

17653

11920

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
  - (2) Answer each next main Question on a new page.
  - (3) Illustrate your answers with neat sketches wherever necessary.
  - (4) Figures to the right indicate full marks.
  - (5) Assume suitable data, if necessary.
  - (6) Abbreviation used convey usual meaning.

**Marks****1. Answer any FIVE :****5 × 4 = 20**

- (a) State the sources and applications of natural rubber.
- (b) Name any four components of tyre and state their role.
- (c) State properties and applications of TSR.
- (d) Silicon rubber is used for high temperature applications. Justify and give specific examples.
- (e) State advantages and limitations of Sulphur vulcanisation.
- (f) Write down the recipe for “Surgical foam”.
- (g) Name types of raw material used in manufacturing of PU rubber. Where are PU rubber they used ?

**2. Answer any TWO :****2 × 8 = 16**

- (a) (i) Write indicative structural formula of styrene butadiene rubber and state the typical rectant ratio. **2**
- (ii) Explain properties and application of SBR. **6**

- (b) (i) Explain characteristics of TCR.
- (ii) Differentiate between natural and synthetic rubber on basis of property characteristics and structure.
- (c) (i) Classify accelerators, giving examples.
- (ii) State the effect of vulcanization on following properties :
  - (1) Mechanical
  - (2) Swelling
  - (3) Low temperature flexibility
  - (4) Compression

**3. Answer any TWO :****2 × 8 = 16**

- (a) (i) Define skimming and topping. **2**
- (ii) Describe working of ram extruder of rubber with a labelled diagram. **6**
- (b) (i) Describe stages in raw rubber manufacturing.
- (ii) For gasket manufacturing, write the typical formulation and explain choice of rubber used.
- (c) (i) Describe tyre building process.
- (ii) Explain concept of green tyre.

**4. Answer any TWO :****2 × 8 = 16**

- (a) (i) Define reclaimed rubber. State its properties and applications.
- (ii) Define thermosetting elastomers. Give two examples.
- (b) (i) Name and write structural formulas of diene monomers used in EPDM rubber. **3**
- (ii) List down any four properties and applications of viton rubber. **5**
- (c) (i) Explain mechanism of sulphur vulcanisation.
- (ii) Describe with reactions, peroxide vulcanisation process.

**5. Answer any TWO :****2 × 8 = 16**

- (a) (i) Write down important properties and application of polyacrylic rubber.
- (ii) Explain the effect of acrylonitrile content on properties of NBR rubber.
- (b) (i) Compare hot feed and cold feed processing of rubber.
- (ii) Explain the terms (1) Plasticity, (2) tack of rubber
- (c) (i) Explain with examples, type of reinforcement used in tyres. **3**
- (ii) Compare standard diagonal ply with radial ply. **5**

**6. Answer any FOUR :****4 × 4 = 16**

- (a) Suggest the rubber for following applications :
    - (i) tyre
    - (ii) Conveyour belt
    - (iii) High pressure seal
    - (iv) Antivibrational use
  - (b) What is neoprene ? State any four properties and applications of neoprene rubber.
  - (c) Explain general applications of vulcanised rubber.
  - (d) Describe the method to measure solubility of rubber.
  - (e) Describe the process of calendaring of rubber.
  - (f) (i) Define foam.
  - (ii) State properties and applications of any one type of surgical foam.
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