

UNIVERSITY OF LUCKNOW

D.Pharm Entrance Examination

Biology Group — Model Test Paper Set 4

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

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SECTION A — Chemistry & Physics [50]

Chemistry

1. State whether true or false: 'The entropy of an isolated system tends to decrease with time.' yeleeSb efke :

- (a) True (b) False
(c) False 'Only at time t= (d) True Only time ~

Answer: (b) False

2. A particle in a box possesses an irremovable minimum energy called the _____.

- (a) Transmission energy (b) Transition-state energy
(c) Barrier energy (d) Zero-point energy

Answer: (d) Zero-point energy

3. For a reaction with rate law $V=k[A][B]^2$, if r reactant [A] is present in large excess of concentration and it remains constant throughout the reaction then the order of the reaction will be _____.

- (a) First order reaction (b) Paeudo-second order reaction
(c) Second order reaction (d) Pseudo-first order reaction

Answer: (b) Paeudo-second order reaction

4. A cubic unit cell has _____

- (a) 1 twofold axes (b) 2 threefold axes
(c) 3 threefold axes (d) 4 threefold axes

Answer: (d) 4 threefold axes

5. Which statement about Miller notation :

- (a) Only (B) is true (b) Both (A) and (B) are true
(c) Both (A) and (B) are false (d) Only (A) is true

Answer: (d) Only (A) is true

6. A sample of mixture of molecules with various chain lengths and molar masses constitute _____.

- (a) Protein (b) Monodisperse polymer
(c) Peptide (d) Polydisperse polymer

Answer: (d) Polydisperse polymer

7. If pure ribosomal preparation from E-coli is sedimented at a high Mg^{2+} concentration, the preparation sediments given _____.

- (a) 3 peaks at 70s, 50 s and 30 s (b) No peak at all
(c) 2 peaks of 30s and 50 s enclosing more area (d) 1 peak at 70 s

Answer: (d) 1 peak at 70 s

8. Compound used as intercalating agent is _____.

- (a) SDS (b) EtBr
(c) CsCl (d) EDTA

Answer: (b) EtBr

9. A protein has a sedimentation coefficient value of 3.12 :

- (a) 16200 (b) 34800
- (c) 33700 (d) 32700

Answer: (c) 33700

10. The instrument that makes use of the current due to electrons that tunnel between the surface and the tip is called _____.

- (a) Transmission electron microscopy (b) Scanning tunnelling microscopy
- (c) Atomic force microscopy (d) Scanning electron microscopy

Answer: (b) Scanning tunnelling microscopy

11. Which statement(s) stands true for Langmuir isotherm?

- (a) Only (B) is true (b) Both (A) and (B) are false
- (c) Both (A) and (B) are true (d) Only (A) is true

Answer: (a) Only (B) is true

12. X-ray diffraction utilises electrons of energy range _____.

- (a) 200-2000 eV (b) >2000 eV
- (c) 10-200 eV (d) <10 eV

Answer: (c) 10-200 eV

13. Catalysts functionalised with siloxane anchors can be attached to SiO nano particles via [Si]- 2 :

- (a) Achieving better catalytic yield (b) Decreasing the reactivity of a reaction
- (c) Enhancing reactivity of Nanoparticles (d) Relatively easy separability of catalyst

Answer: (d) Relatively easy separability of catalyst

14. Catalyst used for heterogenous electrolysis for water oxidation are _____.

- (a) Palladium complex (b) Platinum (finely divide)
- (c) Siloxanes (d) Nickel oxides

Answer: (d) Nickel oxides

15. Shape selective catalysts are called _____.

- (a) Silanols (b) Enzymes
- (c) Colloids (d) Zeolites

Answer: (d) Zeolites

16. Materials possessing both amorphous and polycrystalline behaviour with abrupt changes 37 YCT in crystal orientation across individual grain boundaries in the extended lattice are _____.

- (a) Glass (b) Ceramics
- (c) Silicates (d) Carbenes

Answer: (b) Ceramics

17. A common method used to grow a single crystal where the non-solvent is layered on the top of crystallisation solvent is called _____.

