



K.K.S. WOMEN'S COLLEGE, BALASORE.

DEPARTMENT OF ZOOLOGY

SUBJECT: ZOOLOGY (HONS.) CC-III & CC-IV

(IIND SEMESTER)

**QUESTION BANK: PREVIOUS YEAR
QUESTIONS WITH MODEL QUESTIONS**

2017

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions selecting either {(a),(b)}
or {(c),(d)} of each question

1. a) Describe the excretory system in Annelida and explain the structure of nephridium. 8
- b) Write short notes on the following : 2+2
- i) Metamerism in Annelida
- ii) General characters of class Oligochaeta.

OR

- c) Classify annelida upto class. Mention the typical characters with example. 8
- d) Write notes on the following : 2+2
- i) Septal nephridia
- ii) Evolution of Coelom.

2. a) Discuss the Respiratory process in Arthropoda. 8

b) Write notes on the following : 2+2

i) Larval forms in crustacea

ii) General Characters of Phylum Arthropoda.

OR

c) Write an essay on metamorphosis in insects. 8

d) Write notes on the following : 2+2

i) Classify arthropoda upto class with example of each class.

ii) Moulting in insects.

3. a) 'Peripatus' the connecting link between Annelida and Arthropoda - Justify. 8

b) Write notes on the following : 2+2

i) Evolutionary significance of Peripatus

ii) General characters of Peripatus.

OR

- c) Discuss the general characters and affinities of Peripatus. 8
- d) Write notes on the following : 2+2
- i) External features of Peripatus
 - ii) Mention the Annelidian characters of Peripatus.
4. a) Give an account of torsion and detorsion in Gastropoda. 8
- b) Write notes on the following : 2+2
- i) Evolutionary significance of trochophore Larva.
 - ii) Discuss the special characters of Phylum Mollusca.

OR

- c) What is Pearl ? Describe the different stages of Pearl formation with labelled diagram. 8
- d) Write notes on the following : 2+2
- i) General characters of class Cephalopoda
 - ii) Respiration in Mollusca.

2022

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Part-I

1. Fill in the blanks : 1 × 8

- a) ✓ Type of coelom found in Annelida is _____ .
- b) ✓ Characteristic feature of polychaeta is _____ .
- c) ✓ Cuttlefish belongs to phylum _____ .
- d) Animal group with pseudocoelom is _____ .
- e) ✓ True coelom appeared first in the course of evolution in _____ .
- f) ✓ An animal with metameric segmentation is _____ .
- g) ✓ The locomotory organs of Echinodermata are _____ .
- h) ✓ Trochophore larve is found in _____ .

[2]

Part-II

2. Answer any *eight* of the following : $1\frac{1}{2} \times 8$
- a) Write any two primitive characters of Echinodermata.
 - b) What is Antedon ?
 - c) Why Prawn and butterflies belong to the same phylum ?
 - d) What is trochophore larva ?
 - e) Define Radula.
 - f) What is Tracheal gills ?
 - g) Define Aerial Respiration.
 - h) Write any three important characters of Asteroidea.
 - i) How does a sea star eat ?
 - j) What are termites ?

Part-III

3. Answer any *eight* of the following : 2×8
- a) Name three molluscs that look very different.
 - b) What are the organs of respiration in Arthropoda ?

[3]

- c) Write the characteristics of Phylum Mollusca.
- d) Write any four characters of Sea star.
- e) Which chemical is used as a soil treatment in termite proofing ?
- f) Differentiate between Bees and Termites.
- g) Define Metamorphosis in Insects.
- h) Write important characteristics of Onychophora.
- i) Define Torsion in Gastropoda.
- j) Write three important functions of Nephridium.

Part-IV

4. a) Describe the structure and functions of a typical Nephridium. 6
- b) What is metamerism ? Discuss the role an evolutionary significance of metamerism in Annelida ?

OR

5. a) Discuss the characteristic features of the phylum Arthropoda and classify the Phylum upto classes. 6

OR

L-644

[Turn over

b) *Peripatus* is the connecting link between Annelida and Arthropoda –Justify.

6. a) Explain the structure of radula and add a note on its functions in *Pila*. 6

OR

b) Write the character of Phylum Mollusca and justify upto classes.

7. a) Describe the structure of water vascular system in an Echinodermata. 6

OR

b) Give an account on Larval forms in Echinodermata.

2022

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

Part-I

1. Fill in the blanks :

1 × 8

- a) Movement of solvent from higher concentration level to lower concentration level is called ____.
- b) Each haemoglobin molecules carries ____ number of O₂ molecules
- c) Steroids, a biologically active organic compound, are derived from ____.
- d) Holoenzyme is made of ____.
- e) Lysosomes are produced by which cell organelles ____.
- f) Most accepted structural model of plasma membrane is ____.

[2]

- g) The rough ER is specially well developed in cells activity engaged in ____.
- h) Who identified Lysosome ____.

Part-II

2. Answer any *eight* of the following : $1\frac{1}{2} \times 8$
- a) What is cyclins in cell cycle ?
 - b) What is the function of Golgi apparatus ?
 - c) What is apoptosis ?
 - d) Write two important functions of Nucleolus.
 - e) What is metastasis ?
 - f) Write two important functions of Mitochondria.
 - g) What is mycoplasma ?
 - h) Define Plasmodesmata.
 - i) What is Micro-filament ?
 - j) Write three important component of Plasma Membrane.

[3]

Part-III

3. Answer any *eight* of the following : 2×8
- a) Write the proteins present in cell membrane.
 - b) What is the function of RER ?
 - c) What is Receptors of signalling molecule ?
 - d) What is signal transduction ?
 - e) What are the 4 types of cell signalling ?
 - f) What is the difference between endocrine and exocrine signalling ?
 - g) What is the role of G protein in a signalling pathway ?
 - h) Define Gap Junction.
 - i) What is the behaviour of Chromosome in Metaphase ?
 - j) What is Cell Theory ?

Part-IV

4. a) Describe the structure and functions of Plasma Membrane. 6

OR

L-668

[Turn over

[4]

- b) What are the functions of tight junctions ? What proteins are involved in these junctions ?
5. a) What is cytoskeleton ? Describe its biological significance. 6

OR

- b) Explain the structure and functions of Golgi apparatus.
6. a) Mitochondria refer as Power House of cell -Justify. 6

OR

- b) Explain the structure and functions of peroxisomes.
7. a) What is Cell Cycle ? Describe the mechanism of cell cycle regulation. 6

OR

- b) Enumerate the chromosomal events during Meiotic Cell division ?

