Registration No : | | | | | | | | | | |

Total Number of Pages : 02

B.Tech/
Integrated Dual Degree (B.Tech and M.Tech)
RBL2B002

2nd Semester Reg. / Back Examination: 2022-2023
Basic Electronics Engineering
AERO, AE, AUTO, BIOTECH,CHEM,CIVIL,CST,CSEAI, CSEDS,CSE,CSIT,CSEAIME,ELECTRICAL & C.E,EEE,ELECTRICAL,ECE,ETC,EIE,MANUTECH,MECH,MME,METTA,MINERAL,MINING,PLASTIC,IT
Time : 3 Hour
Max Marks : 100
Q.Code : M383
Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.
The figures in the right hand margin indicate marks.

Part-I

Q1 **Answer the following questions:** **(2 x 10)**

a) Draw the equivalent circuit diagram of a diode.
b) Draw V-I characteristics of the ideal zener diode.
c) Write the applications of CE, CB, CC configuration of transistors.
d) Define slew rate.
e) Distinguish between BJT and FET.
f) Draw the circuit diagram of an Op Amp differentiator.
g) Write 4 applications of closed loop Op amp circuits.
h) Draw logic gate symbols for NOR & X-OR gates.
i) Draw the OR gate using NAND gates.
j) $(127)_{10} = (\ ?\ )_8$ and $(110110)_2 = (\ ?\ )_{16}$

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 × 8)**

a) Draw the VI characteristics of a diode and explain about its current equation.
b) Explain the principle of operation of a pnp transistor.
c) What is a zener diode? Explain about its constructional details with applications.
d) Explain the operation of a digital inverter.
e) Explain about MOSFET and its characteristics.
f) Explain the principle of operation of a JFET.
g) Design a circuit which produces the output voltage $V_0 = 2V_1 - 6V_2 + 9V_3$ using Op-amp with minimum resistance value 50kΩ.
h) Write the ideal characteristics of Op-amp, with its physical interpretation.
i) Derive the output voltage of a differentiator circuit using Op-amp.

j) Design a full adder using NOR gates only.
k) Design a X-OR gate using minimum number of NOR gates.
l) Explain about number systems and its conversion details.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 Explain various types of transistors, its constructional details and input output characteristics. **(16)**

Q4 Explain in detail about CMOS, its constructional details, merits and applications. **(16)**

Q5 What is an op-amp, its equivalent circuit, applications with neat circuits. **(16)**

Q6 Design a half adder, full adder, full substractor with NAND gates only. **(16)**