- (a) Vapour diffusion (b) Interfacial method
- (c) X-ray diffraction (d) Sublimation

Answer: (a) Vapour diffusion

18. HgS possesses a _____

- (a) Rhombohedral (b) FCC
- (c) BCC (d) Cubic centre

Answer: (b) FCC

19. Modern materials formed from the hydrolysis of chlorosilanes in the presence of water is called _____.

- (a) LDPE (b) Carbosilanes
- (c) HDPE (d) Polydimethylsiloxanes

Answer: (d) Polydimethylsiloxanes

20. The alkaloid found in *Sarracenia flava*, the yellow pitcher plant is _____.

- (a) Coniine (b) Nicotine
- (c) Piperine (d) Quinine

Answer: (a) Coniine

21. A preliminary confirmatory test that can be done for identification of flavonoids is _____.

- (a) Ferric chloride test (b) Silver mirror test
- (c) Sodium hydroxide test (d) Conc. Sulphuric acid test

Answer: (c) Sodium hydroxide test

22. Ionic solids are only soluble in _____.

- (a) Extremely Polar solvents (b) Mix of non-polar and polar solvents
- (c) Supercritical solvents (d) Non-polar solvents

Answer: (a) Extremely Polar solvents

23. Conversion between polymorphs can be observed by _____.

- (a) NMR (b) Tensiometer
- (c) Differential scanning calorimeter (d) Gravimetric analysis

Answer: (c) Differential scanning calorimeter

24. Which of the following systems has 7 symmetry elements?

- (a) Tetragonal (b) Orthorhombic
- (c) Cubic (d) Triclinic

Answer: (b) Orthorhombic

25. In body centered cubic structure. atoms occupy all the corners of the cube and body centre position in a unit cell. BCC Structure 8. The fluorite structure is adopted by which of following?

- (a) NaCl (b) TiO
- (c) ZnS (d) CaF₂

Answer: (d) CaF₂

Physics

26. The Clausius - Mossotti relation holds best for ?

- (a) Solids (b) Polar molecules
- (c) Gases and dilute solutions (d) Concentrate solutions

Answer: (b) Polar molecules

27. In Young's experiment the distance between 10⁻³ the slits was obtained as m, the distance between the slits and the screen as 3.0 m. The 2.1×10⁻³ width of the fringe is obtained as m. The colour of light used in the experiment will be ?

- (a) Yellow (b) Red
- (c) Violet (d) Green

Answer: (b) Red

28. Two lenses of powers +4D and -2D are kept in contact. The combinations focal length will be ?

- (a) 25cm (b) 75cm
- (c) 100cm (d) 50cm

Answer: (d) 50cm

29. A person hears an explosion 17.7 s after it took place. If the atmospheric temperature is C , the approximate distance of the place of explosion from the person is:

- (a) 2.0 km (b) 6.0 km
- (c) 3.0 km (d) 4.0 km

Answer: (b) 6.0 km

30. For diffraction at a single slit, the width of the central maximum is _____ the wavelength of light ?

- (a) Inversely proportional (b) Proportional to the square of
- (c) Independent of (d) Proportional to

Answer: (d) Proportional to

31. Which of the following has least surface area for a given volume?

- (a) Cube (b) Cone
- (c) Cylinder (d) Sphere

Answer: (d) Sphere

32. A heat engine is operating between temperatures 500 K and 400 K. What is the efficiency of the engine?

- (a) 0.50 (b) 0.80
- (c) 1.25 (d) 0.20

Answer: (d) 0.20

33. A gas is kept in a rigid container. Heat equal to 500 J is supplied to the gas. Change in the internal energy of the gas is:

- (a) 23.8 J (b) 11.9 J
- (c) 50 J (d) 500 J

Answer: (d) 500 J

34. In a potentiometer experiment, two cells connected in series get balanced at 8 m length on wire. If the connection of the terminal of cell of lower emf are reversed, the balance length is obtained at 4 m. The ratio of emf's of two cells is ?

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

Answer: (c) 3 :

35. There is a diode connected to an external resistance and an e.m.f. source as shown in figure. Assuming that potential barrier developed in diode - is 0.5 V, the value of current in the circuit is ?

