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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