

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BTECH
BRANCH: CHEMICAL ENGINEERING

SEMESTER : VII
SESSION : MO/2025

SUBJECT: CL435 ELASTOMER TECHNOLOGY

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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		CO	BL
Q.1(a)	What is meant by the term <i>latex rubber</i> ? What is the major disadvantage of using natural rubber in its unvulcanised form, and what is the underlying chemical reason for this behavior?	[5]	BL-2
Q.1(b)	How is a rubber-smoked sheet prepared? Differentiate between TSR (Technically Specified Rubber) and SMR (Standard Malaysian Rubber).	[5]	BL-3
Q.2(a)	Name the three main commercially available grades of CR, distinguishing them based on their structural differences. How does EPM differ from EPDM in terms of chain branching?	[5]	BL-4
Q.2(b)	Why are different curing systems used for CSMs? Name at least three curing systems commonly employed for CSM curing.	[5]	BL-2
Q.3(a)	What are the major classes of accelerators used in rubber technology? Explain each class with appropriate chemical names and their corresponding chemical structures.	[5]	BL-2
Q.3(b)	What are fillers in the context of elastomer technology? On what basis are fillers classified? What is meant by ozonation in rubber?	[5]	BL-3
Q.4(a)	Discuss the role of an internal mixing mill in rubber compounding. Mention two advantages of an internal mixer compared to a roll mill.	[5]	BL-2
Q.4(b)	What are the main characteristic parameters of a roll mill that influence its mixing efficiency? Illustrate the time-torque curve, indicating TC ₅₀ and TC ₉₀ .	[5]	BL-3
Q.5(a)	Draw a cross-sectional view of a general purpose passenger tyre, labeling the important parts of the same. What is the main difference between bias tyre, and radial ply tyre.	[5]	BL-3
Q.5(b)	A conveyor Belt can be called a composite of compounded rubber and a reinforcing material in the form of textile or in extreme cases steel cables". Analyze the functioning of the rubbery part and the reinforcing part elaborating how they are interdependent.	[5]	BL-4

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