

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

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

# GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER- V (New) EXAMINATION – WINTER 2019

Subject Code: 2152601

Date: 25/11/2019

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.

- Q.1 (a) With labeled diagram, list the components of structure of rubber vulcanizate. 03
- Q.1 (b) Explain the construction and working of Moving Die Rheometer(MDR). 04
- Q.1 (c) By taking an example of Thiazole accelerator, discuss the reaction chemistry of Accelerated Sulphur vulcanization. 07
- Q.2 (a) Give main advantages of 'Polymeric Sulphur'. 03
- Q.2 (b) Write a short note on 'Colloidal Sulphur'. 04
- Q.2 (c) Explain an effect of crosslink structure and type on the given properties of vulcanizate:  
(i)Resilience and Heat Buildup (ii) Hardness 07
- OR
- Q.2 (c) Explain an effect of crosslink structure and type on the given properties of vulcanizate:  
(i)Fatigue (ii)Low Temperature Properties 07
- Q.3 (a) What is an effect of Co-Agent on peroxide cure? Also give main classes of Co-Agent. 03
- Q.3 (b) Give advantages of peroxide cure on sulphur vulcanization. 04
- Q.3 (c) Write a short note on Guanidine accelerators. 07
- OR
- Q.3 (a) Which radical forms of peroxide are preferred for elastomer curing? 03
- Q.3 (b) Give disadvantages of peroxide cure over sulphur vulcanization. 04
- Q.3 (c) Write a short note on Thiourea accelerators. 07
- Q.4 (a) How is an assessment of state of cure done by physical method? 03
- Q.4 (b) With suitable example, explain the vulcanization by metal oxides. 04
- Q.4 (c) Write a short note on water curing. 07
- OR
- Q.4 (a) Write down the formula to assess the state of cure by chemical method. 03
- Q.4 (b) With suitable example, explain the vulcanization Quinone Dioxime. 04
- Q.4 (c) Discuss in detail about the limitations of vulcanization temperature. 07
- Q.5 (a) Write down the practical significance of 'flow period' in manufacturing the moulded articles. 03
- Q.5 (b) What is an influence of compound composition on Liquid Curing Method (LCM)? 04
- Q.5 (c) Discuss in detail about the microwave vulcanization technique. 07
- OR
- Q.5 (a) How is rate of vulcanization studied kinetically? 03
- Q.5 (b) Explain the principle of 'Fluid Bed Vulcanization'. 04
- Q.5 (c) Write a short note on 'Autoclave Curing'. 07

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