Printed Pages:02 **Sub Code: KEC-201T**

Paper Id: 238167 **Roll No.** | | | | | | | | | | | | | | |

B. TECH
(SEM II) THEORY EXAMINATION 2022-23
EMERGING DOMAIN IN ELECTRONICS ENGINEERING

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

(a) Write the diode current equation of a p-n junction diode
(b) State the application of Zener diode
(c) Compare JFET & BJT.
(d) Why FET is called VOLTAGE controlled device
(e) List the ideal characteristics of op-amp.
(f) What do you mean by IOT?
(g) What are universal gates? Why are they called so?
(h) What is a Logic gate? What is meant by a bit, pair, and quad?
(i) Write a short note on MOBILE communication system.
(j) Describe the need of modulation in communication system.

SECTION B

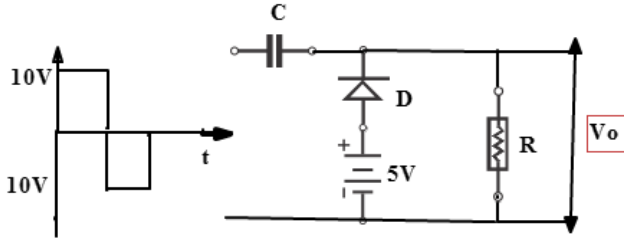
2. Attempt any *three* of the following: 10x3=30

(a) Draw a neat circuit diagram of HALF wave rectifier and explain its operation with output waveforms.
(b) Explain Working Principle of Enhancement type MOSFET (n-channel). Draw its drain and transfer characteristics.
(c) Explain how an op-amp can be used as an inverting amplifier, non- inverting amplifier and summing amplifier. Derive expressions for output voltage.
(d) Simplify the following function using K map
F (A, B, C, D) = Σm (1, 3, 4, 5, 6, 7, 9, 11, 13, 15)
(e) Draw the block diagram of element of communication system. Explain functions of each block briefly.

SECTION C

3. Attempt any *one* part of the following: 10x1=10

(a) Explain the working of p-n junction diode in FB and RB conditions and draws its V-I characteristics.
(b) Trace the output of the given circuit fig.



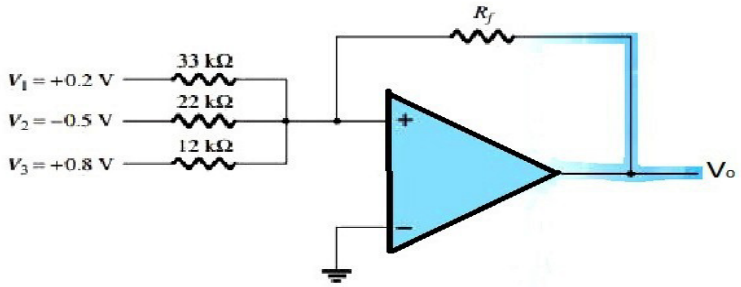
4. Attempt any *one* part of the following: 10x1=10

(a) Describe the construction and working of a NPN transistor in common emitter (CE) configuration with respect to size and doping. Also, draw the input and output characteristic graph.

(b) Draw & Explain N-channel JFET construction. Draw & Explain its characteristics**.**

5. Attempt any *one* part of the following: 10x1=10

(a) Calculate the output voltage developed by the circuit of Fig. below for R_f = 330 KΩ.



(b) Draw the Block diagram of Op-Amp and explain its each block.

6. Attempt any *one* part of the following: 10x1=10

(a) Simplify the Boolean expressions to minimum number of literals

i) (A + B)(A + C')(B' + C')

ii) AB + (AC)' + AB'C (AB + C)

iii) (A+B)' (A'+B')'

(b) Define Universal Gates. Implement AND, OR, NOT by using NAND gates only

7. Attempt any *one* part of the following: 10x1=10

(a) Define AM. Sketch the AM wave and drive the expression for AM wave.

(b) (i) Describe briefly Satellite Communication.

(ii) Write a short note on MOBILE communication system