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M.Sc.(Biotech.)-I Sem.

Roll No.

NP-3333

**M. Sc. (Biotechnology) Examination,
Dec. 2017**

Tools & Techniques of Biotechnology

[(H-104) M. Sc. (Biotech.)]

Time : Three Hours]

[Maximum Marks : 50

Note: Attempt questions from all Sections as per instructions.

Section-A

(Very Short Answer Questions)

Answer all the *five* questions. Each question carries 2 marks. Very short answer is required not exceeding 75 words. $2 \times 5 = 10$

1. What are the basic components of the light microscope ?

(2)

2. What is the principle of mass spectrometry ?
3. What are the components of column chromatography ?
4. What are the different kinds of rotors used in centrifugation ?
5. What are radioisotopes and what are their characteristics ?

Section-B

(Short Answer Questions)

Answer any *two* questions out of the following three questions. Each question carries 5 marks. Short answer is required not exceeding 200 words. $5 \times 2 = 10$

6. Discuss about the chromatographic performance parameters.
7. Describe the applications of chromatography.
8. Describe the support media used in electrophoresis.

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Section-C

(Detailed Answer Questions)

Answer any *three* questions out of the following five questions. Each question carries 10 marks. Answer is required in detail. $10 \times 3 = 30$

9. What are the components of a Gas chromatography system ? Describe the detectors used in this system.
10. Describe contrast microscopy in detail. What are its applications ?
11. Describe the principle and applications of centrifugation.
12. Give a detailed account of ionization during mass spectroscopy and its applications.
13. What is radioactivity ? Discuss the applications of radioisotopes in biological sciences.

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A

Printed Pages : 3

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Roll No.

M.Sc. (Biotechnology) -I Sem.

NP-3333

M. Sc. (Biotechnology) Examination,

November-2019

**TOOLS AND TECHNIQUES OF
BIOTECHNOLOGY**

(H-104)

M. Sc. (Bio-Tech.)

Time : Three Hours]

[Maximum Marks : 50

Note : Attempt questions from **all** Sections as per instructions.

Section-A

(Very Short Answer Questions)

Note : Attempt all the *five* questions. Each question carries 2 marks. Very short answer is required not exceeding 75 words. $5 \times 2 = 10$

1. Why 2D electrophoresis is better than SDS PAGE or IEF alone ?
2. Explain the principle of "density gradient centrifugation technique". How can it be used for separating different cellular components ?

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[P.T.O.]

(2)

3. What are the applications of analytical ultracentrifugation in biology? How sedimentation co-efficient and density of a protein are related?
4. Why NMR is called "Nuclear Magnetic Resonance" and not simply nuclear magnetic spectroscopy?
5. Define radiation dose?

Section-B

(Short Answer Questions)

Note : This section contains three questions. Attempt any *two* questions. Each question carries five marks. Short answer is required not exceeding 200 words. $2 \times 5 = 10$

6. Write short note on ultracentrifugation?
7. Differentiate between U.V. visible absorption spectroscopy and fluorescence spectroscopy.
8. Explain the mobile and stationary components of HPLC?

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Section-C

(Detailed Answer Questions)

Note : This section contains five questions. Attempt any *three* questions. Each question carries 10 marks. Answer is required in detail. $3 \times 10 = 30$

9. Define microscopy? Describe the structure, principle and working of SEM and TEM?
10. What are the principles and applications of PAGE? Differentiate between Agar Gel electrophoresis and SDS-PAGE.
11. Briefly explain the principles of different types of spectroscopy along with their applications in Biotechnology.
12. Define radioactivity. What are the different types of subatomic particles released from naturally occurring radioisotopes?
13. Describe briefly the principle and techniques of centrifugation. Also mention the types of centrifuges.

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Roll No.

M.Sc. (Biotech.)-I Sem.

NP-3333

**M.Sc. (Biotechnology) Examination,
Dec. - 2020**

**Tools & Techniques of Biotechnology
(H-104)**

[M.Sc. (Bio-Tech.)]

Time : Three Hours]

[Maximum Marks : 50

Note : Attempt questions from all sections
as per instructions.

Section-A

(Very Short Answer Questions)

Note : Answer all the **five** questions. Each
question carries 2 marks. Very short
answer is required not exceeding 75
words.

$2 \times 5 = 10$

1. Mention different types of centrifuges
available for the centrifugation.

P.T.O.

2. What are radioisotopes?
3. Briefly mention the applications of GLC.
4. What is the constitution of mass spectrometers?
5. What is the principle behind electron microscopy?

Section-B

(Short Answer Questions)

Note : Answer any **two** questions out of the following three questions. Each question carries 5 marks. Short answer is required not exceeding 200 words. $5 \times 2 = 10$

6. What are the different types of spectroscopy and what are its main applications?
7. What is the principle and application of Adsorption chromatography?

8. Describe in brief type of rotors used in centrifugation.

Section-C

(Detailed Answer Questions)

Note : Attempt any **three** questions.

Each is 10×3=30

9. Write down the applications of HPLC and its principle.
10. Describe in detail edelectrophoresis of nucleic acids.
11. What is radioactivity? Describe in detail detection, measurement and applications of this technique.
12. Discuss the principle and applications of 'permeation chromatography'.

13. Describe the process of detection, estimation and recovery of proteins in gels during electrophoresis.

- (b) Types of centrifuge
- (c) Safety in the Laboratory
- (d) Fluorescent probes
- (e) 2D-PAGE

Section-B

(Short Answer Type Questions)

Note : Answer any **one** out of the following each carries 10 marks. Answer is required not exceeding 300 words.

1×10=10

2. Mention the contribution of following workers-
 - (a) A.Tiselius
 - (b) Cerenkov
 - (c) M.Tswett
 - (d) Lambert
3. Enumerate the list of references (10) in the form of books with authors, e-references research papers which you have studied for this paper syllabus.

4. Differentiate the followings-

- (a) Stationary and Mobile phase
- (b) Optical and chemical quenching
- (c) Autoradiography and Fluorography
- (d) γ -rays and x-rays

Section-C

(Detailed Answer Questions)

Note : Answer any **two** questions. Each carries 15 marks. Answer is required in detail. $2 \times 15 = 30$

5. What is affinity chromatography. Discuss it with group. Specific ligand used in this experiment.

6. Discuss the different safety aspects during the radio-tracer experiments.

7. If a solution containing ATP is found to an absorbance of 0.17 in a 1 cm cuvette and molar extinction coefficient is 1.54×10^4 ($\text{mol. dm}^{-3} \text{y}^{-1} \text{cm}^{-1}$).

What is-

- (a) Concentration of ATP solution. *very easy*
 - (b) Transmission of the solution in 1 cm cuvette.
 - (c) Absorbance of a 2.5×10^{-1} mm solution of ATP in a 4 cm cuvette. *easy question*
8. Discuss the principle and applications of confocal microscopy.
9. What are factors affecting Electrophoresis with detail reference to Agarose, PAGE, PFGE. *easy*

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100% pass

10/12