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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

END SEMESTER EXAMINATION-2015

B.Tech. VI Semester, Branch-BT

COURSE CODE: 10B11BT613

MAX. MARKS: 45

COURSE NAME: Cell and Developmental Biology

COURSE CREDITS: 04

MAX. TIME: 3 HRS

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

**Section A**

(1 x 9 = 9 marks)

1. What is the biological significance of uncoupling of electron transport chain?
2. Define a protocol for confirmation of isolated organelle as mitochondria.
3. Differentiate between SEM and TEM?
4. What is the significance of KDEL sequences?
5. What do you understand by morula and how many cells are present in human embryo at this stage?
6. Differentiate between symport and antiport transport systems with suitable examples.
7. Give the principle of giemsa staining for karyotyping.
8. Define heparin and its significance.
9. Differentiate between magnification and resolution.

**Section B**

(5 x 3 = 15 marks)

1. A hormone level once gets elevated after 5-6 days of fertilization confirms the embryo development? Name this hormone and explain the developmental of human embryo at this point of time. Also explain the potential application of this hormonal elevation, which is being utilized in modern medical science.
2. NADH can be transported in mitochondria by two shuttle mechanisms into mitochondria; however different organs utilized different shuttles. Name and explain these shuttles and also describe the fate of total number of ATP produced by these mechanisms.
3. Explain molecular details of gastrulation stage and also define different types of cells movements.

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4. An organelle of cell has a major role in the autophagy. However, it has several other functions in biosynthetic pathways as well as in clearing mechanisms of cell. Name this organelle and explain the various functions associated with this organelle.
5. Define the following terms:
- a) Zebra fish as a model for studies of human diseases
  - b) Biological significance of receptor mediated endocytosis

**Section C**

(7 x3 = 21 marks)

1. a) Explain acrosomal and cortical reactions associated with normal human fertilization. What are the biological significances of these reactions in fertilization?
- b) Proteins are associated with phospholipids in plasma membrane however due to their structural features these show the different functions in membrane. Define and explain the classes of membrane proteins with example.
2. Define three major components of cell cyto-skeleton system. Explain their structural details, location and biological significance.
3. a) What do you understand by term protein trafficking? Explain in brief the process of protein maturation during vesicular transport and define the role of SNAREs in this event.
- b) Justify the statement: "Cholesterol an amphipathic molecule is required for maintaining the plasma membrane integrity".

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