IIND SEMESTER

SUBJECT: ZOOLOGY (HONS.) CC-III & CC-IV

**OTHER QUESTIONS: PREVIOUS YEAR
QUESTIONS WITH MODEL QUESTIONS**

+3 2nd Sem
Zoo (H) - IV

(2)

2 0 1 7

Full Marks : 50

Time : 2½ hours

The questions are of equal value

Answer **all** questions

1. Write short notes on the following :
 - (a) Cell theory
 - (b) Facilitated transport
 - (c) Mitochondrial respiratory chain
 - (d) GPCR.
2. Briefly describe the structure and function of endoplasmic reticulum.

Or

Write notes on the following :

- (a) Golgi apparatus
 - (b) Structure of virus.
3. Describe the steps of TCA cycle with suitable presentation. Add a note on the enzymes involved in regulation of TCA cycle.

A/7(626)

(Turn Over)

Or

Write notes on the following :

- (a) Chemiosmotic hypothesis
 - (b) Structure and function of microtubules.
4. What is nucleosome concept? Explain the solenoid model of genomic organization involved in packaging.

Or

Answer the following :

- (a) Write a note on structure of nucleus.
 - (b) Differentiate between Euchromatin and Heterochromatin. <https://www.odishastudy.com>
5. Explain the cell cycle and its regulation with suitable diagrammatic presentation.

Or

Write notes on the following :

- (a) Prophase-I
- (b) cAMP as second messenger.

A/7(626)—3000

+3 2nd Sem/Zoo (H)-IV

+3-2nd Sem —
Zool (H) – III

2018

Time : 2½ hours

Full Marks : 50

The questions are of equal value.

Answer all questions.

1. Write short notes on the following :
 - (a) Metamerism
 - (b) Detorsion in Gastropoda
 - (c) Tube feet
 - (d) Characteristics of Onychophora
2. (a) Discuss the general characteristics and classification up to classes of Annelida.

OR

Write notes on the following :

- (a) Nephridia in Annelida
- (b) Evolution of Coelom

FU – 15/2

(Turn over)

3. Briefly discuss the distinctive characteristics of the Phylum Arthropoda and classify them upto classes, giving their important characters and common examples.

OR

Write notes on the following :

- (a) Respiration in insects
 - (b) Evolutionary significance of Onychophora
4. Discuss the different kinds of respiration in Molluses. <https://www.odishastudy.com>

OR

Discuss the Torsion in Gastropoda and add a note on its significance.

5. Give an account of larval forms in Echinodermata.

OR

Write notes on the following :

- (a) Classification upto classes of Echinodermata.
- (b) Water vascular system in Asterozoa.

FU – 15/2 (3,500)

(2)

+3-2nd Sem —
Zool (H) – III

**+3-2nd Sem ---
Zool (H) – IV**

2018

Time : 2½ hours

Full Marks : 50

The questions are of equal value.

Answer all questions.

1. Write short notes on the following :

- (a) Origin of Eukaryotic Cell
- (b) Passive transport
- (c) Nucleolus
- (d) Peroxisomes

2. Describe various structural models of plasma membrane.

OR

Write notes on the following :

- (a) Cell junctions
- (b) Active transport

FU – 16/2

(Turn over)

3. Describe the structure and functions of Golgi apparatus.

OR

Write short notes on the following :

- (a) Lysosomes
- (b) Differentiate between prokaryotic cell and eukaryotic cell

4. Describe the structure and function of Mitochondria <https://www.odishastudy.com>

OR

Write notes on the following :

- (a) Semi autonomous nature of mitochondria
 - (b) Mitochondrial respiratory chain
5. Give a brief account of mitotic cell division and add a note on its significance.

OR

Write notes on the following :

- (a) Structure of nuclear envelop
- (b) Structure and function of microfilament and intermediate filament.



FU – 16/2 (3,500)

(2)

**+3-2nd Sem ---
Zool (H) – IV**

IInd Semester Zoology
CC – III (NON-CHORDATES II: COELOMATES)

SECTION – A

Fill in the blanks. [each carrying 1 mark]

1. Mollusca divided into _____ classes.
2. Gastropods body is _____ type division.
3. _____ is a locomotory organ in echinoderm.
4. Sea stars belong to _____ class.
5. Madreporites are present on which surface in sea star.
6. Which class of echinoderm lack arms?
7. Most primitive arthropods belong to which class?
8. Arthropod exoskeleton is made up of _____ .
9. What is the difference between torsion and detorsion?
10. The _____ in arthropod is lined with permeable cuticle.
11. What is the basic unit in the eye of insects?
12. What type of circulatory system is found in annelids?
13. Metameric segmentation is the characteristic of which phylum?
14. Evolutionary significance of Onychophora.
15. The maxillulae help in _____.
16. The mandibles are used in _____.
17. Nephridia's are _____ in function.
18. The antennules are _____ in function.
19. Octopus belongs to the class _____.
20. What is the common name of devil fish?

SECTION – B

SHORT TYPE QUESTIONS. [carrying 1.5 and 2 marks]

1. What is coelom?
2. What is acoelomata?
3. What is pseudocoelom?
4. What are the excretory organ in Annelida?
5. What are the classes of Arthropoda?
6. How many types of honey bees are there?
7. Write five important general characteristics of Onychopora.
8. What is torsion?
9. What is trochophore larva?
10. What is water-vascular system?
11. Define Arthropods.
12. Write five important general characteristics of Echinodermata.
13. Write five general characteristics of Mollusca.
14. What is the evolutionary significance of Onychopora?
15. What is detorsion?
16. What is rasping organ?
17. Write short notes on metamerism in annelida.
18. Write the general characteristics of class oligochaeta.
19. What is septal nephridia.
20. Write down the evolution of coelom.
21. Writwe down the larval forms in crustacean.
22. What is moulting in insects?
23. Write down the evolutionary significance of peripatus.

