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**SARDAR PATEL UNIVERSITY**

M.Sc. (Polymer Science &amp; Technology) Semester-I Examination – 2015

Friday, 24<sup>th</sup> April 2015

10:30 a.m. to 1:30 p.m.

PS02CPST10: Polymer Additives

Note: (1) Attempt all questions.

Total marks: 70

(2) Figures to the right indicate full marks.

Q. 1

**Answer the following**

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- (1) Azodicarbonamide is used as \_\_\_\_\_ in cellular plastics  
(a) physical blowing agent (b) chemical blowing agent (c) flame retardant (d) none of these
- (2) With increasing duration of shear, network structure can be broken by overcoming the adsorptive forces of the matrix molecule and hence viscosity may be reduced these effect is known as \_\_\_\_\_  
(a) Newtonian (b) pseudoplastic (c) thixotropic (d) none of these
- (3) \_\_\_\_\_ is a peroxide decomposer  
(a) Dibutyl tin maleates (b) stearic acid (c) dilauryl thiodipropionate (d) none of these
- (4) Chemical compound that modify pyrolysis reactions of polymers or oxidation reactions implies in the combustion by slowing them down or by inhibiting them are known as \_\_\_\_\_  
(a) Toughening agent (b) blowing agent (c) flame retardant (d) none of these
- (5) Oxamide are used as \_\_\_\_\_  
(a) blowing agent (b) flame retardant (c) chelating agent (d) none of these
- (6) \_\_\_\_\_ absorb the energy generated by impact and dissipate it in nondestructive fashion  
(a) Toughening agent (b) adhesion promoter (c) anti ageing additive (d) none of these
- (7) \_\_\_\_\_ is a additive which increase flexibility, elongation or workability.  
(a) Filler (b) antistatic agent (c) plasticizer (d) none of these
- (8) \_\_\_\_\_ is the adhesion of two adjacent layers of film  
(a) lubrication (b) blocking (c) friction (d) none of these

Q. 2

**Answer the following (any seven)**

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- (1) Write the requirement of stabilizer for halogenated polymer
- (2) Explain chelating agent as metal deactivator
- (3) Write the normal rule for the selection of lubricants
- (4) Define bleeding & blooming
- (5) How antistatic agent works?

- (6) Which are major friction problems encountered in plastic processing
- (7) Discuss the secondary stabilizer
- (8) Write the degradation of polymer by a free radical mechanism.
- (9) Write the resonance stabilization in primary antioxidant
- Q. 3**
- (a) Explain the special stabilizer for halogenated polymer 06
- (b) **Answer the following** 06
1. Define additive and write the classification of additive according to their specific function.
  2. Discuss the migration and consumption of additive
- OR**
- (b) Write the mechanism for polymer degradation. Explain the role of primary stabilizer 06
- Q. 4**
- (a) Write a note on plasticizer 06
- (b) **Answer the following** 06
1. Explain unavoidable side effect of additive
  2. Explain the compatibility and mobility of additives
- OR**
- (b) Explain the effect of natural radiation on ageing of plastics and Explain the role of carbon black and pigment as UV absorbers 06
- Q. 5**
- (a) Discuss the burning mechanism of plastics and Explain the role of flame retardant agents 06
- (b) **Answer the following** 06
1. Discuss the synergistic stabilizer system
  2. Discuss blowing agent
- OR**
- (b) **Write a note on following** 06
1. Antiblock additive
  2. Thixotropic agents
- Q. 6**
- (a) Discuss the external lubricants 06
- (b) **Answer the following** 06
1. Discuss the method of incorporation of additives into polymer matrix
  2. Write a note on antistatic agents
- OR**
- (b) **Answer the following** 06
1. Explain the role of filler as cost reducing additive in polymer
  2. Write a note on adhesion promoter

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