c) Discuss DC biasing of BJT.

d) In transistor application mostly CE connections are used. Explain the reason for this.

OR

Draw and explain the voltage-current characteristics of P-n diode.

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Roll No .....

BE-104

B.E. I & II Semester

Examination, June 2016

Basic Electrical and Electronics Engineering

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each question are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
iv) Except numericals, Derivation, Design and Drawing etc.

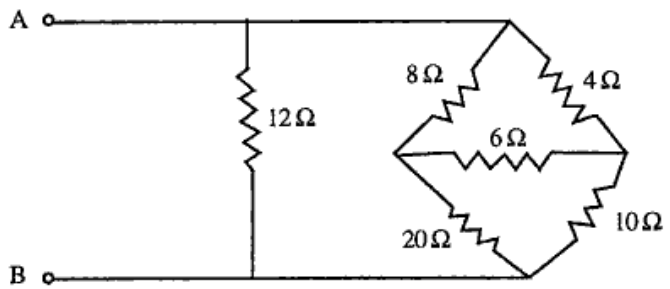
Unit - I

1. a) Distinguish between voltage source and current source.

b) Define 3-phase balanced supply with phasor diagram.

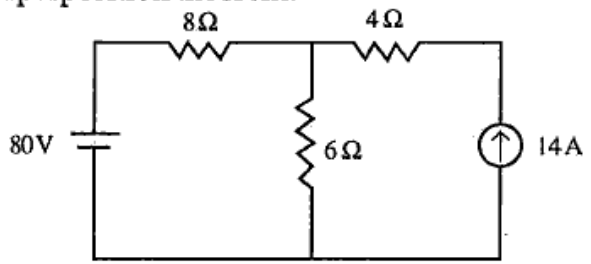
c) Find RMS value of the triangular wave.

d) Find the resistance R_{AB} in the figure using star-delta transformation.



OR

Find the current through 6Ω resistor in the circuit using superposition theorem.



Unit - II

2. a) What is the role of MMF in magnetic circuit?

   b) Write the main parts of a transformer.

   c) Explain No load losses in a transformer.

   d) Draw an approximate equivalent circuit of a single-phase transformer and write all notations used in it.

OR

A 10 KVA, 2000/1000V single phase transformer in having an efficiency of 95% at full load 0.8 p.f. lagging and also at half full load 0.7 p.f. lagging. Find

i) Input at full load 0.8 p.f. lagging.

ii) Input at half load 0.7 p.f. lagging.

Unit - III

3. a) With reference to D.C. Machine. Write the function or use of field winding and armature winding.

   b) Write the difference between self excited and separately excited D. C. Machine.

   c) Why synchronous machine is called synchronous? Explain EMF equation of an alternator.

   d) A 6 pole alternator running at 1200 rpm supplies a three phase induction motor wound for 4 poles. If the rotor induced emf makes 3 alternator per second. Find the actual rotor speed.

OR

Draw and explain the torque-slip characteristics of 3 phase induction motor.

Unit - IV

4. a) Name the three logical operations associated with binary logic.

   b) Find the decimal equivalent number of the following binary number.

   1110 0011

   c) State and explain De Morgan's theorem.

   d) Design a full adder circuit using NAND gates.

OR

Simplify the Boolean function $Z = AB + \bar{A}C + BC$, therefore design the logic circuit using AND and OR logic gates.

Unit - V

5. a) What is drift current in the semiconductors?

   b) The rectifier diodes are never operated in the breakdown region, why?