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Code No. : 14506 O2

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (Mech. Engg.) II Year II-Semester Old Examinations, May-2018

Electrical Circuits and Machines

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

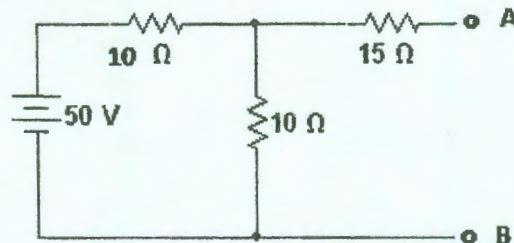
Part-A (10 × 2 = 20 Marks)

1. Define KCL and KVL.
2. Define RMS value.
3. What is transformation ratio?
4. Give the relationship between line and phase quantities in a 3-phase star connected system.
5. List main parts of a dc generator?
6. What is back EMF?
7. Define synchronous speed and slip of an induction motor.
8. How RMF will be produced in three phase Inductions Motor?
9. Why single phase motor is not self starting? Explain.
10. What are the applications of capacitor run motors?

Part-B (5 × 10 = 50 Marks)

(All sub-questions carry equal marks)

11. a) Define i) active power ii) reactive power iii) power factor.
b) Find Thevenin's resistance and Thevenin's voltage across A – B



12. a) Prove that two watt meters are sufficient for 3-phase circuit power measurement.
b) Draw the equivalent circuit of transformer and indicate all the parameters on it.
13. a) Classify the d.c generators according to excitation.
b) A 5 kW, 200V, d.c shunt generator has armature resistance of 0.1Ω and shunt field resistance of 50Ω . Find the generated e.m.f when it is supplying full load.
14. a) Explain the construction and principle of operation of induction motor.
b) Illustrate torque-slip characteristics of induction motor.
15. a) Explain the construction and principle of operation of capacitor run single phase motor.
b) Explain the various types of stepper motors.

16. a) A resistance of 20Ω , inductance of 25mH are connected in series and fed from a 250V , 50 Hz single phase a.c supply.
Find i) impedance
ii) current
iii) power consumed and
iv) power factor.

b) List the advantages and applications of auto transformer.

17. Answer any *two* of the following:

- a) Illustrate Characteristics of d.c shunt motor.
b) Illustrate Star-delta starter.
c) Illustrate Brush less dc motor.

