LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **CHEMISTRY**

FOURTH SEMESTER – **APRIL 2022**

UCH 4602 – CHEMISTRY OF MATERIALS

Date: 23-06-2022 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

PART – A

Answer ALL questions. **(10 x 2 = 20 Marks)**

1. State the principle of sol-gel method.
2. Distinguish between single and multi-walled carbon nanotubes.
3. State Curie Weiss law for ferrimagnets.
4. What are cooper pair of electrons?
5. Define the term: Transducer.
6. Mention any two VOCs and their health effects.
7. Define oligomers.
8. What are elastomers? Give an example.
9. Differentiate thermoplastics and thermosetting plastics with examples.
10. How would you prepare Nylon-66?

PART – B

Answer any EIGHT questions. **(8 x 5 = 40 Marks)**

11. Explain the synthesis of nanomaterials by inert gas condensation method.
12. Discuss the properties of carbon nanotubes in brief.
13. What are metal excess defects? Explain.
14. Discuss the role of *p*-*n* junction in rectifiers.
15. Explain the differences between ferro and paramagnetic materials.
16. Distinguish between hard and soft magnets.
17. What are biosensors? Explain the application of biosensors.
18. Explain the mechanism of VOC sensing of semiconductors.
19. Describe the calendaring polymer processing technique.
20. Derive rate expression for free radical polymerization.
21. How are Novolac and Bakelite prepared? Mention its applications.
22. Describe the vulcanization of rubber.

PART – C

Answer any FOUR questions. **(4 x 10 = 40 Marks)**

23. Draw the block diagram and explain the instrumentation of SEM.
24. Why do ferromagnets show spontaneous magnetisation? Explain.
25. Explain the mechanism of alcohol sensing by *n*-type and *p*-type semiconductors.
26. Discuss the generation of hydrogen using Honda Cell.

27a. Briefly explain the addition and condensation polymerization techniques with suitable examples.

b. How will you synthesis Buna-S and Buna-N? Mention their applications.

28. Explain the synthesis of polyethylene using Ziegler-Natta catalyst.

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