

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3162609****Date:12-07-2023****Subject Name:Rubber Compound and Product Testing****Time:10:30 AM TO 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.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- | | | |
|------------|---|-----------|
| Q.1 | (a) Summarize the purpose of testing. | 03 |
| | (b) Why is it necessary to carry out the testing at different conditions? | 04 |
| | (c) Explain the general classification of the tests with suitable examples. | 07 |
| Q.2 | (a) Differentiate the tack and adhesion. | 03 |
| | (b) Explain the importance of coefficient of thermal expansion of rubber. | 04 |
| | (c) Explain the term hardness with respect to rubber. Discuss any one method for hardness measurement. | 07 |
| OR | | |
| | (c) Discuss in detail about the vertical rebound test. | 07 |
| Q.3 | (a) Write in brief about the non standard methods for dimension measurement. | 03 |
| | (b) Write down the scope and practical significance of stress relaxation test under compression. | 04 |
| | (c) Discuss in detail about the tensile test. | 07 |
| OR | | |
| Q.3 | (a) Which methods are available to determine the density of rubber? Which one is preferable? | 03 |
| | (b) Discuss any four terminologies related to tensile properties of vulcanized rubber. | 04 |
| | (c) Discuss in detail about different types of durometer with working principle and their limitations. | 07 |
| Q.4 | (a) Write down effect of short term temperature and long term temperature respectively on rubber. | 03 |
| | (b) List the different pendulums available for resilience measurement. Write about any one. | 04 |
| | (c) Draw schematic diagram of ozone exposure apparatus. Write down the standard conditions under which the test is conducted? | 07 |
| OR | | |
| Q.4 | (a) Why the flexural tests are not usually conducted for rubber? | 03 |
| | (b) Explain the following grades of crack (i) Grade-B (ii) Grade-C. | 04 |
| | (c) Explain the test method to measure the swelling resistance of rubber when whole vulcanizate is exposed to liquid. | 07 |
| Q.5 | (a) Which different types of abrasants are used to carry out abrasion test? | 03 |
| | (b) Give the general features related to permeability test. | 04 |
| | (c) Discuss in detail about the compression set measurement under constant load. | 07 |
| OR | | |
| Q.5 | (a) Write in brief about the classification of fatigue test. | 03 |
| | (b) Write down the procedure of cut-growth measurement by using ross-flexing machine. | 04 |
| | (c) Write down the procedure to carry out the accelerated ageing of rubber product by heating in air. | 07 |
