PROVISIONAL ANSWER KEY

Question Paper Code: 16/2025/OL

Exam:KEAM 2025 BPHARM-3

Date of Test: 29-04-2025

1. A solution is prepared by adding 4 g of a substance to 46 g of ethanol. What is the mass percentage of the solute?

A) 8%

B) 10%

C) 4%

D) 6%

E) 12%

Correct Answer : Option A

2. The order of energy of orbital in the same subshell is

A) $E_{2s}(Na) > E_{2s}(Li) > E_{2s}(K)$

B) $E_{2s}(Li) > E_{2s}(Na) > E_{2s}(K)$

C) $E_{2s}(K) > E_{2s}(Na) > E_{2s}(Li)$

D) $E_{2s}(Li) > E_{2s}(K) > E_{2s}(Na)$

E) $E_{2s}(Na) > E_{2s}(K) > E_{2s}(Li)$

Correct Answer : Option B

3. Which of the following is correct about the stability of half filled and completely filled subshells?

(i) Relatively small shielding

(ii) Larger coulombic repulsion energy

(iii) Smaller exchange energy

(iv) Smaller coulombic repulsion energy

(v) Larger exchange energy

A) (i), (ii) and (iii)

B) (i), (iii) and (v)

C) (i), (iv) and (v)

D) (ii), (iii) and (v)

E) (i), (ii) and (iv)

Correct Answer : Option C

4. The correct order of ionization enthalpy is

A) C < B < O < N

B) B < O < C < N

C) N < C < O < B

D) B < C < O < N

E) C < B < O < N

Correct Answer : Option D

5. The increasing order of atomic radii is

A) C < N < O < F

B) F < O < C < N

C) O < F < N < C

D) F < N < O < C

E) F < O < N < C

Correct Answer : Option E

6. Which of the following molecule has expanded octet?

A) BCl_3

B) NO_2

C) NO

D) SF_6

E) BeH_2

Correct Answer : Option D

7. Which of the following molecule has 3 bond pairs and 2 lone pairs of electrons?

A) NH_3

B) SO_2

C) ClF_3

D) SF_4

E) H_2O

Correct Answer : Option C

8. Which of the following is an extensive property?

A) Molar volume

B) Internal energy

C) Temperature

D) Density

E) Pressure

Correct Answer : Option B

9. Which of the following molecule has the highest standard enthalphy change of fusion $(\Delta_{fus} H^{\Theta})\ (in\ kJ\ mol^{-1})$?

A) H_2O

B) CO
C) C_6H_6
D) CCl_4
E) $NaCl$

Correct Answer : Option E

10. At equilibrium, the concentration of $N_2 = 5\times10^{-3}M, O_2 = 2.8\times10^{-3}$ M and $NO = 1.4\times10^{-3}$ M in a sealed vessel at 800 K. What is the value of Kc for the reaction at same temperature?

$$N_{2(g)} + O_2 \rightleftharpoons 2NO$$

A) 0.41
B) 0.14
C) 0.18
D) 0.5
E) 0.28

Correct Answer : Option B

11. $Cu_{(s)} + 2Ag^{+}_{(aq)} \rightleftharpoons Cu^{2+}_{(aq)} + 2Ag_{(s)}$ (E°_{cell} = 0.295 V, 2.303 RT/F = 0.059 V)

A) 10^{20}
B) 10^{15}
C) 10^{10}
D) 10^{-1}
E) 10^{-2}

Correct Answer : Option C

12. Which of the following compound is used to cover the surface of the metallic object to prevent corrosion?

A) Phenol
B) Benzene
C) Acetone
D) Bisphenol
E) Nitrophenol

Correct Answer : Option D

13. Which of the following gas has the lowest solubility in water at 298 K?

A) Argon
B) Carbon dioxide
C) Formaldehyde
D) Methane
E) Vinyl chloride

Correct Answer : Option A

14. In a reaction, 3A → Products, the concentration of 'A' decreases from 0.6 mol L^{-1} to 0.3 mol L^{-1} in 20 minutes. What is the rate of the reaction during this interval?

