B.Tech Odd Semester (CBCS) Exam., December—2016

ELECTRONICS AND TELECOMMUNICATION ENGINEERING

(3rd Semester)

Course No. : ETC-303

(Analog Electronic Circuit)

Full Marks : 75
Pass Marks : 30

Time : 3 hours

Note : 1. Attempt **one** question from each Unit.
2. Begin each answer in a new page.
3. Answer parts of a question at a place.
4. Assume reasonable data wherever required.
5. The figures in the margin indicate full marks for the questions.

UNIT—I

1. *(a)* What is operating point? What are the importances of operating point? 2+3=5

(b) What is biasing *f* transistor? Draw the different biasing circuits for FET and MOSFET. 2+8=10

2. Describe the following : 5×3=15

(a) Thermal runaway

(b) Stability factor

(c) Load line

UNIT—II

3. *(a)* What is loading effect? Explain with example the loading effect due to series connected load. 2+5=7

(b) In an amplifier, the maximum voltage gain is 2000. It falls to 1414 at 10 kHz and 50 Hz. Find *(i)* bandwidth, *(ii)* lower cut-off frequency and *(iii)* upper cut-off frequency. 4

(c) A multistage amplifier employs five stages each of which has a power gain of 30. What is the total gain of the amplifier in dB? If a negative feedback of 10 dB is employed, find the resultant gain. 4

4. *(a)* What are DC amplifiers? Mention a few applications of DC amplifiers. 5

(b) In two-stage RC coupled amplifier for each stage R_{in} 2 k and 80, find *(i)* voltage gain of second stage and *(ii)* overall voltage gain. 7

(c) Why does transformer coupling give poor frequency response? 3

UNIT—III

5. (a) Compare series resonance with parallel resonance. 7

(b) What is Q factor? What is the significance of Q factor? Show that Q factor is related with bandwidth. 2+4+2=8

6. (a) What is Miller capacitance? Derive the expressions for Miller's input capacitance and Miller's output capacitance. 2+(4×2)=10

(b) Write the differences between single-tuned and double-tuned amplifiers. 5

UNIT—IV

7. (a) In the Colpitts oscillator, C_1 0 2 F and C_2 0 02 F. If the frequency of the oscillator is 10 kHz, find the value of the inductor. Also find the required gain for oscillation. 5

(b) Draw the circuit diagram of a Wien-bridge oscillator and briefly explain its working. 8

(c) Why is positive feedback required for oscillator? 2

8. Write short notes on the following : 7½×2=15

(a) Oscillator

(b) Phase-shift oscillator

UNIT—V

9. (a) What is multivibrator? Describe briefly the different types of multivibrator. 8

(b) Write some of the applications of multivibrators. 4

(c) List the functional part of IC555. 3

10. Write short notes on the following : 7½×2=15

(a) Linear voltage regulator

(b) DC power supply

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