QPC: RS20BTECH215 AR 19 Reg. No

GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Second Semester – Regular) Examinations, September – 2021

BESBS1032 – Basic Electrical & Electronics Engineering

(Common to all branches)

Time: 2 hrs Maximum: 50 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) **(1 x 10 = 10 Marks)**

Q.1. Answer ***ALL*** questions [CO#] [PO#]

a. Kirchhoff's current Law is applicable for _____only. [CO1] [PO1]

(i) Loops (ii) Junctions

(iii) Mesh (iv) Both (i) & (iii)

b. If current lags the voltage in a single phase AC circuit then the circuit is _____ [CO1] [PO1]

(i) R-L in series (ii) R-C in series

(iii) R-L-C in series (iv) None of these

c. Phase voltage in a star connected load is equal to _____ times the Line voltage. [CO1] [PO1]

(i) √3 (ii) √3/2

(iii) 1 (iv) 1/√3

d. Which of the following does not change in a transformer? [CO1] [PO1]

(i) Current (ii) Voltage

(iii) Frequency (iv) Impedance

e. If 'Ns' is the synchronous speed and 's' is the slip, then actual running speed of an induction motor will be [CO2] [PO1]

(i) Ns (ii) s × N

(iii) (1-s)Ns (iv) (Ns-1)s

f. DC motor is preferred over AC motor due to [CO2] [PO1]

(i) Low speed operation (ii) Variable speed operation

(iii) High speed operation (iv) Fixed speed operation

g. A forward biased pn junction diode has a resistance of the order of [CO3] [PO1]

(i) Ω (ii) kΩ

(iii) MΩ (iv) GΩ

h. What is the relationship between I_{CEO}& I_{CBO}? [CO3] [PO1]

(i) $I_{CEO}= (\beta+1) I_{CBO}$ (ii) $I_{CEO}= \alpha (I_{CBO})$

(iii) $I_{CEO}=(\beta-1) I_{CBO}$ (iv) $I_{CEO}= (1+\alpha) (I_{CBO})$

i. Which part is called as heart of CRO? [CO4] [PO1]

(i) Amplifier (ii) Sweep generator

(iii) Trigger circuit (iii) CRT

j. The decimal number 158 is equal to the binary number _____. [CO4] [PO2]

(i) 01111001 (ii) 10111101

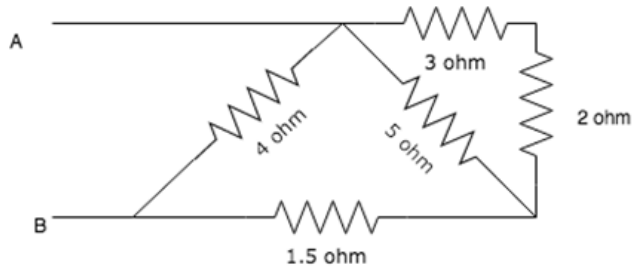
(iv) 01011110 (v) 10011110

PART – B: (Short Answer Questions) **(2 x 5 = 10 Marks)**

Q.2. Answer ***ALL*** questions [CO#] [PO#]

a. A resistor of 12 Ω is connected across a potential difference of 60 volts. Calculate the power dissipated and the energy transferred to heat in 4 minutes. [CO1] [PO2]

b. Calculate the total resistance between the points A and B. [CO1] [PO2]



c. Write the emf equation of DC Generator. Explain the term associated with it. [CO2] [PO1]

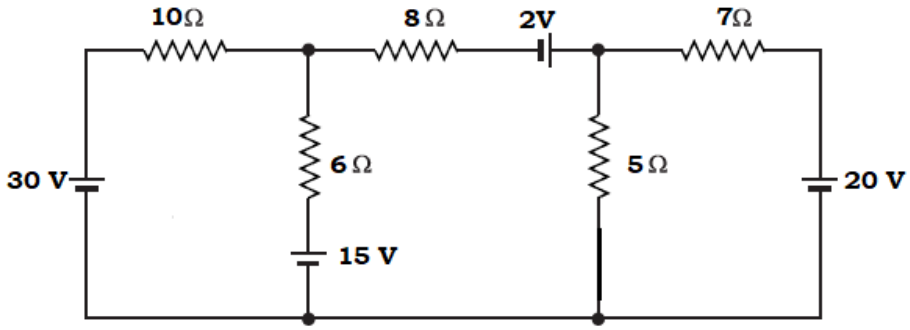
d. Define Peak Inverse Voltage of a rectifier. What are PIV for full wave centre tapped and bridge rectifiers? [CO3] [PO1]

e. Implement the logic circuit of the expression Y= A'B +C by using NOR gate only. [CO4] [PO2]

PART – C: (Long Answer Questions) **(6 x 5 = 30 Marks)**

Answer ***ANY FIVE*** questions | Marks | [CO#] | [PO#]

3. By applying Nodal analysis, find current in the 5 Ω resistor of the network shown in Fig. (6) [CO1] [PO2]



4. A choke coil takes a current of 2 A lagging 60° behind the applied voltage of 200 V at 50 Hz. Calculate the inductance, resistance and impedance of the coil. Also, determine the power consumed when it is connected across 100-V, 25-Hz supply. (6) [CO1] [PO2]

5. A balanced star connected load has resistance of 20Ω and inductance of 60 mH per phase is connected to a three phase supply of 440 V and 50 Hz. Find the (i) Line current (ii) Phase current (iii) Power factor (iv) Active power and reactive power consumed by the network. (6) [CO1] [PO2]

6. State and explain working principle of a single phase Transformer. (6) [CO2] [PO1]

7. Draw the circuit diagram of a full wave bridge type rectifier using diode and explain its operation. (6) [CO3] [PO1]

8. A silicon diode having 20 Ω internal resistance is used as half wave rectifier. If the applied input voltage is 50 sin 100 7πt and load resistance is 800 Ω, then find (6) [CO3] [PO2]

   (a) I_m. I_{dc} and I_{rms}.
   (b) Output frequency and ripple factor

   AC input and output power and efficiency.

9. Which are the gates known as universal gate and why? Also verify the universal properties of NAND gate. (6) [CO4] [PO1]

10. Reduce the expression (A+(BC)')'(AB'+ABC) (c) A[B+C'(AB+AC')'] (6) [CO4] [PO2]

--- End of Paper ---