KEAM 2025 April 24 Pharmacy Question Paper

Time Allowed :3 Hours	**Maximum Marks : 600**	**Total Questions :**150

General Instructions

Read the following instructions very carefully and strictly follow them:

1. This question paper comprises 150 questions.
2. The Paper is divided into three parts- Maths, Physics and Chemistry.
3. There are 45 questions in Physics, 30 questions in Chemistry and 75 questions in Mathematics.
4. For each correct response, candidates are awarded 4 marks, and for each incorrect response, 1 mark is deducted.

1. Which of the following is non-aromatic?

(A) cyclohexene

(B) benzene

(C) naphthalene

---

2. The correct order of boiling point:

CH_3-CH_2-CH_2-CH_2-NH_2, CH_3-CH_2-NH-CH_2-CH_3, CH_3-CH_2-N$(CH_3)_2$

(1) CH_3-CH_2-CH_2-CH_2-NH_2 > CH_3-CH_2-NH-CH_2-CH_3 > CH_3-CH_2-N$(CH_3)_2$

(2) CH_3-CH_2-NH-CH_2-CH_3 > CH_3-CH_2-CH_2-CH_2-NH_2 > CH_3-CH_2-N$(CH_3)_2$

(3) CH_3-CH_2-N$(CH_3)_2$ > CH_3-CH_2-CH_2-CH_2-NH_2 > CH_3-CH_2-NH-CH_2-CH_3

(4) CH_3-CH_2-N$(CH_3)_2$ > CH_3-CH_2-NH-CH_2-CH_3 > CH_3-CH_2-CH_2-CH_2-NH_2

---

3. Which of the following is a non-polar molecule?

(A) CO_2

(B) H_2O

(C) CH_3Cl

---

4. Which among the following shows -R effect?

(A) -NO_2

(B) -NH_2

(C) -$NHCOCH_3$

(D) -OCH_3

---

5. Which one of the series of hydrogen spectrum is in the visible region?

(A) Lyman series (UV)

(B) Balmer series (Visible)

(C) Paschen series (IR)

(D) P-fund series

---

6. In the reaction $3Mg + N_2 \rightarrow Mg_3N_2$, the oxidation number of Mg changes is:

(A) $0 \rightarrow +3$

(B) $0 \rightarrow +6$

(C) $0 \rightarrow +2$

---

7. Which of the following is an extensive property?

(A) Density

(B) Volume

(C) Heat capacity

---

8. Choose the incorrect statement: (a) Actinoids are least reactive. (b) Does not react with HCl. (c) Does not react with HNO_3.

---

9. Which is a heterocyclic compound?

(A) Pyridine

(B) Benzene

(C) Toluene

(D) Cyclohexane

---

10. Chloro benzene and acetyl chloride react with anhydrous $AlCl_3$, to form 4-chloroacetophenone. The reaction is an example of:

(a) Nucleophilic substitution

(b) Nucleophilic addition

(c) Electrophilic substitution

---

11. Which of the following have a complete octet?

(A) $BeCl_2$

(B) BF_3

(C) $SnCl_2$

(D) LiCl

---

12. Acetone can be converted to 2-methylpropan-2-ol using:

(A) Grignard reagent

(B) Sodium hydride

(C) Hydrogen gas with Ni catalyst

(D) Sodium borohydride

---

13. N_2 exerts partial pressure of 7.698 bar in 1L water at 298K. What is the mole fraction of N_2 in the solution? Given that N_2 = 76.48K bar.

(A) 0.1

(B) 0.2

(C) 0.3

(D) 0.4

---

14. Which of the following is diamagnetic?

(A) $[MnCl_6]^{3-}$

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

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

(D) $[FeF_6]^{3-}$

---

15. $KMnO_4$ on heating at 513K produces:

(A) K_2MnO_4

(B) MnO_2

(C) Mn_2O_3

(D) MnO

---

16. IUPAC name of the compound $[Cr(H_2O)_3(NH_3)_3]Cl_3$

(A) Chromium(III) ammine aqua chloride

(B) Chromium(III) ammine chloride aqua

(C) Chromium(III) hexaaquachloride

(D) Chromium(III) hexaamminetrichloride

---

17. Square planar compound is:

(A) CCl_4

(B) CS_2

(C) XeF_4

---

18. A compound formed by reacting $CoCl_2$ with excess NH_3 gives 1 mol of AgCl with $AgNO_3$. Form the compound:

(A) $[Co(NH_3)_6]Cl_2$

(B) $[Co(NH_3)_4Cl_2]Cl$

(C) $[Co(NH_3)_5Cl_2]Cl$

(D) $[Co(NH_3)_3Cl_3]$

---

19. The element that has the highest melting point in the 3d series is:

(A) V

(B) Cr

(C) Mn

(D) W

---

20. The reagent for Etard's reaction is:

(A) CH_3COCl

(B) $AlCl_3$

(C) CrO_3

(D) NaOCl

---

21. Which element in the 3d series can form dihalides?

(A) Sc

(B) Ti

(C) Mn

(D) Fe

---

22. A body is rotated about a fixed axis. Which of the following is correct about angular velocity?

(A) Angular velocity is constant for a rotating body.

