

P. Pages : 2

Time : Three Hours

**AW - 3253**

Max. Marks : 80

- Notes :
1. All question carry marks as indicated.
 2. Answer **three** question from Section A and **three** question from Section B.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Assume suitable data wherever necessary.
 5. Diagrams and chemical equations should be given wherever necessary.
 6. Illustrate your answer necessary with the help of neat sketches.
 7. Discuss the reaction, mechanism wherever necessary.
 8. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1. a) Explain the process of storage, hardening and crystallization of natural rubber. 7
b) Discuss the mixing, forming and vulcanization manufacturing process sequence in rubber industry. 7

OR

2. a) Define the term elastomer. Discuss the collection of natural rubber and the properties of raw natural rubber. Also give the various applications of natural rubber. 7
b) Explain the mastication and compounding process for raw rubber. 7
3. a) Define the term 'Vulcanization of Rubber'. Discuss the different non-sulfur methods of rubber vulcanization. 7
b) Discuss the various factors and conditions affecting rate of vulcanization. 6

OR

4. a) Discuss in detail the reaction mechanism of vulcanization of rubber. 6
b) Explain the characteristic properties, and application of oil extended rubber. 7
5. What do you mean by retrading of tyre ? Discuss in detail the design aspects, consideration and design pattern for tyre retrading. 13

OR

6. Explain the processing, properties and applications of followings : 13
 - i) Nitrile Rubber
 - ii) SBR

7. a) What are the various types of filter and reinforcement for plastics ? Discuss the choice of filters and properties required for plastics compounding. 9
- b) What are plasticizers ? Discuss the effect of addition of plasticizer on the properties of plastic materials. 5

OR

8. a) What do you mean by plastic additives ? Discuss the different types of additives and their role in polymer compounding. 9
- b) What is the selection criteria of lubricants for plastics ? Give its various types with example. 5
9. Explain the properties, application and selection criteria for the following additives by giving example of each : 13
- i) U.V. Stabilizer
 - ii) Flame Retardant
 - iii) Toughening Agent

OR

10. Discuss the properties, application and selection criteria for the following additives by giving example of each - 13
- i) Foaming Agents
 - ii) Antiozonants
 - iii) Antistatic Agent
11. a) Discuss in detail the preparation, properties and application of animal glue and fish glue. 7
- b) Explain the standard test method of Lap shear strength for determining the strength of adhesive. 6

OR

12. a) How will you classify the polymer adhesives ? Discuss in detail the structural requirement of polymers to act as a adhesive for various substrate. 7
- b) Explain the preparation, properties and applications of any one commercial adhesive. 6
