

(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID : 131111

Roll No.

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B.TECH.

(SEM. I) THEORY EXAMINATION, 2015-16

ELECTRONICS ENGINEERING

[Time:3 hours]

[Total Marks:100]

Note:All sections are *compulsory*.

SECTION-A

1. Attempt **all** parts .All parts carry equal marks. Write answer of all part in short . (2x10=20)
 - (a) What is the purpose of Delay block in CRO?
 - (b) Define slew rate of an OPAMP.
 - (c) Why Si is preferred over Ge for manufacturing of electronic devices.
 - (d) In JFET $I_{DSS}=6mA$, $V_p=-3V$ biased at $V_{GS}=-2V$. Determine the value of g_m ?
 - (e) Define Op-Amp and Draw its block diagram.

- (f) Explain Common Collector configuration in case of NPN transistor.
- (g) Explain ohmic region of the JFET.
- (h) What do you understand by 'cut-in' voltage of a diode?
- (i) Differentiate between deterministic and random signals.
- (j) Define need of unity gain amplifier using an OpAmp.

SECTION-B

Attempt any five questions from this section. (10x5=50)

2. (i) Determine V_o , and draw the output waveform of the given network of Figure 1.

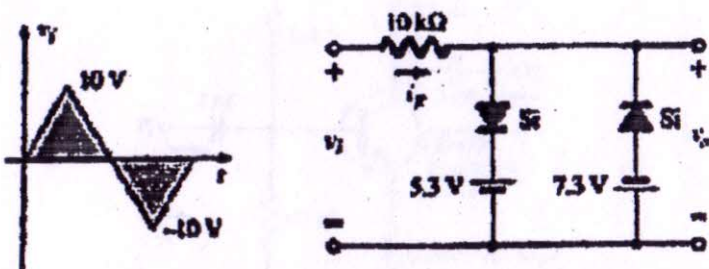


Figure 1

- (ii) For the network of Figure 2, determine the range of V_i that will maintain V_L at 20 V without exceeding the maximum current rating of 60 mA.

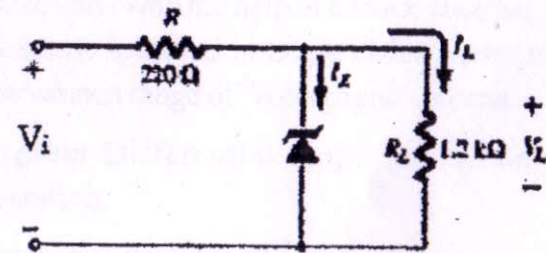


Figure 2

3. (i) Determine V_o and I_D for the network of Figure 3.

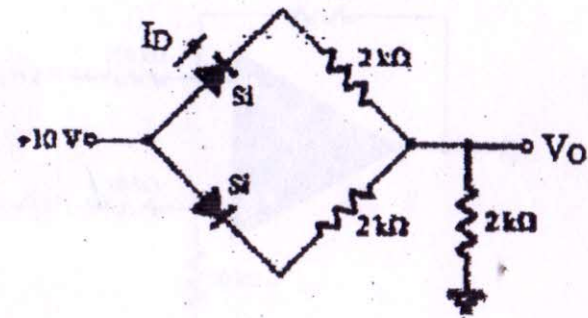


Figure 3

(3)

P.T.O.

- (ii) Sketch V_o for the network of Figure 4 for the input shown.

