B.Tech. – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

00889   **Term-End Examination**

December, 2014

BIEL-005 : ANALOG ELECTRONIC CIRCUITS

Time : 3 hours   *Maximum Marks : 70*

Note : *Attempt any **seven** questions. Assume suitable missing data, if any. Use of scientific calculator is permitted.*

1. Explain the h-parameter equivalent circuits of a transistor in CE and CC configurations with a neat diagram. **10**

2. Draw the circuit diagram of Darlington amplifier. Give its main characteristics, merits and application. *10*

3. A BJT is found to have f_T = 500 MHz, $r_{bb'}$ = 100 Ω, g_m = 100 m mho, $C_{b'e}$ = 5 p Farad, $r_{b'e}$ = 900 Ω and h_{fe} = 100 as parameters. It is used in CE amplifier with R_S = 500 Ω and R_L = 1 kΩ. Determine the mid-band voltage gain. *10*

4. Draw the circuit of a simple Class A amplifier which can provide power amplification and explain its working. **10**

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5. Draw a parallel resonant circuit. Plot a curve showing the variation of circuit current. Provide a brief explanation for its variation. *10*

6. In a negative feedback amplifier, A = 100, β = 0·02 and input signal voltage is 40 mV. Determine *10*

   (i)   voltage gain with feedback

   (ii)   feedback factor

   (iii) output voltage

7. (a)   Determine the oscillation frequency of a transistor based Hartley oscillator with the circuit values L_1 = 150 μH, L_2 = 1·5 mH, M = 75 μH and C = 150 pF. *5*

   (b)   Why is Wein-bridge oscillator commonly used as an audio-oscillator ? *5*

8. Draw the circuit of an astable multivibrator. Justify that it is a two-stage R-C coupled amplifier using feedback. *10*

9. Discuss briefly the merits and demerits of R-C coupled amplifier. *10*

10. Write short notes on any *two* of the following : *2×5=10*

   (a)   Cascode amplifier

   (b)   555 timer

   (c)   Phase shift oscillator

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