- (a) 0.025 A (b) 0.05 A
- (c) 0.03 A (d) 0.02 A

Answer: (d) 0.02 A

36. A bulb is stamped as 60 W/240 V. The resistance when lighted by 240 volt is:

- (a) 480 ohm (b) 560 ohm
- (c) 960 ohm (d) 240 ohm

Answer: (c) 960 ohm

37. Internal resistance of a cell depends on ?

- (a) All of these (b) Nature of electrode
- (c) Area of the electrode (d) Distance between electrode

Answer: (a) All of these

38. The population inversion in He-Ne laser is produced by ?

- (a) Photon excitation (b) electron excitation
(c) inelastic atomic collisions (d) chemical reaction

Answer: (b) electron excitation

39. The total energy of a particle executing simple harmonic motion depends upon its ?

- (a) frequency only (b) frequency and amplitude both
(c) amplitude only (d) initial state

Answer: (b) frequency and amplitude both

40. At a given temperature, mean free path of a gas is ?

- (a) Directly proportional to the pressure (b) None of the above
(c) Inversely proportional to the pressure (d) Independent of pressure

Answer: (c) Inversely proportional to the pressure

41. When a perfect gas is supposed to expand freely against vacuum in an insulated vessel, the gas undergoes:

- (a) a change in pressure (b) a change in temperature
(c) a change in pressure and phase both (d) a change in phase

Answer: (b) a change in temperature

42. The dimensions of Planck's constant are equivalent to which of the following ?

- (a) Angular momentum (b) Linear momentum
(c) Energy (d) Force

Answer: (a) Angular momentum

43. A star is emitting yellow light. If it is accelerated towards earth, then to an observer on earth it will appear :

- (a) unchanged (b) shining yellow
(c) gradually changing to red (d) gradually changing to blue

Answer: (d) gradually changing to blue

44. When water freezes, the distance between its molecules :

- (a) decreases (b) increases
(c) not changes (d) becomes zero

Answer: (b) increases

45. Which thermometer is preferred for rapidly changing temperature ?

- (a) Resistance thermometer (b) Liquid in glass
(c) Gas thermometer (d) Thermo couple thermometer

Answer: (d) Thermo couple thermometer

46. Heat transfers by the process of convection occurs:

- (a) Only in solids (b) Only in liquids
(c) In solids, liquids and gases (d) Only in liquids and gases

Answer: (d) Only in liquids and gases

47. If the density of aluminium is 2600 and its Young modulus is $7.8 \times 10^{10} \text{ N/m}^2$, the speed of sound in aluminium will be :

- (a) 6431 m/s (b) 3000 m/s
(c) 340 m/s (d) 5477 m/s

Answer: (d) 5477 m/s

48. Three capillaries of lengths l , $2l$ and $4l$ with their radii r , $2r$ and $4r$ respectively are connected in series and a fluid is flowing through the capillaries placed horizontally. Pressure across the capillaries will be in the ratio ?

- (a) 1:2:4 (b) 1:8:24

(c) 64:8:1 (d) 4:2:1

Answer: (c) 64:8:1

49. The fictitious force on a body of mass 5 kg in a frame of reference moving vertically upwards m/s^2 with an acceleration of 5 is ?

(a) 25 N, vertically downwards (b) 25 N, vertically upwards

(c) 74 N, vertically downwards (d) 74 N, vertically upwards

Answer: (a) 25 N, vertically downwards

50. Time period of a simple pendulum depends on its :

(a) l (b) m

(c) both (a) and (b) (d) none of these

Answer: (a) l

SECTION B – Biology [50]

Zoology

51. Mature larva of housefly is ?

(a) Maggot (b) Eight

(c) Metamorphosis (d) Arthropoda

Answer: (a) Maggot

52. The component unit of compound eye insects is called ?

(a) Ommatidia (b) Molluscs

(c) Calcium carbonate (d) Mollusca

Answer: (a) Ommatidia

53. Animal is cold blooded and has 4-chambered heart ?

(a) Arthropoda (b) Crocodile

(c) Ommatidia (d) Fasciola

Answer: (b) Crocodile

54. Salpa and Doliolum belong to ?

(a) Pseudocoelomate (b) Malpighian tubules

(c) Tunicata (d) Kingdom animalia

Answer: (c) Tunicata

55. A limbless amphibian is ?

(a) Platyhelminthes (b) Arthropoda

(c) Ichthyophis (d) Chitin

Answer: (c) Ichthyophis

56. Flexible body of euglenoids is due to the presence of ?

(a) Osmoregulation and excretion (b) Proteinaceous pellicle

(c) Calcium carbonate (d) Body surface

Answer: (b) Proteinaceous pellicle

57. Casual organisms of sleeping sickness and kala-azar belong to ?

(a) Flagellated protozoans (b) Chameleon and Turtle

(c) Grasshoppers and Earthworm (d) Aschelminthes

Answer: (a) Flagellated protozoans

58. A ciliated protozoan is ?

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- (a) Jointed legs (b) Malpighian tubules
(c) Metamerism (d) Paramecium Caudatum

