Total No. of printed pages = 3

ANALOG ELECTRONICS – I

Full Marks – 70

Pass Marks – 28

Time – Three hours

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

Answer any *five* questions.

1. (a) Distinguish between conductor, insulator and
semiconductor with the help of energy band
diagram.

   (b) Differentiate between intrinsic and extrinsic
semiconductor.

   (c) Explain how a n-type semiconductor is
formed.   6+2+6=14

2. (a) Draw the V-I characteristic curve for PN
junction diode. What is PIV ?

   (b) Write 3 essential conditions that must be
satisfied for proper working of Zener diode.

[Turn over

(c) Write two applications of Zener diode.

(d) Draw a circuit diagram of voltage regulator using Zener diode.   3+3+2+6=14

3. (a) Draw the output characteristic (V-I) of an npn transistor in CB mode for different emitter currents.

(b) Define α and β and deduce a relationship between them.

(c) Write down the difference between CE and CC modes in terms of input impedance, output impedance, current gain and voltage gain.   4+6+4=14

4. (a) What is faithful amplification ?

(b) Draw voltage divider biasing circuit for an npn transistor.

(c) Mention two reasons for shifting operating point in DC load line.

(d) Draw a practical single-stage CE amplifier circuit showing all components.
                    2+3+2+7=14

5. (a) Draw a R-C coupled 2-stage amplifier. What are its advantage. Draw its frequency versus gain curve.

   (b) Derive an expression for gain of an amplifier using negative feedback.   8+6=14

6. What is an oscillator ? How does it differ from an amplifier ? Explain with a neat diagram the working principle of Hartley oscillator.

                                        2+2+10=14

7. Write short notes on any *two* :   2×7=14

   (a) Bridge rectifier

   (b) Push pull amplifier

   (c) Filters

   (d) LED

   (e) Triode.