

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI • EXAMINATION – SUMMER 2013****Subject Code: 161905****Date: 30-05-2013****Subject Name: Control Engineering****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)** Explain the following: **07**
 (i) Open loop control system
 (ii) Closed loop control system
 (iii) Servomechanism
- (b)** (i) Define transfer function and explain its significance in control engineering. **07**
 (ii) List and explain the different applications of control engineering in various in fields.
- Q.2 (a)** Draw a neat sketch of microprocessor based digital control system and explain the functions of each element. State its advantages also. **07**
- (b)** Write short note on : control systems for thermal power plant **07**
- OR**
- (b)** Explain the concepts of fuzzy logic and fuzzy control systems. **07**
- Q.3 (a)** Compare hydraulic control system with pneumatic control system in detail. State the different applications of pneumatic control system. **07**
- (b)** State the different types of hydraulic pumps and explain the factors affecting selection it. Explain the construction and working of vane pump with neat sketch. **07**
- OR**
- Q.3 (a)** Represent a generalised hydraulic control system by a block diagram and explain the functions of each element. **07**
- (b)** Explain the construction and working of 4 ó land rotary spool valve with neat sketches. **07**
- Q.4 (a)** What do you mean by stability of a control system? Explain Routhø stability criterion. **07**
- (b)** Explain Masonø rule as used for determining the overall transfer function from a signal flow diagram. **07**
- OR**
- Q.4 (a)** What does a block diagram represent? Explain it in detail. List its salient characteristics. Explain the following:
 Summing point, takeoff point. **07**
- (b)** List the basic types of control actions and explain the PDI control action in detail. **07**
- Q.5 (a)** What do you mean by mathematical modeling of a control system? Explain its importance. **07**
- (b)** Explain and derive the transfer function for an armature controlled d.c. motor. **07**
- OR**
- Q.5 (a)** Write short note on: Analogue models of mechanical and electrical system. **07**
- (b)** Explain the transient response of second order system. **07**
