17653

16172

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.

Marks

1. Attempt any FIVE : **5 × 4 = 20**

(a) Define 'thermoset'. Name two thermosetting elastomers. Where are they used ?

(b) Write typical properties and applications of PU rubber.

(c) (i) 'Butyl rubber is widely used for inner tubes of tyre.' Explain.

(ii) Name monomers used in making polyacrylate rubber. Write the typical monomer ratio.

(d) Explain purpose of 'mustication'.

(e) Explain the terms :

(i) Plasticity of rubber

(ii) Tack of rubber

(f) How are 'surgical foams' manufactured ? Where are they used ?

(g) Explain concept of 'green tyres'.

2. Answer any TWO : **2 × 8 = 16**

(a) (i) Write chemical name and represent chemical structure of 'natural rubber'. **(3)**

(ii) Name sources of natural rubber. **(2)**

(iii) Explain 'limitations' of natural rubber. **(3)**

(b) (i) Write typical composition of monomers used in the manufacture of SBR. Name method of polymerisation. State role of :

(1) Hydroquinone

(2) Dodecyl mercaptan usually used

(ii) State applications of SBR.

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

3. Answer any TWO : **2 × 8 = 16**

(a) (i) Represent hypothetical structural formula of poly(dimethyl siloxane). On what does the MW depend ? **(2)**

(ii) Explain properties and applications of silicon rubber. **(6)**

(b) (i) Explain with examples, 'classification' of 'accelerators' for vulcanisation. **(5)**

(ii) Explain their roles in vulcanisation. **(3)**

(c) For 'gasket' manufacturing :

(i) Write typical recipe, explaining choice of rubber. **(3)**

(ii) Describe the process. **(5)**

4. Answer any TWO : **2 × 8 = 16**

(a) (i) Name and write structural formula of monomer, used in manufacturing 'neoprene' rubber. Why does the rubber impart fire resistance ?

(ii) What is 'EPDM' rubber ? State its properties.

(b) (i) Name non-sulphur vulcanising agents. **(2)**

(ii) Explain their mechanism, with the help of reactions. **(6)**

(c) Describe construction of a tyre. Draw a labelled diagram of its cross-section.

5. Answer any TWO : **2 × 8 = 16**

(a) Write full form of 'TCR'. Explain its characteristic properties and applications.

(b) (i) Write indicative structural formula of 'nitrile rubber'. Indicate typical reactant ratio used. **(2)**

(ii) Explain its typical properties and applications. **(6)**

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

6. Answer any FOUR : **4 × 4 = 16**

(a) What are 'reclaimed rubbers' ? Where are they used ?

(b) Explain applications of 'Viton rubber'.

P.T.O.

(c) Why is rubber vulcanised ? Which type of rubber is suitable for vulcanisation ?

(d) Compare : Hot-feed and cold-feed processing of rubber.

(e) Explain the terms :

(i) raw rubber

(ii) latex

(f) Explain with examples, ‘reinforcements’ used in tyres.

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