

III B.Tech I Semester Regular Examinations, November 2005**INDUSTRIAL ELECTRONICS****(Instrumentation & Control Engineering)****Time: 3 hours****Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. Write a technical note on the following:
 - (a) Frequency response of DC amplifier.
 - (b) Advantages and disadvantages of DC amplifier.
 - (c) Applications of DC amplifier. [5+5+6]
2. (a) Design a Zener shunt voltage regulator with the following specifications: $V_o=10$ V, $V_{in}=20-30$ V, Load current =30-50 mA, $I_z=20-40$ mA.
(b) With a neat circuit diagram explain the principle of operation of a series type voltage regulator. [8+8]
3. (a) Sketch a regulator circuit that uses an LM237 IC negative voltage regulator and explain it.
(b) Explain how the differential output of a regulator improves its performance. [8+8]
4. (a) Which thyristor rating is in danger of being exceeded when a load is inductive, and what is the conventional limiting technique?
(b) What are the different signals which can be used for turning on an SCR by gate control? Compare them. [8+8]
5. (a) A single phase fully controlled bridge converter supplies an inductive load. Assuming that the output current is virtually constant and is equal to $I_d=3$ A, determine the following performance measures, if the supply voltage is 230V and if the firing angle is maintained at $(\pi/6)$ radians. i) Average output voltage ii) Supply fundamental current iii) Fundamental power factor iv) supply harmonic factor v) voltage ripple factor
(b) Explain the effect of freewheeling diodes in converter circuits. [10+6]
6. Design a snubber circuit and explain its operation and give its applications. [16]
7. Explain the SCR sequential flasher used for automobile turn signals. [16]
8. (a) Explain the theory and principle of dielectric heating.
(b) List various Industrial applications of dielectric heating. [8+8]

III B.Tech I Semester Regular Examinations, November 2005

INDUSTRIAL ELECTRONICS

(Instrumentation & Control Engineering)

Time: 3 hours

Max Marks: 80

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

1. (a) Explain the DC amplifier using cathodeemitter follower as the 1st stage and derive the expression for its gain using its equivalent circuit.
(b) Explain the cathodeemitter drift compensation technique in DC amplifiers.
[8+8]
2. Explain in detail the various protection techniques with neat diagrams for regulated power supplies. [16]
3. (a) List out the types of IC voltage regulators and explain each with examples.
(b) List out fabrication methods of integrated circuits. [8+8]
4. (a) Which thyristor rating is in danger of being exceeded when a load is inductive, and what is the conventional limiting technique?
(b) What are the different signals which can be used for turning on an SCR by gate control? Compare them. [8+8]
5. (a) Explain SCR as a static switch.
(b) Draw the general SCR phase control circuit and draw its waveforms. [6+10]
6. Design a snubber circuit and explain its operation and give its applications. [16]
7. Design a simple and inexpensive burglar alarm to give an audio and visual indication of a door opening. Design for battery operation and low standby power. [16]
8. (a) Explain the theory and principle of dielectric heating.
(b) List various Industrial applications of dielectric heating. [8+8]

III B.Tech I Semester Regular Examinations, November 2005

INDUSTRIAL ELECTRONICS

(Instrumentation & Control Engineering)

Time: 3 hours

Max Marks: 80

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

1. (a) Explain the DC amplifier using cathodeemitter follower as the 1st stage and derive the expression for its gain using its equivalent circuit.
(b) Explain the cathodeemitter drift compensation technique in DC amplifiers.
[8+8]
2. (a) What is the disadvantage of single transistor SMPS and how it can be eliminated using bridge type of configuration?
(b) A single transistor, fly back SMPS operating at 16 kHz is supplying a mean load power of 120W at a mean voltage of 80 V from a dc source of 110 V. Estimate the mark/ space ratio of the output voltage and the value of inductance required in the circuit.
[8+8]
3. (a) List out the types of IC voltage regulators and explain each with examples.
(b) List out fabrication methods of integrated circuits.
[8+8]
4. Explain different triggering modes of Triac and give comparison among them. [16]
5. Explain the full wave thyristor phase-control circuit using its waveforms when the load is inductive and derive the expressions for average load voltage, average load current and RMS load voltage. [16]
6. Design a snubber circuit and explain its operation and give its applications. [16]
7. (a) What is meant by electronic timer and explain it with examples.
(b) Explain the DC operated timer using its circuit.
[8+8]
8. (a) Explain the theory and principle of dielectric heating.
(b) List various Industrial applications of dielectric heating.
[8+8]

III B.Tech I Semester Regular Examinations, November 2005**INDUSTRIAL ELECTRONICS****(Instrumentation & Control Engineering)****Time: 3 hours****Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain the operation of a two stage D.C amplifier using Miller compensation technique.
(b) List out the specifications of a D.C amplifier. [10+6]
2. (a) Explain the operation of a Shunt type Voltage Regulator with neat sketch.
(b) Derive the expressions for series Resistance of above Voltage Regulator.
(c) Design a Shunt Regulator for
output voltage 9.1v
 $I_L (\text{max}) = 100\text{mA}$
 $I_L (\text{min}) = 10\text{mA}$
 $I_z(\text{knee}) = 20\text{mA}$
 $V_{in} = 20\text{v}$ [6+4+6]
3. (a) Draw the basic electronic voltage stabilizer circuit and explain it.
(b) Define the terms regulation factor and stabilization ratio of a voltage regulator. [8+8]
4. (a) Explain why the inner two layers of an SCR are lightly doped and are wide.
(b) Explain in detail the turn-off mechanism of an SCR.
(c) Explain why the holding current of an SCR is less than the latching current. [5+5+6]
5. Explain the fully controlled single phase bridge type phase controlled rectifier circuit and give the expression for the average dc output voltage. [16]
6. Design a snubber circuit and explain its operation and give its applications. [16]
7. (a) Explain the principle and operation of SCR alarm circuit.
(b) Explain the speed control of induction motor using triac. [8+8]
8. (a) Explain the theory and principle of dielectric heating.
(b) List various Industrial applications of dielectric heating. [8+8]
