Code No: RR211003 **Set No. 1**

**II B.Tech I Semester Supplementary Examinations, November 2006**
**INSTRUMENTATION COMPONENTS**
**( Common to Electronics & Instrumentation Engineering and Electronics & Control Engineering)**

**Time: 3 hours** **Max Marks: 80**

**Answer any FIVE Questions**
**All Questions carry equal marks**

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Mention the advantage and disadvantages of chain drives over belt drive.
   (b) Enumerate different terms used in chain drive.
   (c) Give the relation between pitch and pitch circle diameter.
   (d) Give the relation between chain speed and angular velocity of sprocket. [4+4+4+4]
2. (a) Explain the principle of working and design features of pressure relief values. [4+4]
   (b) Explain the terms lift and capacity as applied to safety relief values. [4+4]
3. (a) Differentiate between a potentiometer and a rheostat.
   (b) What is the difference between voltage and current transducers.
   (c) Mention two uses of each of current and voltage transducers. [6+6+4]
4. (a) What is a multistock stepper moter? [4]
   (b) Describe the working of a multistock stepper motor with neat diagram. [4+4]
   (c) Mention two uses of stepper motor. [4]
5. (a) Define tranconductance, forward transfer admittance and drain resistance of a JEFT.
   (b) Explain the operation of an n-channel enhancement MOSFET using its characteristics.
   (c) Compare the above MOSFET with depletion type. [6+8+2]
6. (a) Give the construction, equivalent circuit and characteristics of DIAC and explain its operation.
   (b) Sketch SCR phase control circuits for
      i. 90 degrees phase control
      ii. 180 degrees phase control.

      In each case show the load waveform and explain the operation of the circuit. [8+8]
7. (a) Is LED a part of an optoisolatory? If so how?
   (b) Generally the p material is emitter in normal diodes but in LED n material made as emitter. Why?

(c) How is the spectral response of a LED determined and on what factor does it depend? [4+6+6]

8. (a) Discuss the spectral transmittance characteristics of an absorption filter.

(b) What are the parameters to be observed in the design of grating.

(c) Give two types of mounting of grating and explain the importance of mount in the grating. [6+4+6]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: RR211003 **Set No. 2**

**II B.Tech I Semester Supplementary Examinations, November 2006**
**INSTRUMENTATION COMPONENTS**
**( Common to Electronics & Instrumentation Engineering and Electronics & Control Engineering)**

**Time: 3 hours** **Max Marks: 80**

**Answer any FIVE Questions**
**All Questions carry equal marks**

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) What is velocity rates as applied to belt drives.
   (b) Derive an expression for velocity ratio of belt drive.
2. (a) Explain with a diagram the operation of pilot operated safety relief value. [5+5]
   (b) What are the merits and demerits of pilot operated by safety relief value? [3+3]
3. (a) With neat diagrams explain the working of a synchro transmit receive system.
   (b) Mention major applications of synchro system. [10+6]
4. (a) In what way is a stepper motor different from an ordinary motor? [4]
   (b) Explain the working of a variable relectance stepper motor with a neat sketch. [4+4]
   (c) What is step angle and what is its significance? [8]
5. (a) What are the losses that occur in capacitors and explain how they can be minimized.
   (b) How can the losses be used in some special application?
   (c) What is meant by self healing property of an electrolytic capacitor?
   (d) List the specifications of resistors. [4+4+4+4]
6. (a) With the help of functional diagram and circuit diagram explain the monostable operation of 555 timer.
   (b) Derive the expression for time delay of a monostable multivibrator. [10+6]
7. (a) What is the essential difference between principle of operation of normal p-n diode and a LED.
   (b) Describe the working principle of light emitting diode with neat diagram.
   (c) Draw the schematic representation of an optocoupler and explain its working principle. [4+6+6]
8. Define the following terms in optical system.
   (a) Resonator

(b) Reflector

(c) Optical filter

(d) Lens [4+4+4+4]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: RR211003 **Set No. 3**

