

313357

24225

3 Hours / 70 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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

**1. Attempt any FIVE of the following :**

**10**

- (a) Define an elastomer with an example.
- (b) Define thermosetting rubber with an example.
- (c) State any two properties of nitrile rubber.
- (d) Define synthetic rubber with an example.
- (e) State the basic need of vulcanization.
- (f) Draw a neat labelled diagram of 3 roll calender.
- (g) Draw a neat labelled diagram of 4 roll calender.

**2. Attempt any THREE of the following :**

**12**

- (a) Describe the sources of natural rubber.
- (b) Suggest the chemical name of rubber found in nature. Explain the four properties of it.
- (c) Describe the manufacturing process of nitrile rubber.
- (d) Explain four important properties of EPDM rubber.



- 3. Attempt any THREE of the following : 12**
- (a) Define reclaimed rubber. State its four advantages.
  - (b) Describe the manufacturing process of butyl rubber.
  - (c) Suggest the name of rubber that can be recycled. Explain its need.
  - (d) Define antioxidants and antiozonants. State any two important examples of each.
- 4. Attempt any THREE of the following : 12**
- (a) Explain the construction and working of two roll mill with a neat sketch.
  - (b) Explain with neat sketch injection moulding of rubber.
  - (c) Explain with neat labelled diagram transfer moulding process of rubber.
  - (d) Describe the working of hot air oven & state its need in rubber processing.
  - (e) Describe the hardness test and resilience test of rubber.
- 5. Attempt any TWO of the following : 12**
- (a) Suggest the additives used to reduce the cost of rubber product and suggest the additive used to improve processing of rubber. Explain the need and functions of all these additives.
  - (b) Suggest the method of vulcanization used to manufacture of O-rings. Explain that method with neat labelled diagram.
  - (c) State the compounding recipes for tyres, conveyor, belt, hose and sheeting.
- 6. Attempt any TWO of the following : 12**
- (a) Describe hot feed and cold feed extrusion process with a neat labelled diagram.
  - (b) Suggest a product manufactured by a ram extrusion of rubber. Explain the process of manufacturing of that part with ram extrusion with a neat labelled diagram.
  - (c) State the steps in latex technology for the manufacture of natural rubber. Explain all these steps in detail.
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