A) $0.05 \text{ mol } L^{-1}min^{-1}$

B) $0.005 \text{ mol } L^{-1}min^{-1}$

C) $0.03 \text{ mol } L^{-1}min^{-1}$

D) $0.6 \text{ mol } L^{-1}min^{-1}$

E) $0.003 \text{ mol } L^{-1}min^{-1}$

Correct Answer : Option B

15. The following data were obtained for the reaction , $2NO_{(g)} + O_{2(g)} \rightarrow 2N_2O_{(g)}$ at different concentrations,

Experiment	[NO]/ mol L^{-1} min^{-1}	$[O_2]$/ mol $L^{-1}min^{-1}$	Initial rate of formation of $[NO_2]$/ mol L^{-1} min^{-1}
1	0.30	0.30	0.096
2	0.60	0.30	0.384
3	0.30	0.60	0.192
4	0.60	0.60	0.768

The rate law of this reaction is

A) Rate = $k[NO][O_2]$

B) Rate = $k[NO][O_2]^2$

C) Rate = $k[NO]^2[O_2]^2$

D) Rate = $k[NO]^2[O_2]$

E) Rate = $k[NO]^2[O_2]^3$

Correct Answer : Option D

16. Which of the following transition element has both bcc and ccp structures at normal temperature?

A) Titanium

B) Vanadium

C) Silver

D) Chromium

E) Manganese

Correct Answer : Option E

17. The most common oxidation states of chromium are

A) +2 and +7
B) +2 and +3
C) +1 and +6
D) +3 and +6
E) +2 and +4

Correct Answer : Option D

18. What is the magnetic moment of divalent ion with three unpaired electrons?

A) 2.84 BM
B) 5.92 BM
C) 3.87 BM
D) 4.90 BM
E) 1.73 BM

Correct Answer : Option C

19. The bond angle of Cr-O-Cr bond in dichromate ion is

A) 90°
B) 126°
C) 109°
D) 60°
E) 120°

Correct Answer : Option B

20. Which of the following transition metal oxide is used in dry battery cells?

A) ZnO
B) TiO
C) V_2O_5
D) NiO
E) MnO_2

Correct Answer : Option E

21. The first and second ionization enthalpies of lanthanoids are comparable with the element

A) Chromium
B) Calcium
C) Germanium
D) Cesium
E) Cadmium

Correct Answer : Option B

22. The percentage of Cr(III) in Ruby is

A) 0.5 to 1 %

B) 1 to 2 %

C) 0.1 to 0.4 %

D) 2 to 3 %

E) 0.1 to 0.3 %

Correct Answer : Option A

23. Which of the following is an outer orbital complex?

A) $[Co(NH_3)_6]^{3+}$

B) $[Mn(CN)_6]^{3-}$

C) $[Co(C_2O_4)_3]^{3-}$

D) $[MnCl_6]^{3-}$

E) $[Fe(CN)_6]^{3-}$

Correct Answer : Option D

24. What is the colour of the complex $[Ni(en)_3]^{2+}$ in water?

A) Pale blue

B) Purple

C) Violet

D) Green

E) Orange

Correct Answer : Option C

25. Hardness of water is estimated by titration with

A) DMG

B) cupron

C) α-nitroso-β-napthol

D) Na_2EDTA

E) ethylenediamine

Correct Answer : Option D

26. The formula of Ammonium phosphomolybdate is

A) $(NH_4)_3PO_4.12MoO_3$

B) $(NH_4)_2.12MoO_4$

C) $(NH_4)_2PO_4.12MoO_3$

D) $(NH_4)_3PO_3.12MoO_3$

E) $(NH_4)_3PO_4.2MoO_3$

Correct Answer : Option A

27. On complete combustion of 0.96 g of an organic compound gives 0.88 g of carbon dioxide and 0.1 g of water. What is the percentage composition of carbon in the compound?

A) 22%

B) 18%

C) 16%

D) 20%

E) 25%

Correct Answer : Option E

28. Which of the following sodium salt of carboxylic acid is used for the preparation of n-hexane by Kolbe's electrolytic method?

A) CH_3CH_2COONa

B) CH_3COONa

C) $HCOONa$

D) $CH_3CH_2CH_3CH_2COONa$

E) $CH_3CH_2CH_2COONa$

Correct Answer : Option E

29. Which of the following oxidizing agent is used for the iodination of methane?

A) HI

B) $KMnO_4$

C) $K_2Cr_2O_7$

D) HIO_3

E) K_2CrO_4

Correct Answer : Option D

30. The product obtained on ozonolysis of 3-Ethylpen-2-ene are

A) Methanal and 3-Hexanone

B) Pentanal and Propanone

C) Ethanal and Pentan-3-one

D) Ethanal and 3-Hexanone

E) Ethanal and Butanone

Correct Answer : Option C

31. The temperature and pressure required for reforming benzene from n-hexane is

A) 473K, 10-20 atm

B) 773K, 10-20 atm
C) 523K, 100 atm
D) 973K , 1-2 atm
E) 573K, 10-20 atm

Correct Answer : Option C

32. Methyl fluoride is prepared by heating methyl bromide in the presence of AgF. This reaction is known as
A) Swarts reaction
B) Finkelstein reaction
C) Sandmeyer's reaction
D) Wurtz reaction
E) Kolbe's reaction