**II B.Tech I Semester Supplementary Examinations, November 2006**
**INSTRUMENTATION COMPONENTS**
**( Common to Electronics & Instrumentation Engineering and Electronics & Control Engineering)**

**Time: 3 hours** **Max Marks: 80**

**Answer any FIVE Questions**
**All Questions carry equal marks**

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) What is velocity rates as applied to belt drives.
   (b) Derive an expression for velocity ratio of belt drive.
2. (a) What are the types characteristics of plugs used in pneumatic control valve.
   (b) Explain the term valve rangeability. [10+6]
3. (a) What does a magnetic amplifier amplify?
   (b) Is magnetic amplifier an energy converter if so how?
   (c) Draw the circuit diagram of a magnetic amplifier and explain how it exerts controls in a control system. [4+4+8]
4. (a) Discriminate between ordinary electric motors and Servo motors.
   (b) Briefly explain the working of D.C and A.C servomotors with neat sketches. [6+10]
5. Give the constructional features of the following resistors.
   (a) Carbon-composition resistor
   (b) Thin film resistor
   (c) Thick film resistor. [5+5+6]
6. (a) Draw the pin configuration of LM 317 and explain each pin
   (b) List the application and specification of LM 317 IC
   (c) List the applications of 723 IC and explain one application with example. [4+6+6]
7. (a) What is the essential difference between principle of operation of normal p-n diode and a LED.
   (b) Describe the working principle of light emitting diode with neat diagram.
   (c) Draw the schematic representation of an optocoupler and explain its working principle. [4+6+6]
8. (a) Discuss the spectral transmittance characteristics of an absorption filter.
   (b) What are the parameters to be observed in the design of grating.

(c) Give two types of mounting of grating and explain the importance of mount in the grating. [6+4+6]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: RR211003 **Set No. 4**

**II B.Tech I Semester Supplementary Examinations, November 2006**
**INSTRUMENTATION COMPONENTS**
**( Common to Electronics & Instrumentation Engineering and Electronics & Control Engineering)**

**Time: 3 hours** **Max Marks: 80**

**Answer any FIVE Questions**
**All Questions carry equal marks**

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Distinguish between pivots and bearings. Write down the advantages and disadvantages of pivots and bearings. [4+4]
   (b) Describe the different Basic Counting of Ratchets. Give its uses. [8]
2. A flat circular diaphragm of mild steel has diameter of 15mm young's modulus is 200GN/m$^2$ and Poisson's ratios is 0.28 find the thickness of the diaphragm if the maximum stress is not exceed 300MN/m$^2$. When the applied pressure is 300kN$^2$ find the deflection at the center of diaphragm. [6+10]
3. (a) What does a magnetic amplifier amplify?
   (b) Is magnetic amplifier an energy converter if so how?
   (c) Draw the circuit diagram of a magnetic amplifier and explain how it exerts controls in a control system. [4+4+8]
4. (a) In what way is a stepper motor different from an ordinary motor? [4]
   (b) Explain the working of a variable relectance stepper motor with a neat sketch. [4+4]
   (c) What is step angle and what is its significance? [8]
5. (a) List the different types of windings that are employed in inductors.
   (b) List the factors affecting the capacitance of capacitors.
   (c) Explain the terms electrical noise, power derating and Boells effect of resistors.
   (d) Explain the colour code for resistors. [4+4+4+4]
6. (a) List the parameters of IC741 and explain the significance.
   (b) Explain 741 IC as a summing and difference amplifier. [8+8]
7. (a) Is LED a part of an optoisolatory? If so how?
   (b) Generally the p material is emitter in normal diodes but in LED n material made as emitter. Why?
   (c) How is the spectral response of a LED determined and on what factor does it depend? [4+6+6]
8. (a) What is the grating and how is it useful in control system.

(b) Mention different types of grating and explain in detail the working of any one of them.

(c) Describe how grating is manufactured. [4+6+6]

⋆ ⋆ ⋆ ⋆ ⋆