

UNIVERSITY OF LUCKNOW

D.Pharm Entrance Examination

Biology Group — Model Test Paper Set 3

Total Questions: 100 | Section A: Chemistry & Physics (50) + Section B: Biology (50)

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SECTION A — Chemistry & Physics [50]

Chemistry

1. Water and 95% ethanol are most used solvent in UV-spectroscopy because _____.

- (a) They are H-bonded solvents (b) They are transparent in UV-spectrum
(c) They dissolve non-polar compounds (d) They are highly polar compounds

Answer: (b) They are transparent in UV-spectrum

2. The minimum amount of fissionable material that can produce a self sustaining chain reaction is called _____.

- (a) Inoculum (b) Flux
(c) Critical mass (d) Feed

Answer: (c) Critical mass

3. Reactors which use UO Pellets enriched to 2.3% fuel, D₂O as moderators and water as coolant is called _____.

- (a) Pressurised water reactor (b) Boiling water reactor
(c) Fast breeder reactor (d) Steam generating heavy water reactor

Answer: (d) Steam generating heavy water reactor

4. Release of chemicals to the environment in US is tracked by _____.

- (a) IUPAC (b) Toxics release inventory
(c) International Chemical Laboratory (d) Pollution prevention control board

Answer: (b) Toxics release inventory

5. % yield of any reaction is given by _____.

- (a) (Actual weight obtained) / (Theoretical weight) × 100
(b) [(Theoretical weight - Actual weight) / Theoretical weight] × 100
(c) [(Actual weight - Theoretical weight) / Theoretical weight] × 100
(d) (Theoretical weight obtained) / (Actual weight) × 100

Answer: (a) (Actual weight obtained) / (Theoretical weight) × 100

6. The stability order for carbocations are _____.

- (a) CH₃ < primary < secondary < tertiary
(b) CH₃ < tertiary < primary < secondary
(c) Tertiary < secondary < primary < CH₃
(d) Tertiary < CH₃ < secondary < primary

Answer: (a) CH₃ < primary < secondary < tertiary

7. Radical stabilization in free radicals is defined by _____.

- (a) C-C bond dissociation energy (b) C-H bond enthalpy
(c) C-C bond enthalpy (d) C-H bond dissociation energy

Answer: (d) C-H bond dissociation energy

8. Example of homogenous catalysts used in homogenous hydrogenation is _____.

- (a) Pt (b) Complexes of Rhodium
(c) Finely dispersed Platinum (d) Finely dispersed Rhodium

Answer: (b) Complexes of Rhodium

9. In epoxidation of E-2-butene, major product formed will be _____.

- (a) trans-2,3-dimethyloxirane (b) Racemic mixture of cis and trans-2,3-dimethyloxirane
(c) cis-2,3-dimethyloxirane (d) Not determinable

Answer: (a) trans-2,3-dimethyloxirane

10. An IR-spectra is found to have a medium adsorption peak near 3400cm^{-1} IR-mheske :

- (a) Aldehydes (b) Esters
(c) Amines (d) Alcohols

Answer: (c) Amines

11. In nitration process, the reaction typically proceeds through a _____.

- (a) Cationic intermediate (b) Zwitterionic intermediate
(c) Anionic intermediate (d) Free radical intermediate

Answer: (a) Cationic intermediate

12. Diel's- Alder reaction is an example of _____

- (a) Regioselective anti (b) Stereospecific anti
(c) Regioselective syn (d) Stereospecific syn

Answer: (d) Stereospecific syn

13. Preparation of initial extract typically implements _____.

- (a) Non-polar solvents (b) Mixture of polar and non-polar solvent
(c) Supercritical fluids (d) Polar solvents

Answer: (d) Polar solvents

14. Benzoic acid and Glycine reacts in presence of Acyl synthetase to give _____.

- (a) N-acetylprocainamide (b) Salicylic acid
(c) Acylic acid (d) Hippuric acid

Answer: (d) Hippuric acid

15. Cholesterol lowering drugs are known as _____.

- (a) Statins (b) Anthraquinones
(c) Alkaloids (d) Quinones

Answer: (a) Statins

16. In polymerization process of Ethylene, it is heated at high pressure in presence of oxygen or a peroxide. This process is known as _____.

