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

CLASS: BE **SEMESTER: IV**
BRANCH: CHEM PLAST. POLYM. **SESSION : SP/2019**

SUBJECT : PC4001 MACROMOLECULAR SCIENCE-I

TIME: 1.5 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

Q1 (a) Define the term block co-polymer and graft-copolymer? [2]
(b) Define Regio-isomers and Geometric isomersfor polymer with examples? [3]

Q2 (a) Write the chemical structure of Teflon, Natural rubber, Polycarbonate and Poly(methyl methacrylate). [2]
(b) Compare the melting temperature (T_m) and solubility of isotactic and atactic polypropylene. [3]

Q3 (a) Write the IUPAC name of the following polymers: (i) Poly(ethylene oxide); (ii) Nylon 6 [2]
(b) Draw a correlation curve between molecular weight and melting temperature of the alkane polymer. [3]

Q4 (a) Why longer chain make more stronger polymers? [2]
(b) How molecular weight and molecular weight distribution of the polymers effect their tensile strength? [3]

Q5 (a) Define amorphous and crystalline structure of the polymers. [2]
(b) How can you corelate the degree of crystallinity and tensile properties (strength & modulus) of the thermoplastics? [3]

Q6 (a) Compare the solubility of HDPE and LDPE with proper justification. [2]
(b) How does glass transition temperature (T_g) of the polymer change with (i) introducing big bulky side group, (ii) chain flexibility, (iii) crosslinking, and plasticizer? [3]

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