

UNIVERSITY OF LUCKNOW

D.Pharm Entrance Examination

Biology Group — Model Test Paper Set 14

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

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SECTION A — Chemistry & Physics [50]

Chemistry

1. The reagent used in the reaction :

- (a) alkaline CHCl_3 (b) alcoholic AgCN
(c) aqueous NH_4Cl (d) alcoholic KCN

Answer: (d) alcoholic KCN

2. The states of hybridization of nitrogen in pyridine and piperidine, respectively are

- (a) sp^2 and sp (b) sp and sp^3
(c) sp^2 and sp^3 (d) sp^3 and sp^2

Answer: (c) sp^2 and sp^3

3. What is the final product (IV) in the following reaction sequence?

- (a) Aniline (b) Benzylamine
(c) p-Methyltoluene (d) Bromobenzene

Answer: (a) Aniline

4. Which of the following compounds will give only monosubstituted product upon further substitution reaction?

- (a) None of the above (b) o-Dinitrobenzene
(c) p-Dinitrobenzene (d) m-Dinitrobenzene

Answer: (c) p-Dinitrobenzene

5. Phosphorus pentachloride does not react readily with :

- (a) acetone (b) diethyl ether
(c) methanol (d) aniline

Answer: (d) aniline

6. The rate at which ethanol reacts with HCOOH (I), CH_3COOH (II), $(\text{CH}_3)_2\text{CHCOOH}$ (III), and $(\text{CH}_3)_3\text{CCOOH}$ (IV) in presence of an acid follows the order

- (a) $\text{IV} > \text{III} > \text{II} > \text{I}$ (b) $\text{III} > \text{IV} > \text{I} > \text{II}$
(c) $\text{II} > \text{III} > \text{I} > \text{IV}$ (d) $\text{I} > \text{II} > \text{III} > \text{IV}$

Answer: (d) $\text{I} > \text{II} > \text{III} > \text{IV}$

7. The reactivity of CH_3COCl (I), $(\text{CH}_3)_2\text{CO}$ (II), $\text{CH}_3\text{COOCH}_3$ (III), CH_3CONH_2 (IV) towards nucleophilic reagents follows the order :

- (a) $\text{I} > \text{II} > \text{III} > \text{IV}$ (b) $\text{III} > \text{I} > \text{IV} > \text{II}$
(c) $\text{II} > \text{I} > \text{III} > \text{IV}$ (d) $\text{IV} > \text{III} > \text{II} > \text{I}$

Answer: (a) $\text{I} > \text{II} > \text{III} > \text{IV}$

8. The boiling points of $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ (I), $(\text{CH}_3)_2\text{CHCH}_2\text{OH}$ (II) and $(\text{CH}_3)_3\text{COH}$ (III) decrease in the order of

- (a) $\text{II} > \text{III} > \text{I}$ (b) $\text{I} > \text{III} > \text{II}$

(c) III > II > I (d) I > II > III

Answer: (d) I > II > III

9. On treatment with sodium hydroxide, glyoxal gives mainly sodium salt :

- (a) glycolic acid (b) glyceric acid
(c) glycerol (d) glycine

Answer: (a) glycolic acid

10. End products obtained during ozonolysis of 1, 3-butadiene are 1, 3-y :

- (a) oxalic acid and formaldehyde (b) formic acid and glycolic acid
(c) formaldehyde and glycolic acid (d) formaldehyde and glycol

Answer: (d) formaldehyde and glycol

11. The reducing agent used in the conversion :

- (a) Stephen's reagent (b) Raney Nickel
(c) Wittig's reagent (d) Tollen's reagent

Answer: (a) Stephen's reagent

12. Formation of acetone cyanohydrin from acetone is an example of S_N2 :

- (a) nucleophilic substitution (b) free radical addition
(c) electrophilic addition (d) nucleophilic addition

