Code: 15A04401 **R15**

B.Tech II Year II Semester (R15) Regular & Supplementary Examinations May/June 2018

ELECTRONIC CIRCUIT ANALYSIS

(Common to ECE & 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) Classify feedback amplifiers.

(b) Design FET phase shift oscillator for frequency of 2.5 kHz.

(c) Write the expression for gain band width product of transmitter amplifier.

(d) Show that $g_{b'e} = g_m/h_{fe}$.

(e) Three identical cascaded stages have an overall upper 3 dB frequency of 20 KHz and lower 3 dB frequency of 20 Hz. What are the f_L and f_H of each stage?

(f) What is the effect of bootstrap technique on emitter follower?

(g) The efficiency of transformer coupled class A amplifier expression is _____ and maximum efficiency is _____.

(h) Define thermal stabilization and heat sink.

(i) Define Q-factor of a small signal tuned amplifier with relevant expression.

(j) When single tuned amplifier is cascaded? What is the effect on bandwidth of the cascaded amplifier?

PART – B

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

UNIT – I

2 (a) Explain the characteristics of the negative feedback amplifier.

(b) The closed loop gain of a (-ve) feedback amplifier is measured as 99.7 when feedback factor is 1/100 and as 297 when a feedback factor of 1/300 is used. Determine open loop gain.

OR

3 (a) Explain the operation of Hartley oscillator using FET amplifier.

(b) Design a phase shift oscillator to have 3 kHz cutoff frequency use a single stage BJT amplifier with power supply = $\pm$ 15V and $\beta \geq 100$.

UNIT – II

4 Derive an expression for CE short circuit current gain.

OR

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

UNIT – III

6 Derive an equation for voltage gain, current gain, input impedance and output impedance of Darlington emitter follower.

OR

7 Illustrate two stage transistor amplifier with neat circuit diagram and relevant expressions.

UNIT – IV

8 Define second harmonic distortion. Derive an expression for second harmonic component of transmitter amplifier.

OR

9 (a) Briefly explain MOSFET power amplifier.

(b) Define cross over distortion and explain the operation of class AB power amplifier.

UNIT – V

10 Describe the operation of single tuned amplifier with neat circuit diagram and relevant expression.

OR

11 Illustrate the operation of double tuned amplifier with neat circuit diagram and necessary equation.

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