

M. Sc. DEGREE EXAMINATION, NOVEMBER 2017
BIOINFORMATICS
FIRST SEMESTER

COURSE : ELECTIVE

PAPER : CELL BIOLOGY AND GENETICS

TIME : 3 HOURS

MAX. MARKS: 100

SECTION – A

I. ANSWER ALL THE QUESTIONS

Choose the correct answer

(5 x 1 = 5)

- Cell Theory was proposed by
 - Beadle and Tatum
 - Schleiden and Schwann
 - Robert Hooke
 - Leeuwenhoek
- The main function of a centrosome is
 - Secretion
 - Protein synthesis
 - Osmoregulation
 - Formation of a spindle fibre
- Assembly of two subunits 40S and 60S of a ribosome is
 - 100S unit
 - 80 S unit
 - 70 S unit
 - 90S unit
- Exon skipping is associated with
 - nonsense mutations
 - silent mutations
 - regulatory mutations
 - RNA processing mutations
- Semiautonomous organelle in the cell is
 - mitochondria
 - Peroxisomes
 - Endoplasmic reticulum
 - Golgi body

Fill in the blanks

(5 x 1 = 5)

- A framework of protein scaffolds called the _____ provides the cytoplasm and the cell with their structure.
- _____ is a disorder which shows X-linked inheritance.
- _____ is partially condensed form of chromatin which is lightly stained.
- Microfilaments are composed of a protein called_____.
- The term gene linkage was coined by _____.

State whether TRUE or FALSE

(5 x 1 = 5)

- SER is well developed in cells engaged in lipid metabolism.
- Lysosomes were discovered by de Duve in 1955.
- The term cell was coined by de Bary when he examined cork tissue.
- Plasmodesmata is a thin layer of cementing material found in adjacent plant cells.
- Linkage prevents segregation of alleles.

Match the following: cell structure with its function

(5 x 1 = 5)

- | | |
|-------------------|------------------------------------|
| 16. Nucleus | Protective barrier |
| 17. Cell membrane | Storage of genetic information |
| 18. Cell wall | Protein synthesis |
| 19. Vacuoles | Structure and rigidity to the cell |
| 20. Ribosomes | Storage organelles |

SECTION – B**II. ANSWER ANY FOUR QUESTIONS****(4x10=40)**

21. Describe the ultrastructure of mitochondria with a suitable diagram.
22. Enumerate upon the importance of post-translational modifications.
23. Compare and contrast prokaryotic and eukaryotic cells.
24. Highlight the importance of the fluid mosaic model.
25. Briefly describe ABO blood grouping.
26. Elaborate upon gene linkage in *Drosophila*.
27. Describe the morphology of a typical bacterial cell.

SECTION – C**III. ANSWER ALL THE QUESTIONS****(2x20=40)**

28. Describe how the nucleus is organized in the cell. What is the structure and function of the nucleolus and add a note on the nucleolar organizing region.
29. Write an essay on sex determination in humans. Add a note on the importance of Y chromosome and Y linked genes.
30. Enumerate upon the lytic and lysogenic cycle in viruses. Illustrate wherever necessary.
31. Write an essay describing the various stages of meiosis. Draw suitable diagrams.