Answer: (d) nucleophilic addition

13. What is the compound C in the following reaction sequence?

- (a) 2, 2-Dibromopropane (b) 2-Bromopropane
(c) 1, 2-Dibromopropane (d) 1-Bromopropane

Answer: (b) 2-Bromopropane

14. The reaction intermediate formed during dehydration of ethanol by concentrated sulphuric acid is a carbocation :

- (a) carbanion (b) carbonium ion
(c) carbene (d) free radical

Answer: (b) carbonium ion

15. Which among (A) cyclohexane (B) cyclopentane (C) cyclopropane (D) cyclobutane possesses a Bayer strain of 19 :

- (a) cyclopropane (b) cyclobutane
(c) cyclohexane (d) cyclopentane

Answer: (b) cyclobutane

16. Which of the following is the end product when benzene is treated with excess of chlorine in presence of light?

- (a) Trichlorobenzene (b) Dichlorobenzene
(c) Monochlorobenzene (d) Hexachlorocyclohexane

Answer: (d) Hexachlorocyclohexane

17. A Friedel-Craft's reaction of benzene with dichloromethane in presence of anhydrous AlCl₃ produces :

- (a) Benzyl chloride (b) Diphenylmethane
(c) Benzal chloride (d) Triphenylmethane

Answer: (b) Diphenylmethane

18. Which of the following molecules is expected to be aromatic?

- (a) Cyclooctatetraene (b) Cycloheptatrienylcation
(c) Cyclobutadiene (d) Cyclopentadienylcation

Answer: (b) Cycloheptatrienylation

19. The hydrocarbon obtained during the reaction : $\text{CH}_3\text{CH}_2\text{MgBr} +$:

- (a) methane (b) ethane
- (c) propane (d) butane

Answer: (b) ethane

20. Carbon tetrachloride is a commonly used liquid in fire extinguishers to combat small fires. This is because :

- (a) it is made up of only covalent bonds (b) its vapors are non-poisonous
- (c) it has no flash point and non- inflammable (d) it has low melting point and boiling point

Answer: (c) it has no flash point and non- inflammable

21. Chlorobenzene is less reactive towards nucleophilic substitution reactions when compared to chloroethane.

This :

- (a) the formation of less stable carbonium ion (b) the hyper conjugative effect
- (c) the increased bond strength by resonance effect (d) the inductive effect by phenyl group

Answer: (c) the increased bond strength by resonance effect

22. Which of the following statements is not true about enantiomers?

- (a) They have the same melting and boiling points (b) They are nothing but non super imposable mirror images
- (c) They have the same chemical reactivity (d) They have the same specific rotation

Answer: (d) They have the same specific rotation

23. butene on reaction with cold dilute 2% KMnO_4 solution meso butane 2, 3- diol. It is 4 dihydroxylation reaction and two OH group are added across bond. 63. The normal C = C bond length in cyclohexene is 0.134 nm and the normal :

- (a) 0.154 nm (b) < 0.134 nm
- (c) 0.134 nm (d) Between 0.134 nm 0.154 nm

Answer: (d) Between 0.134 nm 0.154 nm

24. When ethyne reacts with silver nitrate solution, ethyne shows peye efmeuJef veeF :

- (a) acidic property (b) oxidizing property
- (c) basic property (d) reducing property

Answer: (a) acidic property

25. On electrolysis of aqueous potassium maleate, the gas collected at anode is peueer :

- (a) a mixture of ethane and ethene (b) ethyne
- (c) ethane (d) ethene

Answer: (b) ethyne

Physics

26. 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) 64:8:1
- (c) 4:2:1 (d) 1:8:24

Answer: (b) 64:8:1

27. 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) 74 N, vertically downwards (b) 25 N, vertically downwards
- (c) 74 N, vertically upwards (d) 25 N, vertically upwards

Answer: (b) 25 N, vertically downwards

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

- (a) none of these (b) m
- (c) l (d) both (a) and (b)