(B) Angular velocity is proportional to the moment of inertia.

(C) Angular velocity depends on the angular acceleration.

(D) Angular velocity is independent of the axis of rotation.

---

23. Express the final answer to the proper number of significant figures:

$$18.0 + 11.515 + 13.2 = \ldots$$

(A) 42.715

(B) 42.7

(C) 42.72

(D) 42.7150

---

24. If a p-n junction diode is forward biased, then:

(A) There will be less resistance

(B) Current is due to minority charge carriers only

(C) Barrier potential increases

(D) Width of depletion region increases

(E) Current is of the order of 10^{-6} A

---

26. Young's modulus and shear modulus are applicable for:

(A) Gases

(B) Solids

(C) Solid and Liquid

(D) Liquid and Gas

---

27. Find the magnetic field inside a solenoid having number of turns 7000, length 1m, and current 1 A.

(A) $4\pi \times 10^{-7}$ T

(B) $4\pi \times 10^{-5}$ T

(C) 2×10^{-3} T

(D) 1×10^{-3} T

---

28. The force between two point charges separated by a distance d is F. If one charge is moved away by a distance d, then the new force is:

(A) $F/4$

(B) $4F$

(C) $F/2$

(D) $F/2$

---

29. Specific heat capacity of diatomic gas at constant volume:

(A) $\frac{5}{2}R$

(B) R

(C) $\frac{3}{2}R$

(D) $\frac{7}{2}R$

---

30. Find the frequency of the waveform shown in the graph.

(A) 0.5 Hz

(B) 1 Hz

(C) 2 Hz

(D) 5 Hz

---

31. Find the magnification of a lens having focal length 5 cm (Least distance of distinct vision = 25 cm).

(A) 0.5

(B) 1

(C) 2

(D) 3

---

32. If T and n are surface tension and coefficient of viscosity, if temperature increases, then:

(A) Surface tension decreases, viscosity decreases

(B) Surface tension decreases, viscosity increases

(C) Surface tension increases, viscosity decreases

(D) Surface tension increases, viscosity increases

---

33. Moment of inertia of a disc about the axis passing through the center and perpendicular to the plane is I_1. What is the moment of inertia about its diameter?

(A) $I_1/2$

(B) I_1

(C) $I_1/4$

(D) $2I_1$

---

34. A wire of length 1m is clamped at half of its length. If the fundamental frequency is 3kHz, then find the velocity.

(A) 6 m/s

(B) 12 m/s

(C) 3 m/s

(D) 1.5 m/s

---

35. Forces acting on 2 bodies of masses 2kg and 3kg are same. What is the ratio of their acceleration?

(A) 3:2

(B) 2:3

(C) 1:1

(D) 1:2

---

36. Monochromatic light passing through a prism doesn't produce:

(A) Spectrum

(B) Diffraction

(C) Refraction

(D) Dispersion

---

37. What is the speed of water flowing through a hole located at a depth h from the surface of water in a tank?

(A) $\sqrt{2gh}$

(B) $\sqrt{gh}$

(C) $2gh$

(D) gh

---

38. Energy dissipated per unit time by a wire of resistance $2R$ connected to a 2V battery.

(A) $\frac{V^2}{2R}$

(B) $\frac{V^2}{R}$

(C) $\frac{V^2}{4R}$

(D) $\frac{V^2}{R} \times 2$

---

39. Area under F and t graph is?

(A) Work Done

(B) Kinetic Energy

(C) Power

(D) Energy

---

40. Vibration of atoms and molecules produce electromagnetic radiation in the region of:

(A) Microwaves

(B) Ultraviolet

(C) Infrared

(D) Visible Light

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41. A ball of mass 10g is dropped from a height of 50m. If 30J energy is lost due to air resistance, then what is the velocity of the ball when it hits the ground?

(A) 20 m/s

(B) 25 m/s

(C) 30 m/s

(D) 35 m/s

---

42. A lift having mass 1000kg moves upward against a frictional force of 2000N. Power given by motor is 36000W. What is the velocity of the lift?

