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

Total Number of Pages : 02

B.Tech

RBL2B002

2nd Semester Regular / Back Examination 2018-19

BASIC ELECTRONICS ENGINEERING

BRANCH : AEIE, AERO, AG, AUTO, BIOTECH, CIVIL, CSE, ECE, EEE, ELECTRICAL, ENV, ETC, IT, MANUTECH, MECH, METTA, METTAMIN, MINERAL, MINING, MME, PLASTIC

Max Marks : 100

Time : 3 Hours

Q.CODE : F358

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 **Only Short Answer Type Questions (Answer All-10)** **(2 x 10)**

a) What is Avalnche break down?

b) Define slew rate and PSRR of op-amp.

c) Determine the DC resistance of a diode at V_D= - 20V if its reverse saturation current is 1 Micro-amp. (Take V_T= 25 milli-amp at room temperature)

d) What do you mean by three state gate? What is its importance in combinational circuit?

e) Write down the advantages of negative feedback.

f) Write down the excitation equation of S-R flip-flops. What is its limitation?

g) State the relation between I_{CO} and I_{CEO}.

h) Differentiate between combinational logic and sequential logic circuit.

i) What is counter? How many flip-flops are required to design a decade counter?

j) What is the significance gain bandwidth product?

Part- II

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

a) Explain the operation of P-N junction diode with V-I characteristics.

b) A crystal diode having an internal resistance ri= 20 ohms is used for full wave rectification. If the applied voltage is V=50sin 2t and the load resistance is RL= 800ohms, determine the following

i) I_m, I_{dc} I_{rms} of output

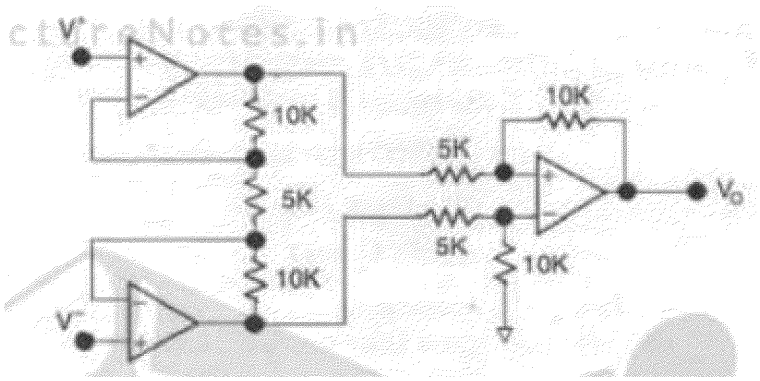
ii) a.c power input and dc power output

iii) Ripple factor

c) Draw the circuit of an emitter follower. Derive the expression for input impedance. Mention at least two applications of an emitter follower.

d) What is Dc load line? Explain base biased method with necessary equation.

e)



Derive the expression for the output voltage and the find the magnitude of the o/p voltage of the op-amp shown above.

f) What is CRO? Draw the block diagram of CRO and explain its operation.

g) In RC coupled amplifier, the output voltage is 5V for a sinusoidal input of 5mV. Determine the voltage gain at mid band frequency and at half power frequencies.

h) Write Short notes on Universal Gate. Also realize NOR using NAND gate only.

i) What is Flip-Flop? Name the types of Flip-Flop. Explain J-K flip- flop using circuit diagram, truth table and excitation equation.

j) Explain the ideal characteristics of electronic instrument.

k) Explain the principle of oscillator circuit. Mention two conditions that must be fulfilled by oscillator circuit.

l) What is POS and SOP of Boolean expressions? Simplify the following expression using Boolean identity $F(A,B,C,D)=\sum_m(4,5,6,7,12,13,14)$.

Part-III

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

Q3 Explain the operation of half wave and full wave rectifier with its input and output waveform. Find the ripple factor in both cases. **(16)**

Q4 How does the construction feature of MOSFET differs from JFET? **(6+10)**
A JFET operates in the linear region with a constant drain voltage of 1V. When the gate voltage is 2V, a drain current of 10 m amp. Flows, but when the gate voltage is changed to 1 V, the drain current becomes 22.8 m amp. Find the pinch off voltage of the device, the channel resistance for the gate voltage of 0 V.

Q5 With a neat circuit diagram, explain the voltage divider bias circuit. Also derive the equation of stability (S) for voltage divider and self-bias circuit. **(16)**

Q6 Derive the of 3-input summing amplifier. Design a single stage common source amplifier for following specification Av= -25 Vo= 2.5V. **(16)**