GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VI (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2162603   **Date: 03/05/2017**

Subject Name: Rubber Equipment Design-I

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		**Answer the following.**	**(14)**
	(1)	Give the importance of V shaped chucks in mixing mill.	
	(2)	Name the equipment through Cross mixing is achieved in rubber compound.	
	(3)	Write the formula for calculating batch size for greater than 20" roll diameter of mixing mill.	
	(4)	How friction ratio is generated in mixing mill?	
	(5)	Write the formula for Griffith's number for mixing mill.	
	(6)	Name the safety devices used for operator safety & mill safety.	
	(7)	Write the function of Break shoe in mixing mill.	
	(8)	List the name of main processes involved in mixing operation.	
	(9)	Which one is main cause for variation in batch weight of mixed mass in mixing mill?	
	(10)	Which metal is used for manufacturing of rolls of mixing mill?	
	(11)	"Roll speed tends to decrease with increase in roll diameter." Is it true or false?	
	(12)	Write the formula for calculating power consumption for Mixing mill.	
	(13)	Mention the importance of oil tank in mixing mill.	
	(14)	If Griffith's number is large, which type of flow you will achieve during mixing in mixing mill?	
Q.2	**(a)**	Write the advantages of Tampered water system in Internal Mixer.	**(03)**
	(b)	Short note on ZZ_2 geometry for Internal Mixer.	**(04)**
	(c)	Discuss the different types of discharge doors for Internal Mixer with their advantages & disadvantages.	**(07)**
		OR	
	(c)	Explain in detail about Heat Transfer in Internal Mixer.	**(07)**
Q.3	**(a)**	Which properties are required for compound used for Calendering process?	**(03)**
	(b)	Discuss in detail about Roller heating for Calender Machine.	**(04)**

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	(c)	Explain the calculation of Roll Separating Force in Calender Machine. Mention the importance of it.	**(07)**

OR

Q.3 **(a)** Explain the different causes for thickness variation in compound **(03)** during Calendering operation.

(b) Write the standard size of Calender machine used in Rubber **(04)** Industries. Write the specifications of rolls, bearing block & liner for that standard size of Calender machine.

(c) Discuss the compounding & processing related problems occurred **(07)** during calendaring operation. Mention their causes & remedies also.

Q.4 **(a)** Find the length of stroke required for an accumulator having a **(03)** displacement of 110 liters. The diameter of plunger is 350mm.

(b) Which points should be taken into consideration while selecting a **(04)** Press?

(c) Discuss in detail about the construction & working of Press classified **(07)** according to source of power.

OR

Q.4 **(a)** Write in detail about the classification of Mechanical Press based on **(03)** suspension.

(b) A hydraulic press has a ram of 12cm.dia. & plunger of 1.5 cm. dia. **(04)** Determine the load lifted if a force of 30 kgf is applied to the plunger. If the plunger has a stroke of 20 cm. how many strokes will be required to lift weight by 0.50 m? Also calculate the volume of additional liquid required & power of the motor driving the plunger if the time taken by the press is 15 minutes.

(c) Short note on: "Hydraulic Jack with Lever arrangement". **(07)**

Q.5 **(a)** Write the formula for different Principal stresses are produced in the **(03)** wall of shell in Autoclave due to high pressure.

(b) Short note on: "Delta-ring closures used in Autoclave". **(04)**

(c) Explain in detail about Autoclave design based on Max. Energy of **(07)** distortion.

OR

Q.5 **(a)** Write about Autofrettage construction of Autoclave. **(03)**

(b) Short note on: "Materials for High Pressure Vessels". **(04)**

(c) Discuss about operating, normal & transient conditions affecting **(07)** during operation of High Pressure Vessels.

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