Answer: (c) l

29. A boat which has speed of 5km/hr in still water crosses a river of width 1 km along the shortest possible path in 15 minutes. The velocity of water of the river in km/hr is:

- (a) 4 (b) 2
- (c) 14 (d) 3

Answer: (d) 3

30. A 2.5 kg iron ball has the same diameter as a 1.25 kg aluminium ball. The balls are dropped at the same time from a cliff. Just before they reach the ground, they have same :

- (a) Kinetic energy (b) Potential energy
- (c) Acceleration (d) Momentum

Answer: (c) Acceleration

31. Planck's constant has the dimension of:

- (a) Energy (b) Frequency
- (c) Angular momentum (d) Momentum

Answer: (c) Angular momentum

32. If 1.20 V potential difference must be applied to stop the fastest photoelectrons emitted by a nickel surface under the action of ultraviolet light of wavelength 2000\AA , calculate the work function of nickel ?

- (a) 4.50 eV (b) 6.21 eV
- (c) 4.80 eV (d) 5.01 eV

Answer: (d) 5.01 eV

33. Which of the following parameters is the same for hydrogen-like atoms and ions in ground states?

- (a) Radius of the orbit (b) Speed of the electron
- (c) Orbital angular momentum of the electron (d) Energy of the atom

Answer: (c) Orbital angular momentum of the electron

34. A coil having inductance 0.15 H and resistance 15Ω is connected across a 220 V, 50 Hz line. Compute the current in the coil ?

- (a) 4.45 A (b) 4.25 A
- (c) 4.00 A (d) 3.50 A

Answer: (a) 4.45 A

35. In Helium-Neon laser, helium atoms ?

- (a) Act as catalytic atom (b) Impart energy to the Neon atoms
- (c) Act as quenching agents (d) Emit laser radiation

Answer: (b) Impart energy to the Neon atoms

36. For D and D lines of Na ≈ 1000 . In order $1/2 \Delta\lambda$ to resolve these lines by a grating in the fourth order of spectrum the total number of line on the grating should be ?

- (a) 500 (b) 1000
- (c) any number (d) 250

Answer: (d) 250

37. A zone plate behaves like a ?

- (a) Glass plate (b) Concave lens

(c) Plane mirror (d) Convex lens

Answer: (d) Convex lens

38. The instrument used to measure optical rotation is known as ?

- (a) Spectrometer (b) Microscope
(c) Polarimeter (d) Interferometer

Answer: (c) Polarimeter

39. In the diffraction of a plane wave due to a circular obstacle (disc) the axial point is always ?

- (a) dark (b) None of the above
(c) bright (d) may be bright or dark

Answer: (c) bright

40. When a thin transparent plate is introduced in the path of interfering beams, the fringe width will ?

- (a) increase (b) remains the same
(c) become zero (d) decrease

Answer: (b) remains the same

41. A converging lens of focal length f is placed in contact with a diverging lens of focal length $3f$. The combination is ?

- (a) A diverging lens of focal length $3f/2$ (b) A converging lens of focal length $3f/2$
(c) A converging lens of focal length $2f$ (d) A diverging lens of focal length $3f$

Answer: (b) A converging lens of focal length $3f/2$

42. For which one of the following concave mirror is not used?

- (a) Shaving glass (b) Inspection internal parts of ear
(c) Reflector in search lights (d) Rear-view mirror in cars

Answer: (d) Rear-view mirror in cars

43. In Young's double slit experiment the slit separation is 0.12 mm, the wavelength of light used is 5893 \AA and interference pattern is observed on a screen 1 m away. The separation between successive bright fringes will be ?