(A) 2 m/s

(B) 3 m/s

(C) 5 m/s

(D) 6 m/s

---

43. If the threshold wavelength of a metal is in the green light region, then which of the following radiation cannot cause emission of electrons from metal?

(A) Blue

(B) Indigo

(C) Violet

(D) UV

(E) Orange

---

44. Relation between C_p, C_v and R

(A) $C_p - C_v = R$

(B) $C_p + C_v = R$

(C) $C_p \times C_v = R$

(D) $C_p / C_v = R$

---

45. Product of uncertainty in position (Δx) and uncertainty in velocity (Δv) has unit:

(A) $m \cdot s$

(B) $m^2 \cdot s^{-1}$

(C) $m \cdot s^{-1}$

(D) $m^2 \cdot s^2$

---

46. A coil of length l and area of cross-section A has resistance R. If the length is increased to 3 times and area decreases to $A/3$, then the new resistance is:

(A) $9R$

(B) $3R$

(C) $R/3$

(D) $R/9$

---

47. A body starts from rest and moves with an acceleration of $2\,\text{m/s}^2$ and comes to rest with a retardation of $2\,\text{m/s}^2$. Find the distance travelled?

(A) $20\,\text{m}$

(B) $25\,\text{m}$

(C) $30\,\text{m}$

(D) $40\,\text{m}$

---

48. Highest limiting conductance at 298 K is:

(1) Ca^{2+}

(2) Cs^{+}

(3) K^{+}

(4) Na^{+}

---

49. A subatomic particle of mass 2.2×10^{-28} kg. Velocity = $3 \times 10^5\,\text{ms}^{-1}$. De Broglie wavelength?

(1) $4.0 \times 10^{-10}\,\text{m}$

(2) 5.0×10^{-10} m

(3) 6.0×10^{-10} m

(4) 7.0×10^{-10} m

---

50. Metal in Wilkinson's catalyst?

(1) Fe

(2) Ni

(3) Ru

(4) Rh

---

51. Energy of H atom in ground state is 13.6 eV. No of spectral lines emitted by 'H' atom when a photon of energy 12.75 eV is received?

(A) 2

(B) 3

(C) 4

(D) 5

---

52. Which shows +6 oxidation state in fluorides?

(A) Mo

(B) Fe

(C) Cr

(D) Mn

---

53. Properties of canal rays:

(A) They are positively charged.

(B) They are negatively charged.

(C) They travel in straight lines.

(D) They have no mass.

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54. The carboxylic acid used widely in the leather industry is?

(A) Acetic acid

(B) Formic acid

(C) Butyric acid

(D) Propionic acid

---

55. Which has intramolecular hydrogen bonding?

Ortho nitrophenol, Para nitrophenol

(A) Ortho nitrophenol

(B) Para nitrophenol

(C) Both

(D) None

---

56. Preparation of $KMnO_4$ from Mg(II):

(A) Manganese oxide

(B) Potassium permanganate

(C) Manganese dioxide

(D) Potassium manganese oxide

---

57. Spin free complex?

(A) Fe^{3+}

(B) Co^{2+}

(C) Ni^{2+}

(D) Cu^{2+}

---

58. Order of acidity CH=CH, CH-C=CH, CH-C=C-CH?

(A) CH=CH > CH-C=CH > CH-C=C-CH

(B) CH-C=CH > CH=CH > CH-C=C-CH

(C) CH-C=C-CH > CH-C=CH > CH=CH

(D) CH-C=CH > CH-C=C-CH > CH=CH

---

59. Amount of charge needed to dissociate MgCl?

(A) 2 moles

(B) 1 mole

(C) 3 moles

(D) 4 moles

---

60. Aryl halides react with Na in dry ether gives diphenyls. Name of the reaction is:

(A) Wurtz reaction

(B) Sandmeyer reaction

(C) Finkelstein reaction

(D) Reimer-Tiemann reaction

---

61. ΔH and ΔS value of a reaction which is non-spontaneous at high T and spontaneous at low T is:

