A) is pyranone with α-glycosidic link

(B) Ring (A) is furanone with α-glycosidic link

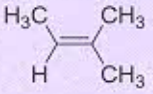
(C) Ring (B) is pyranone with β-glycosidic link

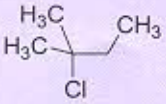
(D) Ring (B) is furanone with α-glycosidic link

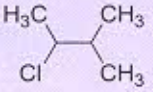
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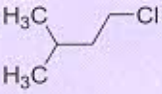
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98. When $(CH_3)_3CCH_2Cl$ is heated at 300 °C. It gives

(A) 

(B) 

(C) 

(D) 

99. The compound formed upon combustion of potassium metal in excess air is

(A) K_2O_2

(B) KO_2

(C) K_2O

(D) KOH

100. For a reaction $C(s) + CO_2(g) \leftrightarrow 2CO(g)$, the partial pressure of CO_2 and CO are 4 and 8 atm, respectively. Kp for the reaction is

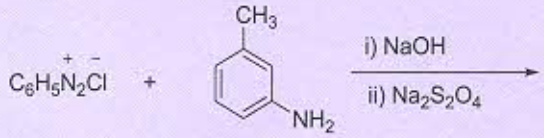
(A) 0.5

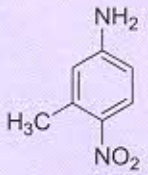
(B) 2

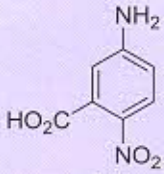
(C) 16

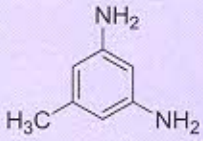
(D) 4

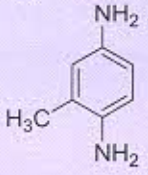
101. Identify the major product for the reaction given below.



(A) 

(B) 

(C) 

(D) 

102. Which of the element is available in carbonic anhydrase?

(A) Pd

(B) Fe

(C) Zn

(D) Pt

103. PV value decreases with increase in P at constant temperature when

(A) there is no attractive or repulsive forces between molecules

(B) attractive and repulsive forces between molecules are equal

(C) attractive forces between molecules are predominant

(D) repulsive forces between molecules are predominant

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104. Among the following pair, which one has both variables as intensive variable?

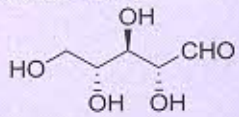
(A) T, V

(B) m, P

(C) d, V

(D) P, T

105. The absolute configuration of the following compound is



(A) R, R, R

(B) R, R, S

(C) R, S, R

(D) S, R, R

106. The ionization potential of hydrogen atom is 13.6 eV. The energy required to remove an electron from n = 2 state of hydrogen atom is

(A) 27.2 eV

(B) 13.6 eV

(C) 6.8 eV

(D) 3.4 eV

107. The correct order of the ligands, OH^-, NO_3^-, PPh_3, pyridine, according to their increasing field strength is

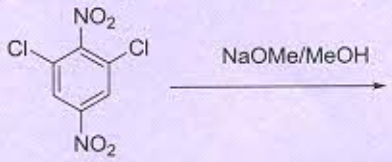
(A) $NO_3^- < OH^- <$ pyridine $< PPh_3$

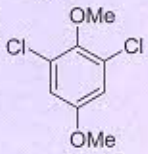
(B) $OH^- < NO_3^- < PPh_3 <$ pyridine

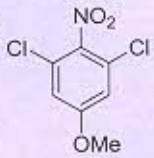
(C) $OH^- < NO_3^-$ < pyridine $< PPh_3$

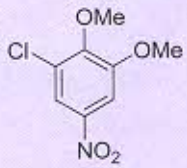
(D) $NO_3^- < OH^- < PPh_3 <$ pyridine

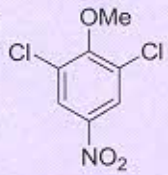
108. The major product of the following transformation is



(A) 

(B) 

(C) 

(D) 

109. For the process to occur under adiabatic condition, the correct condition is

(A) $\Delta T = 0$

(B) $\Delta U = 0$

(C) $\Delta p = 0$

(D) $q = 0$

110. For the reaction, $A(s) + 2\ B^+(aq) \rightarrow A^{2+}(aq) + 2\ B(s)$, the E^0 is 1.18 V. Then the equilibrium constant for the reaction is

(A) 10^{10}

(B) 10^{20}

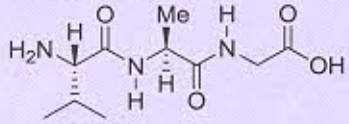
(C) 10^{40}

(D) 10^{60}

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111. The following tripeptide can be synthesized from the following amino acid



(A) Glycin, Leucine and Alanine

(B) Alanine, Isoleucin and Glycine

(C) Valine, Alanine and Glycine

(D) Alanine, Serine and Glycine

112. If the solubility of a sparingly soluble salt AX_2 is s mole/lit, the solubility product is

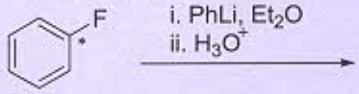
(A) $4s^3$

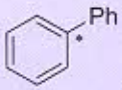
(B) $8s^3$

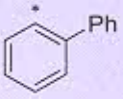
(C) $4s^2$

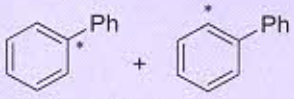
(D) s^2

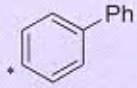
113. Identify the product of the following reaction.



(A) only 

(B) only 

(C) 

(D) 

114. The number of Na atom in 46 gm of Na (atomic weight of Na = 23) is

(A) 6.023×10^{23}

(B) 2

(C) 1

(D) 12.046×10^{23}

115. Buna-N Synthetic rubber is obtained by copolymerization of

(A) $CH_2=CH-CH=CH_2$ and $H_5C_6-CH=CH_2$

(B) $CH_2=CH-CN$ and $H_2C=CH-CH=CH_2$

(C) $H_2C=CH-CN$ and $CH_2=CH-C(CH_3)=CH_2$

(D) $H_2C=CH-C(Cl)=CH_2$ and $H_2C=CH-CH=CH$

116. If the density of methanol is 0.8 KgL^{-1}, what is its volume needed for making 4L of its 0.25 M solution?

(A) 4 ml

(B) 8 ml

(C) 40 ml

(D) 80 ml

117. 0.5 molal solution of a solute in benzene shows a depression in freezing point equal to 2 K. Molal depression constant for benzene is 5 K Kg mol^{-1}. If the solute forms dimer in benzene, what is the % association?

(A) 40

(B) 50

(C) 60

(D) 80

118. The vapour pressure of pure benzene at certain temperature is 1 bar. A non-volatile, non-electrolyte solid weighing 2 gm when added to 39 gm of benzene (molar mass 78 gm mol^{-1}) yields solution of vapour pressure of 0.8 bar. The molar mass of solid substance is

(A) 32

(B) 16

(C) 64

(D) 48

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119. Among P, S, Cl, F, the elements with most negative and least negative electron gain enthalpy, respectively, are

(A) Cl, S

(B) F, S

(C) Cl, P

(D) F, P

120. One mole of an ideal gas expands isothermally and reversibly from 2 lit to 20 lit at 300 K. If the final pressure of the gas is 1 bar, the work done by the gas is

(A) – 300 R *ln*10

(B) 300 R *ln*10

(C) 18

(D) –18

Space for Rough Work:

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