- (a) 4.50 mm (b) 5.50 mm
(c) 6.50 mm (d) 4.91 mm

Answer: (d) 4.91 mm

44. When the length of an astronomical telescope tube increases, its magnifying power :

- (a) May decrease or increase (b) Increases
(c) Decreases (d) Does not change

Answer: (c) Decreases

45. The number of cardinal points in a thin lens is :

- (a) two (b) six
(c) three (d) zero

Answer: (b) six

46. The minimum distance between an object and its real image formed by a convex lens is ?

- (a) $2f$ (b) $f/2$
(c) $4f$ (d) f

Answer: (c) $4f$

47. The ratio of the speeds of sound in nitrogen gas to that in helium gas at 300 K is ?

- (a) $1/7$ (b) $3/7$

(c) 5 (d) 2/7

Answer: (c) 5

48. A source of unknown frequency produces 8 beats with a source of 250 Hz and 12 beats with a source of 270 Hz. The frequency of the unknown source is ?

(a) 282 Hz (b) 242 Hz

(c) 262 Hz (d) 258 Hz

Answer: (d) 258 Hz

49. For a diatomic gas the root mean square velocity at room temperature is 1930 m/s. The gas will be:

(a) Cl₂ (b) H₂

(c) F₂ (d) O₂

Answer: (b) H₂

50. In a mixture of ideal gas which one of the following is same for all molecules :

(a) Speed (b) Mean translational kinetic energy

(c) Root mean square speed (d) Root mean square momentum

Answer: (c) Root mean square speed

SECTION B – Biology [50]

Zoology

51. The genomic DNA of a bacterium is ?

(a) Circular (b) Centrosomes

(c) Cell membrane (d) Glycocalyx

Answer: (a) Circular

52. _____ component provides sticky character to the bacterial wall is ?

(a) Glycocalyx (b) Cristae

(c) Mitochondrion (d) Nuclear envelope

Answer: (a) Glycocalyx

53. Cell theory was given by ?

(a) 1972, fluid mosaic model (b) Nuclear membrane

(c) Golgi apparatus (d) Schleiden and Schwann

Answer: (d) Schleiden and Schwann

54. Non-membrane bound cell organelles is found in both prokaryotes and eukaryotes ?

(a) Golgi apparatus (b) Ribosomes

(c) Cell membrane (d) Plasmids

Answer: (b) Ribosomes

55. the important site of formation of glycoproteins and glycolipids in eukaryotic cells is ?

(a) Nuclear membrane (b) Food vacuoles

(c) Golgi bodies (d) Flemming

Answer: (c) Golgi bodies

56. The events does not occur in rough endoplasmic reticulum is ?

(a) Smaller, faster (b) Mitochondrion

(c) Nactatins membrane (d) Phospholipid synthesis

Answer: (d) Phospholipid synthesis

57. does not differ in E.coli and Chlamydomonas is ?

- (a) Eukaryotic cell (b) Nuclear membrane
(c) Cell membrane (d) Prokaryotic cell

Answer: (c) Cell membrane

58. The fluid mosaic model of plasma membrane proposed by is ?

- (a) Food vacuoles (b) Singer and Nicolson
(c) Prokaryotic cell (d) Golgi apparatus

Answer: (b) Singer and Nicolson

59. 'Omnis cellula-e cellula' i.e. new cells arise from pre-existing cell, this statement was given by ?

- (a) Mitochondrion (b) Filament
(c) Cell membrane (d) Rudolf Virchow

Answer: (d) Rudolf Virchow

60. Largest isolated single cell is ?

- (a) Ostrich egg (b) Nuclear envelope
(c) Mesosomes Eukaryotic Cells (d) Filament

Answer: (a) Ostrich egg

61. Cells having membrane bound nucleus are known as ?

- (a) Ostrich egg (b) Eukaryotic cell
(c) Protein synthesis (d) Chromoplast

Answer: (b) Eukaryotic cell

62. "Cell lineage theory" by stating that "Omnis cellula e cellula" proposed by is ?

