

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEM-VI Regular Examination May 2011

Subject code: 162603

Subject Name: Rubber Equipment Design-I

Date: 19/05/2011

Time: 10.30 am – 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)**

- (i). Write the type of Starter & type of Couplings to connect motor & reduction gear shaft in Mixing Mill.
- (ii). Justify the relation between Roll diameter & length with regards to capacity of Mixing Mill.
- (iii). What are the rpm of Stock- blender rolls v/s rpm of mixing mill rolls? Why? Justify your answer.
- (iv). What will be the effect if we increase in roll nip & increase in ratio of reduction gear in Mixing Mill?
- (v). List the methods for mounting couplings over the shaft in Mixing Mill. Write the maximum possible bore size for given coupling/pulley.
- (vi). Write the material (type of metal grade) used for gears & type of material used for lubrication of roll end gear in Mixing Mill.
- (vii). What steps you will take to avoid accidents on a Rubber Mixing Mill before processing?

Q.2(A) Explain in detail about the Flow analysis in Internal Mixer. **(07)**

(B) Describe in detail about Tampered water system in Internal Mixer. **(07)**

OR

(B) Discuss in detail about Full four flighted Rotor Geometry in Internal Mixer. **(07)**

Q.3(A) Explain in detail about the Calculation of Roll Separating force in Calender Machine. **(07)**

(B) Short Note on Roll bearings of Calender Machine. **(07)**

OR

Q.3(A) Answer the following. **(08)**

- (i) Give the specifications of Bearing Block & Liner for $13 \frac{1}{2}'' \times 14 \frac{1}{2}''$ Calender Machine.
- (ii). Which type of lubricating system is required for Calender Roll bearings? Why?
- (iii). Which problem may be occurred in final product of Calender sheet? Write the causes & its remedies for it.
- (iv) Which are the important demands for a Calender Machine?

- (B) Short Note on Mounting of the Calender Rolls. (06)
- Q.4(A) Describe in detail about the Pressure Accumulator. Derive the formula for Capacity of Accumulator (07)
- (B) A Hydraulic Press has a ram of 12cm. dia. & plunger of 1.5 cm dia. Determine the load lifted if a force of 294.3 N 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 & the power of motor driving the plunger if the time taken by the press is 15 minutes. (07)
- OR**
- Q.4(A) Discuss the classification of Press on the basis of Mechanism of Ram driving with figure. (10)
- (B) Which points should be taken into consideration while selecting a Press? (04)
- Q.5(A) Short Note on Removable Closures used in Autoclave. (06)
- (B) Discuss in detail about the Materials used for manufacturing of High Pressure Vessels. (08)
- OR**
- Q.5(A) Which are principal stresses produced in the wall of shell in Autoclave due to high pressure? Explain in detail with their formula. (07)
- (B) Explain in detail about Design of High Pressure Vessels for Rubber industry based on Maximum energy of Distortion. (07)
