

## Analytical Techniques In Plant Sciences, Life Science VI semester

### Question bank for OBE 2020

#### Instructions to the students:

*Your semester end theory exam will be open book examination which will be of 75 marks.*

*Each exam will be of **2 hours**. You will be provided with 1 extra hour to scan your answersheets and upload it.*

*Every question paper will comprise of 6 questions of equal marks i.e. **18.75** marks; out of which you have to perform any **four**.*

*Questions can be analytical whose straight answer you won't get in any book. That is why the answers are expected to be simple, to the point and non lengthy.*

Q1. Explain the different techniques used in sample preparation for electron microscopy. Describe how freeze fracture technique helps in understanding the membrane structure. How is freeze fracture different from freeze etching?

Q2. Expand FISH. Give an account of the technique and its application. What is the name of the technique whose principle is FISH and is used to mark different genes on a chromosome? Explain its procedure with diagram.

Q3. Hypothetically imagine, you have gone to a lab to test for finding abnormality in your blood count. The technician draws blood and sends it for further analysis. Which technique will be used to find details about the cells present in your blood? How fluorochromes are helpful in this technique? Explain with well labelled diagram, the principle behind the technique.

Q4. What are fluorochromes, give any two names of the same. Give principle and applications of analytical techniques which uses fluorochromes.

Q5. If you have gone to a murder scene, where you find five different blood samples out of which one is one that of victim's and one is of suspect. What will you do to zero in on the suspect? Give the principle of the technique you will use along with its other applications.

Q6. What are the techniques using which you can characterize nucleic acids and proteins? Give the principle and applications of each technique.

Q7. If you are given a mixture of essential oils, how would you separate them? Explain the technique in detail.

Q8. How will you study the internal structure of a membrane? Give the details of the technique along with well illustrated diagrams.

Q9. Which technique should be employed to study the precise location of a tracer in a tissue? Explain with the help of a well illustrated experiment.

Q10. How will you study the surface topography of a specimen in detail. Give the ray diagram of the involved technique long with the method of sample preparation.

Q11. With the help of well illustrated diagrams explain the chromatographic techniques in which the separation is done on the basis of (1) charge, (2) size and (3) biological reaction.

Q12. If you are provided with a cell homogenate and you have to pellet down the mitochondria, what should be your strategy to do so? Define Svedberg unit and its relevance in cell fractionation studies. Differentiate between sucrose and CsCl density gradient centrifugation.

Q13. (a) The number of COVID 19 patients that visited the doctor for consultation for 10 consecutive days is arranged in an increasing order in the following table. Find out the median of patients that visited the doctor per day.

8	10	12	14	16	18	19	20	22	25
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(b) Find the mean from the following data

Marks	5	10	15	20	25	30	35	40
No. of Students ( <i>f</i> )	5	7	9	10	8	6	3	2

(c) Calculate the standard deviation from the given data

Sl. No.	1	2	3	4	5	6	7	8	9	10
Size	20	22	27	30	31	32	35	40	45	48