EC-1869

B. Tech. (Semester-II) Examination

Electronics Engg.

Time: Three Hours

Maximum Marks 100

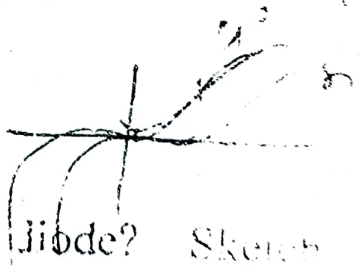
Note: Attempt questions from all the sections.

Section-A

(Short Answer Type Questions)

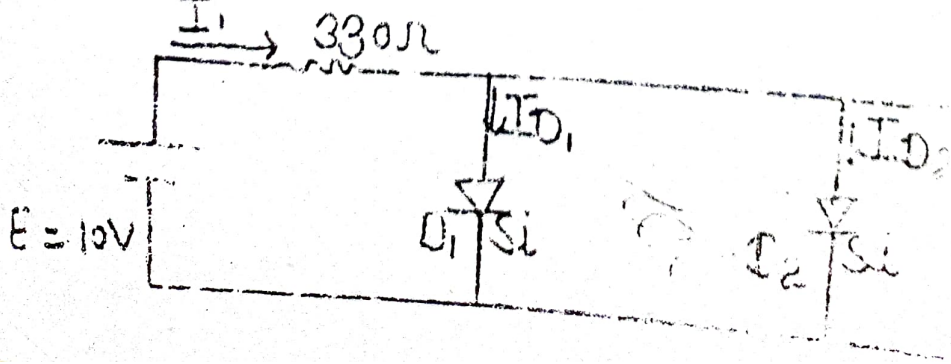
Note: Attempt any ten questions. Each question carries marks. (3x10=30)

1. Explain Semiconductors.



2. What is PN junction diode? Sketch the characteristics of Si and Ge diodes.

3. Determine V_0, I_1, ID_1 and ID_2 for both the diode configuration:-



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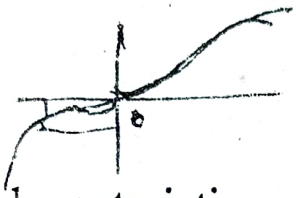
Define PIV. Also write the different values of PIV for different rectifiers.

What is zener diode? Sketch the $V-I$ characteristics of zener diode.



Draw the $V-I$ characteristics of CB transistor.

Compare the CB, CE and CC transistor configurations.

Design a fixed bias circuit using a silicon transistor having $\beta = 100$. Vce is 10v and dc bias conditions are to be $V_{CE} = 5v$ and $I_c = 5mA$.

Differentiate between BJT and FET

Write the important characteristics of an ideal operational amplifier.

Convert the following:

(a) $(0.625)_{10} = (\ )_2$

(b) $(172.878)_{10} = (\ )_8$

(c) $(ABC.75)_{16} = (\ )_{10}$

(d) $(434.67)_8 = (\ )_{16}$

$(101112.75)_{16} = (\ )_{10}$

(a) 1.011 (b) 0.1010

13. Apply Demorgan's theorem and simplify

$$\overline{A + B\bar{C} + D(E + \bar{F})}$$

14. Construct $EX - OR$ gate using NAND gates only.

15. Simplify $ABC + AB\bar{C} + A\bar{B}C$ using K-map.

Section-B

(Long Answer Type Questions)

Note: Attempt any three questions. Each question carries 20 marks. **(20x3=60)**

1. Describe the construction and working of N-channel depletion MOSFET. Also describe the characteristics of N-channel depletion MOSFET.

2. Draw the h-parameter equivalent of CE transistor and determine R_i, R_o, A_I and A_V expressions.

3. Draw the circuit diagram of an OP-Amp as an adder, subtractor, differentiator and integrator. Then determine the output voltage for all the four configurations.

(i) Describe the circuit diagram and input-output waveform for bridge (full wave) rectifier.

(ii) Describe the shunt capacitor filter used circuit diagram.

Draw the circuit diagram and explain the working of

(i) Half wave voltage doubler ckt. and

(ii) Full wave voltage doubler circuit

Explain the following:

(i) FET

(ii) Zener breakdown

(iii) CMRR

(iv) Zener diode as shunt regulator