(A) $\Delta H > 0, \Delta S < 0$

(B) $\Delta H < 0, \Delta S > 0$

(C) $\Delta H > 0, \Delta S > 0$

(D) $\Delta H < 0, \Delta S < 0$

---

62. The amount of NaOH required to neutralize 9.8g H_2SO_4 is:

(A) 1 mol

(B) 0.1 mol

(C) 2 mol

(D) 0.5 mol

---

63. Phenol can be converted into benzene by treating with:

(A) Zn dust

(B) Na-Hg

(C) $LiAlH_4$

(D) $NaBH_4$

64. Acetanilide is prepared by reacting ——-and——-.

(A) Aniline and acetic acid

(B) Aniline and acetic anhydride

(C) Acetone and aniline

(D) Aniline and acetic chloride

---

65. Matrix match: Match the items in the list with the appropriate compounds.

Matrix match

i) Non reducing disaccharide	a) Fructose
ii) Reducing disaccharide	b) Glucose
iii) Aldohexose	c) Sucrose
iv) Ketohexose	d) Lactose
v) Polysaccharide	e) Maltose

---

64. Which of the following shows -R effect?

(A) $-CN$

(B) $-OCOCH_3$

(C) $-OCH_3$

(D) $-Cl^-$

(E) $-OH$

---

65. Which of the following is more soluble in water at 298 K?

(A) HCHO

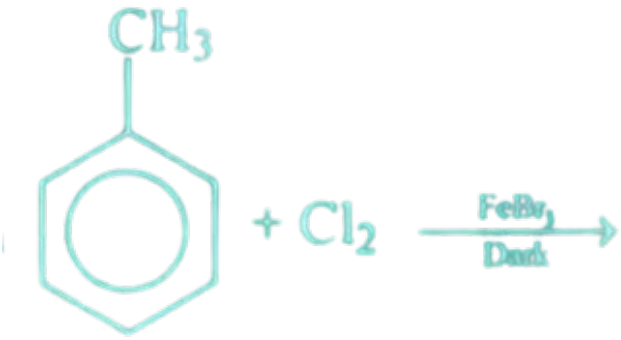
(B) Vinylchloride

(C) Argon

(D) CO_2

(E) None of the above

66. Identify the product of the reaction:



(A) 1-chloro-2-methylbenzene

(B) 1-chloro-3-methylbenzene

(C) 1-chloro-4-methylbenzene

(D) 2-chloro-1,4-dimethylbenzene

---

67. Which of the following has the smallest ionic radius?

(A) Sc^{3}

(B) Ti^{3}

(C) V^{3}

(D) Cr^{3}

(E) Mn^{3}

---

68. Which of the following amino acids are synthesized in our body?

(A) Proline

(B) Valine

(C) Histidine

(D) Arginine

(E) Leucine

---

69. Which of the following has an expanded octet?

(A) NH_3

(B) H_2SO_4

(C) SF_4

(D) $BeCl_2$

---

70. IUPAC name of C_6H_14 is:

(A) Hexane

(B) Cyclohexane

(C) Heptane

(D) Octane

---

71. Name of the following reaction:

Benzaldehyde + Acetophenone $\rightarrow$ Benzalacetophenone

(A) Aldol Condensation

(B) Friedel-Crafts Acylation

(C) Claisen Condensation

(D) Benzoin Condensation

---

72. The pKa value of a 0.1 M solution of a weak acid HA with pH = 4 is:

(A) 4.5

(B) 5

(C) 3

(D) 3.5

---

73. Aspirin is also called:

(A) Methylsalicylate

(B) Ethyl salicylate

(C) Acetylsalicylate

(D) Acetylsalicylic acid

---

74. Which of the following statement is incorrect?

(A) Work done in uniform circular motion is zero

(B) Work done in stretching a spring is positive

(C) Work done on a freely falling body is positive

(D) Work done depends on time taken

---

75. A shell in projectile motion explodes while in motion, what is the trajectory of the center of the fragments?

(A) A straight line

(B) A circle

(C) A parabola

(D) A hyperbola

---

76. Which of the following is true in an SHM?

(A) PE is maximum at $x = 0$

(B) KE is maximum at $x = 0$

(C) PE is minimum at $x = A$

(D) KE is minimum at $x = 0$

---

77. When blue light is incident on metal surface, photoelectrons are emitted. When green light is incident, no photoelectrons are emitted. What is the number of photoelectrons emitted when yellow light is incident?

(A) Zero

(B) Equal to the number for blue light

(C) Less than for blue light

(D) Greater than for blue light

---

78. What is the ratio of gyration of ring and disc?

(A) 1:2

(B) 1:4

(C) 2:1

(D) 1:1

---

79. When a body is dropped from height H, the time taken to reach the ground is T. What is the time taken to reach height H/2 from the ground?

