**BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI**

**Biology Project Laboratory (BIO F231)**

# Second Semester 2015-16

**Comprehensive Examination**

Duration: 3 hrsMax Marks: 60 Date: 06/05/2016

**Note: Answer strictly in the same series as questions. Keep your answer brief and to the point**

**[Q1]** Describe so as to clearly differentiate between primary culture, cell line/cell strain and continuous cell lines. **[6]**

**[Q2]** What is replicative cell senescence and what is its significance in cell culture technology? **[6]** **[Q3]** What kind of enzyme is Trypsin? On which type of cell lines is it generally used? What is its role and how can you stop its activity? **[6]**

**[Q4]** Differentiate between **[6]**

(a) RPMI and DMEM/EMEM

(b) Trypan blue and MTT Assay

**[Q5]** Provide short answers for the following **[6 x 2=12]**

(A) What was the indicator present in the media prepared by you and what does it indicate?

(B) What is the role of L-Glutamine in cell culture media?

(C) What purpose does CO2 incubator serve in cell culture experiments?

(D) During your experiments, you used a tray containing a salt solution in your CO₂ incubator. What is the name of salt used? Mention two uses of this solution?

(E) Why the serum used in cell culture media isolated from Fetal calf and not from adult animal?

(F) What are the properties of PBS (Phosphate buffered saline) used in cell culture media?

**[Q6]** Before passaging your adherent cells, you wanted to count them and also check their viability. So you took 100 µl of the cell suspension (after trypsinization) and added 300 µl of trypan blue to it. After counting all four chambers, you got: Live cells (30+33+28+29) and Dead cells (7+3+6+4) respectively. From above data, calculate the:

1. Percentage of viable cells
2. Concentration of viable cells/ml.  **[6]**

**[Q7]** What are the features desirable in a macromolecule to be analyzed for phylogenetic analysis? Which macromolecule did you use for phylogenetic analysis in your experiment? What features does it possess that makes it suitable for the purpose? **[5+1+4=10]**

**[Q8]** Provide one example or one word/one phrase answer. Write answer only in answer sheet provided. Do not write anything on the question paper. **[8]**

(1) A Metal whose ions are immobilized in the matrices of affinity chromatography.

(2) A kind of immunoprecipitation which is used to determine the location of DNA binding sites on the genome for a particular protein of interest.

(3) The name of non specific dye commonly used in real time PCR.

(4) A common blocking agent used in western hybridization.

(5) The kind of natural competence in bacteria which requires a bacteriophage.

(6) Spore strips of this organism are used as biological indicators in autoclaving procedure.

(7) In flow cytometry; the cells are permeabilised and treated with this fluorescent dye before analysis. It stains the DNA quantitatively.

(8) The kind of reverse transcriptase PCR (RTPCR) that uses a synthetic RNA that can be distinguished from the target RNA by a small difference in size or sequence.

All the best