24. Write the general characteristics of peripartus.
25. Write general characteristics of Cephalopoda.

SECTION – C

Long questions. [each carrying 6 marks]

1. Describe general characteristics of Annelida.
2. Describe the classification upto classes of phylum Annelida.
3. Describe briefly about the evolution of coelom.
4. Give an account of nephridia and coelomoducts in Annelids.
5. Describe excretion in annelid and the structure of nephrostome.
6. Give an outline classification on phylum Arthropoda up to classes.
7. Describe briefly the respiration in arthropod.
8. Describe the different types of metamorphosis met within insects and mention the factors that govern the process of metamorphosis.
9. Give an account of torsion and detorsion in Gastropoda.
10. Describe the evolutionary significance of trochophore larva.
11. Describe the water vascular system in asteroid.
12. Describe in details of social life in bees.
13. Describe in details of social life in termites.
14. Give an account of the characters of phylum Echinodermata and classify it up to classes giving examples.
15. Describe larval form in Echinodermata.
16. Give an account of vision in Arthropoda.
17. Describe in details of water-vascular system in Asteroidea.
18. Give a brief account on the larval forms in Echinodermata.
19. Describe the general characteristics of mollusca.
20. Classify annelid upto classes. Mention the typical characters with example.

CC – IV (CELL BIOLOGY)

SECTION – A

Fill in the blanks. [each carrying 1 mark]

1. The term cell was given by _____.
2. Plasma membrane is made up of _____ .
3. Which theory explains that plasma membrane is selectively permeable?
4. Ribosomes are composed of _____ and _____.
5. Cristae in mitochondria serves as sites for
6. The longest stage in the cell cycle is
7. The division of cytoplasm is known as
8. When the activity of one gene is suppressed by the activity of a non- allelic gene, it is known as
9. Chromatin is composed of
10. The point at which polytene chromosomes appear to be attached together is known as

SECTION – B

SHORT TYPE QUESTIONS. [carrying 1.5 and 2 marks]

1. In which stage are lampbrush chromosome observed?
2. What is interphase?
3. What is diad?
4. Mention the significance of chiasmata.
5. What is synapse?
6. At which stage of mitosis, chromosomes arrange themselves around the equator?
7. What is meiosis?
8. Which phase follows the S phase in cell cycle?
9. What is karyokinesis?
10. What is quiescent phase (G₀)?

SECTION – C

Long questions. [each carrying 6 marks]

1. Distinguish between mitosis and meiosis.
2. Describe the stages of mitosis.
3. What is cell division?
4. Discuss the use and biological significance of each type of cell division.
5. Discuss the structure and function of Endoplasmic reticulum.
6. Give an account of ultra structure of mitochondria.
7. Give the structure and function of nucleus.
8. Give an account of cell cycle and its regulation.
9. Describe active and passive transport across membrane.
10. Describe the salient features of the Fluid Mosaic Model of plasma membrane.
11. Comment on the role of the Golgi complex in the process of cell secretion.

1. The term cell was given by _____. (Ans: Robert Hooke)
2. Robert Hooke observed the cells of cork from _____. (Ans: Quercus suber)
3. Robert Hooke gave diagrams and description of his observations in his book _____. (Ans: Micrographia)
4. Cell theory was formulated by _____ and _____. (Ans: Schleiden and Schwann)
5. The first person to see a living cell was _____. (Ans: Antony Von Leeuwenhoek)
6. _____ referred protoplasm as the “physical basis of life”. (Ans: T. H. Huxley)
7. _____ gave the name “protoplasm” – the first substance. (Ans: J. E. Purkinje)
8. Protoplasm was described as _____ by Felix Dujardin. (Ans: Sarcodite)
9. _____ given the statement “*Omnis cellulae cellula*”. (Ans: Rudolf Virchow)
10. _____ first studied the unicellular microscopic organisms. (Ans: Leeuwenhoek)
11. Chemiosmotic coupling hypothesis was postulated by _____. (Ans: Peter Mitchell)
12. To determine the ultrastructure of a cell organelle, the most likely method to be used would be _____. (Ans: Electron microscopy)
13. Physical basis of life is _____. (Ans: Protoplasm)
14. Major part of the cell is made of _____. (Ans: Water)
15. All living cells show _____ movement of protoplasm. (Ans: Streaming)
16. An undefined fibrillar nucleus is seen in _____. (Ans: Prokaryotic cell)
17. Animal cells are interconnected by _____. (Ans: Desmosomes)
18. _____ are button-like junctions made of two types of cadherin family proteins: desmoglein and desmocollin. (Ans: Desmosomes)
19. The space occupied by DNA in the prokaryotic cells is called as _____. (Ans: Nucleoid)
20. The genetic material of prokaryotic cells lacks _____ proteins. (Ans: Histone)
21. The cell is not applied for _____. (Ans: Virus)

22. The membrane around the vacuole is known as _____. (Ans: Tonoplast)
23. The special term used for the diffusion of water through cell membranes is _____. (Ans: Osmosis)
24. In prokaryotes, the electron transport chain occurs in _____. (Ans: Cell membrane)
25. Microfilaments are composed of a protein called _____. (Ans: Actin)
26. A plant cell wall is mainly composed of _____. (Ans: Cellulose)
27. Lipids are insoluble in water because lipid molecules are _____. (Ans: Hydrophobic)
28. Cytoplasmic continuity between the neighbouring cells is maintained by _____. (Ans: Plasmodesmata)
29. In plant cells, _____ type of gap junctions are found. (Ans: Plasmodesmata)
30. Carriers that transport two types of molecules in the same direction are called _____. (Ans: Symporters)
31. The alternative name of occluding junctions or tight junctions is _____. (Ans: Zonulae occludentes)
32. Glycolipids in the plasma membrane are located at _____. (Ans: The outer leaflet of the plasma membrane)
33. Singer and Nicolson's model of plasma membrane differs from Robertson's model in _____. (Ans: Arrangement of proteins)
34. The unit membrane concept of plasma membrane was suggested by _____. (Ans: J. David Robertson)
35. The trilamellar model to explain the structure of plasma membrane was proposed by _____. (Ans: Danielli and Davson)
36. The fluid mosaic model of cell membrane was proposed in 1972 by _____ and _____. (Ans: S. J. Singer and G. L. Nicolson)
37. Lysosome was discovered by _____. (Ans: De Duve)
38. _____ is regarded as suicidal bag of the cells. (Ans: Lysosome)

