

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI • EXAMINATION – SUMMER 2013****Subject Code: 162603****Date: 28-05-2013****Subject Name: Rubber Equipment Design-I****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 (a)** Answer the following. (10)
- (i) List the different parts of mixing mill. Write the function of any three parts.
- (ii) What are the safety devices to avoid damage to mill roll & operator?
- (b)** Answer the following. (04)
- (i) Which are the main processes involved in mixing operation?
- (ii) “Roll speeds tend to decrease with increase in roll diameter”. Justify the statement.
- Q.2 (a)** Explain the calculation of Roll separating force by Ardichvili’s equation. (07)
- (b)** Answer the following.
- (i) Short note on “Mounting of Calender Rolls.” (05)
- (ii) How you can measure the thickness of Calender sheet in a unique way? (02)
- OR
- (b)** Discuss the compounding, processing & final product related problems, their causes & remedies for calendaring operation. (07)
- Q.3 (a)** Explain the different types of discharge door with their advantages & disadvantages. (07)
- (b)** Describe about ‘Tampered Water System.’ (07)
- OR
- Q.3 (a)** List the typical maintenance problems for Internal Mixer. Write their probable cause & possible solution for any three. (07)
- (b)** Define the purpose of ram in Internal Mixer. Discuss the different configuration of ram with their advantages, disadvantages & limitations. (07)
- Q.4 (a)** Explain the classification of mechanical press on basis of mechanism of ram driving. (07)
- (b)** Explain in detail about Hydraulic Accumulator. Discuss about its capacity also. (07)
- OR
- Q.4 (a)** A Hydraulic press has a ram of 12 cm. diameter & plunger of 1.5 cm. diameter. Determine the load lifted of 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 & the power of the motor driving the plunger if time taken by press is 15 minutes. (07)

----P.T.O.----

- Q.4 (b)** Answer the following.
- (i)** The weight of a 350 mm plunger of an accumulator is 4500 kg. What additional weight to be placed upon it to develop a hydraulic pressure of 42 kg/ cm²? **(05)**
- (ii)** What ram force is developed in a Hydraulic press if $f_p = 450$ N, $D_r = 30.5$ cm, $D_p = 10.2$ cm? **(02)**
- Q.5 (a)** Discuss about the importance of operating, normal & transient condition while designing of an autoclave. **(07)**
- (b)** Short note on “Materials for High Pressure Vessels”. **(07)**
- OR
- Q.5 (a)** Discuss the different types of Vessel Closures. **(07)**
- (b)** How many types of stresses are produced in shell? Explain the variation of stresses along the radius of the shell & along thickness for a thin cylinder. **(07)**
