

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2014

Subject code: 1724007

Date: 25-06-2014

Subject Name: Weathering of Rubber

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 mark.

- Q. 1 (a)** Discuss in detail about the ultraviolet degradation of rubber with necessary reaction mechanism. **07**
- Q. 1 B i** Explain the basic types of degradation. **04**
- ii** Write down the function of photostabilizer. Also give the examples of photostabilizer. **03**
- Q. 2 (a)** Discuss the factors which influence the choice of test parameters. **07**
- Q. 2B i** Explain the different methods used to prepare the test specimen. **04**
- ii** Differentiate the oxygen degradation and ozone degradation. **03**
- OR**
- Q.2 B i** Summarize the important considerations in natural weathering test. **05**
- ii** What do you mean by service life of the rubber product? How is it assessed? **02**
- Q. 3 (a)** Write down the principle of hardness test. List the different methods available for hardness measurement. Explain any one method. **07**
- Q. 3B i** How an elongation measurement is carried out in tensile test? **04**
- ii** Write a brief note on storage modulus. **03**
- OR**
- Q. 3 (a)** Discuss in detail about the tear test. **07**
- Q. 3B i** Explain an effect of specimen thickness on the rate of oxygen diffusion. **04**
- ii** Write a brief note on loss modulus. **03**
- Q. 4 (a)** Discuss in detail about the heat build up test. **07**
- Q. 4B i** Which are the different possible geometries by which the test specimen and abradant can be rubbed together? **05**
- ii** Write down the result of compression set measurement under constant load method. **02**
- OR**
- Q. 4 (a)** Discuss in detail about the test in which prime aim is to propagate the crack. **07**
- Q. 4B i** Write a short note on different types of abradants. Also list the factors affecting the rate of abrasion. **05**
- ii** Write down the result of compression set measurement under constant deflection method. **02**
- Q. 5 (a)** Describe the construction and working of ozone exposure apparatus. **06**
- Q. 5B i** Explain the model for swelling resistance. **05**
- ii** Quote the general relation for the change of property with time. **03**
- OR**
- Q. 5 (a)** Write down the procedure to carry out the accelerated ageing of rubber product in air. **06**
- Q. 5B i** Explain the model for stress relaxation and creep. **05**
- ii** What are the objectives behind the accelerated testing? **03**