- (a) Filament (b) Aleuroplasts
(c) Smaller, faster (d) Rudolf Virchow

Answer: (d) Rudolf Virchow

63. Found a cytoplasm, chloroplasts, mitochondria and ER, organelle is ?

- (a) Cytoskeleton (b) Ribosome
(c) 70S type (d) Eukaryotic cell

Answer: (b) Ribosome

64. Nucleus of the cell was discovered by ?

- (a) Circular (b) Absence of nucleus
(c) Robert Brown (d) Plasma membrane

Answer: (c) Robert Brown

65. Cells which lack membrane bound nucleus are known as ?

- (a) Flemming (b) Telocentric
(c) Ribosomes (d) Prokaryotic cell

Answer: (d) Prokaryotic cell

66. The simplest way to distinguish a prokaryotic from a eukaryotic cell is to check for ?

- (a) a nucleus (b) Cisternae
(c) Glycocalyx (d) Phospholipid synthesis

Answer: (a) a nucleus

67. The main area of cellular activities in plant and animal cells is ?

- (a) Cytoplasm (b) Centrioles
(c) Nucleoid (d) Nuclear membrane

Answer: (a) Cytoplasm

68. Animal cells contain a non-membrane bound organelle which helps in cell division. This organelle is called ?

- (a) Centrosome (b) Circular
- (c) Ostrich egg (d) Flemming

Answer: (a) Centrosome

69. Cell theory states that is ?

- (a) Mannans, CaCO₃, Galactans (b) Have no role in protein synthesis
- (c) All cells arise from pre-existing cells (d) Cell wall is made up of peptidoglycans

Answer: (c) All cells arise from pre-existing cells

70. An exception to cell theory is ?

- (a) Smaller, faster (b) Virus Prokaryotic Cells
- (c) Food vacuoles (d) Presence of thylakoids

Answer: (b) Virus Prokaryotic Cells

71. The genetic material of a prokaryotic cell is known as ?

- (a) Cytoplasm (b) Rudolf Virchow
- (c) Nucleoid (d) Nuclear membrane

Answer: (c) Nucleoid

72. Structure is present only in prokaryotic cell ?

- (a) Plasmid (b) Active transport
- (c) Nucleoid (d) Circular

Answer: (a) Plasmid

73. Structures is not found in a prokaryotic cell ?

- (a) Mesosomes Eukaryotic Cells (b) Ribosome, RER, SER
- (c) Nuclear envelope (d) Nucleoid

Answer: (c) Nuclear envelope

74. Ribosomes is not true for ?

- (a) Have no role in protein synthesis (b) Cell wall is made up of peptidoglycans
- (c) RER is easily observed in the cell (d) All cells arise from pre-existing cells

Answer: (a) Have no role in protein synthesis

75. are self replicating, extra chromosomal segments of double stranded circular and naked DNA, present in a bacterial cell ?

- (a) Plasmids (b) Nucleolus
- (c) Centrosome (d) Prokaryotic cell

Answer: (a) Plasmids

Botany

76. Characterised by the presence of a rigid cell wall are ?

- (a) A dikaryon (b) Eubacteria
- (c) Spores (d) Androecium

Answer: (b) Eubacteria

77. The smallest organisms which cause diseases among plants are ?

- (a) Mosses (b) Mycoplasma
- (c) Sporozoans (d) Euglena

Answer: (b) Mycoplasma

78. Heterocysts, specialised for nitrogen fixation, occur in certain ?

- (a) R. H. Whittaker (b) Blue-green algae (Anabaena)
(c) Chemosynthetic bacteria (d) Mycoplasma 17 gical Classification

Answer: (b) Blue-green algae (Anabaena)

79. The organisms which do not derive energy directly or indirectly from sun is ?

- (a) Slime moulds (b) M. W. Beijerinck
(c) Chemosynthetic bacteria (d) Chrysophytes

