Code No. : 11017

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD
B.E. (CBCS) I-Semester Main Examinations, December-2017

Basic Electrical Engineering
(For CSE, ECE & IT)

Time: **3 hours**   Max. Marks: **60**

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

Part-A (10 × 2 = 20 Marks)

1. What assumptions are to be made in the definition of Ohms' law?
2. Why load resistance is to be connected in parallel to circuit equivalent resistance for getting load current using Norton's theorem?
3. Define power factor and write power factor for a pure DC circuit.
4. Mention about coefficient of coupling in magnetic circuits.
5. Draw internal and external characteristics and magnetization characteristic of series generator.
6. How do we control the speed of DC shunt motor below rated speed?
7. State the assumptions for an ideal transformer.
8. Write the classification of three phase induction motor based on its rotor type.
9. What is the function of moderator in nuclear power plant?
10. State where a capacitor start & run Induction motor is used?

Part-B (5 × 8 = 40 Marks)
(All sub-questions carry equal marks)

11. a) Explain the procedure to find the load current of a complex network using Thevenin's theorem.
    b) When a resistor is placed across a 250 V supply, the current is 10 A. What is the value of resister that must be in parallel to increase the load current to 15 A?

12. a) Draw the phasor diagram showing the relation between Voltage & current for pure resistive, pure capacitive, pure inductive and RL circuits.
    b) Derive the Energy stored in an Inductor.

13. a) Derive EMF equation of a DC generator.
    b) A 220 V DC shunt motor having an armature resistance of 0.1 Ω carries an armature current of 40A and runs at 750 RPM. If the flux is reduced by 25% using field regulator, find the speed of the motor assuming load current constant.

14. a) Derive regulation of alternator for lagging power factor with vector diagram.
    b) A 100 kVA transformer has an iron loss of 0.5 kW and full load copper loss of 1.6 kW. Calculate its efficiency at
       i) Full load for 0.8 power factor   ii) Half- Full load for 0.8 power factor.

15. a) Explain about the working of thermal power plant with a neat schematic.
    b) Why a single phase induction motor is not a self-starting motor and mention its applications.

16. a) The electric load in a small workshop consists of 14 lamps, each rated at 240 V, 60W and 3 electric furnaces and each rated at 240V, 1 kW. What is the effective resistance of the load?
    b) Distinguish between three phase star and delta connections.

17. Answer any *two* of the following:
    a) Explain about the working of a DC motor.
    b) Write about the working of a three phase induction motor.
    c) Describe about the working of a variable reluctance stepper motor.

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