39. Lysosomes are known as “suicidal bags” because _____. (Ans: Hydrolytic activity/ Hydrolytic enzymes)
40. _____ is thought to be exceptionally rich in hydrolytic enzymes. (Ans: Lysosome)
41. _____ cytoplasmic organelle have a high content of acid phosphatase and other hydrolytic enzymes. (Ans: Lysosome)
42. When a lysosome fuses with a phagosome, it results in the formation of _____. (Ans: Secondary lysosomes)
43. Most of the hydrolytic enzymes function at _____. (Ans: Acidic pH)
44. Peroxisomes are rich in _____. (Ans: Oxidative enzymes)
45. _____ cell organelle is concerned with photorespiration. (Ans: Peroxisomes)
46. Centriole takes part in the formation of _____. (Ans: Spindle)
47. The properties of integral membrane proteins can be studied by _____. (Ans: Freeze-fracture technique and electron microscopy)
48. Fluid mosaic model of cell membrane was given by _____. (Ans: Singer and Nicolson)
49. The fluidity of the plasma membrane increases with _____. (Ans: Increase in unsaturated fatty acids in the membrane)
50. _____ proteins of the plasma membrane defines GPI anchored proteins. (Ans: Peripheral proteins of the plasma membrane)
51. _____ is a trans-membrane protein that form a hydrophilic channel which greatly accelerate the process of osmosis. (Ans: Aquaporins)
52. Sodium and potassium pumps are examples of _____. (Ans: Active transport)
53. The pumping of molecules or ions through a membrane against their concentration gradient is called _____. (Ans: Active transport)
54. The resting potential membrane is determined by _____. (Ans: Potassium-ion gradient)
55. The cellular sodium and potassium ion concentrations are maintained by _____ pump. (Ans: Na^+ - K^+ pump)

56. The term _____ derived from the electrochemical gradient described as the measure of the potential energy stored as a combination of proton and Voltage (electrical potential) gradients across a membrane. (Ans: Proton-motive force – PMF)
57. _____ is a transporter used to pump cations across the membrane and to flip the membrane phospholipids. (Ans: P-type ATPase)
58. The oxygen and carbon dioxide crosses the plasma membrane by the process of _____. (Ans: Passive diffusion)
59. A cell without a cell wall is termed as _____. (Ans: Protoplast)
60. The function of the centrosome is _____. (Ans: Formation of spindle fibres)
61. The term mitochondria was coined by _____. (Ans: Carl Benda)
62. _____ cell organelle is involved in apoptosis. (Ans: Mitochondria)
63. _____ is known as power house of the cell. (Ans: Mitochondria)
64. The main function of mitochondria is _____. (Ans: Respiration)
65. Cristae help in _____. (Ans: Respiration)
66. _____ and _____ are genetically autonomous. (Ans: Mitochondria, chloroplasts)
67. Fo – F1-ATPase is a membrane-bound enzyme found in the inner membrane of _____. (Ans: Mitochondria)
68. Cytoplasmic organelles, called _____ are centers for cellular respiration. (Ans: Mitochondria)
69. The stalked elementary particles present on the inner surface of inner membrane of mitochondria are called _____. (Ans: Oxysomes)
70. _____ number of principal hypotheses have been advanced to account for the coupling of oxidation and phosphorylation in mitochondria. (Ans: Three)
71. _____ is absent in prokaryotic cells, instead mesosomes are present. (Ans: Ans: Endoplasmic reticulum)
72. Camillo Golgi first described the internal reticular apparatus in the nerve cells of _____ as a special cytoplasmic area impregnated with silver nitrate. (Ans: Barn owl)

73. In eukaryotic cells ribosomes are attached to _____. (Ans: Endoplasmic reticulum)
74. Endoskeleton of cells is made of _____. (Ans: Endoplasmic reticulum)
75. _____ cell component is responsible for development of nuclear membrane. (Ans: Endoplasmic reticulum)
76. The endoplasmic reticulum occurs in all the eukaryotic cells except _____ of mammals. (Ans: Erythrocytes or R.B.Cs)
77. _____ type of ER is comparatively more stable. (Ans: Rough ER)
78. Ribosomes are attached to endoplasmic reticulum through _____. (Ans: Ribophorins)
79. Polyribosomes are aggregation of _____. (Ans: Several ribosomes held together by a string of mRNA)
80. An organelle in which protein synthesis occurs is _____. (Ans: Ribosomes)
81. Phosphatidylserine residues in the plasma membrane are located at _____. (Ans: Inner leaflet of the plasma membrane)
82. Distribution of intrinsic proteins in the plasma membrane is _____. (Ans: Asymmetrical)
83. Polythene chromosomes are found because of _____. (Ans: Endomitosis)
84. The histone octamer contains _____. (Ans: 8 histones of four different types)
85. The rRNA is synthesized by _____. (Ans: Nucleolus)
86. _____ is known as mitoplast. (Ans: Mitochondria without outer membrane)
87. The Lipid drugs' detoxification including the other harmful compounds of various types in the ER is carried out by _____. (Ans: Cytochrome P450)
88. The Major difference between the human cheek cells and onion peel cells is _____. (Ans: Cell wall presence in onion peel cells)
89. _____ first observed the Golgi apparatus in 1897. (Ans: Italian cytologist Camillo Golgi)
90. An organelle that mainly serves as a packaging area for molecules that are distributed across the cell and are called _____. (Ans: Golgi apparatus)

91. Structures similar to Golgi bodies found in plants have been referred to as _____. (Ans: Dictyosomes)
92. Dictyosomes is an alternative name used for _____. (Ans: Golgi complex)
93. Cellulose and hemicellulose which are constituents of cell wall are synthesized by _____. (Ans: Golgi apparatus)
94. Major secretory organelle of the cell is _____. (Ans: Golgi complex)
95. The Golgi components characterized by their dilated edges, compactly arranged in parallel fashion is known as _____. (Ans: Cisternae)
96. _____ cytoplasmic organelles react only with silver salt and osmic acid i.e. osmic or argentophilic in nature. (Ans: Golgi cisternae)
97. The two types of Golgi vesicles are known as _____ and _____. (Ans: Smooth and coated vesicles)
98. Neuro-transmitter release from neurons occurs by _____ Secretory vesicles. (Ans: Regulated)
99. Nucleus was discovered by _____. (Ans: Robert Brown)
100. The outer delimiting membrane is absent in _____. (Ans: Nucleoli)
101. Autophagic vacuoles result in _____ of a cell. (Ans: Death)
102. A new term _____ was proposed to donate the small proteinaceous infectious particle. (Ans: Prion)
103. Prions were discovered by _____. (Ans: Stanley B. Prusiner)
104. An older name for mycoplasma was _____. (Ans: PPLO – Pleuro Pneumonia Like Organisms)
105. In tobacco mosaic virus _____ acts as genetic material. (Ans: RNA)
106. The chief role of nucleolus in a nucleus concern _____. (Ans: Ribosomal synthesis)
107. _____ is the site of protein synthesis. (Ans: Ribosome)

