

**B. Tech. 5th Semester (F) Scheme (EEE)**  
**Examination, December-2018**

**ANALOG ELECTRONIC CIRCUIT**

**Paper-EE-305-F**

*Time allowed : 3 hours]*

*[Maximum marks : 100*

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*Note : First question is compulsory. Attempt five questions in all, selecting one question from each section.*

1. (a) Explain the effects of coupling and bypass capacitor in a circuit.
- (b) What is an oscillator ? How does it differ from an amplifier ?
- (c) Distinguish between Class -A, Class-B and Class-C operation of amplifiers.
- (d) Differentiate between linear and non linear applications of operational amplifiers. 5×4

**Section-A**

2. Define the lower cut-off frequency and upper cut-off frequency. Derive expression for these frequencies in terms of circuit components. Draw the frequency response curve of an R-C coupled amplifier. 20

3. (a) Differentiate between positive and negative feedback. How does negative feedback modify the gain of an amplifier ? 10
- (b) What is the effect of unbypassed emitter lead resistance  $R_E$  on the gain of an amplifier ? 10

### Section-B

4. (a) What are the Barkhausen condition of oscillations in electronic systems ? What are the factors which affect the frequency stability of an oscillator? 10
- (b) Explain how oscillations are initiated and sustained in an oscillator. Draw the ckt diagram of an R-C phase shift oscillator and briefly explain the principle of operation. 10
5. Enumerate the advantages of R-C oscillators. Explain the working of an R-C phase shift oscillator and find the expression for its frequency of oscillation. Find the limit on the gain of amplifier used in this oscillator. 20

### Section-C

6. (a) Explain how the position of Q-point varies in case of Class-A, B and C operation. 10

7. Draw the circuit diagram of an inverting amplifier using op-amp and derive the expression for its voltage gain. Explain the significance of virtual ground. Define CMRR of a differential amplifier. Realize a differentiator using op-amp. 10

### Section-D

8. Write note on –
- (i) Bridge amplifier
  - (ii) Current to voltage converter
  - (iii) Scale changer
  - (iv) Phase shifter 20
9. Write notes on :
- (i) Comparators
  - (ii) Logarithmic Amplifier
  - (iii) APC
  - (iv) Waveform Generator. 20