- (a) Coordination polymerization (b) Anionic polymerization
(c) Free radical polymerization (d) Cationic polymerization

Answer: (c) Free radical polymerization

17. The binding of oxygen molecules :

- (a) Interannular Cooperativity (b) Intramolecular Cooperativity
(c) Intermolecular Cooperativity (d) Chelate Cooperativity

Answer: (c) Intermolecular Cooperativity

18. An alkaloid containing an indole core and produced in living organism from the amino acid tryptophan is _____.

- (a) Quinine (b) Piperine
(c) Bufotenin (d) Ephedrine

Answer: (c) Bufotenin

19. Structure isoelectronic with naphthalene is _____.

- (a) Benzimidazole (b) Pyrrole
(c) Furan (d) Imidazole

Answer: (a) Benzimidazole

20. Maltose, which is obtained by hydrolysis of starch and cellobiose are _____.

- (a) Monosaccharide (b) Sugar
(c) Polysaccharide (d) Disaccharide

Answer: (d) Disaccharide

21. Anion exchange chromatographic methods at high pH (>12) with sodium hydroxide or sodium hydroxide :

- (a) Proteins (b) Sugar
(c) Anions (d) Carbohydrates

Answer: (d) Carbohydrates

22. Liquid chromatography is a technique used to separate a sample into its individual parts. This separation occurs based on the interaction of the sample with the mobile and stationary phases. Because there many stationary :

- (a) 50% (b) 100%
(c) 41% (d) 50.20%

Answer: (c) 41%

23. When macromolecular crowding increases, the chemical potential of protein _____.

- (a) Remains unchanged (b) Increases
(c) Initially increases then decreases (d) Decreases

Answer: (b) Increases

24. For a molecule, molecular ion peak appears :

- (a) $\text{CH}-\text{CHO}-\text{CH}-\text{CH}_3$ (b) $\text{CH}-\text{CH}-\text{CO}-\text{CH}-\text{CH}_3$
(c) $\text{CH}-\text{CH}-\text{CO}-\text{O}-\text{CH}-\text{CH}_3$ (d) $\text{CH}-\text{CH}-\text{CO}-\text{CH}_3$

Answer: (c) $\text{CH}-\text{CH}-\text{CO}-\text{O}-\text{CH}-\text{CH}_3$

25. XRD peaks are produced by _____

- (a) Destructive interference (b) Constructive interference
(c) Absorption (d) Diffraction

Answer: (b) Constructive interference

Physics

26. A conductor has a positive charge of 19.2×10^{-19} Coulombs. How many electrons are in short on the conductor ?

- (a) 12 (b) 16
(c) 20 (d) 18

Answer: (a) 12

27. The cell reaction of a secondary battery is ?

- (a) Endothermic (b) Irreversible
(c) Equilibrium (d) Reversible

Answer: (d) Reversible

28. The internal resistance of an ideal constant voltage source is ?

- (a) Infinite (b) None of the above
(c) equal to resistance of load (d) Zero

Answer: (d) Zero

29. A body of mass 1 kg is suspended from a string of length 1 meter. The body is rotated in a vertical circle with constant speed 2 m/s. The tension of the string when it is horizontal is ?

- (a) 2N (b) 3N
(c) 4N (d) 1N

Answer: (c) 4N

30. A person climbs up a stalled escalator in 60 s. If standing on the same but escalator running with constant velocity he takes 40 s. How much time is taken by the person to walk up the moving escalator ?