Correct Answer : Option B

33. Benzene diazonium chloride on treatment with reagent 'X' gives iodobenzene. The regeant 'X' is
A) Cu_2I_2
B) AgI
C) I_2
D) HI
E) KI

Correct Answer : Option E

34. Which of the following is not a chiral molecule?
A) 2-Chlorobutane
B) 2,3-Dihydroxy propanal
C) 2-Bromo propionic acid
D) Butan-2-ol
E) 2-Bromo-2-methoxypropane

Correct Answer : Option E

35. The product obtained on the reaction of propanone with CH_3MgBr followed by hydrolysis is
A) 2-Methylpropan-2-ol
B) Butan-1-ol
C) Butan-2-ol
D) 2-Methylpropan-1-ol
E) 2-Methylpropane

Correct Answer : Option D

36. The reagent used for the conversion of carboxylic acids to primary alcohols is

A) PCC

B) $LiAlH_4 \,/\, H_2O$

C) $NaNO_2 \,/\, HCl$

D) $Pd \,/\, H_2$

E) $Pt \,/\, H_2$

Correct Answer : Option B

37. The order of acidity of the following compounds is
(i) o-Nitrophenol (ii) Phenol (iii) o-Cresol (iv) Ethanol

A) (i) < (iii) < (ii) < (iv)

B) (iii) < (i) < (ii) < (iv)

C) (i) < (ii) < (iii) < (iv)

D) (iv) < (iii) < (ii) < (i)

E) (iii) < (ii) < (i) < (iv)

Correct Answer : Option C

38. When benzene is treated with carbon monoxide and hydrogen chloride in the presence of anhydrous aluminium chloride, benzaldehyde is formed. The reaction is known as

A) Etard reaction

B) Stephen reaction

C) Hell-Volhard-Zelinsky reaction

D) Gatterman-Koch reaction

E) Aldol reaction.

Correct Answer : Option D

39. When C_6H_5CHO reacts with the mixture of HNO_3 and H_2SO_4 at 273-283K gives

A) o- Nitrobenzaldehyde

B) m-Nitrobenzaldehyde

C) p-Nitrobenzaldehyde

D) Toluene

E) Nitrobenzene

Correct Answer : Option A

40. Match the following

Compound	**use**
(a) Benzaldehyde	(i) food preservative
(b) Methanoic acid	(ii) nylon 6,6
(c) Sodium benzoate	(iii) perfumary
(d) Hexanedioic acid	(iv) Electroplating industry

A) a-(i), b-(ii), c-(iii), d-(iv)
B) a-(iii), b-(i), c-(iv), d-(ii)
C) a-(i), b-(iii), c-(ii), d-(iv)
D) a-(ii), b-(iv), c-(i), d-(iii)
E) a-(iii), b-(iv), c-(i), d-(ii)

Correct Answer : Option E

41. The number of moles of alkyl halides required to convert primary amine into quaternary ammonium salt is

A) 1
B) 2
C) 3
D) 4
E) 5

Correct Answer : Option C

42. The order of boiling point of the following amines is

(i) Butan-1-amine (ii) N-Ethylethanamine (iii) N,N-Dimethylethanamine

A) (i)> (iii) > (ii)
B) (i) > (ii) > (iii)
C) (iii) > (ii)> (i)
D) (iii) > (i) > (ii)
E) (ii) > (i) >(iii)

Correct Answer : Option B

43. An aromatic compound (X) of molecular formula, C_7H_7Cl, on ammonolysis gives Y(Molecular formula, $C_7H_9\,\mathrm{N}$) . The compound 'Y' reacts with two moles of CH_3Cl gives N, N-Dimethylphenylmethanamine. The compounds 'X' and 'Y' are

A) Benzylchloride and Aniline
B) Chlorobenzene and Aniline
C) Benzylchloride and Benzylamine
D) Chlorobenzene and Benzylamine
E) Benzoylchloride and Benzylamine.

