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GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI • EXAMINATION - WINTER 2013

| Subj | ect Co | ode: 162601 Date: 27-11-2013 | |
|-------------|------------|--|----|
| Subj | ect Na | ame: Rubber Compound and Product Testing | |
| | | 30 pm to 05:00 pm Total Marks: 70 | |
| Instru | ctions: | 444 -114 | |
| | 2. M | ttempt all questions. Take suitable assumptions wherever necessary. igures to the right indicate full marks. | |
| Q. 1 | (a) | Discuss in detail about the purposes of testing. | 07 |
| Q. 1 | (b) | Answer the following | |
| Q ·- | i | Why is it necessary to carry out the testing at different conditions? Also | 04 |
| | ii | give the limitations of test result. Write a brief note method-A to determine the dimensions of product. | 03 |
| | 11 | write a oriel note method-A to determine the dimensions of product. | 03 |
| Q. 2 | (a) | Discuss in detail about different types of durometer with working principle and their limitations. | 07 |
| Q. 2 | (b) | Answer the following | |
| ~· - | i | What do you mean by green shrinkage? How is it determined? | 05 |
| | ii | Define the term PRI. Write down the formula to calculate PRI. OR | 02 |
| Q. 2 | (b) | Define the term resilience. Discuss in detail about the resilience measurement by using bashore resiliometer. | 07 |
| Q. 3 | (a) | Discuss the terminologies related to tensile properties of vulcanized rubber and thermoplastic elastomer. | 06 |
| Q. 3 | (b) | Answer the following | |
| Q. 3 | (b) i | Give the practical significance of tear test. How the tear test differs from | 04 |
| | | tensile test? | |
| | ii | Write down the test specimen preparation and test conditions respectively for compression set test. | 04 |
| | | OR | |
| Q. 3 | (a) | With labeled diagram, explain the construction and working of tensile testing machine. | 06 |
| Q. 3 | (b) | Answer the following | |
| | i | Explain the factors affecting the tear strength of rubber product. | 04 |
| | ii | Which methods are used to measure the compression set? Draw an experimental set up of any one method. | 04 |
| Q. 4 | (a) | Discuss in detail about the ageing test of vulcanizate in presence of ozone. | 07 |
| Q. 4 | (b) | Answer the following | |
| ζ | i | Write down the procedure of cut-growth measurement by using ross- | 04 |
| | ii | flexing machine. How deterioration of rubber is carried out by microorganism? | 03 |

| Q. 4 | (a) | Discuss in detail about the ageing test of vulcanizate in presence of air. | 07 |
|------|------------|---|----------|
| Q. 4 | (b) | Answer the following | |
| | i ii | Explain the following grades of crack (i) Grade-B (ii) (i) Grade-C Compare ozone degradation with oxygen degradation. | 04 03 |
| Q. 5 | (a) | Explain the term permeability. Discuss the constant volume method to study permeability behavior of vulcanizate. | 07 |
| Q. 5 | (b) | Answer the following | |
| | i | Draw a neat diagram of electrode assembly used to measure the volume resistivity. | 04 |
| | ii | Write a brief note on ASTM reference fuels. OR | 03 |
| Q. 5 | (a) | Explain the term solubility constant. Discuss the constant pressure method to study permeability behavior of vulcanizate. | 07 |
| Q. 5 | (b) | Answer the following | |
| | i | Write a short note on abradants. | 04 |
| | ii | Write a brief note on ASTM reference oil. | 03 |