- (a) 45 s (b) 24 s
(c) 37 s (d) 27 s

Answer: (b) 24 s

31. A projectile has a maximum range of 16 km. At the highest point of its motion, it explodes into two equal masses. One mass drops vertically downward. The horizontal distance covered by the other mass from the time of explosion will be:

- (a) 8 km (b) 32 km
(c) 16 km (d) 24 km

Answer: (c) 16 km

32. In Bohr model of the hydrogen atom, the 2.2×10^6 electron travels with speed m/s in a circle ($r = 5.3 \times 10^{-11}$ m) about the nucleus. The value of B at the nucleus due to electron's motion, is:

- (a) 40.0 T (b) 30.0 T
(c) 12.5 T (d) 25.0 T

Answer: (c) 12.5 T

33. The equation $-\mathbf{J} \cdot \mathbf{E} = +\nabla \cdot \mathbf{s}$ is called ∂t ?

- (a) Stoke's law (b) None of these
(c) Coulombs law (d) Poynting theorem

Answer: (d) Poynting theorem

34. The peak voltage in a 240V A.C. source is ?

- (a) 340 V (b) 240 V
(c) 380 V (d) 300 V

Answer: (a) 340 V

35. The phenomenon of adiabatic demagnetization is used to ?

- (a) Produce very low temperature (b) Demagnetize a magnet
(c) Generate electricity (d) Purify a gas

Answer: (a) Produce very low temperature

36. Which of the following produces magnetic field?

- (a) Diamagnetic substance (b) Force
(c) Time varying field (d) Electric dipole

Answer: (c) Time varying field

37. The increase in the relativistic mass of a particle of rest mass 1 gm when it is moving with 0.8 c velocity is :

- (a) 0.667 gm (b) 1 gm
(c) zero (d) 1.667 gm

Answer: (d) 1.667 gm

38. The frequency of a light spring when 1 kg weight is suspended on its end is 4 oscillations per second. If 4 kg weight suspended to the same spring, the frequency of oscillations shall be ?

(a) 4 per sec (b) 16 per sec

(c) 2 per sec (d) 8 per sec

Answer: (c) 2 per sec

39. If work required to blow a soap bubble of radius R is W , then the additional work required to blow its radius upto $3R$ will be ?

(a) $3W$ (b) $9W$

(c) $8W$ (d) $27W$

Answer: (c) $8W$

40. Eight equal drops of water are falling through air with a steady velocity of 5 cm/sec . If the drops collapse, what will be the new terminal velocity?

(a) 20 cm/s (b) 10 cm/s

(c) 5 cm/s (d) 40 cm/s

Answer: (a) 20 cm/s

41. In the circuit show in figure, power developed across $1\ \Omega$, $2\ \Omega$ and $3\ \Omega$ resistance are in the ratio of ?

(a) $6 : 4 : 1$ (b) $2 : 1 :$

(c) $4 : 2 : (d) 1 : 2 :$

Answer: (c) $4 : 2 :$

42. A capacitor of capacitance $6\ \mu\text{F}$ is charged upto 100 volt . The energy stored in the capacitor is- ?

(a) 0.06 H (b) 0.6 J

(c) 0.03 J (d) 0.3 J

Answer: (c) 0.03 J

43. An electron and a proton are about m apart. Their relative motion is chiefly determined by ?

(a) gravitational forces (b) nuclear forces

(c) magnetic forces (d) electrical forces

Answer: (d) electrical forces

44. Twenty seven identical drops of mercury are charged simultaneously to the potential of 10 volts . If all the drops combine to form a single drop, what will be the potential of bigger drop ? Assume drops to be spherical ?

(a) 90 volts (b) 120 volts

(c) 100 volts (d) 70 volts

Answer: (a) 90 volts

45. $\mathbf{J}=\sigma\mathbf{E}$, where \mathbf{J} is current density, σ is conductivity and \mathbf{E} is electric field, is ?

