

GUJARAT TECHNOLOGICAL UNIVERSITY**B. E. Sem-VI Examination May 2011****Subject code: 161703****Subject Name: Control System Components****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 (a)** Define the following terminology - **07**
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|----------------------------------|------------------|
| i) Bellow seal | ii) Plug |
| iii) Linear Flow Characteristics | iv) Yoke |
| v) Rangeability | vi) Safety Valve |
| vii) Relief Valve | |
- (b)** Write a short note on **07**
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|------------------------------|
| i) Types of cam as per shape |
| ii) Classification of Relays |
- Q.2 (a)** Basic and FCI equation of control valve sizing **07**
- (b)** Which are different types of gears and explain them in brief. **07**
- OR**
- (b)** What is meant by backlash in gears? Also explain how backlash in the gears can be minimized by various methods. **07**
- Q.3 (a)** Classify the actuators of control valves and explain them in brief. **07**
- (b)** What is the need of valve positioner for the operation of control valve? Explain the operation of spilt range with example. **07**
- OR**
- Q.3 (a)** Explain the working of any one flow switch is using movable parts and the one which is not using movable parts. **07**
- (b)** Which level switches are used for liquid level and solid material level detection? Explain the working of any level switch in detail. **07**
- Q.4 (a)** What is difference between AC & DC servomotors? Explain the Fleming's left hand rule in connection with DC motor. **07**
- (b)** Which are different types of stepper motors? Also explain the various applications of stepper motor in instrumentation. **07**
- OR**
- Q.4 (a)** Explain the criteria for the selection of control valves. **07**
- (b)** Differentiate between single port & double port design of globe valve. Also explain three basic trim designs of control valves with respect to their inherent flow characteristics. **07**
- Q.5 (a)** Explain the working of pneumatic and electronic transmitters. **07**
- (b)** Explain the various applications of relays. What is the difference between relay and contactor? **07**
- OR**
- Q.5 (a)** Which are the components of cam? Explain the various types of followers. **07**
- (b)** What do you mean by chattering of safety valve? Why is the rupture disc preferred in series with safety valve? **07**
