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Total Number of Pages: 02

B.Tech
BE2102

2nd Semester Back Examination 2015-16
BASIC ELECTRICAL ENGINEERING
BRANCH: ALL
Time: 3 Hours
Max Marks: 70
Q.CODE: W505

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

- Q1** Answer the following questions: **(2 x 10)**
- a) Define Peak factor and Form factor of an alternating quantity.
 - b) What do you understand by controlled voltage source?
 - c) A voltmeter V of 23k ohm resistance in series with a resistor R across a 230V supply.
 - d) What is Ohm's law?
 - e) Define reluctance and m.m.f in case of magnetic circuit.
 - f) What is back emf in a DC motor? Explain.
 - g) A resistor of 20 ohm in series with 0.5H inductor is connected across a supply of 250V, 50Hz.
 - h) Difference between Moving Iron Instrument and PMMC type Instrument.
 - i) What do you understand about 3-phase Induction motor?
 - j) Two impedances $4+j3\Omega$ and $4-j3\Omega$ are connected in parallel. Find the impedance and power factor.
- Q2**
- a) State and explain Maximum Power Transfer theorem with suitable example. **(5)**
 - b) In a series combination of two resistance 4Ω and 9Ω , the voltage across the 4Ω resistor is 12V. **(5)**
- Q3**
- a) Explain the importance of B-H curve and B-H loop for magnetic materials. Explain the methods adopted in practice to reduce hysteresis loss and eddy current loss. **(5)**
 - b) Derive the expression for emf induction in a DC generator. Explain each term briefly. **(5)**
- Q4**
- a) Derive the expression for average value of a sinusoidal AC quantity. **(5)**
 - b) In an AC single phase circuit three impedances of value $5 < 30^\circ\Omega$, $10 < 60^\circ\Omega$, and $4-j8\Omega$ are connected in series with a 230V, 50Hz supply. **(5)**
 - (i) Find the total combined impedance in Rectangular form?
 - (ii) Magnitude of the current flowing in the circuit?

Q5 Derive with mathematical expression of rise and decay current of a series R-L circuit excited with DC source of V volts. Also draw their graphs. **(10)**

Q6 a) Find out the total power consumed by the three phase star connected balanced load using two Wattmeter method. Take any load impedances with 440V, 50Hz supply frequency. **(5)**

b) Explain details about Moving Iron Type Instruments. **(5)**

Q7 Explain the working of a thermal power plant with a neat sketch of the components. Also find out the expected speed of revolution of the steam turbine if the turbo generator to be Installed has a 2-pole structure and the system frequency is to be maintained at 50Hz. **(10)**

Q8 Write short notes on any two of the followings: **(5 x 2)**

a) Power factor

b) Controlled Voltage Sources

c) Construction and operation of AC single phase induction motor.