

**SARDAR PATEL UNIVERSITY**

M.Sc. Polymer Science &amp; Technology Semester-II Examination – 2016

Wednesday, 6<sup>th</sup> April 2016

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.

**Que. 1 Answer the following****08**

- (1) Azodicarbonamide is used as \_\_\_\_\_ in cellular plastics  
(a) physical blowing agent (b) chemical blowing agent (c) flame retardant (d) none of these
- (2) Viscosity of \_\_\_\_\_ fluid remains constant at all shear rates at a constant temperature and pressure.  
(a) Newtonian (b) non newtonian (c) Thixotropic (c) 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) \_\_\_\_\_ are used as a thixotropic agent for polyester resin  
(a) Dibutyl tin maleates (b) stearic acid (c) zinc oxide (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) In the thermal degradation, oxidation reaction may be accelerated by presence of \_\_\_\_\_  
(a) stearic acid (b) Heavy metal ion impurities (c) Inhibitor (d) none of these
- (8) Minimum voltage which causes a permanent loss of dielectric properties under specified conditions is known as \_\_\_\_\_  
(a) Dielectric strength (b) Antistatic (c) Arc resistance (d) none of these

**Que. 2 Answer the following (any seven)****14**

- (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) Discuss fungicide
- (5) Explain Excited state quenchers
- (6) Which are major friction problems encountered in plastic processing

- |        |     |  |    |
|--------|-----|--|----|
| Que. 3 | (a) | Write a note on plasticizer  | 06 |
|        | (b) | <b>Answer the following</b>  | 06 |
|        |     | 1. Define additive and write the classification of additive according to their specific function.                              |    |
|        |     | 2. Explain the compatibility and mobility of additives   |    |
|        |     | <b>OR</b>  |    |
|        | (b) | <b>Answer the following</b>  | 06 |
|        |     | 1. Explain the additive which alter the polarity of the surface  |    |
|        |     | 2. Discuss the stabilizer against photo-oxidation  |    |
| Que. 4 | (a) | Explain the special stabilizer for halogenated polymer   | 06 |
|        | (b) | Write the mechanism for polymer degradation. Explain primary stabilizer and resonance stabilization in primary antioxidant     | 06 |
|        |     | <b>OR</b>  |    |
|        | (b) | Explain the effect of natural radiation on ageing of plastics and Explain the role of carbon black and pigment as UV absorbers | 06 |
| Que. 5 | (a) | Discuss the burning mechanism of plastics and Explain flame retardant agents   | 06 |
|        | (b) | <b>Answer the following</b>  | 06 |
|        |     | 1. Give a brief account on filler  |    |
|        |     | 2. Discuss the additive used in expansion process  |    |
|        |     | <b>OR</b>  |    |
|        | (b) | <b>Answer the following</b>  | 06 |
|        |     | 1. Explain the additive which increase the surface roughness   |    |
|        |     | 2. Discuss the synergistic stabilizer system   |    |
| Que. 6 | (a) | Discuss the external lubricants  | 06 |
|        | (b) | <b>Answer the following</b>  | 06 |
|        |     | 1. Discuss the method of incorporation of additives into polymer matrix  |    |
|        |     | 2. Write a note on antistatic agents   |    |
|        |     | <b>OR</b>  |    |
|        | (b) | <b>Answer the following</b>  | 06 |
|        |     | 1. Explain Toughening agent  |    |
|        |     | 2. Write a note on thixotropic agents  |    |

Page 2 of 2