

Five Year Integrated M.Sc. Examination, 2017

Semester - VIII

Course: LS-4-8-1

(Techniques in Biology)

Time: Four Hours

Full Marks: 80

Questions are of value as indicated in the margin.

Answer **Question No.1** and **any four** from the rest.

1. Write short notes on **any ten** of the following: 2x10=20
 - a. What is the composition of freezing medium?
 - b. Write the composition of a medium used for monoclonal antibody production.
 - c. Explain the use of Trypsin-EDTA in mammalian cell culture.
 - d. What is DMEM? Name a chemical used for indicating pH of the medium.
 - e. Using spectrophotometry, how do you determine the purity of nucleic acids?
 - f. Genome and Glycome.
 - g. What is PAGE?
 - h. How is body labelling of a probe different from end labelling?
 - i. What are exons and introns?
 - j. Difference between gDNA and cDNA.
 - k. What do you mean by high stringency washes in Southern/Northern hybridizations?
 - l. What substance can be used to detect DNA in a gel under UV? What is the principle behind the detection?
2.
 - a. What are the advantages and disadvantages of primary culture and cell lines?
 - b. Mention some of the important uses of serum.
 - c. Draw a flow chart for mammalian cell culture (thawing to splitting).
 - d. What are the important proteins which are involved in cell-cell attachment that also provide support for growth of cell lines? 5+3+5+2=15
3. Write short notes on:
 - a. Southern blotting
 - b. Northern blotting
 - c. Taking suitable example(s), discuss the use of these techniques. 5+5+5=15
4.
 - a. What is 2-D gel electrophoresis?
 - b. What is native gel electrophoresis?
 - c. Explain how proteins get separated in SDS-PAGE?
 - d. Explain the use of molecular weight markers in electrophoresis.
 - e. Explain how 2-D gel electrophoresis could be used for proteome comparison with a suitable example. 1+1+2+1+10=15
5.
 - a. What is/are the difference between sterilization and disinfection?
 - b. Briefly describe sterilization by autoclaving.
 - c. What is "tyndalization"?
 - d. What is/are the preferred method(s) of sterilization for Penicillin solution, FCS, hygroscopic powders and glass articles?
 - e. What is HEPA filter?
 - f. Briefly describe gel exclusion chromatography. 2+5+2+2+1+3=15

P.T.O.

(2)

6. a. What is a DNA micro-array?
b. What is parallel sequencing?
c. There are two agarose gels with concentration 2% and 1% (w/v). You have two mixtures of DNA. Sample A contains 3kbp, 3.2kbp and 4 kbp fragments. Sample B contains 3kbp, 5 kbp and 7kbp fragments. If you are to choose only one agarose gel for one sample, which one would you choose for Sample A and why?
d. With the help of a flow chart explain how you would compare the transcriptomes of heart and brain tissues of a mouse. 1+1+3+10=15
7. Briefly describe any three methods of NGS. 5x3=15
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