(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 9587 Roll No. | | | | | | | | | | |

B. Tech.

(SEM. I) ODD SEMESTER THEORY EXAMINATION 2013-14

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Time : 3 Hours *Total Marks : 100*

Note : Attempt **all** questions. Assume suitable data wherever necessary.

SECTION—A

1. Attempt **all** parts of this question : **(2×10=20)**

   (i) What is the condition of resonance in RLC circuit ?

   (ii) What will be reactive power, if power factor is unity ?

   (iii) Why armature windings are placed in rotor in DC Machine ?

   (iv) Is single phase motor self starting ?

   (v) What is the bias in which Zener diode works ?

   (vi) Which is the device in which Pinch-off situation occurs ?

   (vii) What is the decimal equivalent of BCD number 1010 1010 ?

   (viii) Write the expression for a lamp which is controlled from two positions A and B.

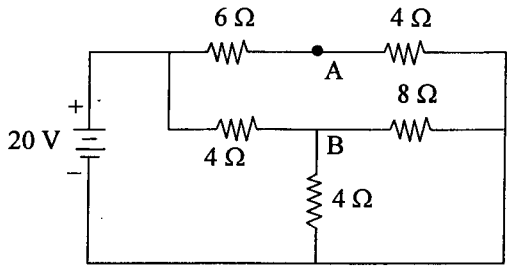
   (ix) Which is the instrument in which no eddy current and hysteresis losses occur ?

   (x) Can voltmeter have very low internal resistance ?

SECTION—B

2. Attempt any **three** parts of the following : **(10×3=30)**

(a) Determine the voltage V_{AB} in the circuit shown in the fig.



(b) What are the differences between a DC shunt motor and a DC series motor ?

(c) Explain the principle of electromechanical energy conversion.

(d) Explain the working principle of capacitor start and capacitor run motor single phase induction motor.

(e) Explain the p-n junction rectifier (half wave and full wave) circuit.

SECTION—C

3. Attempt any **one** part of the following : **(10×1=10)**

(a) Explain the diode acts as rectifier and write the difference between Ideal Diode and Commercial Diode with the help of V-I characteristics.

(b) Draw the structure of JFET and explain in detail the effect of gate-source voltage on the channel when :

(i) No bias

(ii) Small reverse bias and

(iii) Large reverse bias such that pinch-off occurs.

4. Attempt any **one** part of the following : **(10×1=10)**

(a) Explain the common base and common emitter configuration of BJT.

(b) Explain the clipping and clamping circuits.

5. Attempt any **two** parts of the following : **(5×2=10)**

(a) Simplify the Boolean function using K-map :

$F(x, y, z) = \Sigma (0, 2, 3, 4, 6)$.

(b) Given Boolean function :

$F = x\,y'\,z + x\,'y'\,z + w'\,x\,y + w\,x'\,y + x\,y\,z$

(i) Obtain the truth table of the function.

(ii) Draw the logic diagram using original Boolean expression.

(c) The given two binary numbers X = 1010010 and Y = 1000011, perform the subtraction (a) X – Y, (b) Y – X using 1's complement.

6. Attempt any **two** parts of the following : **(5×2=10)**

(a) Derive the torque equation of PMMC. A PMMC Instrument with 100 turn coil has a magnetic flux density in its air gap of B = 0.2 T. The coil dimension are diameter (D) = 1 cm, length l = 1.5 cm. Calculate the torque on the coil for a current of 1 mA.

(b) Explain the circuit of moving Iron type Voltmeter and Ammeter.

(c) Explain the single phase dynamometer type wattmeter.

7. Attempt any **one** part of the following : **(10×1=10)**

(a) Describe the different type of electrical instruments.

(b) Explain the pinch off in JFET. Also explain the fixed biasing of JFET.