Code No. : 1210

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD
B.E. I Year II - Semester (Main) Examinations, July - 2015

Basic Electrical Engineering
(For CSE, ECE and IT Branches)

Time: 3 hours

Max. Marks: 70

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

Part-A (10 X 2=20 Marks)

1. State Kirchoff's Voltage law.
2. The active power and apparent power of a circuit are 5 kW and 10kVA. Calculate the power factor of the circuit.
3. Show the relationship between line and phase voltages and currents for star connected 3-ϕ system.
4. List out the various losses in a transformer.
5. Draw internal and external characteristics of a dc shunt generator.
6. Draw circuit diagram of a dc compound motor.
7. Draw speed-torque characteristics of a 3-ϕ induction motor.
8. List out the applications of stepper motor.
9. Name the type of alternator used in thermal power station.
10. Define voltage regulation in 3-ϕ alternator.

Part-B (5 X 10=50 Marks)

11. a) State and explain Ohm's law. [4]
    b) Derive expressions for energy stored in inductor and capacitor. [6]

12. a) Explain with a neat circuit diagram how 3-ϕ power can be measured by two wattmeter method. [5]
    b) Draw and explain equivalent circuit of a 1-ϕ transformer, showing all the primary and secondary parameters, currents and voltages. [5]

13. a) Draw and discuss briefly constructional details of a dc generator. [7]
    b) A dc series motor draws 50 A at 250 V. Its armature and field resistances are 0.22 Ω & 0.12 Ω respectively. Neglecting constant losses, find the output power of the motor. [3]

14. a) Explain the operation of star-delta starter of a 3-ϕ induction motor with a neat circuit diagram. [6]
    b) A 4 pole, 3-ϕ induction motor operates from a supply whose frequency is 50Hz. Calculate [4]
    (i) the speed at which the magnetic field of the stator is rotating (ii) the speed of the rotor when the slip is 0.04 (iii) the frequency of the rotor current at standstill and (iv) the frequency of the rotor currents when the slip is 0.03.

15. a) Sketch basic layout of a nuclear power plant. [6]
    b) Discuss how regulation of a 3-ϕ alternator can be found by using synchronous impedance method. [4]

16. a) A circuit consists of 4 Ω resistance in series with an inductance of 9.55 mH. Calculate the power factor, power dissipated in resistance and current drawn from a supply of 240 V, 50 Hz. [5]
    b) Explain the principle and operation of autotransformer with a neat circuit diagram. [5]

17. Answer any **two** of the following:
    a) Speed control of dc shunt motor. [5]
    b) Capacitor start & run 1-ϕ induction motor. [5]
    c) Solar power energy. [5]

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