



**College of Engineering, Pune**  
(An Autonomous Institute of Government of Maharashtra)

**END SEMESTER EXAM**

**F.Y. B. Tech. (AS 105)- (Living Machines)**

Day & Date- Tuesday/ May 04, 2010

Timing- 10 am to 1 pm

Max. Marks- 50

Duration – 3 hrs.

**Instructions:**

1. Figures to the right indicate full marks. All questions are compulsory
2. Support your answer with neat and labeled sketches wherever necessary.
3. Maintain the continuity in attempting the answer/s of same question/ sub questions
4. Over writing or scratching of answer to objective questions will not be assessed

**Q.1 A Fill in the blanks with appropriate word/s and rewrite the sentence 05**

- 1 Colonies of recombinant plasmids on agar appear white in color due to absence of enzyme -----.
- 2 The process of producing transgenic animals, for large scale production of milk protein is known as -----.
- 3 Washing away of slime layer from trickling filter is known as -----.
- 4 Blocking ----- can disrupt development, cause infertility.
- 5 The bioinformatics tool ----- is used for comparing gene and protein sequence.
- 6 ----- allow large cross-section muscles to attach to a smaller area of bone.
- 7 By exposing micro organisms to alternate aerobic and anaerobic conditions ----- is removed.
- 8 ----- embedded in quantum dots with several colors are used for DNA sequencing.
- 9 ----- is major connecting link between catabolic and anabolic reactions in the cell.
- 10 Silicon and germanium are ----- type of biomaterials.

**B Match the following from Column A with B and rewrite both columns 05**

	<u>Column A</u>	<u>Column B</u>
1	Innulin	Transport protein
2	DNA	Storage Protein
3	Cholesterol	Mucopolysaccharide
4	Casein	Structural polysaccharide
5	Chondrin sulphate	Contractile protein
6	RNA	Storage polysaccharide
7	Haemoglobin	Structural protein
8	Actin	Protein synthesis
9	Agar	Prostaglandin
10	Collagen	Genetic information
		Membrane lipid

- Q. 2 A Explain what will happen in following cases (any five):** **05**
- 1 Troponin and tropomyosin removed from the muscles.
  - 2 Transducer is not incorporated in a biosensor.
  - 3 Cholesterol gets deposited in blood vessel.
  - 4 Electrodes not fitted in experimental set up in Miller & Urey's experiment.
  - 5 Crushed rocks & ceramic bricks are not sprayed in trickling filter.
  - 6 Excitation filter is removed from the fluorescence microscope.
  - 7 *Taq* polymerase is not added while running PCR
- B Sketch & label any one from the following:** **03**
- Transverse section of axial filament of cilia/ flagella
  - Electron Transport Chain (ETC)
- C Define any 4 terms:** **02**
- |                         |                |
|-------------------------|----------------|
| Biochemical Engineering | Biomechanics   |
| Bioinformatics          | Bioremediation |
| Biomaterial             | Biomolecules   |
- Q. 3 A Describe fluorescence activated cell sorting (FACS) method.** **03**
- B Explain principle of techniques used in cell biology and application (any 3)** **03**
- |                       |                    |
|-----------------------|--------------------|
| Tissue culture        | Cell fractionation |
| X ray crystallography | Chromatography     |
- C State the 6 steps in the process of cloning and describe any one of them.** **04**
- OR**
- Explain non cyclic photo-phosphorylation and its significance in photosynthesis.
- Q. 4 A Attempt any two from the following:** **06**
- Describe any three advances in the field of Bioengineering.
  - Write a note on Environmental Impact Assessment.
  - Elaborate on any three methods used in synthesis of scaffold.
- B Describe the structure of myosin muscle protein with suitable diagram.** **04**
- OR**
- Discuss the diagnostic uses of MRI and CT scan. Add a note on the limitations on their use.
- Q. 5 A Identify in which machine / tool following parts are present and comment on their function -- any 3** **03**
- |                 |                           |
|-----------------|---------------------------|
| PMT device      | Associated electronics    |
| Dichroic mirror | Platinum Oxygen electrode |
| Biodisc         |                           |
- B Describe 2 functions of cell organelles – any 3** **03**
- C Write short notes on – any 2** **04**
- 1 Collision (with suitable biological example)
  - 2 Types of data bases in bioinformatics (2 examples of each)
  - 3 Requirements of an ideal biosensor.