(b) A 3 phase, 6 pole 50 Hz induction motor has a slip of 2% at no load and 3% at full load. Determine-
(i) Synchronous speed.
(ii) No load speed.
(iii) full load speed.
(iv) frequency of rotor current at standstill.
(v) frequency of rotor current at full load.

(c) Is Synchronous machine a self starting motor? If not then explain the methods of starting of a synchronous motor?

PAPER ID : 2018

TEE-201 **Printed Pages : 4**

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

Roll No.

B. Tech.

(SEM. II) EXAMINATION, 2012

BASIC ELECTRICAL ENGG.

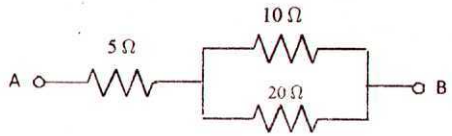
Time : **3** Hours] [Total Marks : **100**

Note : Attempt all questions. Each question carries equal marks

1 Attempt any four questions :

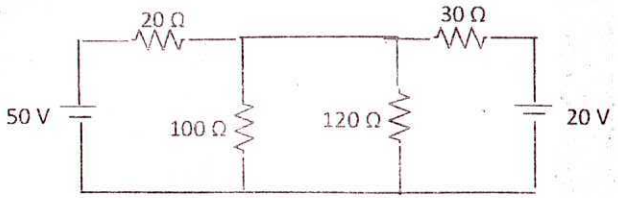
(a) Define the following
(i) Resistance
(ii) Specific Resistance
(iii) Potential Difference
(iv) Unilateral Element
(v) Ammeter

(b) In the circuit shown, 100 V dc voltage is applied across terminals A-B, calculate the power dissipated in each resistor and the reading of a voltmeter connected across the 5 Ω resistor.



(c) State and Prove the maximum Power Transfer theorem.

(d) Using nodal method, find current through 100 Ω resistor.



(e) Explain the conversion of current source into equivalent voltage source for solving a problem.

2 Attempt any four questions

(a) Find the equivalent impedance of the following impedances connected in parallel

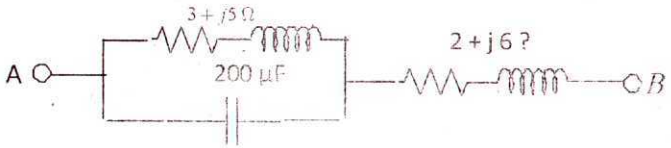
$$Z_1 = 8+j6,\ Z_2 = 8-j6,\ Z_3 = 8.66+j5.$$

(b) For the following impedance $Z_1 = 10 + j20$, find its conductance and susceptance.

(c) What do you mean by resonance in a series ac circuit? What will be the power factor of series resonating circuit?

(d) A balanced star connected load of 8 + j6 ohms per phase is connected to a 3-phase, 230 V supply. Find the line current, power factor, power, reactive volt amperes and total volt-amperes.

(e) A voltage of 250 V at 50 Hz is applied to the circuit shown below, find current drawn from the source.



3 Attempt any two questions :

(a) Draw the phasor diagram for a practical transformer under the condition that a lagging power factor load is connected across its terminals.

(b) An iron ring of mean circumference 80 cm is made of round iron of area 8 cm^2. It has a cut of 2 mm wide and is wound with 500 turns. Find the current required to produce a flux of 0.8 mWb across the air-gap. Relative permeability of the iron is 1000.

(c) A transformer is rated at 100 kVA. At full load its copper loss is 1400 W and iron losses are 940 W. Calculate

(i) The efficiency at full load , unity power factor.

(ii) The efficiency at half load, same power factor

(iii) The load kVA at which maximum efficiency will occur.

4 Attempt any two questions :

(a) Explain the principle and construction of attraction type moving iron instruments. Discuss their merits and demerits?

(b) Draw the characteristics of a compound D.C generator? An 8-pole lap connected armature has 40 slots with 12 conductors per slot generates a voltage of 500 V. Determine the speed at which it is running if the flux per pole is 50 mWb?

(c) Explain the principle of operation of a three phase induction motor? Draw its speed- torque characteristics

5 Attempt any two questions :

(a) Write short note on any two of the following?

(i) Operation of stepper motor with diagram?

(ii) Construction diagram and the working of Auto-transformer starter?