B 405

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2005.

Second Semester

Industrial Biotechnology

IB 131 — CELL BIOLOGY

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Draw Singer and Nicholson model of bio-membrane structure.

2. Differentiate symport and antiport with examples.

3. What are the functions of oncogenes in tumour cells?

4. Explain autocrine mode of signalling with example.

5. Differentiate 'primary culture' and 'immortal cell line'.

6. Name any four model organisms studied in cell biology experiments.

7. Differentiate phagocytosis and pinocytosis with example.

8. What are proton pumps?

9. Indicate functions of cyclins and calmodulin.

10. Write short notes on cryopreservation.

PART B — (5 × 16 = 80 marks)

11. (i) Distinguish cell division occurring in somatic and germ cells. Explain various events taking place in germ cell division with diagrams. (10)

(ii) Explain the principle and working of fluorescent and phase contrast microscope. (6)

12. (a) Describe in detail the isolation, characterization and quantitation of a receptor. (16)

Or

(b) Explain in detail about G protein-coupled and Tyrosine kinase lined receptors. (16)

13. (a) Describe in detail about the cytoplasmic organelles present in plant, animal and bacterial cells. (16)

Or

(b) Describe the culturing methods for plant and animal cell cultures. (16)

14. (a) Compare the major classes of ATP powered ion and small molecule pumps. How Na^+ and K^+ concentrations are maintained at intracellular level. (16)

Or

(b) Explain in detail about the entry of viruses and toxins into the cells. (16)

15. (a) Explain in detail about the active and passive transport of molecules across cell membranes. (16)

Or

(b) (i) Distinguish between autocrine, paracrine and endocrine ligands. (6)

(ii) Describe the signal transduction with a plasma membrane receptor using a cytokine ligand and using phospholipids second messenger. (10)