

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- VIth SEMESTER–EXAMINATION – MAY- 2012

Subject code: 162603

Date: 15/05/2012

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 **06**

- i. Write the importance of V shaped Chuks in Mixing Mill.
- ii. “Roll speeds tend to decrease with increase in Roll diameter”. Justify the statement.
- iii. How you calculate the batch size for mixing mill? Batch size for a given two roll mill depends on which factors?

Q.1 (b) Answer the following **08**

- i. List the vital parts of Mixing Mill. Write the function of any two parts.
- ii Write the specification of Mixing Mill which is widely used in Rubber industries.

Q.2 (a) Describe in brief about construction & operation of Calender Machine, used for different application in Rubber industries. **07**

(b) Derive the equation for Calculation of roll separating force for Calender Machine. **07**

OR

(b) List the compounding & processing related problems for Calender Machine. Write the causes & remedies for it. **07**

Q.3 Answer the following. **14**

- i. What measures can be taken to ensure uniform platen temp?
- ii. List the type of heaters used in hydraulic press with its advantages & disadvantages.
- iii. How type and placement of Thermocouple affect the performance of rubber hydraulic press?
- iv. What is yield strength and its significance in Hydraulic Press Main frame design?
- v. Describe significance of various electrical/electronic components used for rubber hydraulic press control panel.
- vi. Draw the Hydraulic circuit diagram for Single acting-Up stroke, gravity return rubber hydraulic press.
- vii. Draw symbols for following components used for rubber hydraulic press.
Spring Loaded DCV, PRV, Pump, Motor, Contactors, Relay, Fuse.

OR

Q.3 (a) List the classification of Mechanical Press according to the basis of mechanism of ram driving. Discuss any three with diagram. **07**

(b) For 450mm*450mm platen size and 300*300mm Mould size and 200mm diameter ram find out the circuit pressure to attain 100Kg/cm² internal cavity pressure. **03**

(c) What ram force is developed in a hydraulic press if $F_p = 450$ N, $D_r = 30$ cm and **04**

- $D_p = 10 \text{ cm?}$
- Q.4 (a)** “Rotor conditions affect output, temperature and other variables”. Justify the statement. **07**
- (b)** Explain in detail about full-four flighted rotor geometry for Internal Mixer. **07**
- OR**
- Q.4 (a)** Short note on ‘Fill Factor’. **07**
- (b)** Explain in detail about Heat Transfer in Internal Mixer. **07**
- Q.5 (a)** Describe about Operating, Normal & Transient conditions for designing of Rubber Autoclave. **07**
- (b)** Answer the following.
- (i)** What do you mean by Shrink – Fit construction for autoclave? **02**
- (ii)** Short note on Materials for Autoclave. **05**
- OR**
- Q.5 (a)** Write about Delta –Ring & Double –Cone Seal Closures for Autoclave. **07**
- (b)** How many types of stresses are produced in the shell wall of Autoclave? Explain in detail. **07**
