VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY (VSSUT), ODISHA
Even Mid Semester Examination for session 2024-25

COURSE NAME:B.Tech SEMESTER:2nd

BRANCH NAME: ALL (Sec: D,E,F,G,H,I,J)
SUBJECT NAME: BASIC ELECTRONICS

FULL MARKS:**30** TIME:**90 Minutes**

Answer **All**Questions.
The figures in the right hand margin indicate Marks. *Symbols carry usual meaning.*

Q1. Answer all Questions. **[2×3]**

a) Define the following terms: - CO1
(i) Doping (ii) Dopant (iii) Donors (iv) Acceptors (v) n-type & p-type semiconductor.

b) Show the doping profile in the emitter, base and collector regions of transistor. Why is the width of the base region is very thin. - CO2

c) Find r's and (r-1)'s complements of the given numbers. - CO2
(i) $(-A678)_H$ (ii) $(-2674)_8$

Q2. **[8]**

(a) A Ge diode a has reverse saturation current of 1.5 μA at 300K. Compute the static and dynamic resistance of the diode for an applied forward bias voltage of 0.3V. [4]

(b) Discuss the operation of p-n junction diode and its various resistances. [4] - CO1

OR

(a) Explain the operation of full wave bridge rectifier with the help of circuit diagram. Mention its advantages and disadvantages when compared with full wave center tap rectifier. [4]

(b) Discuss and derive all the necessary parameters of full wave bridge rectifier with neat circuit diagram. [4] - CO1

Q3. **[8]**

(a) Explain the working principle of transistor with neat sketch. Draw and explain the output characteristics of transistor in CE configurations. [4]

(b) Carryout the following addition by using 1's and 2's complement notation. [4] - CO2
(i) (+13, -11), (ii) (-15, +9)

OR

(a) Develop the relation between α, β, and γ in transistor. [4]

(b) Write De-Morgan's theorem and verify by its truth table [4] - CO

Q4. **[8]**

(a) Convert the following numbers into the required base. [4]

(i) $(1001010.1010111)_2=()_8$, (ii) $(A356.56)_H =()_8$

[4]

(b) Write the collector current expression in CB and CE configuration. - CO3

OR

(a) What do you mean universal gate? Realize Ex-OR and Ex-NOR gate using NOR Gate. [4]

(b) Represent 8,-7,12,-19 in 8bit signed complement representation. [4]

- CO3