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B.E. (FULL-TIME) DEGREE END SEMESTER EXAMINATIONS APRIL 2011

Industrial Engineering, Second Semester
EE9169 Fundamental of Electrical Engineering

Time: 3 Hours

Max. Marks: 100

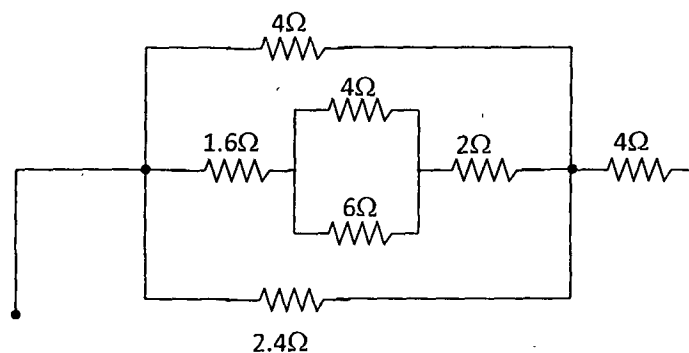
Answer ALL question carry equal marks

PART – A (10 X 2 = 20 Marks)

1. Three 2100Ω resistors, all in parallel are connected across a $210V$, d.c. source. Calculate the total current and current through each resistor.
2. Define: (i) frequency (ii) rms value of alternating current (or emf).
3. Explain the building up process of emf in the d.c. shunt generator.
4. Explain back emf.
5. How the transformers are used in transmission lines?
6. Prove that 3-phase power can be measured with two wattmeters.
7. Why induction motors are preferred?
8. Explain the principal of operation of single phase alternator.
9. How are measuring instruments classified?
10. What is meant by damping?

PART – B (5 X 16 = 80 Marks)

11. Describe with sketch of a moving coil voltmeter.
12. (a) Calculate the total resistance of the circuit shown in the fig.. Also find the current taken by the circuit if the applied voltage is $220V$.



(OR)

- (b) A coil of resistance 5Ω and inductance of $0.3H$ is connected in series with a capacitance of 35 Micro Farad across a $200V$, $50Hz$ supply. Find the impedance, current, power factor, and total power taken from the supply.

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13. (a) Draw the connection diagrams of various types of d.c. motors and also explain the characteristics of each type.

(OR)

- (b) A 400V d.c. motor takes 5A at no load. Its armature and field resistances are 0.5Ω and 200Ω respectively. Calculate the efficiency when the motor takes 50A on full load. Also calculate the percentage-change in speed from no load to full load.

14. (a) (i) Explain principle of working of a transformer (ii) Deduce the emf equation of a transformer. (iii) Show the placement of HV and LV windings on the core limbs of a three phase transformer.

(OR)

- (b) Three coils each with a resistance of 11.88Ω and an inductance of 0.07H are connected in star to a 3-phase 433V, 50Hz supply. Find (i) the line current and the total power absorbed (ii) if these three coils are connected in delta to the same supply calculate the line current and the total power absorbed.

15. (a) (i) Explain the principle of working of a 3-phase induction motor. (ii) Describe the two types of rotor construction of induction motor.

(OR)

- (b) Draw and explain the circuit of direct on line starter, star-delta starter and manual auto-transformer starter of a three phase induction motor.