Answer: (c) Chemosynthetic bacteria

80. Naked cytoplasm, multinucleated and saprophytic are the characteristics of ?

- (a) Spores (b) Slime moulds
(c) Androecium (d) Euglena

Answer: (b) Slime moulds

81. All eukaryotic unicellular organisms belong to ?

- (a) Fabaceae (b) Protista
(c) Kingdom Plantae (d) Chrysophytes

Answer: (b) Protista

82. The multinucleate slimy mass of protoplasm forms the body of slime moulds is called ?

- (a) Papilionaceae (b) Plasmodium
(c) Fabaceae (d) Papilionoideae

Answer: (b) Plasmodium

83. Causal organisms of malaria belong to the groups of protozoan protists is ?

- (a) Sporozoans (b) Pellicle
(c) Mosses (d) Spores

Answer: (a) Sporozoans

84. Ciliated protozoan is ?

- (a) Slime moulds (b) Cell wall composition
(c) Papilionoideae (d) Paramecium caudatum

Answer: (d) Paramecium caudatum

85. Kingdom, has no well defined boundaries ?

- (a) Fabaceae (b) Mycorrhiza
(c) Protista (d) Papilionaceae

Answer: (c) Protista

86. Members of Kingdom Protista are primarily ?

- (a) Aquatic (b) Spores
(c) Silica (d) Monera

Answer: (a) Aquatic

87. The Kingdom Protista forms a link with kingdom is ?

- (a) M. W. Beijerinck (b) Cell wall composition
(c) Mycoplasma 17 gical Classification (d) Plantae, Fungi, Animalia

Answer: (d) Plantae, Fungi, Animalia

88. Chief producers in oceans are ?

- (a) Copeland (b) Monera
(c) Protista (d) Diatoms

Answer: (d) Diatoms

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89. Red tides are caused by ?

- (a) Dinoflagellates (b) Heterocyst
- (c) Sporozoans (d) Mycoplasma

Answer: (a) Dinoflagellates

90. Most of them have two flagella; one lies longitudinally and the other transversely in a furrow between the wall plates. Here we are talking about ?

- (a) Complete, zygomorphic, pentamerous (b) Virus, Viroids, Lichens
- (c) Fabaceae (d) Gonyaulax group

Answer: (d) Gonyaulax group

91. Diatomaceous earth is the deposition of cell wall in their habitat by diatoms takes over ?

- (a) Billions of years (b) Siliceous wall
- (c) Chemosynthetic autotrophic bacteria (d) A dikaryon

Answer: (a) Billions of years

92. The spores of slime mould are dispersed by ?

- (a) Plasmodium (b) Air currents
- (c) Sporozoans (d) Chrysophytes

Answer: (b) Air currents

93. This organism behaves like plants in the presence of light and absence of organic food, but in reverse conditions behaves like animals is ?

- (a) Mosses (b) Euglena
- (c) Fabaceae (d) Protista

Answer: (b) Euglena

94. Euglena belongs to kingdom ?

- (a) Halophiles (b) Protista
- (c) Gelatinous sheath (d) Dinoflagellates

Answer: (b) Protista

95. The most notorious sporozoan, Plasmodium, is responsible for causing ?

- (a) Dinoflagellates (b) Malaria
- (c) Mycoplasma (d) Diatoms

Answer: (b) Malaria

96. The cell walls form two thin overlapping shells in which group of organisms such that they fit together is ?

- (a) Monera (b) Eubacteria
- (c) Protista (d) Chrysophytes

Answer: (d) Chrysophytes

97. Unlike other algae, diatoms do not readily decay due to is ?

- (a) Aquatic (b) A dikaryon
- (c) Eubacteria (d) Siliceous wall

Answer: (d) Siliceous wall

98. Diatoms belong to ?

- (a) Chemosynthetic bacteria (b) Dinoflagellates
- (c) Chrysophytes (d) Protista

Answer: (c) Chrysophytes

99. In this kingdoms some members have cell wall and some are without cell wall ?

- (a) Spores (b) Protista
(c) Linnaeus (d) Four kingdoms

Answer: (b) Protista

100. Organisms were never included in protista ?

- (a) Copeland (b) Slime moulds
(c) Mosses (d) Chitin

Answer: (c) Mosses

