Total No. of printed pages = 3

Et-305/AE-I/3rd Sem/M/2013

ANALOG ELECTRONICS - I

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer question No.1 and any *five* from the rest.

1. (a) On the basis of conductivity, classify the solids. Explain their behaviour on the basis of energy band phenomenon. 5

   (b) Explain with suitable diagram, how a p-type semiconductor is formed. 5

2. (a) Draw the V-I characteristic curve of a P-N junction diode. What is avalanche breakdown? 2+2=4

   (b) Draw the circuit diagram of half wave rectifier. Explain its working principle. Derive an expression for its efficiency. 2+3+3=8

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3. (a) Draw the symbol for an npn transistor. Draw the CE transistor amplifier configuration using npn transistor and explain how voltage amplification is achieved. 1+5=6

(b) Draw the output characteristics of a transistor in CE configuration and label all the parameters. 6

4. (a) Define α and β for a transistor and establish a relation between them. 5

(b) Write a note on DC load line. 3

(c) Give a comparison table for CB, CE and CC transistor amplifier. 4

5. (a) What do you mean by faithful amplification ? Write the basic conditions for faithful amplification in transistor. 2+3=5

(b) What are the various methods of biasing a transistor ? Draw and explain the circuit diagram of base resistor biasing circuit. 2+5=7

6. (a) Define gain, frequency response and band width. Name various methods of cascading multi-stage amplifier. 3+2=5

(b) Draw the circuit diagram of a multi-stage RC coupled amplifier. Draw its gain v/s frequency characteristic and indicate cut-off frequency and band width. 3+4=7

7. (a) Classify amplifier on the basis of its biasing condition and explain each in short. 5

(b) Draw a circuit diagram of push-pull amplifier. What is cross-over distortion ? Explain with diagram. 3+4=7

8. (a) Derive a formula for negative feedback amplifier gain. 4

(b) Classify transistor oscillator circuit. Explain Hartely oscillator with neat diagram. 2+6=8

9. Write short notes on any *two* : 6×2=12

(a) Zener diode

(b) Vacuum tube

(c) Regulated power supply

(d) Filter circuit.