108. Physical carriers of hereditary characters is _____. (Ans: Chromosomes)
109. The first person to isolate and characterize nucleic acid was _____. (Ans: Friedrich Miescher)
110. A chromosome having a centrally located _____ is called metacentric. (Ans: Centromere)
111. The function of centrosome is _____. (Ans: Cell plate formation)
112. Microtubule is involved in the _____. (Ans: Cell division)
113. Somatic pairing is characteristic of _____ chromosomes. (Ans: Polytene)
114. Nucleic acids are polymers of _____. (Ans: nucleotides)
115. Phosphoric esters of nucleosides are known as _____. (Ans: Nucleotides)
116. DNA generally acts as a template for _____. (Ans: both DNA and RNA)
117. An octamer of four histones complexed with DNA is called _____. (Ans: Nucleosome)
118. _____ was awarded Nobel Prize for the synthesis of RNA. (Ans: S. Ochoa)
119. RNA controls the synthesis of _____. (Ans: Enzymes)
120. Most abundant RNA in the cell is _____. (Ans: rRNA)
121. A complete set of chromosomes inherited as a unit from one parent is called _____. (Ans: Genome)
122. Chromosomes having one very small arm and another long arm is called _____. (Ans: Acrocentric)
123. Chromosomes with equal arms are called _____. (Ans: Metacentric)
124. A genophore is made up of _____. (Ans: A single double stranded DNA)
125. Lampbrush chromosomes are seen in _____ stage. (Ans: Meiotic prophase)

CHAPTER-10: CELL CYCLE AND CELL DIVISION

One mark questions

1. Define cell cycle
2. Name the phases of cell cycle
3. What is the G₁ phase of the interphase?
4. Which phase follows the S phase in the cell cycle?
5. What is mitosis?
6. What is meiosis?
7. In which phase of cell division crossing over?
8. What term is used for a full set of DNA instructions in a cell?
9. In which phase of the cell division the chromosomes are set free in the cytoplasm?
10. By which method cytokinesis occurs in animal cells?
11. What is the significance of Pachytene?
12. At what stage of mitosis, chromosomes arrange themselves around the equator?
13. What is karyokinesis?
14. What is cytokinesis?
15. What is the average cell cycle span for mammalian cell?
16. What is quiescent phase (G₀)?
17. Why is mitosis called equational division?
18. What are bivalents?
19. What is the Synapse?
20. What is chiasmata?
21. Why is meiosis called reductional division?
22. What is terminalization?
23. What is cell plate?
24. In yeast mitosis is a means of reproduction, Why?
25. Mention the significance of chiasmata.
26. The chromosomes are set free into cytoplasm in one of the following stages
a) Prophase b) Telophase c) Anaphase d) Metaphase
27. In which phase of the M phases the morphology of the chromosome can be best studied?
28. Spindle fibers get attached to centromere of the chromosome of the following stage
a) Telophase b) Anaphase c) Prophase d) Metaphase

29. What is a metaphasic plate?
30. Name the pathological condition when uncontrolled cell division occurs.
31. Name the enzyme which is involved in crossing over.
32. What is a significance of crossing over?
33. What is mean by recombination?
34. What is interphase
35. Which phases of the cell cycle takes longer time to complete
36. Name the adult animal cell which do not divide
37. What is syncytium?
38. Give an example for syncytium condition.
39. What id diad?
40. What is interkinesis?
41. What is tetrad?

Two Marks questions

1. Mention the role of centriole during cell division?
2. Write difference between zygotene and pachytene?
3. Draw a labeled diagram of Anaphase.
4. Draw a labeled diagram of Metaphase.
5. Write any two significance of mitosis?
6. Two events occur during S – phase in animal cells. DNA replication and duplication of centriole. In which parts of the cell do events occur?
7. Comment on the statement “Meiosis enables the conservation of specific chromosome number of each species even though the process actually results in reduction of chromosome number.
8. How does cytokinesis in plant cells differ from that in the animal cells?
9. Write a note on S – phase?
10. Mention different sub-stages of prophase-1 of meiosis?
11. Mention the significance of cell cycle?
12. Mention the phases of mitosis?
13. Give the sequence of events occurring during prophase of mitosis.
14. Give the key features of meiosis.
15. Differentiate between Meiosis-1 and meiosis-2.
16. List the features of diakinesis.
17. Write the characteristics of metaphase of M phase ?

18. Write the characteristic feature of telophase M phase?

19. Write the features of diplotene?

20. Mention the anaphase-1 character?

Four Marks Questions .

1. Distinguish between prophase and telophase?
2. Explain interphase with its stages.
3. With neat labeled diagram compare metaphase and anaphase of mitosis.
4. Match the following

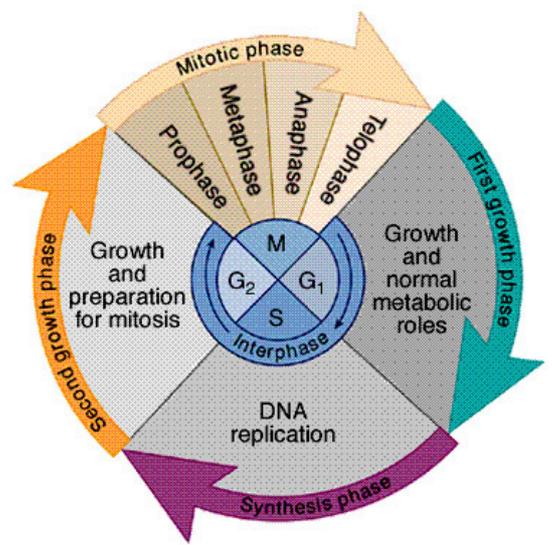
Column 1

Column 2

- | | |
|--------------|-------------------------------------|
| a) Prophase | 1. Formation of metaphasic plate |
| b) Metaphase | 2. Disintegration of nucleolus |
| c) Anaphase | 3. Reformation of nuclear membrane |
| d) Telophase | 4. Movement of daughter chromosomes |
-
5. List the difference between prophase and telophase of mitosis.
 6. With neat labeled diagram distinguish between zygotene and pachytene of prophase 1

Five marks Question

1. Distinguish between mitosis and meiosis.
2. Describe the stages of prophase-1 of meiosis.
3. Describe the stages of mitosis.
4. Distinguish between metaphase of mitosis and metaphase -1 of meiosis.



