



B. Tech. Degree V Semester Examination in Polymer Science and Engineering November 2014

PE 1504 RUBBER PROCESSING AND PRODUCTS MANUFACTURE

Time: 3 Hours

Maximum Marks: 50

PART A

(Answer *ALL* questions)

(10 x 2 = 20)

- I. (a) What is meant by mastication? What are the changes taking place during mastication?
 (b) Draw a typical graph showing the relationship between temperature and efficiency and mastication.
 (c) What is meant by cure rate mismatch? How will it affect the mechanical properties of an elastomers blend?
 (d) What are the advantages of transfer moulding over compression moulding?
 (e) What are the advantages of autoclave curing over hot air curing?
 (f) Why soluble sulphur bloom to the surface of the rubber compound?
 (g) What is meant by profile calendering?
 (h) Why does silica filler retard curing of natural rubber?
 (i) How do silane coupling agents improve the reinforcement of silica filler?
 (j) What are the methods for improving rubber to metal bonding?

PART B

(4 x 7½ = 30)

- II. (a) Explain briefly all the different steps involved in mixing on an internal mixer. (5)
 (b) What are the methods used to check the quality of dispersion? (2½)
- OR**
- III. (a) Explain briefly the calendering process used for making rubber coated nylon fabric. (4½)
 (b) What are the factors contributing to uniform thickness of the calendered product? (3)
- IV. (a) Explain briefly the rubber injection moulding. (4)
 (b) What are the advantages of injection moulding over transfer and compression moulding? (3½)
- OR**
- V. (a) Discuss briefly the microwave curing used for the production of EPDM profiles. (5)
 (b) Compare fluidized bed curing and molten salt bath curing. (2½)
- VI. (a) Explain briefly the different steps involved in the manufacture of a solid tyre. (4½)
 (b) Design a suitable formulation for a solid tyre having hardness 70 shore A. (3)
- OR**
- VII. (a) Which are the different types of mechanical seals used in rubber industry? (2½)
 (b) Explain briefly the manufacture of an oil seal. (3½)
 (c) Design a suitable formulation for an oil resistant seal. (1½)
- VIII. (a) Explain briefly the construction of a conveyor belt. (2½)
 (b) Discuss briefly all the steps involved in the manufacture of a conveyor belt. (4)
 (c) What are its important uses? (1)
- OR**
- IX. (a) Discuss briefly the manufacture of rubber covered rollers. (4)
 (b) Design a suitable formulation for an oil resistant rubber covered roller having hardness 20 shore A. (2)
 (c) What are the important uses of rubber covered rollers? (1½)