Register Number:……..

B.TECH., DEGREE EXAMINATIONS MAY/JUNE 2013

Fourth Semester

BIO TECHNOLOGY

BTY107: Instrumental Methods of Analysis

Time: Three Hours **Maximum Marks: 100**

Answer ALL Questions:-

PART A (10x1=10 Marks)

1. Which calibration method utilize analogs as standards?

a) Calibration curve b) Internal standard c) Standard addition d) Response method

2. Which one of the following is NOT an example for chemical noise?

a) temperature b) amplifier c) pressure d) light intensity

3. Absorbance can be calculated using ---------- formula

a) A = εcl b) A = ε/ cl c) A = c/ εl d) A = l/ εc

4. The path length of a cuvette is ----------

a) 1dm b) 1mm c) 1cm d) 1m

5. Glass transition temperature is a property that can be investigated by ---------- technique

a) TGA b) DSC c) AAS d) TMA

6. Which one of the following metal CANNOT be used as an electrode?

a) copper b) silver c) platinum d) cerium

7. The purity of an enzyme at various stages of purification is best measured by:

a) Total protein b) enzyme activity

c) Specific activity d) Percent recovery of protein

8. Which would be best to separate a protein that binds strongly to its substrate?

a) Gel filtration b) Affinity chromatography c) Cation exchange d) Anion exchange

9. Mass spectrometers separate isotopes of different elements based on their:

a) mass b) electric charge c) mass divided by electric charge d) none of these

10. Who developed MALDI/ TOF?

a) Tanaka b) Benett Fenn c) Aston d) Dempster

PART B (10x 2 =20 Marks)

11. List different types of noise with suitable examples
12. Define precision
13. Define Beer – Lambert's law
14. Define fluorescence
15. Outline the principle of Potentiometry
16. Define DSC
17. Explain the term "resolution" in chromatography
18. What is the principle of Capillary electrophoresis
19. Outline the principle of TOF
20. List out few primary and secondary quenchers

PART C (5x14=70 Marks)

21. a) (i) What are instrumental methods? Describe briefly about their classification.

(ii) Write a note on signal to noise enhancement.

(OR)

b) (i) Explain signal to noise ratio.

(ii) Write a note on calibration of instrumental methods.

22. a) (i) Write the principle and application of atomic absorption spectroscopy.

(ii) Briefly explain the application of Nephelometry.

(OR)

b) (i) Explain the principle and application of Raman spectroscopy.

(ii) Write a note on the applications of fluorescence spectroscopy.

23. a) (i) Write a note on Biosensors and their applications.

(ii) Explain the applications of differential scanning calorimetry.

(OR)

b) (i) Explain the instrumentation and applications of Potentiometry.

(ii) Brief on the applications of voltammetry.

24. a) (i) Define the following (a) Rate and plate theory (b) Van Deemter equation.

(ii) Explain the principle and applications of Gas chromatography.

(OR)

b) (i) Write a note on HPLC with special emphasis on applications.

(ii) Explain the applications of size exclusion chromatography.

25. a) (i) Discuss on the biological applications of Mass spectrometry.

(ii) Explain the principle and applications of NMR spectroscopy.

(OR)

b) (i) In detail discuss the principle, method and applications of autoradiography.

(ii) Explain the principle and application of X-ray diffraction.

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