বিদ্যাসাগর বিশ্ববিদ্যালয়
VIDYASAGAR UNIVERSITY

Question Paper

B.Sc. Honours Examinations 2020
(Under CBCS Pattern)
Semester - VI
Subject: CHEMISTRY
Paper: DSE - 4 (T + P) (Polymer Chemistry – Theory + Practical)

Full Marks: 40 (Theory) + 20 (Practical) = 60
Time: 4 Hours

Candiates are required to give their answer in their own words as far as practicable.
Questions are of equal value.

Answer any **one question** [within 250 words] from each Part.

Part A: Polymer Chemistry (Theory)

1. Write a short note on addition polymerisation.
2. Critically comment on degree of crystallinity of polymer.
3. Discuss the nature of dipole force in polymers.
4. Write a short note on glass transition temperature (T_g).
5. Write down the Flory-Huggins theory and critically comment on Flory-Huggins free energy of mixing for polymers.
6. Critically comment on "number average molecular weight" and "mass average molecular weight".

7. Write a short note on "silicon rubber compounds".
8. Critically comment on "kinetics of copolymerization". What do you mean by graft copolymers?
9. Write a short note on fluoropolymers.
10. Write a short note on polyurethanes.
11. Comment on the utility of conducting polymers.
12. Critically comment on free volume theory of polymer.

Part B: Polymer Chemistry (Practical)

1. Explain the procedure for preparation of Nylon 66/6.
2. Write down the principles and methodology for determination of molecular weight by viscometry.
3. Explain the procedure for preparation of Novalac resin.
4. Explain the procedure for preparation polymerization of MMA with AIBN.
5. Write down the principles and procedure for preparation of urea formaldehyde (U-F) resin.
6. Write down the principles and methodology for estimation of the amount of HCHO in the given solution by sodium sulphite method.
7. Write down the principles and methodology for determination of molecular weight by end group analysis: polyethylene glycol (PEG) (OH group).
8. Explain the procedure for preparation polymerization of styrene with benzoyl peroxide.
9. Explain the procedure for redox polymerization of acrylamide.
10. Explain the procedure for preparation of precipitation polymerization of acrylonitrile.
11. Write down the principles and methodology for Differential Scanning Calorimetric (DSC) analysis of polymers.
12. Write down the principles and methodology of preparation of polyacrylamide and its electrophoresis.