K22P 3269

Reg. No. : .....

Name : .....

IV Semester M.Sc. Degree (CBSS – Reg./Supple./Imp.) Examination, April 2022
(2018 Admission Onwards)
CHEMISTRY
CHE4C.12 : Interdisciplinary Topics and Instrumentation Techniques

Time : 3 Hours Max. Marks : 60

SECTION – A

Answer **all** questions in **one** word or **one** sentence. **Each** question carries **one** mark.

1. An example for a phase transfer catalyst is
2. Number of lines in the EPR spectra of benzene radical anion is
3. Give an example of an ionic liquid providing its structure.
4. What type of molecules can be used for anion recognition ?
5. Sonochemical synthesis utilizes
6. Data obtained from a TGA is a plot of _____ vs _____.
7. What is nanomedicine ?
8. Give one method to synthesize gold nanoparticle.

SECTION – B

Answer **any eight** questions. Answer may be in **two** or **three** sentences. **Each** question carries **two** marks.

9. Depict the synthesis of calixarene.
10. Give an example for the working of a molecular switch.
11. What is the principle of nephalometry ?
12. Explain the principle of Mossbauer spectroscopy.
13. How is Grignard reaction done in a green manner ?
14. Give example of fluorous organic media.
15. Explain isomer shift.
16. How is benzyl bromide converted to benzonitrile in a 2-phase system ?
17. What is dynamic mechanical analyzer used for ?

P.T.O.

18. How does nanocomposite differ from conventional composites ? Give example.
19. Discuss about SWCNT and MWCNT.
20. What is the source of radiation used in ESR spectroscopy ? What type of molecules give ESR signals ?

SECTION – C

Short paragraph questions. Answer **any four** questions. **Each** question carries **three** marks.

21. Explain self assembly with an example.
22. How is Mossbauer spectroscopy useful to distinguish Fe^{3+} and Fe^{2+} ?
23. Differentiate between DTA and DSC.
24. Give 2 examples of microwave organic synthesis.
25. Why does nanoparticles show unique properties ?
26. What is DLS technique ?

SECTION – D

Essay type questions. Answer **four** questions. **Each** question carries **six** marks.

27. A) Explain 12 principles of green chemistry.

OR

B) Explain the bonding in supramolecular systems taking 3 different examples.

28. A) Explain (i) Nanolithography and (ii) Quantum dots.

OR

B) Explain with example 2 approaches for nanomaterial synthesis.

29. A) For a radical the magnetic field is 3810 G, the frequency of the microwave is 9600 MHz. What is the value of its g factor ? ($1T = 10^4$ G).

OR

B) Explain the hyperfine interactions in EPR with example.

30. A) Explain principle and application of thermometric titration experiments.

OR

B) Explain direct injection enthalpymetry.