

Total Pages – 4

B.Sc. RNLKWC(A)-/DSE-4T/22

2022

CHEMISTRY

[Honours]

B.Sc. Sixth Semester End Examination - 2022

PAPER - DSE-4T

Full Marks : 40

Time : 2 hours

*The figures in the right-hand margin indicate marks.
Candidates are required to give their answers in their own
words as far as practicable.
Illustrate the answers wherever necessary.*

Group - A

1. Answer any five from the following :- $5 \times 2 = 10$
- (a) What types of molecular forces are present in polymers?
 - (b) What are the physical significance of the value $p=0$ and $p=1$ where p =extent of reaction.
 - (c) Define chain growth polymerization process.

(Turn Over)

(2)

- (d) 10g of organic substance when dissolved in two litres of water gave an osmotic pressure of 0.59 atm at 7°C. Calculate the molecular weight of the substance.
- (e) What are the differences between free radical and ionic polymerization?
- (f) The glass transition temperature of poly styrene is higher than that of polypropylene and polyethylene. Explain why?
- (g) What is back biting?
- (h) Write down the criteria of a polymer that required for crystallisation.

Group - B

Answer any four from the following. $4 \times 5 = 20$

2. (a) Derive Carothers equation for bifunctional monomer. 3
- (b) Explain the structure dependent conductivity of polymer? 2
3. (a) What is free volume and how it originates into polymer? 3
- (b) Derive expression of enthalpy change (ΔH) for polymer mixing. 2

B.Sc. RNLKWC(A)-/Chemistry/DSE-4T/22

(Continued)

(3)

4. Classify polymer with examples. 5
5. (a) What is the number average molecular weight and weight average molecular weight? How they are related to each other? 3
- (b) Draw a Dilatometric plot (specific volume vs. temperature) 2
6. (a) How fluoro polymers are prepared? 2
- (b) Discuss photo chemical polymerization process. 3
7. (a) What is polydispersity index? Cite one example where its value is unity. 3
- (b) What is the difference between polymer and macro molecule? 2

Group - C

Answer any one from the following : $1 \times 10 = 10$

8. Write short notes on : (any four) $2 \frac{1}{2} \times 4 = 10$
- (a) Ziegler-Natta catalyst.
- (b) Electrochemical polymerization process.

B.Sc. RNLKWC(A)-/Chemistry/DSE-4T/22

(Turn Over)

(4)

(c) Flory-Hiiggins equation.

(d) Polyurethane Polymer.

(e) Polymer additives.

(f) Co-ordination polymerization.

9. (a) A polymer sample consists of a mixture of three mono-disperse polymers with molar masses 250000, 300000 and 350000 g/mol in the ratio 1:2:1 by number of chains. Calculate M_n ; M_w and M_w/M_n . 4

(b) Write the differences between bulk polymerization and solution polymerization. 3

(c) What are the advantages and disadvantages of emulsion polymerization. 3