

(78) Seat No.: _____

No. of printed pages: 2

SARDAR PATEL UNIVERSITY

M.Sc. (Polymer Science & Technology) Semester-III Examination-2016

Saturday, 22nd October-2016

02:00 P.M. to 05:00 P.M.

PS03CPST08: RUBBER TECHNOLOGY

Total Marks: 70

- Note:** (1) Attempt all questions.
(2) Figures to the right indicate marks.

Q. 1 Answer the following multiple choice questions. **08**

- (1) The most important source of natural rubber is from _____ tree.
(i) *Hevea brasiliensis* (ii) *Parthenium argentatum* (iii) *Castilla elastica*
(iv) *Funtumia elastica*.
- (2) The pressure exerted by water inside the cell against the cell wall is known as _____ pressure.
(i) cell (ii) turgor (iii) both of above (iv) none of above.
- (3) _____ catalyst used for manufacturing of SBR.
(i) sulphur (ii) s-butyl lithium (iii) Ziegler-Natta (iv) both 2 & 3.
- (4) _____ strength of elastomers is its resistance to deterioration and fracture before vulcanization.
(i) Green (ii) Tensile (iii) Flexural (iv) All.
- (5) Slate powder is used as a _____ in rubber industry.
(i) plasticizer (ii) coupling agent (iii) filler (iv) cross linker.
- (6) _____ used to promote Cord-rubber adhesion.
(i) Resorcinol-formaldehyde (ii) Butadiene-styrene-vinyl pyridine emulsions
(iii) Both of above (iv) None of above.
- (7) 2,6-di-t-butyl-p-cresol is used as a _____ agent.
(i) antioxidant (ii) antiozonant (iii) antireversion (iv) antidegradant.
- (8) The sulphur having melting point _____ °C is used for vulcanization.
(i) 100 (ii) 115 (iii) 110 (iv) 120.

Q. 2 Attempt **any seven** of the following. **14**

- (1) How is levulinic aldehyde formed? Explain with reaction.
- (2) Enlist drawback of raw rubber.
- (3) Write down important characteristics of rubber.
- (4) Explain structure, properties and applications of Chlorosulphonated polyethylene.

- (5) Write a note on ethylene-acrylic elastomer.
- (6) Explain classification and properties of carbon black.
- (7) Write a note on rubber hose.
- (8) Explain the role of sulphur donor with suitable examples.
- (9) Draw neat labelled flow diagram of polyisoprene manufacturing.

- Q. 3** (a) Write a note on following. 06
- 1. Preservation and coagulation of Latex
 - 2. Cultivation of natural rubber
- (b) Explain following. 06
- 1. Cyclised rubber
 - 2. Chemically modified forms of natural rubber

OR

- (b) Explain technically specified rubber with neat labelled flow diagram. 06

- Q. 4** (a) Discuss in detail about Styrene-butadiene rubber (SBR). 06
- (b) Discuss about following synthetic rubber 06
- 1. Ethylene-propylene-diene terpolymer
 - 2. Polychloroprene rubber

OR

- (b) Write a note on various temperature resistant elastomers. 06

- Q. 5** (a) Write a note on following 06
- 1. Non sulphur vulcanisation
 - 2. Petroleum products used in elastomers.
- (b) Discuss in detail about peroxides used for cross linking of elastomers. Enlist various advantages and draw backs compared to sulphur vulcanization. 06

OR

- (b) Write a note on rubber compounding. 06

- Q. 6** (a) Discuss in detail manufacturing of furnace and thermal black. 06
- (b) Discuss in detail about theory of sulphur vulcanization and accelerator action. 06

OR

- (b) Write a note on following 06
- 1. Conveyor and power transmission belt
 - 2. V-belt

— X —
 (2)