

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**Diploma Engineering Semester –IV Examination Dec. - 2011**

Subject code: 341703

Date: 12/12/2011

Subject Name: Control System Components

Time: 10.30 am – 1.00 pm

Total Marks: 70

**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. English version is considered Authentic.

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|-------------|-----|---|-----------|
| <b>Q.1</b>  | (a) | (i) Define the valve terminology.   | <b>04</b> |
|             |     | <ul style="list-style-type: none"> <li>• Trim</li> <li>• Valve body</li> <li>• Normally Open</li> <li>• Stem</li> </ul> | <b>03</b> |
|             |     | (ii) Explain check valve.   |           |
|             | (b) | What is the function of valve actuator in control valve? Explain single and double acting piston actuator.              | <b>07</b> |
| <b>Q.2</b>  | (a) | Explain solenoid valve in brief and write its application.  | <b>07</b> |
|             | (b) | Define pneumatic positioner and explain electropneumatic positioner.  | <b>07</b> |
| <b>OR</b>   |     |   |           |
|             | (b) | Explain in brief butterfly valve.   | <b>07</b> |
| <b>Q.3</b>  | (a) | List the factor affecting control valve selection and explain any one.  | <b>07</b> |
|             | (b) | Enlist various types of control valve noise. What are the different methods to reduce it? Explain any one.              | <b>07</b> |
| <b>OR</b>   |     |   |           |
| <b>Q.3</b>  | (a) | Explain the control valve characteristics.  | <b>07</b> |
|             | (b) | Write the principle and types of gyroscope. Explain vertical gyroscope.   | <b>07</b> |
| <b>Q.4</b>  | (a) | List the various types of potentiometer. Explain potentiometer as a position indicator.                                 | <b>07</b> |
|             | (b) | What is slewing rate in case of stepper motor? Explain in brief variable reluctance stepper motor.                      | <b>07</b> |
| <b>OR</b>   |     |   |           |
| <b>Q. 4</b> | (a) | Write the difference between DC techogenerator and AC techogenerator.   | <b>07</b> |
|             | (b) | Explain field controlled DC servomotor.   | <b>07</b> |
| <b>Q.5</b>  | (a) | What is 'equivalent noise resistance' in terms of potentiometer? Explain the potentiometer as an error detector.        | <b>07</b> |
|             | (b) | List the various types of servomotors and explain the torque speed characteristics of two phase induction motor.        | <b>07</b> |
| <b>OR</b>   |     |   |           |
| <b>Q.5</b>  | (a) | Explain the position control system with feedback using techogenerator.   | <b>07</b> |
|             | (b) | Write a short note on 'Synchro as an error detector'  | <b>07</b> |

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