QP Code: RD19MSC055 Reg. No | | | | | | | | | | | AR 19

GIET UNIVERSITY, GUNUPUR – 765022

M. Sc (Third Semester) Examinations, December' 2020

PHPE 302 – ELECTRONICS

(Physics)

Time: 2 hrs Maximum: 50 Marks

(The figures in the right hand margin indicate marks.)

PART - A

Q.1. Answer ALL the Questions. **(2 x 10 = 20)**

a. What is the effect of negative feedback on bandwidth and voltage gain of a voltage series feedback amplifier?

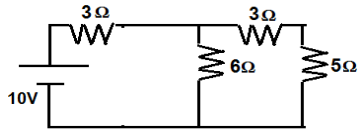
b. What are the advantages of crystal controlled oscillator over R-C phase shift oscillator?

c. Explain the statement- "A JFET is a voltage controlled device whereas BJT is a current controlled device".

d. For a given OP AMP the CMRR is 10^5 and differential gain is $10^{5.}$ Find the common mode gain of this OP AMP.

e. Give the truth table of a J-K flip flop.

f. Find out the current through 5 Ω resistor in the following circuit using Thevenin's theorem.



g. Simplify the logic expression $Y= \overline{AB} + \overline{A} + AB$

h. Draw the output wave shape of an OP AMP integrator with a square-wave input.

i. Why are open – loop OP AMP configurations not used in linear applications?

j. What are the differences between BJT and JFET ?

PART-B

Q.3. Answer ANY FIVE Questions. **(6 x 5 = 30 Marks)**

2. Draw the small signal low frequency hybrid parameter equivalent circuit of a CE transistor amplifier and derive the expressions for power gain in trans conductance model.

3. Write the relation between drain current and gate-to-source voltage for an enhancement type MOSFET. How is an n-channel MOSFET used as a resistor?

4. What is Nyquist criterion for a regenerative circuit? Describe the physical significance of Nyquist criterion in an oscillator.

5. What is meant by frequency stability of an oscillator? Why is the frequency stability of piezoelectric crystal controlled oscillator high?

6. What is a non-inverting OP AMP? With a neat circuit diagram derive an expression for voltage gain, input impendence and output impedance of non-inverting amplifier using OP AMP.

7. Explain how an OP AMP can be used as a voltage comparator.

8. Show that a bubbled AND gate is equivalent to a NOR gate and a bubbled OR gate is equivalent to NAND gate.

9. With the help of a truth table explain the operation of a J-K flip-flop having preset and clear input facilities.

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