Answer: (d) Paramecium Caudatum

59. Reproduction is synonyms with growth i.e, increase in number of cell ?

- (a) Fasciola and Taenia Aschelminthes (b) Chlamydomonas and Amoeba
(c) Annelida and arthropoda Arthropoda (d) Chameleon and Turtle

Answer: (b) Chlamydomonas and Amoeba

60. Exoskeleton of arthropods is composed of ?

- (a) Cattle leech (b) Annelida
(c) Chitin (d) Tunicata

Answer: (c) Chitin

61. The characters is absent in all chordates except mammals ?

- (a) Mammary glands (b) Neophrone
(c) Body surface (d) Pseudocoelomate

Answer: (a) Mammary glands

62. Exclusive character of Class Mammalia is ?

- (a) Annelida and arthropoda Arthropoda (b) Fasciola and Taenia Aschelminthes
(c) Presence of a muscular diaphragm (d) A mantle & unsegmented body

Answer: (c) Presence of a muscular diaphragm

63. Bilateral symmetry, segmentation, coelom and open circulatory system characterises, phyla is ?

- (a) Arthropoda (b) Mantle cavity
(c) Bilateral (d) Body surface

Answer: (a) Arthropoda

64. is common among crab and honeybee ?

- (a) Jointed legs (b) Maggot
(c) Pseudocoelomate (d) Metamerism

Answer: (a) Jointed legs

65. Lateral appendages in Annelida are ?

- (a) Arthropoda (b) Parapodia
(c) Eight (d) Kingdom animalia

Answer: (b) Parapodia

66. Phylum Mollusca can be distinguished from other invertebrates by the presence of is ?

- (a) A mantle and non-segmented body (b) Lampreys and Hag fishes
(c) Annelida and arthropoda Arthropoda (d) Leeches, Earthworm and liver fluke

Answer: (a) A mantle and non-segmented body

67. Respiratory organs of Arthropods are ?

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

Answer: (c) Gills, Book-gills, Book-lungs and tracheae

68. Largest number of species are trace in ?

- (a) Bilateral (b) Mammary glands
(c) Arthropoda (d) Mantle cavity

Answer: (c) Arthropoda

69. Exoskeleton of Arthropods is formed by ?

- (a) Tunicata (b) Parapodia
- (c) Chitin (d) Mollusca

Answer: (c) Chitin

70. An economically important insect is ?

- (a) Respiratory, Excretory system (b) Prawn, Scorpion, Locusta
- (c) Silkworm and apis (d) Calcium carbonate

Answer: (c) Silkworm and apis

71. Invertebrates with jointed-legs are included in Phylum ?

- (a) Echinodermata (b) Mantle cavity
- (c) Mammary glands (d) Arthropoda

Answer: (d) Arthropoda

72. Excretory organs of arthropods are ?

- (a) Arthropoda (b) Mammary glands
- (c) Malpighian tubules (d) Silkworm and apis

Answer: (c) Malpighian tubules

73. In arthropods the balancing organ is ?

- (a) Flagellated protozoans (b) Longitudinal, Circular
- (c) Cuttle fish (d) Statocyst

Answer: (d) Statocyst

74. Silver fish, scorpion, crab and honey bee is common among ?

- (a) Whales, Dolphins, Seals (b) Jointed appendages Mollusca
- (c) Silkworm and apis (d) Prawn, Scorpion, Locusta

Answer: (b) Jointed appendages Mollusca

75. In ctenophora, the body bears _____ external rows of ciliated comb plates, help in locomotion is ?

- (a) Cuttle fish (b) Eight
- (c) Cnidoblasts 8 (d) Torpedo

Answer: (b) Eight

Botany

76. The outside of the epidermis is often covered with a waxy thick layer called ?

- (a) Monocot root (b) An annual ring
- (c) Cuticle covering (d) Phloem parenchyma

Answer: (c) Cuticle covering

77. Hypodermis of dicotyledonous plants is made up of ?

- (a) Woody trees (b) Summer
- (c) Monocot stem (d) Collenchyma

Answer: (d) Collenchyma

78. Radial vascular bundles occur in ?

- (a) Flaccidity of bulliform cells (b) Both monocot and dicot roots.
- (c) Sieve tubes and companion cells (d) Has a sclerenchymatous hypodermis

Answer: (b) Both monocot and dicot roots.