CHAPTER CELL CYCLE AND CELL DIVISION

Answers

- 1) The sequence of events by which cell duplicates its genome, synthesis of other constituents of the cell and eventually divides into two daughter cell.
- 2) a) Interphase b) M Phase
- 3) The G_1 phase Corresponds to interval between mitosis & initiation of DNA replication.
- 4) G_2 Phase
- 5) Cell divides equally to produce identical daughter cell so that they receive equal number of chromosomes as that of it's parents cell
- 6) It is a special type of division takes place in the gonads during gametogenesis by which the diploid cell undergo division producing haploid daughter cells
- 7) During pachytene of prophase-1
- 8) Genome
- 9) Metaphase
- 10) By process of furrowing of plasmamembrane exactly at the middle
- 11) Genetic recombination occurs
- 12) Metaphase
- 13) It is a process of division of nucleus into daughter nuclei in a dividing cell.or segregation of duplicated chromosome into daughter nuclei.
- 14) Division of cytoplasm
- 15) 24 hours
- 16) G_0 Phase means cell remain metabolically active but no longer proliferate.
- 17) Since the no of chromosomes in the parent and progeny cells is the same.
- 18) The homologous chromosomes which are involved in pairing process are called bivalent
- 19) The process of pairing of homologous chromosomes during zygotene
- 20) cytological appearance of X mark at the site of recombination
- 21) When cell under goes meiotic division that daughter cells receives half the chromosome number that of it's parent cell.
- 22) It is the process of movement of X mark appearance from the middle of the chromatids to the end of the chromatids of homologous chromosomes

- 23) It is a precursor of cell wall formed at middle of the nuclei in a divisional cell. later forms middle lamella
- 24) The yeast is a unicellular organism
- 25) Chiasmata helps in exchange of part of the chromatids of non-sister chromatids
- 26) d) metaphase
- 27) Metaphase
- 28) Metaphase
- 29) The plane of alignment of the chromosomes at equator
- 30) Cancer
- 31) Recombinase
- 32) Crossing over helps in genetic recombination
- 33) It is a process of exchange of part of the chromatids of non-sister chromatids of homologous chromosomes
- 34) The phase between two successive M phases
- 35) Interphase
- 36) Heart cells
- 37) It is a multinucleate condition arise due to karyokinesis not followed by cytokinesis
- 38) Liquid endosperm in coconut.
- 39) The two haploid daughter cells still attached each other at the end of telophase-I is called diad.
- 40) The stage between the two meiotic divisions
- 41) The four haploid cells still attached together at the end of telophase-II

Or

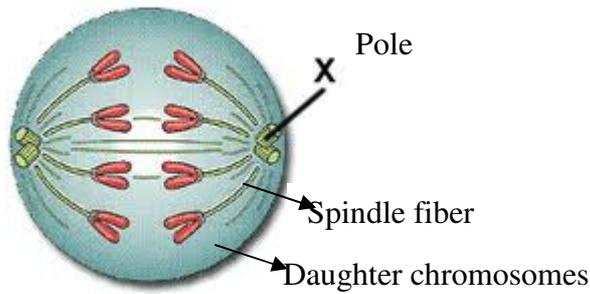
A four-part structure that forms during the prophase of meiosis and consists of two homologous chromosomes, each composed of two sister chromatids.

Two Marks Answers

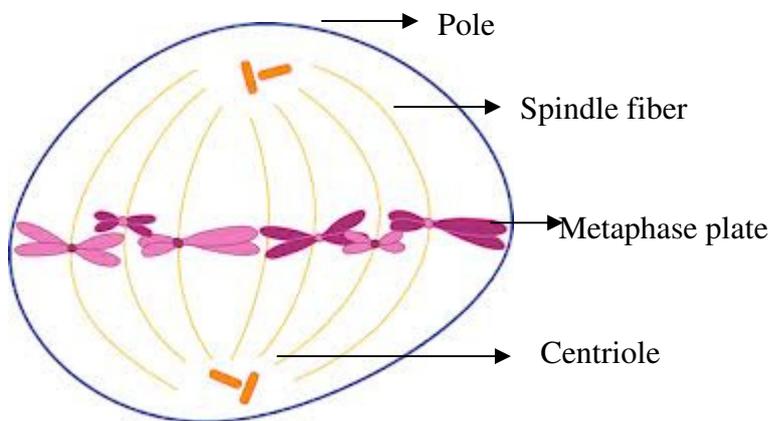
1. a) Centriole undergoes duplication during S-phase
b) it establishes the polarity in a divisional cell
c) it produces spindle fibers
- 2.

Zygotene	Pachytene
The homologous chromosome started pairing	The bivalents clearly appear as tetrads
Formation of synaptonemal complex	Appearance of recombination nodules

3.



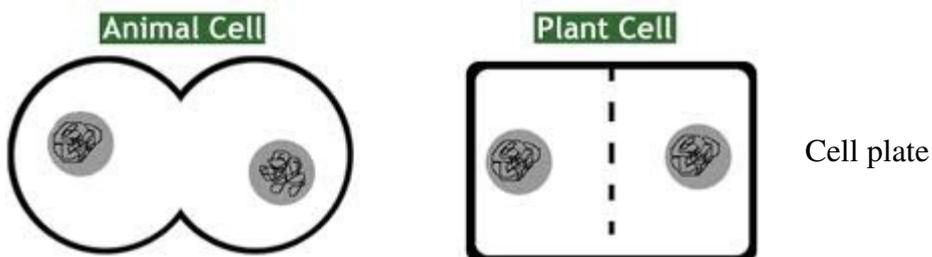
4.



