REV-00
MSZ/34/38 2014/01

M.Sc. ZOOLOGY
First Semester
Bioinstrumentation and Cell Biology
(MSZ - 02)

Duration: 3Hrs. **Full Marks: 70**

Part-A (Objective) =20
Part-B (Descriptive)=50

(PART-B: Descriptive)

Duration: 2 hrs. 40 mins. **Marks: 50**

1. Answer the following questions in brief (any *five*) **2×5=10**

a) What is chiasmata? How it is important during cell division?
b) How meiosis is differing from Mitosis? Give reasons.
c) Write a note on Ciliary movement.
d) Write a note on acetyl-choline.
e) The second division of meiosis is same with mitosis. Explain.
f) Mention the use of flow cytometry.
g) What is barr body?

2. Answer the following questions (any *five*) **3×5=15**

a) A solution containing RNA, DNA, and Proteins is subjected to centrifugation. Arrange these biological particles (RNA, DNA etc) in the centrifuge tube with the help of a diagram according to their sedimentation rate. Show the separation with the help of a suitable diagram.
b) Write the principal of phase contrast microscopy.
c) State and explain with suitable diagram how Cyclin-CDK complex gets regulated in a cell cycle control system?
d) What is a ring chromosome? How is it formed?
e) Write a short-note on polytene chromosome.
f) Write a note on cross section of the axoneme of a cilium.
g) Discuss on the cell membrane permeability.

3. Answer the following questions in details (any *five*) **5×5=25**

a) Mention the phenomenon of Bar eye formation in drosophila. What is position effect? Describe with examples the phenomenon of chromosomal translocation.

b) What do you understand by cell cycle checkpoints? State and explain the regulatory mechanism of spindle assembly checkpoint.

c) Write a note on the transmission of nerve impulse.

d) What are the different separation techniques? Discuss briefly about thin layer and column chromatography.

e) Briefly describe the steps for Freeze fracture of tissues.

f) Why meiosis is called reduction division. Why Meiosis is important. Give reasons in support of significance of meiosis.

g) How SEM is different from TEM. Give reasons. Write the applications of flurosescent microscopy.

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(The figures in the margin indicate full marks for the questions)

Duration: 20 minutes **Marks – 20**

PART A- Objective Type

Choose the correct options from the following: **1×20=20**

1. Nodes of Ranvier is
   a. Interruption in myelin sheath
   b. Only myelin sheath
   c. Both of the two
   d. None of these

2. Sarcomere is
   a. Muscle cell membrane
   b. Muscle cytoplasm
   c. Cell wall
   d. Space between two Z lines.

3. Which of the following is not because of a neuron?
   a. Receive signal
   b. Transmit signal
   c. Development of a brain tumor
   d. None of these

4. Which of the following is the most longest phase in meiosis?
   a. Prophase I
   b. Metaphase
   c. Telophase
   d. Non of these

5. Tetrad is
   a. Four sister and non-sister chromatids
   b. Four sister chromatids
   c. Four chromosomes
   d. None of these

6. In synapsis
   a. Homologous chromosome pairs
   b. Non-homologous chromosome pairs
   c. Both a &b are correct
   d. None of these

7. The flagella tend to beat in a
   a. Coordinated rhythm
   b. Independently
   c. Both a and b
   d. None of these

8. Condenser of a microscope is
   a. The resolution power
   b. Minimum distance at which two objects are resolvable as separate entities.
   c. Maximum distance at which two objects are resolvable as separate entities.
   d. Concentrates light to the specimen

9. Flurophore substances used in
   a. Fluorescent microscope
   b. Phase contrast microscope
   c. Flow cytometry
   d. Both **a and c** are correct

10. The protein which helps in regulation of DNA damage check point and is also known as tumor supressor protein is

    a. P 21 protein b. P 53 protein c. Ubiqutin protein d. Mad/Bub protein

11. In the process of regulation of spindle assembly checkpoint, the Cdc 20 molecule is inhibited by

    a. APC/C complex b. Mad/Bub complex c. SCF complex d. none of the choices

12. The example of CDK inhibitor proteins (CKIs) is

    a. Wee1 kinase b. CAK c. Cdc 25 d. none of the choices

13. S- cyclins bind to CDKs during S-phase and are required for
    a. commit the cell to DNA replication b. promote events in mitosis
    c. initiation of DNA replication d. to halt cell cycle

14. MPF means
    a. mitosis progression factor b. mitosis protein factor
    c. mitosis promoting factor d. mitosis passing factor

15. Cyclin D forms complexes with

    a. CDK 6 and CDK 4 b. CDK 2 and CDK 4 c. CDK 1 d. CDK 2

16. The cyclin subunit of a cyclin-CDK complex is known as

    a. catalytic unit b. regulatory unit c. functional unit d. none of the choices

17. Cryopreservation is useful for
    a. Preservation of semen b. Living cell c. Very young fetuses d. All of the above

18. Which of the following is not a goal of tissue fixation?
    a. Terminate metabolism b. Prevent enzymatic self digestion
    c. Harden tissue by cross linking d. Freeze cell components

19. Which is not true for Eosin stain?
    a. Acidic dye b. Dyes basic molecule pink c. Dyes RER d. Dyes lysosomes

20. Cells when isolated from a tissue and grown *in vitro* is called
    a. Sub culture b. Primary culture c. Passaging d. all of the above

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