PAPER ID-311482

Roll No:

B.TECH
(SEM I) THEORY EXAMINATION 2020-21
BASIC ELECTRONICS

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.	Define slew rate and CMRR.	
b.	Differentiate between Avalanche and Zener break down.	
c.	Write advantages and disadvantages of FET over BJT.	
d.	Explain the principle of operation of LED.	
e.	Derive the relationship between α and β.	
f.	Why BJT is called bipolar device?	
g.	A lissajous pattern on a CRO is stationary and has 4 horizontal and 2 vertical tangencies. The horizontal frequency is 100 Hz, find vertical frequency.	
h.	Write different characteristics of an ideal Op-Amp.	
i.	Write difference between Conductor, Semiconductor and Insulator.	
j.	Why Si is preferred over Ge?	

SECTION B

2.	Attempt any *three* of the following:	10x3=30
a.	Draw the common emitter circuit and sketch the input and output characteristics. Also explain active region, cutoff region and saturation region by indicating them on the characteristic curve.	
b.	Explain the construction and working of N-channel JFET. Draw the drain characteristic and transfer curve.	
c.	Explain the V-I characteristic of p-n junction diode. How it is differ from Zener diode?	
d.	Draw the circuit and discuss the working of full wave bridge rectifier with suitable input -output waveforms. What is PIV of bridge rectifier?	
e.	Derive an expression for voltage gain of inverting and non-inverting ideal operational amplifier configurations.	

SECTION C

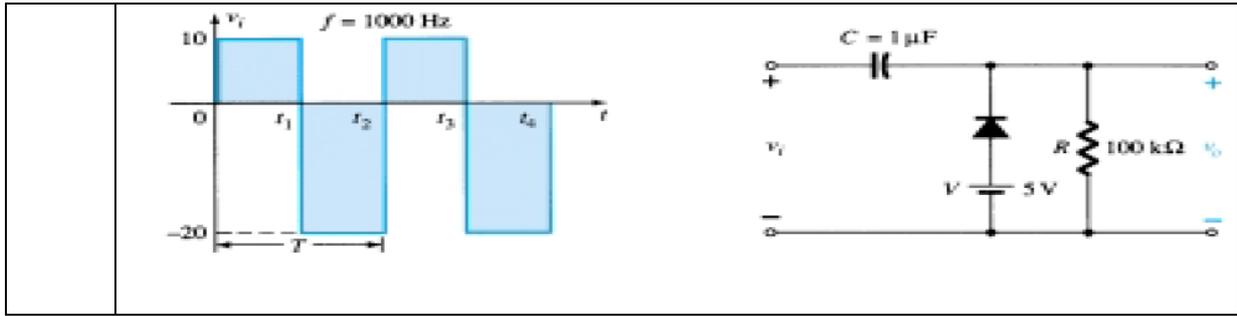| 3.	Attempt any *one* part of the following:	10x1=10
a.	Discuss the need of modulation in the communication engineering. Which types of modulations are used in television?	
b.	For the Zener diode network of Fig, determine V_L, V_R, I_Z, and P_Z.	

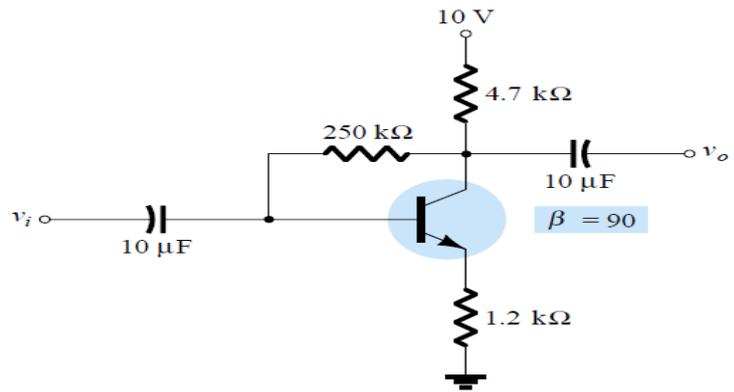| 4.	Attempt any *one* part of the following:	10x1=10
a.	Explain with block diagram how DMM can measure AC and DC signals and various other electrical parameters?	
b.	Determine v_o for the network of Fig for the input indicated	

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

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a.	Draw the general block diagram of CRO and explain each block.

b.	Determine the quiescent levels of I_{C_Q} and V_{CE_Q} for the network of Fig

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

a.	Draw and explain the block diagram of a ramp-type digital voltmeter (DVM).
b.	Determine the output waveform for the network of Fig. and calculate the output dc level and the required PIV of each diode.
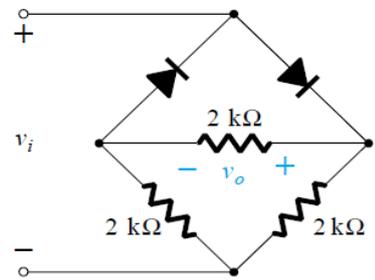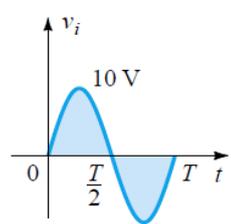
7. Attempt any *one* part of the following: 10x1=10

a.	Explain how Op-Amp can be used as i) Integrator ii) Inverting Summer and iii) Voltage Follower
b.	Determine V_C and V_B for the network of Fig