SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY
DEEMED UNIVERSITY

Course: B.E./B.Tech. Semester: I
Title of the paper: Applied Chemistry - I Max. Mark: 80
Sub. Code: ET 104 (2002/2003/2004/2005) Time: 3 Hours

PART – A (10 x 2 = 20)

Answer ALL the Questions

1. A water sample contains 27.2 mg of $CaSO_4$ per litre. Calculate the hardness in terms of $CaCO_3$ equivalents.
2. What are the requisites of water for municipal supply?
3. Define the term "functionality of a monomer". Mention its significance.
4. What are fillers? Give two examples.
5. What is green house effect?
6. State one biochemical effect of mercury and suggest an antidote for mercury poisoning.
7. What are the raw materials required for the manufacture of Portland cement?
8. What is thermal spalling? How is it minimized?
9. What are the requirements of a propellant?
10. How aluminium and tungsten metal powders are manufactured?

PART – B (5 x 12 = 60)

Answer ALL the Questions

11. (a) What are ion exchange resins? How demineralization process of water softening is carried out? (7)
    (b) What are the troubles introduced by the use of hard water in boilers? Explain the scales and sludges in boilers. (5)

(or)

12. (a) How total harness of water sample is estimated by EDTA method?
    (b) Describe the hot lime soda process for softening of water.
13. (a) Explain the mechanism of free radical polymerisation.

(b) Describe with a neat sketch the process of injection moulding. Mention its merits.

(or)

14. (a) List the differences between addition and condensation polymerizations.
(b) Discuss the preparation, properties and uses of different kinds of polyethylene and PVC.

15. (a) State the common types of water pollutants, their sources and effects? Mention the methods by which water pollutants can be removed.
(b) Discuss the causes of lead pollution and the measure to prevent it.

(or)

16. (a) Write a note on
(i) Ozone depletion (ii) Differences between BOD and COD.
(b) Explain the toxic effects of SO_2 and CO.

17. (a) What is setting and hardening of cement? Explain the chemistry involved in setting and hardening of cement. (7)
(b) What are refractories? What are the characteristics of a good refractory? (5)

(or)

18. (a) Explain the properties
(i) Refractoriness and (ii) porosity as applied to refractories.
(b) Write short notes on special cements.

19. (a) Write a note on explosives. (8)
(b) What are the various advantages and disadvantages of powder metallurgy process? (5)

(or)

20. (a) How are compacting and sintering done in powder metallurgy?
(b) What is a propellant? Describe the classification of propellants.