

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BE
BRANCH: CHEMI. & PLAST POLY

SEMESTER : V
SESSION : MO/18

SUBJECT: PC5001 POLYMER TECHNOLOGY-II

TIME: 3 HOURS

FULL MARKS: 60

INSTRUCTIONS:

1. The question paper contains 7 questions each of 12 marks and total 84 marks.
 2. Candidates may attempt any 5 questions maximum of 60 marks.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) Write down two uses of Uf and MF resins. Justify the resin's applicability in such area. [2]
Q.1(b) Write down the reactions involved in PU foam synthesis. [4]
Q.1(c) Describe the procedure of Novolac manufacturing process mentioning reaction conditions, reagents and reactor used. Write down structure of A-stage, B-stage and C-stage resin. [6]
- Q.2(a) Compare between silicone fluid and rubber in respect of application and chemical structure. [2]
Q.2(b) Write down chemical structure of vinyl ester and unsaturated polyester. Explain the difference in curing reaction mechanism of these two in respect of their chemical structure. [4]
Q.2(c) Give three different examples of applications of polysulfone and polycarbonate. Justify the applicability of these resins in these cases. [6]
- Q.3(a) Write down any two limitations of PES and PEEK. [2]
Q.3(b) Compare flammability of any engineering plastic with one commodity plastic. Also mention the limitations of these two resins regarding their application. [4]
Q.3(c) What are the parameters controlling barrier property of plastics? Compare toughness of PC and PMMA in respect of chemical structure. [6]
- Q.4(a) Explain the requirements of polymer structure to be conducting. [2]
Q.4(b) Differentiate between flocculation & Coagulation mechanism. Give examples of polymers being used for waste water treatment plants. [4]
Q.4(c) Give two examples of piezoelectric polymers. Write short notes on these. [6]
- Q.5(a) Give a suitable example of typical LCP showing the different building units in it. Write two limitations of LCP. [2]
Q.5(b) Degradation of polymers may reduce environment pollution---elaborate this statement in respect of biodegradable polymers. What are the basic requirements of polymers to be biodegradable? [4]
Q.5(c) Give examples of magnetic polymers. Where do we find their application? [6]
- Q.6(a) Define barrier property. [2]
Q.6(b) How is barrier property of polymers controlled by its morphology? [4]
Q.6(c) Explain the term ESCR. Where do we find the effect of environmental stress cracking? Explain your answer with proper reason. [6]
- Q.7(a) Justify the application of [3X4]
a. PEEK and PC in defence application
b. Polymers used in artificial heart valve and total hip replacement
c. HDPE and Polyvinyl alcohol in agriculture

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