

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

## GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2018

Subject Code:2152601

Date:27/11/2018

Subject Name:Vulcanisation

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. Draw figures wherever necessary

- Q.1 (a)** Which rubbers are generally preferred for sulphur vulcanization? Why? **03**
- Q.1 (b)** Write in brief on vulcanization of thick rubber article. **04**
- Q.1 (c)** Explain the effect of crosslink type and structure on given vulcanizate properties:(i) Fatigue Properties (ii) Ageing Behavior (iii)Permanent Set **07**
- Q.2 (a)** How an assessment of State of Cure is done by physical method? **03**
- Q.2 (b)** Write a short note on shawbury curometer. **04**
- Q.2 (c)** Discuss the limitations of vulcanization temperature. **07**
- OR**
- Q.2 (c)** Discuss the principle, construction and working of Oscillating Disc Rheometer(ODR). **07**
- Q.3 (a)** List out the properties which are optimized in NR vulcanizate with short crosslinks. **03**
- Q.3 (b)** Explain the competing reactions occur simultaneously during accelerated sulphur vulcanization. **04**
- Q.3 (c)** Write a short note on sulphur donors. **07**
- OR**
- Q.3 (a)** List out the properties which are optimized in NR vulcanizate with longer crosslinks. **03**
- Q.3 (b)** Explain the post vulcanization network reaction observed during sulphur vulcanization. **04**
- Q.3 (c)** Discuss in detail about the zinc dithiocarbamate accelerators. **07**
- Q.4 (a)** Which peroxide radicals are preferred for rubber vulcanization? **03**
- Q.4 (b)** Explain sulphur monochloride cure with suitable example. **04**
- Q.4 (c)** Discuss in detail about Fluidized Bed Vulcanization. **07**
- OR**
- Q.4 (a)** What do you mean by co-agent? Also give it's two examples. **03**
- Q.4 (b)** Explain the vulcanization by phenol formaldehyde resin with suitable example. **04**
- Q.4 (c)** Discuss in detail about the rotational vulcanization technique. **07**
- Q.5 (a)** Write about the vulcanization medium used in case of Liquid Curing Method (LCM). **03**
- Q.5 (b)** Give advantages and disadvantages of superheated steam vulcanization over saturated steam vulcanization. **04**
- Q.5 (c)** Write on microwave vulcanization equipment. **07**
- OR**
- Q.5 (a)** For which rubber products, water vulcanization is carried out? Why? **03**
- Q.5 (b)** Which different phases are observed during the free-heating? **04**
- Q.5 (c)** Explain the reaction mechanism of electron beam vulcanization. Also compare irradiation vulcanization to chemical vulcanization. **07**

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