- 5) a) The mitosis helps in increase in number of cells
- b) In unicellular organism it is a means of reproduction

- 6) DNA replication —Occur in nucleus
- Duplication of centriole —Occur in cytoplasm

- 7) During gamete formation parent diploid cell undergoes meiosis producing two haploid cell, they become gametes. The two male and female haploid gametes fuse together to form zygote – restoring diploidy.
- 8) In plant cell wall formation starts in the centre of the cell as cell plate and grows outward to meet existing lateral walls but in animal cell the cytokinesis is achieved by the appearance of a furrow in the plasmammembrane. This furrow gradually deepens towards meddle and join divides the cell.



a) During S-phase the DNA replicates.

10) Substages of prophase - 1

1 leptotene 2. Zygotene 3. Pachytene 4. Deplotene 5. Diakinesis

11) a) Multiplication of cell (Reproduction of cell)

b) Ensuring the exact distribution of chromosomes and cell content to daughter cells

12) Phases of mitosis

a) Prophase

c) Anaphase

b) Metaphase

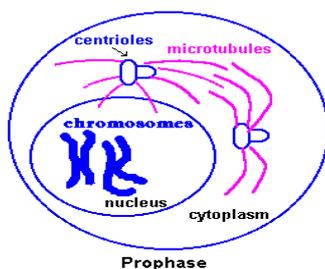
d) Telophase

13) a) Chromatin material started condensing

b) Duplicated centriols move towards opposite poles(In animals cells)

c) Mitotic spindle start appearing

d) Cell do not show gogli compelx endoplasmic reticulum nucleolus and nuclear envelop(Disappear)



14) Key features:

a) The diploid cell become haploid

b) chiasmata occurs in pachytene

c) Variations are created which are the source for evolution

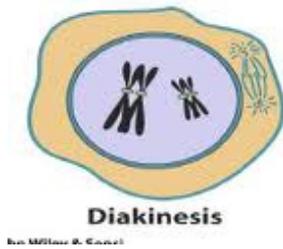
d) Meiosis occurs during gametogenesis

15)

Meiosis – 1	Meiosis – 2
* It occurs in Diad stage	* It occurs in tetrad stage
* Homologous chromosomes forms metaphasic plate	* Separated chromosomes forms metaphasic plate
* Homologous chromosomes gets separated	* Separated chromosomes gets divided
* Chromosomes are reduce to half by separation	* Chromosomes are duplicated by division

16) * Terminalisation of chiasmata

- * Chromosomes are highly condensed
- * Meiotic spindle is ready to prepare the homologous chromosomes for separation
- * Nucleolus and nuclear membrane starts break down



17) * Chromosomes are set free into cytoplasm

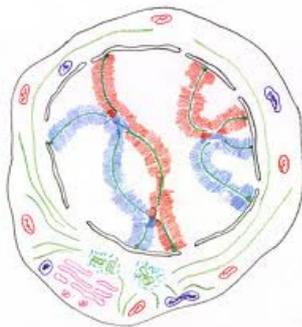
- * Chromatids of a chromosomes are attached to spindle fibers
- * Formation of metaphase plate
- * The chromosomes divide longitudinally produce daughter chromosomes

18) * The chromosomes that have been reached their respective poles

- * Chromosomes decondense so that individual identity is lost
- * Nuclear envelop develops around the chromosomes cluster
- * Nucleolus, golgi complex & endoplasmic reticulum reform

19) * dissolution of synaptonemal complex

- * Tendency of recombine homologous chromosomes starts separate from each other
- * X-marks are clearly appeared.(sites of chiasmata)

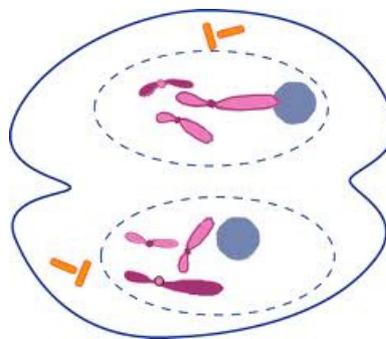
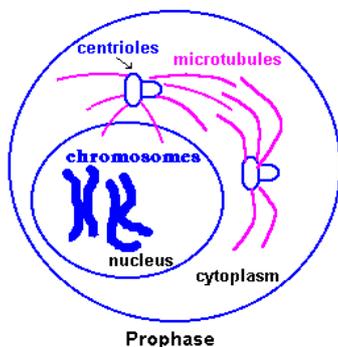


20) * Homologous chromosomes separates

- * Separated Homologous chromosomes moving towards opposite poles

Four Marks Answers

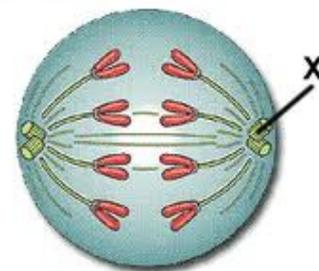
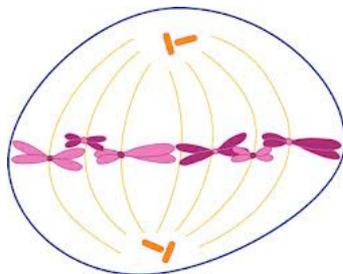
1)



Prophase	Telophase
<ul style="list-style-type: none"> • Chromatin condense • Chromatin becomes chromosomes • Nucleolus disappear • Nuclear membrane breaks 	<ul style="list-style-type: none"> • Chromosomes decondense • Chromosomes become chromatin form • Reforming of nucleolus • New nuclear membrane develops

- 2) * The phase between two successive M phases
- *The interphase includes G_1 , S and G_2 ,
 - *In G_1 phase cell is metabolically active and continuously grows
 - *S or synthesis phase marks the period during which DNA synthesis takes place. So that DNA per cell doubles. In animals cell centriole replicates
 - * G_2 during the G_2 phase proteins are synthesised in preparation for mitosis while cell growth continues.