Correct Answer : Option C

44. Oxidation of gluconic acid with nitric acid gives

A) n-hexane
B) fructose
C) glucose
D) glyceraldehyde
E) saccharic acid

Correct Answer : Option E

45. The carbohydrates are stored in animal body as

A) cellulose
B) starch
C) glycogen
D) amylopectin
E) amylase

Correct Answer : Option C

46. The dimensions of $\frac{B}{E}$ are (B- Magnetic induction, E-electric field intensity)

A) $M^0L^{-2}T^1$
B) $M^0L^{-1}T^2$
C) $M^0L^1T^1$
D) $M^0L^{-1}T^1$
E) $M^0L^1T^{-1}$

Correct Answer : Option D

47. A hockey player hits a ball with an impulse of 15 Ns. If time of hit is 0.2 s, the average force exerted by the player on the ball is

A) 75 N
B) 50 N
C) 15 N
D) 20 N
E) 25 N

Correct Answer : Option A

48. If the position of the particle as a function of time t is $\vec{r} = 8t\hat{i} + 3t^2\hat{j} + 3\hat{k}$ m, then the acceleration of the particle is (in ms^{-2})

A) 6
B) 3
C) 8
D) 4
E) 5

Correct Answer : Option A

49. The force acting on the particle of 0.2 kg mass whose displacement is described by the equation $x = 3t + 7t^2$ m is

A) 1.0 N
B) 3.2 N
C) 6.4 N
D) 8.6 N
E) 2.8 N

Correct Answer : Option E

50. A bullet of 10 g mass is fired at a speed of 50 ms^{-1} by a gun of 2 kg mass. The recoil speed of the gun (in ms^{-1}) is

A) 0.3
B) 0.25
C) 0.5
D) 0.75
E) 1.25

Correct Answer : Option B

51. The work done to lift a 60 kg mass to a height of 5 m from the ground is (g = 10 ms^{-2})

A) 3000 J
B) 750 J
C) 1250 J
D) 6000 J
E) 4500 J

Correct Answer : Option A

52. Energy equivalent of mass 0.5 kg is

A) $9 \times 10^{16} J$
B) $3 \times 10^{16} J$
C) $2.5 \times 10^{16} J$
D) $6 \times 10^{16} J$
E) $4.5 \times 10^{16} J$

Correct Answer : Option E

53. Three particles of equal mass lie at distances of 1 cm , 2 cm and 3 cm from the origin. The distance of their centre of mass from the origin is

A) 2 cm
B) 1 cm
C) 2.5 cm
D) 3 cm
E) 6 cm

Correct Answer : Option A

54. Angular momentum of a particle will not be zero, if the

A) angle between position vector and linear momentum is 0º
B) particle is at the origin
C) angle between position vector and linear momentum is 90º
D) linear momentum vanishes
E) angle between position vector and linear momentum is 180º

Correct Answer : Option C

55. An astronaut experiences weightlessness in space satellite because

A) the gravitational force is small at that location
B) both the astronaut and the satellite are in free fall towards earth
C) of the small gravity in the horizontal direction
D) of the small gravity in the vertical direction
E) of the gravitational pull of the moon

Correct Answer : Option B

56. For smaller deformations, stress is directly proportional to the strain for any material. Then the constant of proportionality is called as its

A) modulus of elasticity
B) Poisson's ratio
C) compressibility
D) coefficient of deformation
E) mechanical strength

Correct Answer : Option A

57. Which one of the following principles helps to explain the flow of blood in artery?

A) Magnus effect
B) Boyle's law
C) Pascal's law
D) Bernoulli's principle
E) Archimedes' principle

Correct Answer : Option D

58. An ideal Carnot engine has an efficiency of 40%. The ratio of the temperature of the sink to that of the source is

A) 0.4
B) 0.6
C) 0.5
D) 0.2

E) 0.3

Correct Answer : Option B

59. If Q1 and Q2 are respectively, the heat supplied and expelled by a system at a constant temperature, then the work done by the system is

