

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

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

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– VII (New) EXAMINATION – WINTER 2019****Subject Code: 2172609****Date: 30/11/2019****Subject Name: Rubber Recycling & Waste Management****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) What is Reclaimed rubber? Write in brief about it. (03)  
(b) List the advantages of cryogenic process for the production of crumb rubber. (04)  
(c) Discuss in detail about the ambient processes to produce crumb rubber. (07)

- Q.2** (a) How the properties of cured rubber will be affected by incorporating ground vulcanizate? (03)  
(b) Write the methods to estimate the degree of diffusion of softener, anti-oxidants, accelerators and stearic acid into ground vulcanisates. (04)  
(c) Discuss in detail about the influence on cured rubber due to the loading and particle size of the ground vulcanizate. (07)

**OR**

- (c) Explain in detail about the effect of the diffusion process on properties of cured rubber. (07)
- Q.3** (a) List the types of sulfur crosslinks and its characteristics. (03)  
(b) Describe the background of the process of microbiological devulcanisation. (04)  
(c) Write a short note on grinding of scrap tyres and inner tubes. (07)

**OR**

- Q.3** (a) Write about covalent bond energies. (03)  
(b) List the advantages of Mechanical devulcanisation process. (04)  
(c) Explain in detail about Ultrasonic Devulcanisation process. (07)
- Q.4** (a) How Boudouard carbon can be produced? Write its applications. (03)  
(b) Describe reductive process for pyrolysis. (04)  
(c) Explain in detail about the Rotary kiln pyrolysis reactor with its working mechanism. (07)

**OR**

- Q.4** (a) Define the term Pyrolysis. Describe in brief about the same. (03)  
(b) Write about the oxidative process for pyrolysis. (04)  
(c) Short note on tyre pyrolysis proposal. (07)
- Q.5** (a) What is the use of crumb rubber in sports ground applications? (03)  
(b) Write in brief about the use of rubber crumb with asphalt-concrete mixes. (04)  
(c) Describe the utilization and importance of scrap tyre for soil modification and oligomers production. (07)

**OR**

- Q.5** (a) Write about the use of crumb rubber as heat and sound insulating material. (03)  
(b) How the rubber crumb can be used for preparation of binder in road pavement construction? (04)  
(c) Explain in detail about production of cationites and anionites from scrap tyre. (07)

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