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131203

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B.TECH
(SEM. II) THEORY EXAMINATION 2017-18
ELECTRONICS ENGINEERING

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

- Note:** 1. Attempt all Sections.
 2. Assume any missing data.

SECTION A

- 1. Attempt all questions in brief. 2 x 10 = 20**
- a. Distinguish between avalanche and zener breakdown.
 - b. Define depletion layer in a diode.
 - c. If α of a transistor changes from 0.981 to 0.987. Find the percentage change in β ?
 - d. Enlist the difference between JFET and MOSFET.
 - e. Define CMRR and Slew rate in OP-Amp.
 - f. An Op-Amp has a differential gain of 103 and a CMRR of 100, input voltages are 120 μ V and 80 μ V. Determine the output voltage.
 - g. State the advantages of digital instruments over analog instruments.
 - h. Explain the role of trigger circuit in CRO.
 - i. Define modulation index?
 - j. Find transmission power efficiency for a tone modulated signal when modulation index is 0.25.

SECTION B

- 2. Attempt any three of the following: 10 x 3 = 30**
- a. Explain full wave bridge rectifier with circuit diagram. Also find efficiency and ripple factor for it.
 - b. Draw & explain CE configuration circuit of BJT with the help of input and output characteristics.
 - c. Explain:
 - (i) Differentiator circuit using Op-Amp.
 - (ii) Unity gain amplifier using Op-Amp.
 - d. Draw a neat block diagram of a cathode ray tube with proper labels. Also explain its working principle.
 - e. With the help of block diagram explain the working of communication system. What is the need for modulation of signal before transmission it to distant place

SECTION C

- 3. Attempt any one parts of the following: 10 x 1 = 10**
- a. (i) Sketch output voltage (V_o) waveform of the following network as shown in figure 1. Assume diode is silicon diode with $V_D = 0.7$.

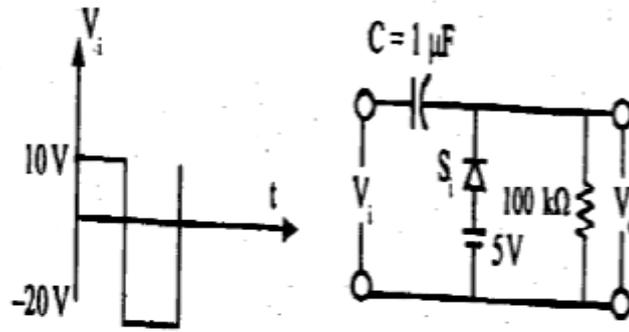


Figure 1

(ii) Determine the current I as shown in figure 2. Assume diode is silicon diode with $V_D = 0.7$.

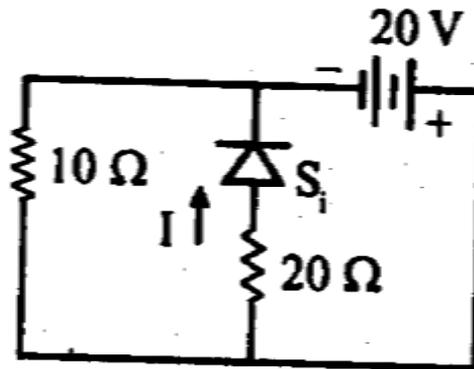


Figure 2

b. Explain Schottky and Varactor diode with their input and output characteristics.

4. Attempt any one parts of the following:

10 x 1 = 10

- What is transistor biasing? Why is it required? Explain the various schemes of transistor biasing.
- Draw and explain N-channel depletion type MOSFET with its characteristics.

5. Attempt any one parts of the following:

10 x 1 = 10

- Define Op-Amp with the help of block diagram. Also describe the equivalent circuit along with its ideal and practical characteristics. Explain virtual ground condition in Op-Amp.
- (i) Find output Voltage of the Op-Amp shown in figure-1.

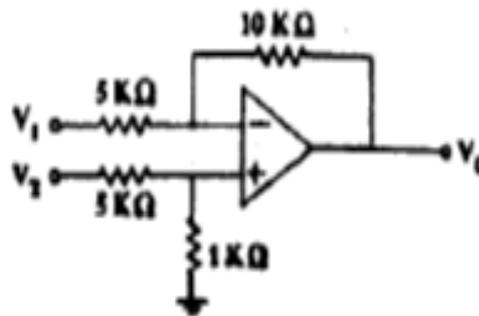


Figure 3

(ii) Find output Voltage of the Op-Amp shown in figure-2

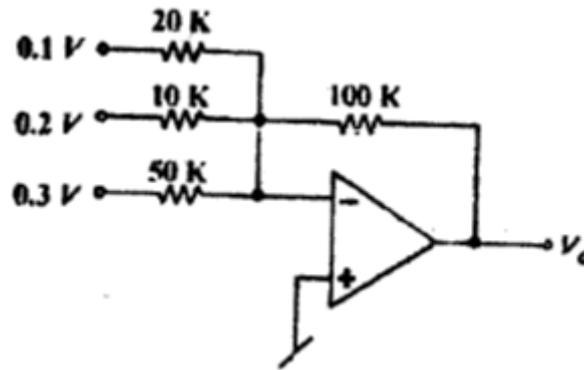


Figure 4

6. Attempt any one parts of the following:

10 x 1 = 10

- With the help of block diagram explain the working of digital multimeter. Mention its advantages and applications.
- Draw the block diagram of CRO. How CRO can be used to measure Voltage, Frequency and Phase difference.

7. Attempt any one parts of the following:

10 x 1 = 10

- How AM modulation and demodulation is done? Explain using block diagrams of modulator and demodulator.
- In an FM system when the audio frequency (AF) is 500 Hz and the AF voltage is 2.4 V, deviation is 4.8 KHz. If the AF voltage is now increased to 7.2 V, what is the new deviation? If the AF voltage is raised to 10 V while the AF is dropped to 200 Hz, what is the deviation? Find modulation index in each case.