No. of Printed Pages : 3 **BIEL-005**

# B.Tech. ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

00951

## Term-End Examination

## December, 2013

## BIEL-005 : ANALOG ELECTRONIC CIRCUITS

*Time : 3 hours* *Maximum Marks : 70*

***Note :*** *(i) Attempt **any five** questions.*

*(ii) All the questions are to be answered in english language only.*

*(iii) Use of scientific calculator is **permitted**.*

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**1.** (a) Specify h-parameters for a transistor in CE configuration. What are the typical values of these parameters ? 7

(b) In a CE amplifier circuit, the following quantities are measured: 7

(i) When ac output is short circuited (i.e. $V_{ce} = 0$)
$I_b = 15\mu A$; $I_c = 1.5mA$; $V_{be} = 15mV$

(ii) When ac input is opened (i.e. $I_b = 0$)
$V_{be} = 1mV$; $I_c = 90\ \mu A$; $V_{ce} = 1.5V$

Determine all the h-parameter of the circuit.

**2.** (a) Draw the circuit of the Direct-coupled amplifier and explain its working. 7

(b) A multistage amplifiers consists of three stages. If the voltage gains of these stages are 40, 60 and 80 respectively and power gains of these stages are 100, 400 and 800 respectively.

(i) Calculate the overall voltage gain in dB. 3.5

(ii) Calculate the overall power gain in dB. 3.5

3. (a) Explain briefly the hybrid-$\pi$ model for small signal analysis. 7

(b) With neat sketch discuss CE high frequency model with resistive load. 7

4. (a) Why a power amplifier known as "large signal amplifier"? Explain, why step-down transformer is used in its collector circuit ? 7

(b) Draw a practical circuit of complementary-symmetry push-pull amplifier and explain its working. State its advantages and disadvantages. 7

5. (a) What is the need of tuned voltage amplifier ? Draw a collector tuned amplifier circuit and explain its working. 7

(b) Draw a parallel resonance circuit. Plot a curve showing the variation of circuit current with frequency and explain. 7

6. (a) Discuss the effect of negative feedback on the voltage gain, stability, distortion, bandwidth, output impedence and input impedence of an amplifier. 7

(b) Draw the circuit diagram of a common-emitter amplifier circuit without by-pass capacitor and explain its working. 7

7. (a) What is Barkhausen criterion for sustained oscillations ? Explain its practical considerations in an oscillator. 7

(b) Draw the circuit of Hartley oscillator and explain its working. 7

8. Write short notes on **any two** : **7x2=14**

(a) Astable multivibrator

(b) Crystal oscillator

(c) 555 Timer

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