COLLEGE OF ENGINEERING PUNE-5.

(Formerly Government College of Engineering, Pune-411005).

END SEMESTER EXAMINATION

EE218- Electrical Installation Practices

Programme: S.Y.B.Tech. Elective (for all branches) Date:19/11/2011
Year: 2011-12 (Spring Semester) Max. Marks: 50
Duration: 3 Hours. (8 to 11 am)

Instructions: 1) Solve **two sub questions (a, b) from each question.**
2) **Each** sub question **carries 5 marks.**
3) Draw neat figures and assume necessary data wherever required.

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Q.1.

(a) Why do we prefer the use of three pin socket and plug in domestic installation? How such sockets and plugs are made use of. Show with installation diagram to a refridgerator motor supplied with 230 V AC.

OR

(a) What is meant by 3 phase 4 wire supply? Explain the function of various wires of a four wire distribution line carring from a substation. Why is the neutral wire required? Explain with proper installation diagrams.

(b) The monthly consumption of a residance can be approximated as under:
Light load: 6 tube lights, 40 watts each working for 4 hours daily
Fan load: 6 fans, 100 watts each working for 6 hours daily
Refridgerator: 2 kWh daily
Miscellaneous load: 2 kW for 2 hours daily.
Find the monthly (30 days) bill at the following tariff:
First 20 units : Rs. 0.50/kWh
Next 30 units : Rs. 0.40/kWh
Remaining units : Rs. 0.30/kWh.
Constant/Fixed charges : Rs 30 per month.
A 5% discount is offered for the advance (prompt) payment.

Q.2.

(a) A 3 phase, 40 kW, 440 V, 50 Hz induction motor operates on full load with an efficiency of 90 percent and at a power factor of 0.8 lagging. Calculate the total kVAr rating of capacitors required to raise the full load power factor to 0.9 lagging. What will be capacitance per phase if the capacitances are (i) Delta connected (ii) Star connected.

(b) Draw the schematic and wiring diagram for an automatic water pumping station. A 3-phase pump motor starts automatically when the water level in the tank reduces considerably and stops automatically when the tank is filled with water.

OR

(b) Obtain the torque equation and draw torque-speed characteristic for induction motor. Explain how this characteristic is suitable for fan and pump loads.

Q.3

(a) A 27 kW, 3-phase, 400 V resistance oven is employ nickel-chrome strip 0.25 mm thick for the three star-connected heating elements. If the temperature of the strip is to be 1000°C and that of the charge be 600°C, estimate a suitable width for the strip. Assume emmissivity=0.9 and radiating efficiency to be 0.5 and resistivity of the strip material is 101.6×10^{-8} Ω-m.

(b) Briefly describe the principle of induction heating used in induction cooker. Explain how heat transfer and temperature control is obtained.

OR

(b) Two DG sets are to be selected and installed into COEP campus. The total connected load in campus is 400 kW. Decide the suitable ratings for generators and engines. Consider diversity factor=0.6. Show the interface of DGs with normal supply system.

Q. 4

(a) An illumination of 300 lux is to be provided in a classroom 20mx10m with 40 watt fluorescent lamps. Determine the number and layout of lamps in the lighting installation. Assume coefficient of utilization=0.5, depriciation factor=0.75, efficiency of tubelight=40 lumens/watt.

(b) Compare Inverter and UPS. Describe on line and off line UPS systems with their block schematic. State criterions for their selection.

OR

(b) A 500 watt load is to be supplied by a 2 kVA online UPS system during power failure. The system contains 3 battries each of 200Ah, 12 V rating. Draw the wiring diagram and prove that the back up period is more than 8 hours.

Q.5

(a) What is meant by auction? Some old machines are to be disposed off through auction. What is the complete procedure? Why auction system is not considered safe and effective sometimes?

(b) Explain the procedure to be followed while purchasing the 20 kVA UPS for electrical labouratory.

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