(a) Maxwell's equation (b) Continuity equation

(c) A form of Ohm's law (d) Ampere's law

Answer: (c) A form of Ohm's law

46. Zone plate is a device to study diffraction. The radii of its zones are proportional to ?

(a) inverse of natural numbers (b) square of natural numbers

(c) square root of natural numbers (d) natural numbers

Answer: (c) square root of natural numbers

47. Two yellow sodium lines of wavelengths 5890 \AA and 5896 \AA are just resolved by a prism. The resolving power of the prism is ?

(a) 6 (b) 981.16

(c) 0.102 (d) 5893

Answer: (b) 981.16

48. The ratio of light intensity scattered by two $^{\circ}$ colours of wavelengths 4000A and 6000A is ?

- (a) 5 (b) 7
(c) 2 (d) 1

Answer: (a) 5

49. In case of diffraction due to an opaque circular disc, the centre of the shadow is always ?

- (a) none of the above (b) coloured
(c) bright (d) dark

Answer: (c) bright

50. Light is polarized to the maximum, when it is incident on a glass surface at an angle of incidence ?

- (a) 670 (b) 570
(c) 370 (d) 530

Answer: (b) 570

SECTION B — Biology [50]

Zoology

51. Organisms bears hollow and pneumatic long bones is ?

- (a) Sea anemone (b) Obelia
(c) Neophron (d) Metamerism

Answer: (c) Neophron

52. Well -developed alimentary canals and muscular pharynxes are present in ?

- (a) Bioluminescence (b) Kingdom animalia
(c) Aschelminthes (d) Porifera Coelenterata/Cnidaria

Answer: (c) Aschelminthes

53. Fertilisation is internal in ?

- (a) Cnidaria (b) Aschelminthes
(c) Crocodile (d) Arthropoda

Answer: (b) Aschelminthes

54. Common name of Ancylostoma is ?

- (a) Osmoregulation, Excretion (b) Gastrovascular cavity
(c) Hookworm Annelida (d) Bioluminescence

Answer: (c) Hookworm Annelida

55. Animals does not undergo metamorphosis is ?

- (a) Longitudinal, Circular (b) Prawn, Scorpion, Locusta
(c) Mammary glands (d) Grasshoppers and Earthworm

Answer: (d) Grasshoppers and Earthworm

56. animals are true coelomates with bilateral symmetry ?

- (a) Annelids 7 (b) Annelida
(c) Crocodile (d) Coelenterata

Answer: (a) Annelids 7

57. Phylum Annelida belongs to ?

- (a) Osmoregulation and excretion (b) Kingdom animalia
(c) Mammary glands (d) Proteinaceous pellicle

Answer: (b) Kingdom animalia

58. A feature of annelids is not ?

- (a) Arthropoda (b) Sea anemone
- (c) Aschelminthes (d) Pseudocoelomate

Answer: (d) Pseudocoelomate

59. Annelid has type of muscles for locomotion ?

- (a) Longitudinal, Circular (b) Cilia for locomotion
- (c) Paramecium Caudatum (d) Silkworm and apis

Answer: (a) Longitudinal, Circular

60. Parapodia helps in is ?

- (a) Crocodile (b) Flagellated protozoans
- (c) Cnidaria (d) Locomotion

Answer: (d) Locomotion

61. Closed circulatory system is present in ?

- (a) Arthropoda (b) Cnidaria
- (c) Pseudocoelomate (d) Annelida

Answer: (d) Annelida

62. The common name of Hirudinaria is ?

- (a) Paramecium Caudatum (b) Cattle leech
- (c) Aschelminthes (d) Arthropoda

Answer: (b) Cattle leech

63. Double ventral nerve cord presents in is ?

- (a) Cnidaria (b) Pheretima
- (c) Longitudinal, Circular (d) Annelida

Answer: (b) Pheretima

64. Nephridia helps in is ?

- (a) Kingdom animalia (b) Osmoregulation, Excretion
- (c) Ascaris & Fasciola (d) Grasshoppers and Earthworm

