



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – CHEMISTRY

FOURTH SEMESTER – APRIL 2018

16UCH4ES02- MATERIALS SCIENCE

Date: 23-04-2018
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

Part-A

Answer ALL questions.

(10 × 2= 20)

1. How are quantum confined structures classified?
2. Differentiate between graphene and graphite.
3. How is the conductivity of conductors varied with temperature?
4. State Curie-Weiss law.
5. Mention any four characteristics of an ideal biosensor.
6. What are optical sensors?
7. Define the response and recovery of a sensor.
8. How is Buna-S prepared?
9. Define number average molecular mass of a polymer.
10. What is Zeigler–Natta catalyst?

Part-B

Answer any EIGHT questions.

(8 × 5= 40)

11. Differentiate between SWMT and MWNT.
12. How are nanomaterials synthesized by inert-gas condensation method?
13. Discuss the electronic property of graphene.
14. What are semiconductors? How are they classified?
15. Differentiate between soft and hard magnetic materials.
16. Write the working principle of electrochemical sensors.
17. Explain the procedure for measuring the humidity of a sample.
18. Discuss the mechanism of alcohol sensing by n-type semiconductors.
19. How is the processing of polymers carried out by injection moulding? Explain.
20. What is gas phase polymerization? Discuss its mechanism.
21. Explain the mechanism of anionic polymerization.
22. What are the steps involved in the preparation of a polymer by emulsion polymerization? Explain.

Part-C

Answer any *FOUR* questions.

(4 × 10= 40)

23. Explain the mechanism of CVD method. Mention two important types of it.

24a. Write the applications of superconducting materials.

b. Describe Bardeen–Cooper–Schrieffer theory of superconductivity. (5+5)

25. Explain the principle of biosensor and its applications in cancer diagnosis.

26. How are the following prepared?

(i) nylon (ii) polymethylmethacrylate

(iii) terylene (iv) neoprene

27. Discuss the synthesis and properties of polyacetylene and polypyrrole.

28. Write a short note on the polymer degradation in the presence of oxygen and ozone.

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