Printed Pages: 02 **Sub code: NEC -101**

Paper Id: 233064 **Roll No.** | | | | | | | | | | |

B.TECH
(SEM I) 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) Describe VI characteristics of the PN junction diode.
(b) Compare avalanche and zener breakdown mechanisms.
(c) Describe the benefits of transistor biasing.
(d) Define the threshold voltage for an E-MOSFET.
(e) Define the CMRR of an op-amp.
(f) The output of a particular op-amp increases 8V in 12μs. Determine the slew rate.
(g) Compare analog and digital instruments.
(h) Write the applications of the digital voltmeter.
(i) Two sine waves have modulation indexes of 0.4 and 0.3. Determine the modulation index of the combined wave.
(j) Explain the benefits of modulation.

SECTION B

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

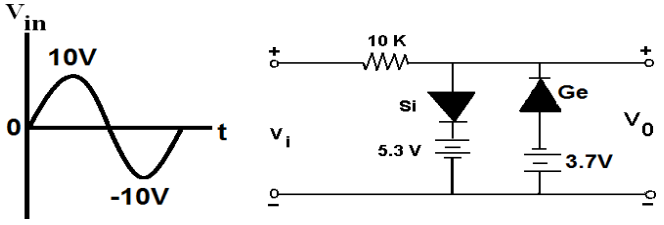
(a) (i) With the help of a neat diagram, explain the working of the voltage doublercircuit.
(ii) Write the short note on the tunnel diode.

(b) Describe the construction and working of an NPN transistor. Define α and β with respect to BJT and derive the relationship between them.
(c) Explain the concept of virtual ground. Explain the working of op-amp as a differentiator.
(d) Draw and explain the block diagram of the CRO and also write the applications of CRO.
(e) Explain modulation for a communication system. Derive the expression for the total power radiated by the modulated signal in amplitude modulation.

SECTION C

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

(a) With neat circuit diagram and waveforms explain the working of a bridge full wave rectifier. Explain the advantages of a full-wave rectifier over a half-wave rectifier.
(b) Determine the output waveform for the given circuit.



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

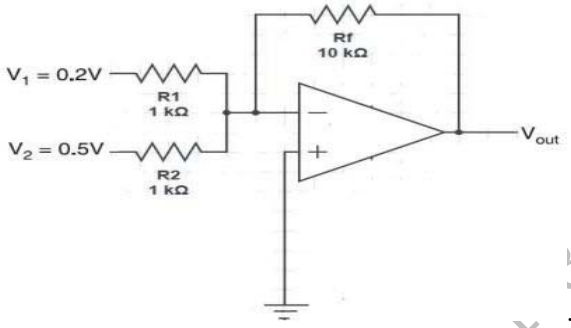
(a) Draw and explain N-channel depletion type MOSFET with their characteristics curve and also compare enhancement type and depletion type MOSFETs.

(b) State two differences between BJT and FET. Explain the construction, and working of N-channel JFET with characteristics curve.

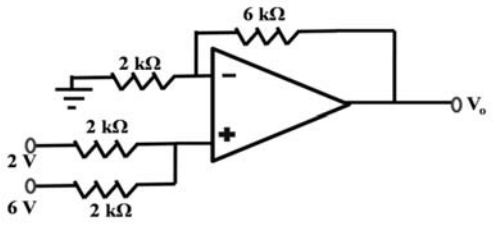
5. Attempt any *one* part of the following: 10x1=10

(a) (i) Draw and explain the block diagram of the op-amp. List the idealcharacteristic of an op-amp.
(ii) Explain the working of op-amp as an adder.

(b) Determine the output of the following Circuits(i)



(ii)



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

(a) Describe the working of a digital multimeter with a proper block diagram and also write its applications.

(b) Describe the measurement of voltage, frequency & phase using CRO.

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

(a) Explain amplitude modulation and demodulation with a proper diagram.

(b) Explain the block diagram of the communication system. A certain transmitter radiates 9 kW with the carrier unmodulated, and 10.125 kW when the carrier is sinusoidally modulated. Calculate the modulation index and percent ofmodulation.

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