PAPER ID-411406

Subject Code: NEC101

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM I) THEORY EXAMINATION 2021-22
ELECTRONICS ENGG

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

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

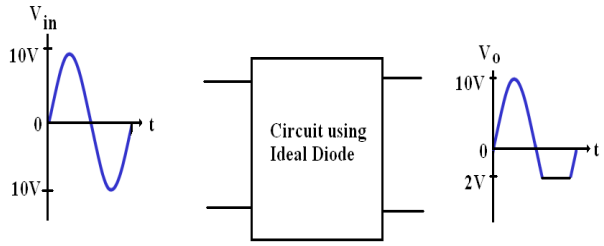
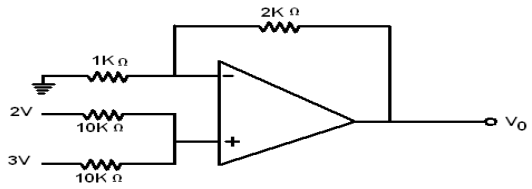
SECTION A

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

Q no.	Question	Marks	CO
a.	What are majority and minority charge carriers in semiconductors?	2	1
b.	What is tunneling phenomena in TUNNEL diode?	2	1
c.	If β=50, I_E=1.8mA and I_{CO}=12μA, Calculate I_C and I_B when transistor is used in CE configuration.	2	2
d.	How FET differs from the BJT?	2	2
e.	Determine CMRR for an OPAMP for input voltage V_1=150μV and V_2=140μV and the output voltage is 45.8mV.	2	3
f.	Explain the concept of Virtual ground in an OPAMP.	2	3
g.	What is the use of trigger circuit in CRO?	2	4
h.	Enlist the advantages of DMM.	2	4
i.	What is need of modulation in communication system?	2	5
j.	What are the sidebands in AM wave?	2	5

SECTION B

2. Attempt any *three* of the following:

Q no.	Question	Marks	CO
a.	(i) Draw and explain the operation of center tapped full wave rectifier with input and output waveforms. Calculate ripple factor. (ii) Draw the circuit for the given input and output as shown in fig (1)  Fig (1)	10	1
b.	Draw and explain the Common Emitter circuit of a transistor. Sketch and explain its input and output characteristics.	10	2
c.	With suitable circuit diagram obtain the expression for output voltage for summer OPAMP. Calculate V_0 for the given network in fig (2).  Fig (2)	10	3
d.	(i) Draw the block diagram of CRO and explain the function of each block. (ii) With the help of suitable block diagram, explain the working Principle of Digital Volt Meter (DVM).	10	4

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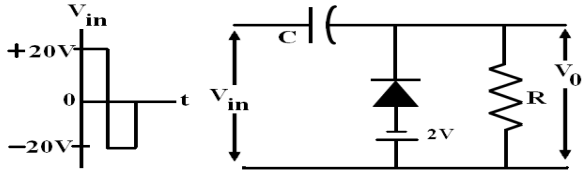
e.	(i) Explain the amplitude modulation. Obtain an expression for an AM wave. (ii) A certain transmitter radiates 9 kW with the carrier unmodulated, and 10.125 kW when the carrier is sinusoidally modulated. Calculate the modulation index, percent of modulation. If another sine wave, corresponding to 40 percent modulation, is transmitted simultaneously, determine the total radiated power.	10	5

SECTION C

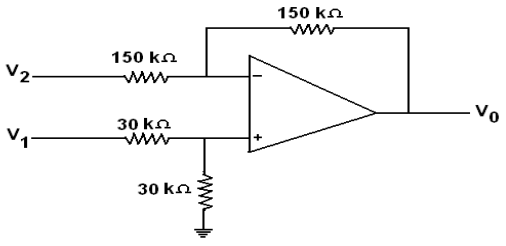
3. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Draw and explain the circuit diagram for negative and positive clamper circuits with input and output waveforms.	10	1
b.	Draw and determine the output waveforms for the given network as shown in fig (3)  Fig. (3)	10	1

4. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	A CE amplifier has a load resistance of 3KΩ, R_1=8.1KΩ, R_2=2.2KΩ, R_C=2.7KΩ, R_E=1.8 kΩ, and V_{CC}=20V. The *h* parameters are h_{ie} = 4KΩ, h_{re}= 7x10^{-4}, h_{fe}=135 and h_{oe}=25μA/V. Draw hybrid model and determine Z_i, Z_O, A_i, A_V.	10	2
b.	With neat sketch describe the construction of an p channel JFET. Explain its principle of operation and draw its drain and transfer characteristics.	10	2

5. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Enlist the characteristics of ideal OPAMP. Obtain the expression for voltage gain in non inverting OPAMP. Calculate the output voltage for the network as shown in fig (4).  Fig. (4)	10	3

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b.	Explain unity gain OPAMP. With suitable circuit diagram obtain the expression for integrator and differentiator OPAMP.	10	3

6. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Draw the block diagram of digital multimeter and explain how it calculates various parameters?	10	4
b.	What is electron gun in CRO? How Phase and frequencies are measured using CRO?	10	4

7. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Sketch the block diagram of communication systems and explain the function of each block.	10	5
b.	What is Angle modulation? Derive an expression for an FM wave with sinusoidal modulation.	10	5