# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.Sc.** DEGREE EXAMINATION – **PLANT BIOLOGY AND PLANT BIOTECHNOLOGY**

FOURTH SEMESTER – **APRIL 2023**

**UPB 4601 – BIOLOGICAL TECHNIQUES**

Date: 06-05-2023 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

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| | **SECTION A - K1 (CO1)** |
| | **Answer ALL the Questions** **(10 x 1 = 10)** |
| 1. | **Fill in the blanks** |
| a) | The device used to take ultra-thin sections is…….. |
| b) | The Lactophenol Cotton Blue (LPCB) wet mount is most widely used method for the staining and observation of …….. |
| c) | One Svedberg unit is _____ seconds. |
| d) | The study of the interaction of radiation with matter is called _____ |
| e) | The carrier gas used in gas chromatography is _____ |
| 2. | **State whether the following statements are TRUE or FALSE** |
| a) | Rawlin's Formula is an example of chemical fixation. |
| b) | Very hard, woody materials are macerated with conc. nitric acid along with a pinch of potassium chlorate. |
| c) | The tendency of a rotating body to move away from the centre of rotation is called centrifugal force. |
| d) | Luminometry does not require a wavelength selector. |
| e) | Chromatography basically employs 3 phases for separation. |
| | **SECTION A - K2 (CO1)** |
| | **Answer ALL the Questions** **(10 x 1 = 10)** |
| 3. | **Choose the correct answer** |
| a) | Safranin is an example of<br>a) natural stain b) synthetic stain c) direct stain d) selective stain. |
| b) | Leaf clearing process if done not very carefully, leaf could be<br>a) destroyed b) folded over c) broken into pieces d) all the above. |
| c) | The following are the Cryoprotectants EXCEPT:<br>a) Glycerol b) Mannitol c) DMSO d) Methanol. |
| d) | NMR is the study of absorption of _____ by nuclei in a magnetic field.<br>a) Radioactive radiation b) IR radiation c) Radio frequency radiation<br>d) Microwaves |
| e) | In chromatography, the stationary phase can be _____<br>a) Solid or liquid b) Liquid or gas c) Solid only d) Liquid only |
| 4. | **Answer the following, each in about 50 words** |
| a) | Mention any two advantages of microtomy. |
| b) | Describe surface replicas. |
| c) | Define pH. |

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| d) | What is luminescence? |
| e) | Expand PAGE. |
| | **SECTION B - K3 (CO2)** |
| | **Answer any TWO of the following in 500 words (2 x 10 = 20)**<br>**Draw diagrams / flowcharts wherever necessary** |
| 5. | Compare the macrophotography with microphotography. |
| 6. | Illustrate squash technique with its principle and procedure. |
| 7. | Give a brief account on the working of pH meter. |
| 8. | Write notes on the chemicals used in SDS PAGE. |
| | **SECTION C – K4 (CO3)** |
| | **Answer any TWO of the following in 500 words (2 x 10 = 20)**<br>**Draw diagrams / flowcharts wherever necessary** |
| 9. | Illustrate the cell wall staining with an example. |
| 10. | Describe the process of lyophilization with applications. |
| 11. | Analyse the phenomenon and applications of luminometry. |
| 12. | Examine the principle on HPLC and its uses. |
| | **SECTION D – K5 (CO4)** |
| | **Answer any ONE of the following in 1000 words (1 x 20 = 20)**<br>**Draw diagrams / flowcharts wherever necessary** |
| 13. | Discuss the working principle and calculation of haemocytometer. |
| 14. | Elucidate the working principle and applications of IR spectroscopy. |
| | **SECTION E – K6 (CO5)** |
| | **Answer any ONE of the following in 1000 words (1 x 20 = 20)**<br>**Draw diagrams / flowcharts wherever necessary** |
| 15. | Give an outline on the collection of plant specimen and tools and equipment for preparing a herbarium. |
| 16. | Discuss the working principle and applications of single and double beam spectrophotometer and the photomultiplier tube. |

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