Answer: (b) Osmoregulation, Excretion

65. Monoecious examples of is ?

- (a) Gills, Book-gills, Book-lungs and tracheae (b) Gills, Lungs and Skin
- (c) Leeches, Earthworm and liver fluke (d) Presence of a muscular diaphragm

Answer: (c) Leeches, Earthworm and liver fluke

66. Triploblastic, metamerically segmented and coelomate animals are found in ?

- (a) Mammary glands (b) Kingdom animalia
- (c) Flatworms (d) Annelida

Answer: (d) Annelida

67. An example of dioecious is ?

- (a) Bilateral (b) Jointed legs
- (c) Nereis (d) Arthropoda

Answer: (c) Nereis

68. Presence of metameres is a characteristic feature of ?

- (a) Annelida and arthropoda Arthropoda (b) Ascaris & Fasciola
- (c) Grasshoppers and Earthworm (d) Gills, Book-gills, Book-lungs and tracheae

Answer: (a) Annelida and arthropoda Arthropoda

69. In phylum arthropoda, excretion takes place through is ?

- (a) Malpighian tubules (b) Crocodile
- (c) Hookworm Annelida (d) Paramecium Caudatum

Answer: (a) Malpighian tubules

70. _____ possesses poison sting and belongs to class chondrichthyes ?

- (a) Arthropoda (b) Trygon
- (c) Flatworms (d) Ommatidia

Answer: (b) Trygon

71. Animals belongs to the same phylum arthropoda ?

- (a) Mammary glands (b) Whales, Dolphins, Seals
- (c) Jointed appendages Mollusca (d) Prawn, Scorpion, Locusta

Answer: (d) Prawn, Scorpion, Locusta

72. Animals like annelids, arthropods, etc. where the body can be divided into identical left and right halves in only one plane, exhibit _____ symmetry is ?

- (a) Eight (b) Bilateral
- (c) Tunicata (d) Crocodile

Answer: (b) Bilateral

73. Changes that allow the conversion of larva into adult is called ?

- (a) Metamorphosis (b) Fasciola
- (c) Arthropoda (d) Mollusca

Answer: (a) Metamorphosis

74. Exoskeleton, metameric segmentation and jointed appendages is characterized by ?

- (a) Mollusca (b) Annelida
- (c) Arthropoda (d) Ctenophora

Answer: (c) Arthropoda

75. Dengue fever is spread by ?

- (a) Body surface (b) Annelida
- (c) Aedes (d) Nereis

Answer: (c) Aedes

Botany

76. The elongated, thick-walled and tapering cells are ?

- (a) Single layer (b) Intercellular spaces
- (c) Sclerenchymatous (d) Collenchyma

Answer: (c) Sclerenchymatous

77. The woody axis of flowering is produced by ?

- (a) Xylem parenchyma (b) Unicellular
- (c) Collenchyma (d) Secondary meristem

Answer: (d) Secondary meristem

78. Plasmodesmata are usually observed between ?

- (a) Sieve tubes and companion cells (b) Dermal , Ground , Vascular tissues
- (c) Flaccidity of bulliform cells (d) Adaxial epidermis of dorsiventral leaf

Answer: (a) Sieve tubes and companion cells

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79. You are given a fairly old piece of dicot stem and a dicot root. The anatomical structures will you use to distinguish between the two ?

