

**Bachelor of Science (B.Sc.) Semester—III Examination
BIOTECHNOLOGY BIOPHYSICAL TECHNIQUES – I
Optional Paper–II**

Time : Three Hours]

[Maximum Marks : 50

N.B. :— (1) All questions are compulsory and carry equal marks.

(2) Draw diagrams wherever necessary.

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| 1. | Describe the principle and instrumentation of UV-Visible spectrophotometry. | 10 |
| | OR | |
| | (a) Explain chromophores and Auxochromes with suitable examples. | 5 |
| | (b) Write difference between spectrophotometer and colorimeter. | 5 |
| 2. | (a) Describe the principle and applications of Mass spectrometry. | 5 |
| | (b) Explain the Instrumentation of spectrofluorometry. | 5 |
| | OR | |
| | Write notes on : | |
| | (c) Applications of UV-visible spectrophotometry. | 5 |
| | (d) Emission flame photometry. | 5 |
| 3. | Explain Gel filtration chromatography with its application. | 10 |
| | OR | |
| | (a) Discuss the principle and application of TLC. | 5 |
| | (b) Explain the different gels used to prepare gel beads for chromatography. | 5 |
| 4. | Discuss the principle and applications of Ion-Exchange chromatography. | 10 |
| | OR | |
| | (a) Write a note on HPLC. | 5 |
| | (b) Write a note on Affinity Chromatography. | 5 |
| 5. | Solve any 10 questions : | 10 |
| | (i) Define EM radiations. | |
| | (ii) What is monochromater ? | |
| | (iii) Which lamp is used on light source in colorimeter ? | |

(Contd.)



Time: 11
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Marks : 50

- (iv) Define nebulizer.
- (v) Give one application of UV-vis spectrophotometry.
- (vi) Give principle of spectrofluorometry.
- (vii) Define mobile phase.
- (viii) How can we detect amino acids in TLC ?
- (ix) Define retention factor.
- (x) Give one example of cationic in exchanger.
- (xi) Give name of one ligand used for mRNA isolation.
- (xii) Name one stationary phase used in HPLC.

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Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
End Semester Examination (ODD Semester) Winter-2022
Shri Shivaji Education Society Amravati's
Science College Congress Nagar Nagpur
B.Sc II Semester III
BIOTECHNOLOGY PAPER – II: BIOPHYSICAL TECHNIQUES

Time: 3 Hrs.

Max. Marks: 50

Note: 1) All questions are compulsory.
2) All questions carry equal marks.

- Q.1) Write the difference between colorimeter and spectrophotometer 10
OR
Write in detail about monochromator, source and detectors of spectrophotometer. 10
- Q.2) Write the qualitative and quantitative applications of Spectrophotometer 10
OR
a) Describe the instrumentation of Spectrofluorimeter. 5
b) Write a note on absorption flame photometry. 5
- Q.3) Write in detail about chromatography. 10
OR
a) Difference between Ascending and descending paper chromatography. 5
b) Write about different types of column chromatography. 5
- Q.4) Explain in detail about Affinity chromatography 10
OR
a) Write about the principle of Ion-exchange chromatography 2 ½
b) Give brief idea on Amino acid analyzer. 2 ½
c) Write about different types of buffers used in chromatography. 2 ½
d) Elements of HPLC 2 ½
- Q.5) Solve any ten out of the following: 1 × 10 = 10
a) What is Lambda maxima?
b) What is polychromatic beam of light?
c) What is Bathochromic shift?
d) Write the formula to find out the concentration of unknown mathematically.
e) Name different types of gel beads.
f) What is Fluorescence?
g) What is Chopper?
h) What is Nebulizer?
i) Expand HPLC
j) What is ligand?
k) What do you mean by matrix in affinity chromatography?
l) Expand DEAE.