

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER- IV EXAMINATION – WINTER • 2014

Subject Code: 142601

Date: 22-12-2014

Subject Name: Rubber Compounding Materials

Time: 02.30 pm - 05.00 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** (a) Answer the following. **06**
- (i) Discuss the difference between grades of Titanium dioxide
- (ii) What is the purpose of combination of Zinc Oxide & Stearic acid worked as an Activator?
- (iii) Discuss the importance of Inert fillers. List the name of it .
- (b) Short Note on Ester Plasticisers. **04**
- (c) What do you mean by 'Rubber Substitute'? Discuss in detail about it. **04**
- Q. 2** (a) Discuss about Rubber Compounding in general according to Processing requirements. **07**
- Q. 2** (b) Write about the important properties of Carbon Black. **07**
- OR
- (b) Describe in detail about manufacturing of Carbon Black by Thermal process with labeled diagram. **07**
- Q. 3** (a) Write the Common Abbreviation, Properties & Applications of Guanidines type of Accelerators. **05**
- (b) Discuss in detail about Dinitroso Pentamethylene Tetramine & Sulphonyl Semicarbazides Blowing Agents. **05**
- (c) Write in detail about the Integral Bonding additives & Stiffening agents as Special purpose additives. **04**
- OR
- Q. 3** (a) Explain in detail about the properties required for Accelerators. **05**
- (b) Steel and glass Fiber are used as reinforcing agents for Rubber products. Justify the statement. **05**
- (c) Discuss the difference between Organic & Inorganic Blowing Agent. **04**
- Q. 4** (a) Write the importance of Anioxidants in Rubber Compounding. Explain the Mechanism of Oxidation . **07**
- (b) Short note on Organic Pigments. **07**
- OR
- Q. 4** (a) Write the properties & Applications of Vulkanox 4010 NA, Vulkanox HSL and Vulkanox Sp works as an Antioxidants. **07**
- (b) Write about the Blue & Red Inorganic Pigments. **07**
- Q. 5** (a) Define the term "Fillers". Write about reinforcing, inert & light fillers. **08**
- (b) Short Note on "Silica." **06**
- OR
- Q. 5** (a) Short Note on Phenolic Resins used as Organic Fillers. **04**
- (b) "Compounding for Rubber products is a combination of Art & Science". Justify the statement. **03**
- (c) Your Shoe manufacturing company has to make a Microcellular sheet of size **07**

30"x 30"x 10 mm thickness. Find its manufacturing cost considering 25% expansion in mold release. Assume appropriate formulation.

Ingredients	Sp.gr	Ingredients	Sp.gr	Ingredients	Sp.gr
NR	0.92	Crumb Rubber	1.05	Oil	0.9
H.S.1958	0.94	Carbon black	1.8	Antioxidant	1.08
Wax	0.9	ZnO	0.53	Accelerator	1.5
Sulfur	2.05	St. Acid	0.85	Blowing Agent	1.00
Clay	2.5	Whiting	2.7		
