

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI • EXAMINATION – WINTER • 2014****Subject code: 162601****Date: 26-11-2014****Subject Name: Rubber Compound and Product Testing****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) Discuss the generalized classification of physical tests with suitable example. What is need for developing the standard test method? **07**

Q.1 (b) Answer the following
i How stress relaxation differs from compression set? Also give the practical significance of stress relaxation test. **04**

ii Write a note on method B used to determine the dimensions of rubber product. **03**

Q.2 (a) Define the term hardness. Write down the construction and working of IRHD apparatus. Also express an output of IRHD test with suitable example. **07**

Q.2 (b) Answer the following
i Write in brief about temperature recovery test. **05**
ii Explain the term fatigue. **02**

OR

Q.2 (b) Answer the following
i Write about test used to measure the change in stiffness of rubber vulcanizate. **05**
ii What do you mean by fatigue life? List the factors affecting fatigue life of vulcanizate. **02**

Q.3 (a) Describe the tear test. **06**

Q.3 (b) Answer the following
i List and define the terminologies related to tensile properties of vulcanized rubber and thermoplastic elastomer. **04**
ii Write about the apparatus used to determine the compression set under constant deflection. **04**

OR

Q.3 (a) How tear test differs from tensile test? Explain the factors affecting the tear strength of rubber product. **06**

Q.3 (b) Answer the following
i Write down the function of extensometer. List out the different types of extensometer. Which one is preferable and why? **04**
ii Write down the procedure to carry out the spring calibration in compression set. **04**

Q.4 (a) Discuss in detail about swelling resistance measurement when whole vulcanizate is immersed in non volatile liquid. **07**

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- Q.4 (b)** Answer the following
- i** Write about test conditions given during ozone ageing of rubber. **04**
 - ii** Give the name of the apparatus used to measure cut growth resistance of rubber. Also list its major components. **03**
- OR**
- Q.4 (a)** Discuss in detail about swelling resistance measurement when only one surface of vulcanizate is exposed to volatile liquid. **07**
- Q.4 (b)** Answer the following
- i** Explain the degradation of rubber by microorganisms. **04**
 - ii** Define the given terms: (i) Dielectric Strength (ii) Permittivity (iii) Power factor **03**
- Q.5 (a)** Discuss the constant volume method to determine permeability of vulcanized rubber. **07**
- Q.5 (b)** Answer the following
- i** Write a short note on abrasants. **05**
 - ii** List the different types of pendulums used to measure the resilience. **02**
- OR**
- Q.5 (a)** Discuss the constant pressure method to determine permeability of vulcanizate. **07**
- Q.5 (b)** Answer the following
- i** Give the different possible geometries by which test piece and solid abrasant can be rubbed together. **05**
 - ii** Write down the practical significance of resilience test. **02**