(A) $\frac{T}{2}$

(B) $\frac{T}{\sqrt{2}}$

(C) $\sqrt{2}T$

(D) $\frac{T}{4}$

---

80. An equiconvex lens of power P is cut perpendicular to its principal axis, into 2 equal parts, power of each part?

(A) $P/2$

(B) $2P$

(C) P

(D) Zero

---

81. What is the angle between the current and the magnetic field if a conductor carrying 2A current placed in a magnetic field of 4T experiences a force of 10N?

(A) $90°$

(B) $45°$

(C) $30°$

(D) $60°$

---

82. What is the path followed by a charge entering a uniform magnetic field with its initial velocity along the direction of the magnetic field?

(A) Circular path

(B) Parabolic path

(C) Straight line

(D) Helical path

---

83. Find the pressure on an air bubble of radius r at a height h from the surface of the water.

(A) $\frac{4T}{r}$

(B) $\frac{2T}{r}$

(C) $\frac{T}{r}$

(D) $\frac{8T}{r}$

---

84. What is the work done to stretch a string?

(A) $\frac{1}{2} \times$ load $\times$ strain

(B) load $\times$ strain

(C) $Y \times$ strain

(D) $\frac{1}{2} \times Y \times$ strain

---

85. Three forces are acting on a particle in which F_1 and F_2 are perpendicular. If F_1 is removed, find the acceleration of the particle.

(A) $\frac{F_2}{m}$

(B) $\frac{F_1}{m}$

(C) $\frac{F_1+F_2}{m}$

(D) $\sqrt{\left(\frac{F_1}{m}\right)^2 + \left(\frac{F_2}{m}\right)^2}$

---

86. Acceleration of the freely falling metal rod in a cycling ring?

(A) g

(B) $2g$

(C) 0

(D) $g/2$

---

87. The ratio of frequency of the 3rd mode of vibration for the closed organ pipe and the open pipe of length L?

(A) 1:2

(B) 2:1

(C) 1:1

(D) 3:2

---

88. To have the same RMS value as that of hydrogen at 30K, what will be the temperature of the oxygen molecule?

(A) 60K

(B) 90K

(C) 180K

(D) 45K

---

89. If $\frac{C_p}{C_v}$ is unity for a process, $PV^\gamma =$ constant, then the process is:

(A) Adiabatic

(B) Isothermal

(C) Isobaric

(D) Isochoric

---

90. If a bar magnet is doped into a circular ring placed horizontally, then what change will happen?

(A) Magnetic field increases in the ring

(B) Magnetic field decreases in the ring

(C) No effect on magnetic field

(D) Magnetic field becomes zero

---

91. If fringe width obtained in a YDSE is 1.3mm. If the whole system is dipped in a liquid of refractive index 1.3, then the new fringe width will be:

(A) 1.3mm

(B) 1mm

(C) 1.6mm

(D) 0.8mm

---

92. Band gap energy of Si is:

(A) 0.8 eV

(B) 1.1 eV

(C) 2.3 eV

(D) 3.5 eV

---

93. Which of the following is incorrect?

(A) Current is a scalar quantity

(B) Current density is a vector quantity

(C) Conductivity is the reciprocal of resistivity

(D) Ohm's law asserts that the graph plotted I vs V is a straight line

---

94. If $B = 400\sqrt{2}\sin(\omega t - kx)$, find the peak value of the magnetic field of the electromagnetic wave.

(A) 400 T

(B) 200 T

(C) 400 Gauss

(D) 200 Gauss

---

95. 3 capacitors of capacitance 12μF each is connected in series. If the voltage is 12V, what charge is drawn from the cell?

(A) 12μC

(B) 36μC

(C) 4μC

(D) 24μC

---

96. The power dissipated by a particle with constant force and constant acceleration is proportional to the:

(A) Load $\times$ Strain

(B) Load

(C) $Y \times$ Strain

(D) Strain

---

97. The dimension of $\lambda \times t$ (decay constant λ multiplied by time t) is:

(A) $[T]$

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

(C) $[T^2]$

(D) $[1]$

---

98. Arrange the following in the order of conductivity: Na, Ag, Fe, Cu

(A) Ag $>$ Cu $>$ Fe $>$ Na

(B) Na $>$ Cu $>$ Ag $>$ Fe

(C) Fe $>$ Ag $>$ Na $>$ Cu

(D) Cu $>$ Na $>$ Fe $>$ Ag

---

99. Find pH of the solution if $[H^+] = 2 \times 10^{-4}$ mol/L

(A) 3.5

(B) 4.5

(C) 5.5

(D) 6.5

---

100. Which among the following acts as a Lewis acid?

(A) AlCl

(B) NH

(C) OH

(D) HO

---

101. What is the Reimer Tieman reaction?

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102. What is Layer's test?