Sub Code:KOE038

Paper Id: 199362 Roll No:

B. TECH
(SEM-III) THEORY EXAMINATION 2019-20
ELECTRONICS ENGINEERING

Time: 3 Hours *Total Marks: 100*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

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

Q no.	Question	Marks	CO
a.	What will happen on number of free electrons in a semiconductor on increasing the temperature?	2	CO1
b.	Differentiate between zener breakdown and avalanche breakdown.	2	CO1
c.	A Zener diode regulator circuit has an input voltage that may vary from 22V to 30 V if the regulated output voltage is 12 V and the load resistance varies from 140 ohms to 10 KOhms. Determine the maximum allowable series resistance.	2	CO2
d.	What is the average current, rms current and efficiency for half wave and full wave rectifier?	2	CO2
e.	Derive the relationship between I_{CEO} and I_{CBO} in BJT.	2	CO3
f.	Describe how an FET can be used as a voltage controlled resistor.	2	CO3
g.	What is unity gain amplifier(buffer)?	2	CO4
h.	What is SLEW RATE explain briefly?	2	CO4
i.	Compare analog and digital instruments.	2	CO5
j.	Write the applications of CRO.	2	CO5

SECTION B

2. Attempt any *three* of the following: **3 x 10 = 30**

Q no.	Question	Marks	CO
a.	(i) Draw and explain the characteristics of transition and diffusion capacitance v/s applied voltage. (ii) What do you mean by diode resistances? A Ge diode at temperature 300K conducts 5mA at voltage 0.35V, predict the diode current if voltage is 0.4V.	10	CO1
b.	With a neat circuit diagram and waveforms explain the working of full wave bridge rectifier and show that its ripple factor is 0.48.	10	CO2
c.	Distinguish between enhancement type and depletion type MOSFETs. Draw the cross-section of N-channel enhancement MOSFET. Explain and draw the transfer characteristics.	10	CO3
d.	Draw the equivalent circuit of an ideal and practical opamp, also explain its applications as summing amplifier.	10	CO4
e.	What is the basic principle of a DVM? Explain Ramp technique of measurement.	10	CO5

SECTION C

3. Attempt any *one* part of the following: **1 x 10 = 10**

Q no.	Question	Marks	CO
a.	Draw the V-I characteristics of an ideal & practical diode and explain. Also write the diode equation in support of your answer.	10	CO1
b.	How reverse saturation current of a diode changes with the temperature? Show the effect of temperature on V-I characteristics curve.	10	CO1

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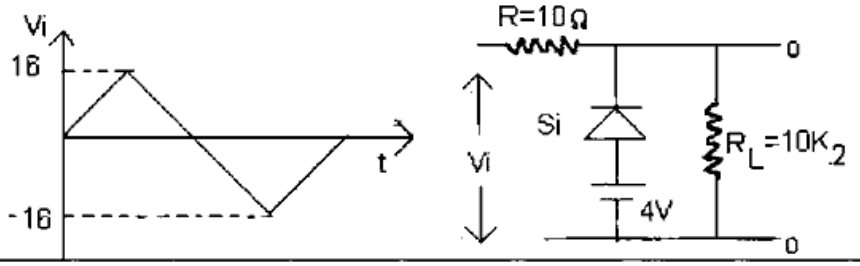
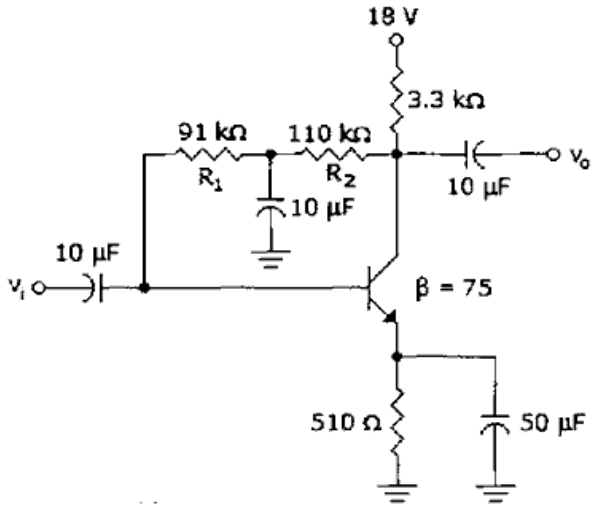
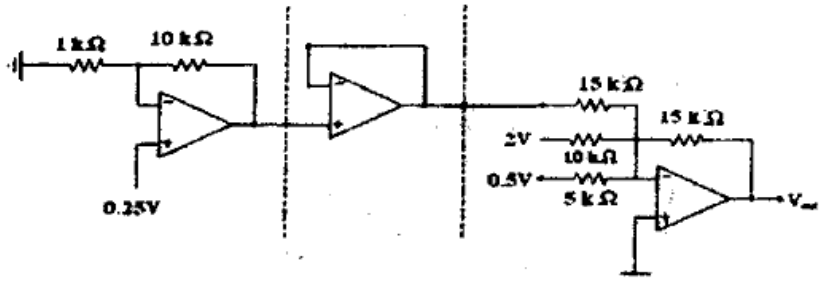
4. Attempt any *one* part of the following: 1 x 10 = 10

Q no.	Question	Marks	CO
a.	(i) In a full wave rectifier, the input is from 30-0-30V transformer. The loadand diode forward resistances are 100Ω and 10Ω respectively. Calculatethe average voltage, dc output power, ac input power, rectificationefficiency and percentage regulation. (ii) Sketch the output Voltage waveform for given circuit 	10	CO2
b.	Draw and Explain the working of tunnel diode & varactor diode with proper diagram and characteristics.	10	CO2

5. Attempt any *one* part of the following: 1 x 10 = 10

Q no.	Question	Marks	CO
a.	Calculate the value of V_{CEQ}, and I_{CQ} for the given circuit. 	10	CO3
b.	The device parameters for an n-Channel JFET are: Maximum current IDSS = 10mA, Pinch off voltage, Vp = - 4V Calculate the drain current for (a) VGS = 0 (b) VGS = - 1.0v (c) VGS = - 4V.	10	CO3

6. Attempt any *one* part of the following: 1 x 10 = 10

Q no.	Question	Marks	CO
a.	Find the output of the following Op-Amp Circuit.  Also explain the characteristics of an ideal opamp.	10	CO4

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b.	Define following terms for an Opamp: (i) Slew rate (ii) Virtual ground (iii) CMRR	10	CO4

7. **Attempt any *one* part of the following:** **1 x 10 = 10**

Q no.	Question	Marks	CO
a.	(i) Explain how we measure voltage, frequency and phase with CRO. (ii)A lissajous pattern on an oscilloscope is stationary. It has 5 vertical tangent values and 6 horizontal tangent values. The frequency of horizontal input is 1800Hz. Determine the frequency of vertical input.	10	CO5
b.	Draw and explain the block diagram of Digital Storage Oscilloscope(DSO) also compare it with analog oscilloscope.	10	CO5