- (a) Protoxylem (b) Collenchyma
- (c) Epidermis (d) Single layer

Answer: (a) Protoxylem

80. Grass leaves curl inwards during very dry weather, because is ?

- (a) Living mechanical tissue (b) Flaccidity of bulliform cells
- (c) From medullary rays (d) Solid endosperm of coconut

Answer: (b) Flaccidity of bulliform cells

81. The tissues provide maximum mechanical support to plant organs. The tissue is ?

- (a) Woody trees (b) Cuticle covering
- (c) Phloem (d) Sclerenchyma

Answer: (d) Sclerenchyma

82. The commonly found tissue in pulp of fruits like guava and in leaves of tea is ?

- (a) Sclereid (b) Secondary meristem
- (c) Secondary xylem (d) Xylem, Phloem

Answer: (a) Sclereid

83. Phloem in gymnosperms lacks is ?

- (a) Both sieve tubes and companion cells (b) Both monocot and dicot roots.
- (c) Deposition of organic compounds (d) Adaxial epidermis of dorsiventral leaf

Answer: (a) Both sieve tubes and companion cells

84. A plant tissue, when stained, showed the presence of hemicellulose and pectin in cell wall of its cells. The tissue represents is ?

- (a) Xylem, Phloem (b) Collenchyma
- (c) Secondary meristem (d) Dicot stem

Answer: (b) Collenchyma

85. conditions of xylem is present in both monocot and dicot stems ?

- (a) Monocot stem (b) Cambium
- (c) Endarch (d) Lateral meristem

Answer: (c) Endarch

86. The tissue system that constitutes bulk of the plant body is ?

- (a) Ground tissue system (b) Guard cell
- (c) Bast fibres (d) Vascular bundles

Answer: (a) Ground tissue system

87. In vascular bundle, a strip of vascular cambium is present in between the xylem and phloem ?

- (a) Open (b) Unicellular
- (c) Lignified (d) Sclerenchyma

Answer: (a) Open

88. Radial vascular bundles characteristically occur in ?

- (a) roots (b) Shimla
- (c) Single layer (d) Collenchyma

Answer: (a) roots

89. Vascular system consists of is ?

- (a) Companion cells (b) Heart wood
(c) Xylem, Phloem (d) Collenchyma

Answer: (c) Xylem, Phloem

90. In collenchyma, thickenings are due to deposition of ?

- (a) Translocation of organic solutes (b) Intercalary meristems
(c) Apical, Intercalary meristem (d) Cellulose, Hemicellulose, Pectin

Answer: (d) Cellulose, Hemicellulose, Pectin

91. In fruit walls of nuts, pulp of guava and pear, seed coats of legumes found ?

- (a) Dicot stem (b) Pectin
(c) Sclereids (d) Three

Answer: (c) Sclereids

92. Root hairs are ?

- (a) Cambium (b) Sclerenchymatous
(c) Unicellular (d) Endarch

Answer: (c) Unicellular

93. Cuticle is absent in ?

- (a) Collenchyma (b) Dicot stem
(c) Roots (d) Periderm

Answer: (c) Roots

94. Cuticle is secreted from ?

- (a) Mechanical support (b) Epidermis
(c) Simple tissues (d) Collenchyma

Answer: (b) Epidermis

95. Bean-shaped structure which encloses stomatal pore is known as ?

- (a) Collenchyma (b) Guard cell
(c) Woody trees (d) Single layer

Answer: (b) Guard cell

96. Mesophyll cells come under is ?

- (a) Internal Ground tissue (b) Sieve tubes and companion cells
(c) Translocation of organic solutes (d) Interfascicular cambium, phellogen

Answer: (a) Internal Ground tissue

97. Closed vascular bundles lack is ?

- (a) Collenchyma (b) Endarch
(c) Cambium (d) Sclereid

Answer: (c) Cambium

98. Epidermal tissue system is not a part of ?

- (a) Companion cells (b) Ground tissue system
(c) Xylem, Phloem (d) Collenchyma

Answer: (a) Companion cells

99. Ground tissue system is not part of ?

- (a) Cuticle covering (b) Vascular bundles
(c) Thin-walled (d) Barrel-shaped

Answer: (b) Vascular bundles

100. If xylem and phloem are arranged to different radii, then arrangement of vascular bundles is said to be ?

- (a) Guard cell (b) Shimla
- (c) Radial (d) Collenchyma

Answer: (c) Radial

