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80018

Dec., 2018
B.Tech. Ist Semester
BASIC ELECTRICAL ENGINEERING
(EE 101 C)

Time : 3 Hours]   [Max. Marks : 75

Instructions :

(i)   *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*

(ii) *Answer any four questions from Part-B in detail.*

(iii) *Different sub-parts of a question are to be attempted adjacent to each other.*

PART–A

1. (a) Differentiate dependent and independent sources.
                                                        (1.5)

    (b) Define hysteresis and eddy current losses.   (1.5)

    (c) State maximum power transfer theorem.   (1.5)

    (d) Define the terms: Q-factor and Bandwidth.   (1.5)

    (e) What is the significance of power factor in AC system?
                                                        (1.5)

    (f) Differentiate between phase and line voltages in three-phase system.   (1.5)

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(b) Two impedances consist of (resistance of 15 ohms and series-connected inductance of 0.04 H) and (resistance of 10 ohms, inductance of 0.1 H and a capacitance of 100 µF, all in series) are connected in series and are connected to a 230 V, 50 Hz a.c. source. Find: (i) Current drawn, (ii) Voltage across each impedance, (iii) Individual and total power factor. Draw the phasor diagram. (8)

5. (a) Derive an expression for the resonant frequency of the parallel circuit shown in Fig. (8)
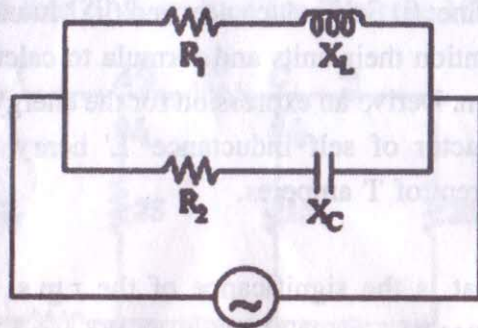
(b) Describe advantages and disadvantages of three-phase system over single-phase system. (7)

6. (a) A balanced 3-phase star-connected load of 8 + j 6 ohms per phase is connected to a three-phase 230 V supply. Find the line-current, power-factor, active-power, reactive-power, and total volt-amperes. (5)

(b) Explain two wattmeter method of power measurement in three-phase AC system at balanced load. What are the effects of power factor on wattmeter reading? (10)

7. (a) Derive emf equation of single-phase transformer. (5)

(b) Explain how the revolving flux is produced in stator of 3-phase induction motor. (5)

(c) With neat sketches explain the construction of three-phase salient pole synchronous generator. (5)