Printed Pages:02 Sub Code:KOE-038

Paper Id: 233310 Roll No.

**B-TECH**
**(SEM III) THEORY EXAMINATION 2022-23**
**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) What is doping? Why it is needed
(b) What is diode capacitance
(c) What is dark current in tunnel diode
(d) Can Zener diode operate in forward biased? If no why
(e) For an N-channel JFET, if $I_{DSS} = 9$ mA and $V_P = -6$ V, calculate $I_D$ at $V_{GS} = -4$ V
(f) How op-amp can work as voltage follower circuit
(g) In which mode can BJT work as a switch
(h) What is CMRR in op-amp? What does it determine
(i) What is advantage of Digital meter over analog meter
(j) What is Lissajous pattern in CRO? Why it is used

**SECTION B**

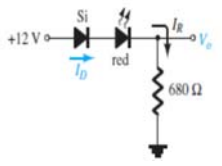
**2. Attempt any *three* of the following: 10x3=30**

(a) Draw V-I characteristic of conventional P-N diode and show the effect of temperature on this curve
(b) With a neat circuit diagram and waveforms, explain the working of center-tapped full-wave rectifier. Show that efficiency of full-wave rectifier is 81%.
(c) Draw CE transistor characteristic curve? Why CE is most popular configuration technique list it comparison
(d) Derive output voltages for Integrator, Differentiator and Subtractor along with the circuit diagram using op-amp.
(e) Explain construction and working of DMM with proper block diagram

**SECTION C**

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

(a) For the circuit shown calculate the output voltage, for red led the voltage drop is 1.8V

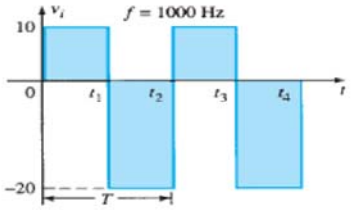


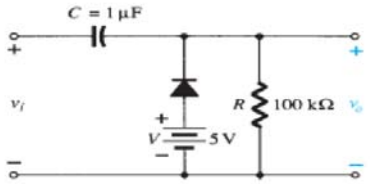

(b) Explain Voltage Doubler Circuit and their types with a neat sketch? What is Diode current equation?

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

(a) Explain what is tunnel diode and varactor diode along with their V-I characteristics curve. List application of both

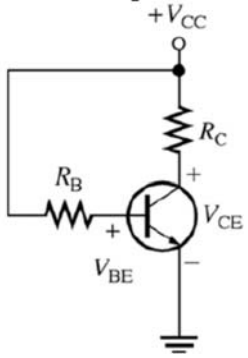
(b) For the circuit shown determine the output voltage




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

(a) Determine Q point value if $\beta$=200,$V_{ce}$=8V, $R_B$=320K, $R_C$=4K

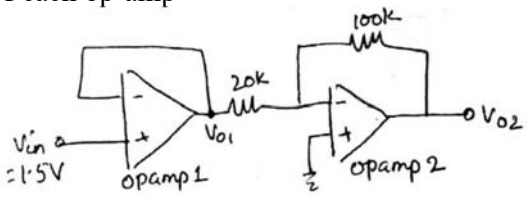



(b) Explain construction and working of N channel depletion MOSFET? Draw the drain characteristic curve?

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

(a) Design an adder circuit using op-amp to obtain an output voltage of Vo = −[0.1$V_1$ + 0.5$V_2$ + 2$V_3$], where $V_1$, $V_2$ and $V_3$ are input voltages. Draw the circuit diagram.

(b) For the op-amp shown determine Vo1 and Vo2.Also write the function of each op-amp




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

(a) Explain in brief along with block diagram of Ramp type digital voltmeter using waveform?

(b) Explain CRO with a neat sketch? How it can be used to measure frequency and phase determine?