79. Conjoint collateral and close vascular bundle with endarch xylem is characteristics of ?

- (a) Xylem, Phloem (b) Monocot stem

(c) Pericycle (d) Phloem parenchyma

Answer: (b) Monocot stem

80. Epidermis is usually consists of ?

(a) Collenchyma (b) Single layer

(c) Shmilla (d) Sclerenchyma

Answer: (b) Single layer

81. Cambium is most active in ?

(a) Summer (b) Heart wood

(c) Xylem (d) Radial

Answer: (a) Summer

82. Lignin is the important constituents in the cell wall of ?

(a) Root (b) Dicot stem

(c) Periderm (d) Xylem

Answer: (d) Xylem

83. Lenticels are found in ?

(a) Woody trees (b) Large pith

(c) Companion cells (d) Cambium

Answer: (a) Woody trees

84. Pericycle in the form of lunar patches of sclerenchyma is found in ?

(a) Dicot stem (b) Collenchyma

(c) Cambium (d) Monocot stem

Answer: (a) Dicot stem

85. Conjoint, collateral and open vascular bundles are found in ?

(a) Monocot root (b) Dicot stem

(c) Companion cells (d) roots

Answer: (b) Dicot stem

86. In mature parts of most of the flowering plants, the tissue formed after dedifferentiation are ?

(a) Has a sclerenchymatous hypodermis (b) Interfascicular cambium, phellogen

(c) From medullary rays (d) Collenchymatous, sclerenchymatous

Answer: (b) Interfascicular cambium, phellogen

87. Elongated or columnar mesophyll cells without intercellular spaces are found towards ?

(a) Adaxial epidermis of dorsiventral leaf (b) Sieve tubes and companion cells

(c) Has a sclerenchymatous hypodermis (d) Deposition of organic compounds

Answer: (a) Adaxial epidermis of dorsiventral leaf

88. Generally more active on the inner side than on the outer side is ?

(a) From medullary rays (b) Xylem will be exarch

(c) The cambial ring (d) Single layer

Answer: (c) The cambial ring

89. In a dicot stem, the interfascicular cambium strip arises is ?

(a) Dicot stem (b) From medullary rays

(c) Heart wood (d) Interfascicular cambium, phellogen

Answer: (b) From medullary rays

90. The wood is, in fact a ?

- (a) Mechanical support (b) Sclereids
(c) Secondary xylem (d) Pericycle

Answer: (c) Secondary xylem

91. Two alternate rings of spring wood and autumn wood is formed by ?

- (a) Monocot stem (b) Leaves of tea
(c) Xylem and Phloem (d) An annual ring

Answer: (d) An annual ring

92. Growth rings are generally well marked in trees growing in ?

- (a) Vascular bundles (b) Shimla
(c) Monocot stem (d) Endarch

Answer: (b) Shimla

93. The function of heartwood is ?

- (a) Mechanical support (b) Secondary xylem
(c) Barrel-shaped (d) Cell dedifferentiation

Answer: (a) Mechanical support

94. The heartwood cannot conduct water because of is ?

- (a) Food material, resins latex and mucilage (b) Adaxial epidermis of dorsiventral leaf
(c) Internal Ground tissue (d) Deposition of organic compounds

Answer: (d) Deposition of organic compounds

95. Phellogen, phellem and phelloderm are collectively known as ?

- (a) Cambium (b) Radial
(c) Shimla (d) Periderm

Answer: (d) Periderm

96. The common feature to heartwood and sapwood is ?

- (a) Both are the regions of secondary xylem (b) Food material, resins latex and mucilage
(c) are highly thick, lignified and dead cells (d) Radial and tangential walls of endodermis

Answer: (a) Both are the regions of secondary xylem

97. If vascular bundles are radial in a plant part ?

- (a) Form secondary tissues (b) Deposition of organic compounds
(c) Monocot stem dicot root (d) Xylem will be exarch

Answer: (d) Xylem will be exarch

98. In a plant part, vascular bundles are conjoint and closed. This plant part ?

- (a) Has a sclerenchymatous hypodermis (b) From medullary rays
(c) Monocot stem dicot root (d) Ground tissue system

Answer: (a) Has a sclerenchymatous hypodermis

99. Sclereids are commonly found is ?

- (a) Dicot stem (b) An annual ring
(c) Leaves of tea (d) Monocot stem

Answer: (c) Leaves of tea

100. Total primary xylem and old secondary xylem contains is ?

- (a) Dicot stem (b) Heart wood
(c) Collenchyma (d) Shimla

Answer: (b) Heart wood