3)



Metaphase	Anaphase
<ul style="list-style-type: none"> *chromosomes are all align on the equatorial line *Formation of metaphasic plate *Centromere touches equatorial line and their arms facing respective poles *The spindle fibers are attaches to kinetochore *Chromosomes are divide and produce daughter chromosomes 	<ul style="list-style-type: none"> *The daughter chromosomes started moving from equator towards their poles *The spindle fibers are shortening *The chromosomes alignment is in such a way the centromeres takes the leading position on their arms follows *Chromosomes during their movement looks like V, J, I, And rod shapes *Chromosomes reaches their poles

4)

Column 1

Column 2

- | | |
|--------------|--|
| a) Prophase | 1. Formation of metaphasic plate (b) |
| b) Metaphase | 2. Disintegration of nucleolus (a) |
| c) Anaphase | 3. Reformation of nuclear membrane(d) |
| d) Telophase | 4. Movement of daughter chromosomes(c) |

5)

Prophase	Telophase
<ul style="list-style-type: none"> Chromosomes are chromatin form Chromosome are lightly visible Nucleolus disappear Nuclear membrane breaks 	<ul style="list-style-type: none"> Chromosomes are decondence Chrsomosomes become chromatin form Reforming of nucleolus New nuclear membrane develops

6)



Zygotene	Pachytene
The homologous chromosome started pairing	The bivalents clearly appears as tetrads
Formation of synaptonemal complex	Appearance of recombination nodules

Five Marks Answers

1.

Mitosis	Meiosis
It occurs in somatic (body) cells	It occurs in reproductive (germ) cells.
It is an equational division.	It is a reductional division.
Two diploid daughter cells are	Four haploid daughter cells are

formed	formed
Daughter cells are similar.	Daughter cells are dissimilar
Nucleus and cytoplasm divides once	Nucleus and cytoplasm divides twice
Prophase is of short duration	Prophase-1 is of long duration
Synapsis do not occur	Synapsis occur
Chiasmata do not takes place	Chiasmata occur

2.

The prophase -1 is the longest process it is divided into 5 sub stages namely leptotene zygotene pachytene diplotene and diakinesis

Leptotene: the chromosomes are thin and lightly visible

Zygotene: Chromosomes starts pairing between homologous chromosomes

Formation of synaptonemal complex

Pachytene: Bivalent clearly appears as tetrads

Appearance of recombination nodules, crossing over occurs

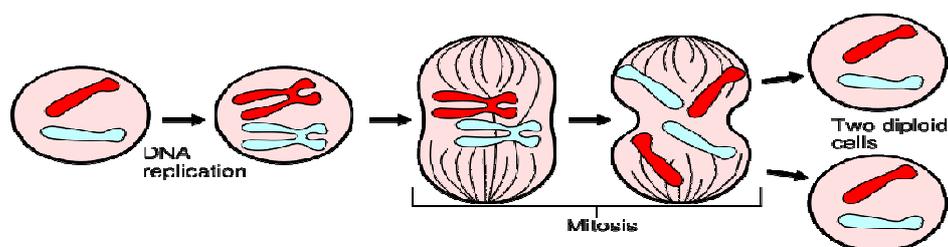
Diplotene: Dissolution of synaptonemal complex

Tendency recombined homologous chromosomes of the bivalents separate from each other

Diakinesis: Terminalization of chiasmata

Nucleolus and nuclear membrane breaks down

3.



a) Prophase

Chromosomes are chromatin form

Chromosome are lightly visible

Nucleolus disappear

Nuclear membrane breaks

Metaphase

*chromosomes are all align on the equatorial line

*Formation of metaphasic plate

*Centromere touches equatorial line and their arms facing respective poles

*The spindle fibers are attaches to kinatochore

*Chromosomes are divide and produce daughter chromosomes

Anaphase

*The daughter chromosomes started moving from equator towards their poles

*The spindle fibers are shortening

*The chromosomes alignment is in such a way the centromeres takes the leading position on their arms follows

*Chromosomes during their movement looks like V, J, I, And rod shapes

*Chromosomes reaches their poles

Telophase

Chromosomes are decondence

Chrmosomes become chromatin form

Reforming of nucleolus

New nuclear membrane develops

4)

Metaphase	Metaphase-1
Parental chromosomes are align on equator	The bivalent chromosomes align on equator
Chromosomes contain two chromatids	The chromosomes contain four chromatids
Centromere splits	Centromere do not splits
Daughter chromosomes are formed	The separation of homologous chromosomes occur

CELL CYCLE & CELL DIVISION

One mark questions

1. The term "meiosis" was coined by _____.
2. Which type of cell division occurs in the gonads?
3. Define cell cycle
4. Name the phases of cell cycle
5. What is the G₁ phase of the interphase?
6. Which phase follows the S phase in the cell cycle?
7. Coiling of chromatids in mitotic and meiotic division is
8. Condensation of chromosomes occurs in _____
9. The number of DNA in chromosome at G₂ stage of cell cycle is _____
10. The longest stage in the cell cycle is _____.
11. Chromosome structure can be observed best during which phase?
12. In which phase of cell division crossing over?
13. Which stage connecting link between Meiosis I and Meiosis II
14. What term is used for a full set of DNA instructions in a cell?
15. In which phase of the cell division the chromosomes are set free in the cytoplasm?
16. By which method cytokinesis occurs in animals cells?
17. What is the significance of Pachytene?
18. At What stage of mitosis, chromosomes arrange themselves around the equator?
19. What is karyokinesis?
20. What is cytokinesis?
21. What is the average cell cycle span for mammalian cell?
22. What is quiescent phase (G₀)?
23. Why mitosis is called equational division?
24. What are bivalents?
25. What is the Synapse?
26. What is chiasmata?
27. Why meiosis is called reductional division?
28. What is terminalization?
29. What is cell plate?
30. In yeast mitosis is a means of reproduction, Why?
31. Mention the significance of chiasmata.
32. In which phase of the M phases the morphology of the chromosome can be best studied?
33. Which stage of the cell division is affected by colchicum?
34. Synaptonemal complex is formed during which stage?
35. Spindle fiber get attached to centromere of the chromosome of _____ stage.
36. What is a metaphasic plate?
37. Name the pathological condition when uncontrolled cell division occurs.
38. Name the enzyme which is involved in crossing over.
39. What is a significance of crossing over?
40. What is mean by recombination?
41. What is interphase
42. Which phases of the cell cycle takes longer time to complete
43. Name the adult animal cell which do not divide
44. What is syncytium?
45. Give an example for syncytium condition.
46. What is diad?
47. What is interkinesis?
48. What is tetrad?