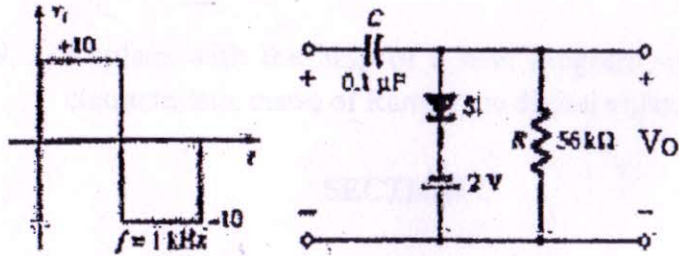


Figure 4

4. For the voltage divider configuration of Figure 5 determine r_o , A_v , Z_{in} and Z_o .

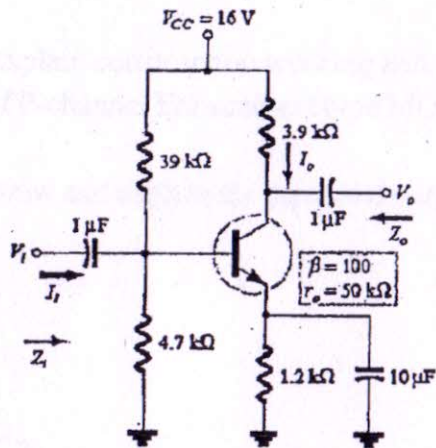


Figure 5

(4)

EC-101

5. Explain the following with the help of necessary diagrams using an Op-Amp.

- (i) Adder
(ii) Integrator

6. (i) Enumerate with the help of a block diagram, of various elements involved in Digital Multimeter to measure the various range of Voltage and Current.

- (ii) Explain Differential amplifier in two mode of operation.

7. (i) Determine the output voltage of an op-amp for input voltages of $V_{i1}=100V$ and $V_{i2}=120V$. The amplifier has a differential gain of $A_d=4000$ and the value of CMRR is:

- (a) 150 (b) 10^3

- (ii) Find V_o for the circuit shown in Figure 6

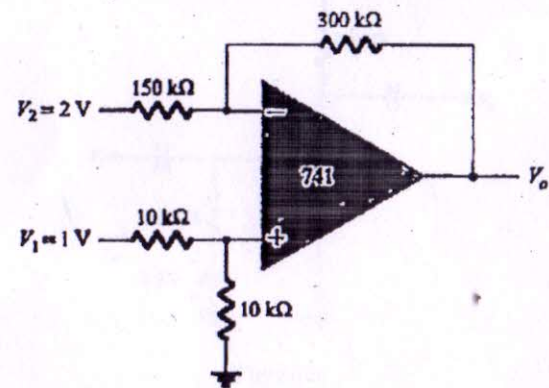


Figure 6

(5)

1800

P.T.O.

8. With the help of a neat block diagram, explain the working of a CRO and describe the method of measurement of phase and frequency using CRO.
9. Explain with the help of a neat diagram working and characteristic curve of Ramp type digital voltmeter.

SECTION-C

Attempt **any two** questions from this section. (15x2=30)

10. (i) Explain the working and characteristic of Tunnel diode with the help of a neat diagram.
- (ii) Describe with the help of circuit diagram, working of a voltage multiplier.
11. (i) Explain construction working and characteristics of P-channel Enhancement type MOSFET.
- (ii) Draw and explain the input and output characteristics.

12. (i) For the common collector configuration in Figure 7, determine I_B , I_C , V_E , V_{CE} .

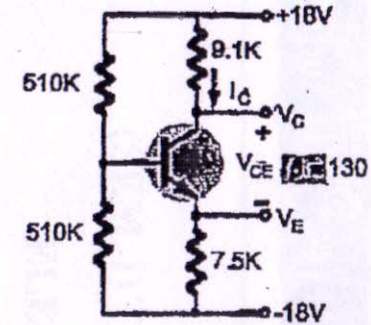


Figure 7

- (ii) Determine Z_i , Z_o and A_v for the circuit of Figure 8. if

$$I_{DSS} = 12\text{mA}, V_p = -6\text{V}, \text{ and } Y_o = 40 \text{ microSiemen.}$$

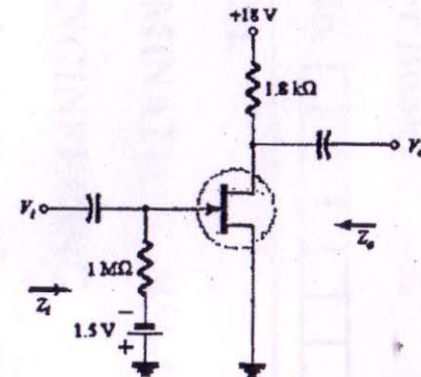


Figure 8