

GUJARAT TECHNOLOGICAL UNIVERSITY**B.E. Sem-IV Examination June 2010****Subject code:142601****Subject Name: Rubber Compounding Materials****Date: 17 / 06 /2010****Time: 10.30 am – 01.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** **14**
- (i) Why Accelerator should have high critical temperature?
 - (ii) “Factice is used to increase the tolerance for liquid softeners in a synthetic rubber compound.” Justify the statement.
 - (iii) Write the difference between Reinforcing Fillers and Inert Fillers.
 - (iv) List the desirable properties of antioxidants.
 - (v) Write the advantages of blowing agents.
 - (vi) “Stiffening agents are used to improve the moulding of very soft compounds.” Justify the statement.
 - (vii) What do you mean by Nanocomposites?
- Q.2(a)** Your company has to make a microcellular sheet of size 25” X 25” X 10mm thickness. Find its manufacturing cost considering 30% expansion on mold release. Assume suitable data. **07**
- (b)** Write the manufacturing process for Carbon Black by Furnace process. **07**
- OR**
- (b)** List different grades of Carbon Black. Write the properties and applications of any three grades in details. **07**
- Q.3(a)** Answer the following. **10**
- (i) Write the properties and applications of Thiazoles type of accelerators.
 - (ii) Discuss in detail about process oils used as plasticizers and softeners.
- (b)** Write a short note on “Retarders” **04**
- OR**
- Q.3(a)** Answer the following. **10**
- (i) Write in detail about Ester Plastcizers
 - (ii) Write a short note on “Activators”
- (b)** Discuss in detail about the Accelerators for Butyl Rubber. **04**
- Q.4(a)** Answer the following. **10**
- (i) Write in detail about the china clay as mineral filler.
 - (ii) Discuss in detail about organic pigments.
- (b)** “Textiles are used as reinforcing agents.” Justify the statement. **04**
- OR**
- Q.4(a)** Answer the following. **10**
- (i) Explain the “Reinforcing concept” in detail.
 - (ii) Write a short note on “Red Pigments”.
- (b)** Write in detail about Flame Retardants. **04**

- Q.5(a)** Answer the following. **10**
- (i) Discuss the factors affecting Ageing.
 - (ii) Discuss different types of polymer clay nano composites
- (b)** Write the advantages and disadvantages of Blowing Agent. **04**
- OR**
- Q.5(a)** Answer the following. **10**
- (i) Explain the mechanism of oxidation.
 - (ii) List the important nano particles used in the preparation of nano composites. Write about any two.
- (b)** Write in detail about dinitroso pentamethylene tetramine as blowing agent. **04**
