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SEAT NO. \_\_\_\_\_



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SARDAR PATEL UNIVERSITY  
SIXTH SEMESTER T. Y. B. Sc. EXAMINATION-2022  
COURSE NO. : US06CICV22

SUBJECT : Polymer Science and Technology

DATE : 5-4-2022, Tuesday

TIME : 3 to 5 pm

Q 1. Answer the following Multiple choice questions. (All are Compulsory)

(10)

1. Bitumen is example of \_\_\_\_ polymer.  
(A) Synthetic (B) Natural (C) Plastic (D) Semi synthetic
2. The degree of bond polarity in the organic compound of alkali metals follows the order  
(A)  $Li > Na < K$  (B)  $Li < Na > K$  (C)  $Li < Na < K$  (D)  $Li > Na > K$
3. In case of Nylon 6, intermolecular cohesive forces restrict segmental motion below...  
(A)  $60^{\circ}C$  (B)  $70^{\circ}C$  (C)  $40^{\circ}C$  (D)  $50^{\circ}C$
4. To know a polymer properly, you have knowledge of  
(A) Brownian movement (B) average MW (C) dispersion pattern (D) Both B & C
5. Linear polymer chains made of \_\_\_\_ single bonds have a high degree of freedom for rotation.  
(A) C-N (B) C-C (C) C-O (D) All of this
6. Which of the following is not the isocyanates?  
(A) BDA (B) MDI (C) PMDI (D) TDI
7. Which of the following is not used in formulation of polychloroprene?  
(A) Chloroprene (B) KOH (C) NaOH (D) Potassium persulphate
8. Ziegler HDPE process, the polymerization proceeds by a \_\_\_\_\_ mechanism?  
(A) Cationic (B) Anionic (C) Coordination (D) Free radical
9. Which of the following is not the styrene based copolymers?  
(A) ABS (B) SAB (C) PVC (D) SAN
10. \_\_\_\_\_ is the raw material for nylon 6.  
(A) Lactone (B) Caprolactum (C) Cyclohexane (D) Cyclohexanone

Q 2. Are the following statements true or false? (All are Compulsory)

(08)

1. Ziegler Natta Catalyst contains organozinc compound.
2. Homopolymers are composed of only one type of monomer.
3. DP and MW are related to the molecular size.
4. Watson-Crick DNA model shows its helical structure.
5. PU adhesives are complex mixture containing PU resin, fillers, pigments and plasticizers.
6. Tertiary amines used as hardners for epoxy prepolymers.
7. Nylon 12 is obtained by the hydrolytic polymerization of dodecanolactam.
8. Polystyrene is soluble in chlorinated and aromatic hydrocarbons.

Q 3. Answer the following short questions. (Any 10 out of 12)

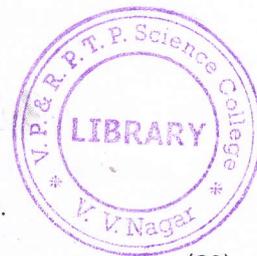
(20)

1. Compare thermosetting and thermoplastic resins.
2. Give the advantage and disadvantage of solution polymerization.
3. Give the conclusions from the study of polycondensation.

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4. Discuss dependence of mechanical strength of a polymer on degree of polymerization.
5. Draw a molecular weight distribution curve for a hypothetical polydispersed polymer sample.
6. Write a note on crystallisability.
7. Write down properties of MF.
8. Draw a flow chart of the preparation of PEP.
9. Write a note on polyurethane sealants.
10. Give the synthesis of Nylon-6.
11. Give the application of polyethylene.
12. Draw a flow chart of Vinyl acetate production by suspension polymerization.



Q 4. Answer the following long questions. (Any 4 out of 8)

(32)

1. Write a note on Ziegler-Natta catalyst and discuss its mechanism for polymerization.
2. Give the comparison between additional and condensation polymerization.
3. Explain the relation between structural regularity and crystallisability.
4. Explain the generalization concept of number average and weight average molecular weight.
5. Explain Novolacs and Resole process for the production of phenol formaldehyde resin.
6. Write a brief note on Epoxy polymer synthesis.
7. Give the application of the nylons.
8. Write down properties and application of Polystyrene.