A) $Q_1 - Q_2$

B) $Q_1 + Q_2$

C) $\frac{Q_1 - Q_2}{2}$

D) $\frac{Q_2 - Q_1}{2}$

E) $\frac{Q_1 + Q_2}{2}$

Correct Answer : Option A

60. For the oscillations of a spring with spring constant k, the false statement is

A) Stiff springs have high value of k

B) Soft springs have small value of k

C) The spring constant is independent of the elastic properties of the spring

D) For smaller oscillations the spring executes simple harmonic motion

E) The period of oscillations of the spring depends upon the value of k

Correct Answer : Option C

61. If the amplitude of the wave $y = 3sin(3x - 5t) + Acos(3x - 5t)$ m is 5 m, the value of A is

A) 3 m

B) 2 m

C) 1 m

D) 5 m

E) 4 m

Correct Answer : Option E

62. In dielectrics, polarization is the dipole moment per unit

A) area

B) lectric field

C) volume

D) length

E) charge

Correct Answer : Option C

63. The energy density of the electric field 2 Vm^{-1} in a capacitor C is ($\varepsilon_{\circ}$ is the permittivity of free space)

A) $3\,\varepsilon_{\circ}$

B) $\frac{\varepsilon_{\circ}}{2}$

C) $4\ \varepsilon_{\circ}$

D) $\frac{\varepsilon_{\circ}}{4}$

E) $2\,\varepsilon_{\circ}$

Correct Answer : Option E

64. A carbon resistor has a tolerance of 20%. As per the colour codes of resistors, the last band in that resistor is

A) silver

B) absent

C) red

D) gold

E) blue

Correct Answer : Option B

65. When a current of 2 A flows through a wire for 2.5 s, the amount of heat liberated is 20 J.The resistance of the wire is

A) 4 Ω

B) 3 Ω

C) 1 Ω

D) 2 Ω

E) 5 Ω

Correct Answer : Option D

66. The magnetic moment of an electron revolving in an orbit of 0.5 m radius with a velocity of $8\times10^{7}ms^{-1}\ is(\text{in}\ Am^{2})$

A) 3.2×10^{-12}

B) 0.4×10^{-12}

C) 6.4×10^{-12}

D) 1.6×10^{-1}

E) 0.8×10^{-12}

Correct Answer : Option A

67. If an electron moves with a velocity v in a magnetic field B, the magnetic force on the electron is maximum when the angle between v and B is

A) 30º

B) 180º
C) 60º
D) 90º
E) 0º

Correct Answer : Option D

68. The flux linked with a coil at any instant is given by $\phi = 5t^2 - 25t - 150$ (in SI unit). The emf induced in the coil at $t = 2s$ is

A) +5 V
B) +3 V
C) -1 V
D) -5 V
E) -3 V

Correct Answer : Option A

69. If the frequency of an electromagnetic wave is 2 MHz, then the time period of oscillation of the accelerated charge is

A) $2.5 \times 10^{-7} s$
B) $1 \times 10^{-7} s$
C) $5 \times 10^{-7} s$
D) $6 \times 10^{-7} s$
E) $2 \times 10^{-7} s$

Correct Answer : Option C

70. The eye defect astigmatism can be corrected by using a

A) convex lens
B) spherical lens
C) plano-convex lens
D) concave lens
E) cylindrical lens

Correct Answer : Option E

71. The intensity of a polarized light can be controlled by a second polarizer from

A) 100% to 0%
B) 50% to 0%
C) 25% to 0%
D) 10% to 0%
E) 75% to 0%

Correct Answer : Option B

72. If a particle is moving with a momentum of $\left(2 \times 10^{10}\right)\mathrm{h}\ kgms^{-1}$ then the de Broglie wavelength associated with it (in angstrom) is (where h is Planck's constant)

A) 1.5

B) 2.5

C) 1.0

D) 0.5

E) 0.75

Correct Answer : Option D

73. The angular momentum of the electron revolving in 2^{nd} orbit is

A) $\frac{h}{\pi}$

B) $\frac{h}{2\pi}$

C) $\frac{2\mathrm{h}}{\pi}$

D) $\frac{3h}{2\pi}$

E) $\frac{h}{3\pi}$

Correct Answer : Option A

74. In the nuclear process, ${}^{22}_{11}Na \rightarrow {}^{22}_{10}Ne + e^{+} + X$, then X is

A) neutrino

B) anti-neutrino

C) electron

D) positron

E) neutron

Correct Answer : Option A

75. In a semiconductor crystal, the total number of electrons in the outer shell is 4N. At absolute zero, the number of energy states of valence and conduction band are respectively

A) 0 and 4N

B) 4N and 4N

C) 4N and 0

D) 8N and 0

E) 0 and 8N

Correct Answer : Option B