

**STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI –600 086**

**(For candidates admitted during the academic year 2009 - 10)**

**SUBJECT CODE: BY/PE/RB43**

**M. Sc. DEGREE EXAMINATION, APRIL 2011**

**BIOTECHNOLOGY  
FOURTH SEMESTER**

**COURSE : ELECTIVE**

**PAPER : RESEARCH METHODOLOGY AND BIOETHICS**

**TIME : 3 HOURS**

**MAX. MARKS: 100**

**SECTION – A**

**ANSWER ALL THE QUESTIONS**

**(10 x 2 = 20)**

1. Random sampling
2. Descriptive and analytical research
3. Gally proof
4. Cross referencing
5. Copy right
6. Biopyracy
7. Curcumin
8. Superbug
9. Biohazards
10. Safety level I and Safety level II

**SECTION – B**

**ANSWER ANY 4 QUESTIONS IN ABOUT 600 WORDS**

**(4 x 10 = 40)**

11. Bring out the procedure for pilot study in a given area of research.
12. Give the outlines with brief notes on the organization of a manuscript.
13. Write an account on the Indian patent of neem.
14. List out various good laboratory practices for genetic engineering experiments.
15. Discuss about the pros and cons of GM foods.
16. Describe the regulations for the use of animals in clinical research.

**SECTION – C**

**ANSWER ANY TWO QUESTIONS IN ABOUT 1500 WORDS**

**(2 x 20 = 40)**

17. Write details on Data collection and presentation of data in different forms.
18. List out various Government agencies for funding life science research projects.  
Write details on the format and procedure for getting grants.
19. Write an essay on IPR.
20. Bring out the legal, social and ethical issues in the study of human genetics.

**\*\*\*\*\***

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86  
(For candidates admitted from the academic year 2009-10) & thereafter

SUBJECT CODE: CH/PC/AI24  
M. Sc. DEGREE EXAMINATION, APRIL 2011  
BRANCH IV- CHEMISTRY  
SECOND SEMESTER  
REG.NO .....

COURSE : MAJOR CORE  
PAPER : ANALYTICAL INSTRUMENTATION  
TIME : 30 MINUTES  
MAX. MARKS: 20

SECTION – A  
TO BE ANSWERED ON THE QUESTION PAPER ITSELF.

Answer all the questions. (20 x 1= 20)

I. Choose the correct answer:

- Hypochromic shift is
  - increase in wavelength
  - decrease in wavelength
  - increase in molar extinction coefficient
  - decrease in molar extinction coefficient
- Plate theory is related with
  - DSC
  - HPLC
  - ESR
  - Amperometry
- The DTA thermogram is recorded using the parameters
  - $\Delta m$  vs  $\Delta T$
  - $\Delta T$  vs time
  - $\Delta m$  vs time
  - $\Delta H$  vs time
- The TOF analyzer is used in
  - FT-NMR
  - FT-IR
  - Mass spectrometer
  - UV spectrometer
- The precessional frequency of an NMR instrument operating at 2.1 tesla is
  - 60 MHz
  - 80 MHz
  - 90 MHz
  - 100 MHz
- In UV spectroscopy, when  $\left(\frac{I_0}{I}\right)$  is 100,  $c$  is 0.05 M and  $l$  is  $1 \text{ cm}^{-1}$ , the  $\epsilon$  ( $\text{M}^{-1}\text{cm}$ ) is
  - 20
  - 40
  - 200
  - 400
- In cyclic voltammetry, the potential difference of a reversible system is
  - 59 mV
  - 108 mV
  - 150mV
  - 15 mV
- Katharometer is used in
  - HPLC
  - GC
  - DTA
  - NMR
- The potential of saturated calomel electrode is
  - +0.201 V
  - 0.201 V
  - 0.341 V
  - +0.242 V
- Beam splitter is related with
  - FT-NMR
  - FT-IR
  - UV
  - Mass spectrometry

**II. Fill in the blanks:**

11. Flame ionization detector is connected with \_\_\_\_\_ chromatographic technique.
12. Ilkovic equation is \_\_\_\_\_.
13. The expansion of DTG is \_\_\_\_\_.
14. The chemical shift of a proton precessing at 146 Hz away from TMS in a 200 MHz instrument is \_\_\_\_\_.
15. The fuel gas used in flame photometry is \_\_\_\_\_.

**III. Answer in one or two lines:**

16. Define residual current.

17. What is Zeeman effect?

18. State Beer-Lambert's law.

19. What is finger print region?

20. Write the principle of amperometric titration.



**STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86**  
**(For candidates admitted from the academic year 2009-10) & thereafter**

**SUBJECT CODE: CH/PC/AI24**

**M. Sc. DEGREE EXAMINATION, APRIL 2011**

**BRANCH IV- CHEMISTRY**

**SECOND SEMESTER**

**COURSE : MAJOR CORE**

**PAPER : ANALYTICAL INSTRUMENTATION**

**TIME : 2 HOURS & 30 MINUTES**

**MAX. MARKS: 80**

**SECTION – B**

**ANSWER ANY FIVE QUESTIONS:**

**(5x8=40)**

1. Discuss any four types of detectors used in gas chromatography.
2. Compare dispersive and Fourier transform IR spectroscopy based on principle and instrumentation.
3. Explain the working principle of polarography.
4. Draw and explain the instrumentation of Electron Impact Mass Spectrometer.
5. Discuss the advantages and disadvantages of premix and total consumption burners in AAS.
6. What are the advantages of amperometric titrations?
7. Compare the principle of NMR and ESR. How these two spectroscopic techniques are combined suitably to investigate a chemical compound.

**SECTION – C**

**ANSWER ANY TWO QUESTIONS.**

**(2x20=40)**

8. a) Describe the principle and application of cyclic voltammetry technique? (8)  
b) Explain the colorimetric estimation of ascorbic acid? (8)  
c) What are the uses of gas chromatography? (4)
9. a) Explain the instrumentation of flame photometry. (10)  
b) Write a short note on the following. (10)  
i) Pretreatment or guard column in HPLC  
ii) Factors affecting Differential Thermal Analysis
10. a) What are the applications of thermometric titrations? (6)  
b) Explain the instrumentation of ICP emission spectroscopy? (8)  
c) Explain the principle and uses of anodic stripping voltammetry. (6)

\*\*\*\*\*

