17653

21415

3 Hours / 100 Marks **Seat No.** | | | | | | | | |

Instructions : (1) All Questions are *compulsory*.

(2) Answer each next main Question on a new page.

(3) Figures to the right indicate full marks.

(4) Abbreviations used convey usual meaning.

(5) Assume suitable data, if necessary.

Marks

1. Answer any FIVE : **5 × 4 = 20**

(a) Compare in general thermoplastic and thermoset-rubbers. Give an example of each.

(b) Write typical composition of monomers in SBR. State properties contributed by the monomers. Write any two applications of SBR.

(c) Write chemical name of 'neoprene'. Explain its properties.

(d) Define 'Vulcanisation'. Name rubbers which are usually vulcanized. Name the methods of vulcanization.

(e) Explain meaning of :

(i) Skimming

(ii) Topping

(f) Write requirements of rubber for 'surgical foam'. Indicate a typical recipe.

(g) Explain the construction of standard diagonal tyres.

2. Answer any TWO : **2 × 8 = 16**

(a) (i) Represent typical hypothetical structure of 'Silicon rubber'.

(ii) Explain its any three properties and any three field of applications.

(b) (i) Explain with reactions, 'chemistry' of vulcanization of rubber with sulphur.

(ii) Give the classification of accelerators with suitable examples.

(c) (i) Write recipe for manufacture of rubber gloves.

(ii) Outline, the manufacturing process of rubber gloves.

P.T.O.

3. Answer any TWO : **2 × 8 = 16**

(a) What is a reclaimed rubber ? Give any three advantages and any three important applications of reclaimed rubber.

(b) Classify PU elastomer as thermoset/thermoplastic. Explain its four properties and four applications.

(c) Explain the principle of calendering and describe method of calendering of rubber.

4. Answer any TWO : **2 × 8 = 16**

(a) (i) Name monomers and write their typical ratios in 'NBR'. Name method of polymerization.

(ii) Write any three uses of NBR.

(iii) Write physical state of butadiene. Explain its storage aspects.

(b) (i) Describe a method of vulcanization.

(ii) Define 'Mastication'. Describe a method of mastication.

(c) (i) Name the tyre components.

(ii) Describe construction of a tyre, with a neat labelled diagram of cross-section of a tyre.

5. Answer any TWO : **16**

(a) (i) Compare : natural and synthetic rubber.

(ii) Explain meaning of :

(1) 'Creep' rubber

(2) 'Smoked' rubber

(b) (i) Name types of monomers used in manufacture of 'polyacrylic rubber'. Which is the plasticising monomers ?

(ii) Explain any three important characteristics and three important applications of acrylic rubber.

(c) (i) Describe 'ram extrusion' of rubber with a neat labelled diagram.

(ii) Describe a method to check viscosity of rubber.

6. Answer any FOUR : **4 × 4 = 16**

(a) (i) Write chemical name of ‘natural rubber’ and its sources.

(ii) State any two uses of natural rubber.

(b) (i) Write chemical name and representative structural formula of ‘vitas rubber’.

(ii) State any two characteristics of vitas rubber.

(c) Name vulcanizing agents. Explain any two uses of any one.

(d) Explain hot feed and cold feed, method of processing of rubber.

(e) Explain concept of ‘green tyres’.

(f) Describe ‘radial ply’ in relation to tyres.

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