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Code: 15A04401 **R15**

B.Tech II Year II Semester (R15) Supplementary Examinations December 2018

ELECTRONIC CIRCUIT ANALYSIS

(Common to ECE and EIE)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) An amplifier with open loop gain Av = 1000±100 is available It is necessary to have an amplifier whose voltage gain values by no more than ± 0.1 percent. Determine the reverse transmission factor (β) of the feedback network used.

(b) What is the condition required for sinusoidal oscillations to be sustained. Also write the expression for frequency of oscillations in RC phase shift oscillator.

(c) A modern bipolar transistor can have C_e = 1pF. If g_m = 50 mA/v. Determine (f_T) for a common emitter amplifier.

(d) What is the relationship between (f_β) and (f_T)?

(e) Distinguish between cascade and cascode amplifiers.

(f) Explain the effect of bypass capacitor in multistage amplifier.

(g) The expression for the efficiency of class B push-pull amplifier is _____ and max efficiency is ____.

(h) Write the expression for total harmonic distortion of an amplifier.

(i) Define stability of tuned amplifier with relevant expression.

(j) What is the effect of Bandwidth in an multistage amplifier?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 (a) Explain the concept of feedback amplifier using block diagram.

(b) An amplifier without feedback given a fundamental output of 36 V with 7 percent (7%) second harmonic distortion when the input in 0.028 V. If 1.2% of the output in feedback into the input in a negative voltage series feedback circuit, what is the output voltage?

OR

3 (a) Derive an expression for oscillating frequency of Wein bridge oscillator and illustrate its operation.

(b) A crystal has the following parameters L = 0.33 H, C = 0.065 pF, C' = 1.0 pF and R = 5.5 kΩ.

(i) Find the series resonant frequency.

(ii) By what percent does the parallel resonant frequency exceed the series resonant frequency?

UNIT – II

4 (a) With the help of hybrid models determine the following high frequency parameters interns of low frequency parameters: (i) Transistor transconductance.

(ii) Input conductance.

(iii) Feedback conductance.

(b) The following transistor measurements made at room temperature:

Ic = 5 mA, V_{CE} = 10 V, h_{fe} = 100, h_{ie} = 600 Ω, C_e = 3 pF, [Aie] = 10 at 10 MHz. find f_β and f_T.

OR

5 Derive an expression for voltage gain, input and output impedances of common drain FET amplifier.

UNIT – III

6 Illustrate the concept of Boot-strap emitter follower with expressions.

OR

7 Describe the two-stage FET amplifier with neat circuit diagram and relevant expression.

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UNIT – IV

8 Explain the operation of class-B amplifier with circuit diagram and also derive an expression for maximum efficiency of push-pull class B amplifier.

OR

9 (a) Describe the operation of complementary symmetry push-pull amplifier.

(b) A transistor supplies 0.85 W to a 4K-load. The zero signal dc collector current is 31 mA and the dc collector current with signal is 34 mA. Determine the percent second harmonic distortion.

UNIT – V

10 With neat circuit diagram, describe the operation of capacitance single tuned amplifier.

OR

11 (a) Explain about staggered tuned amplifiers.

(b) Describe briefly the effect of bandwidth of double tuned amplifier, when amplifiers are cascaded.

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