C 46575 (Pages : 3) Name.....

Reg. No.....

# EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION JUNE 2008

## PTEE 2K 803 (A)/EE 2K 805 (A)—ELECTRICAL SYSTEM DESIGN AND ESTIMATION

Time : Three Hours Maximum : 100 Marks

*Answer* **all** *the questions.*
*Assume suitable data if any.*

### Part A

I. (a) List out the advantages of U.G. cables.

(b) What are the materials used for underground cables ?

(c) What are the advantages of PVC pipe system in interior wiring system ?

(d) What are the essential requirements of an efficient lighting system ?

(e) Discuss, how to calculate the size of the wire for A.C. motor rated in HP is determined knowing its power factor and efficiency.

(f) What are the requirements should be fullfil to selecting conductor size for a power installation?

(g) In the Installation of distribution lines, if the support of the soil is very poor, what are the additional stability should be provide.

(h) What are the factors depends on cost of running a distribution line ?

(8 × 5 = 40 marks)

### Part B

II. (a) Two transformers 500 kVA, 11 kV/415 V are to be erected in on Indoor sub-station. The 11 kV overhead line supply is available at a distance of 100 metres, estimate the quantity of material required using underground cables.

*Or*

(b) Design 11 kV 3 core underground cable feeder for 750 kVA transformer. The length of the feeder upto substation is 1 km. where the feeder gets terminated, estimate the materials required.

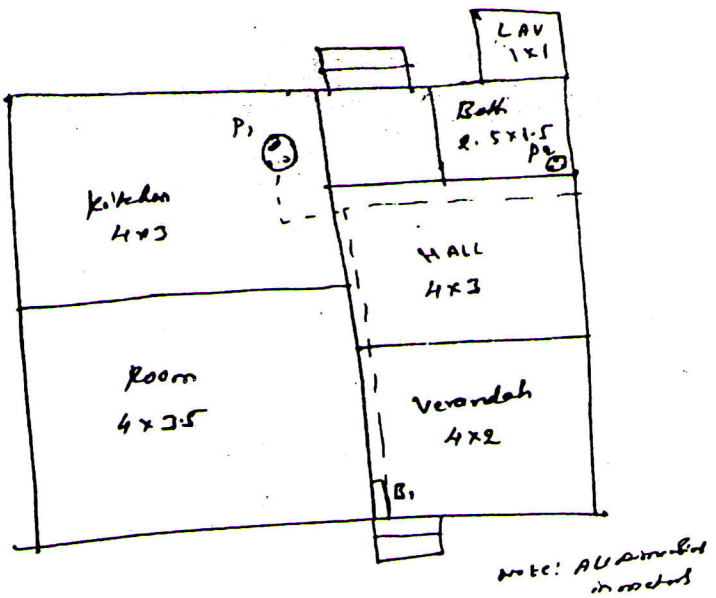
(15 marks)

III. (a) The sketch shows a low income group Goverment quarters. It is already having lighting installation with 800 W, load. The departmental pole is 10 m. away and the existing service main is of 3/20 VIR with copper conductor.



Turn over

The installation is to be converted to AEH with 1.5 kW load each in kitchen and bath. Prepare an estimate of cost for the additions and alterations required. Use separate head for separate items of work.

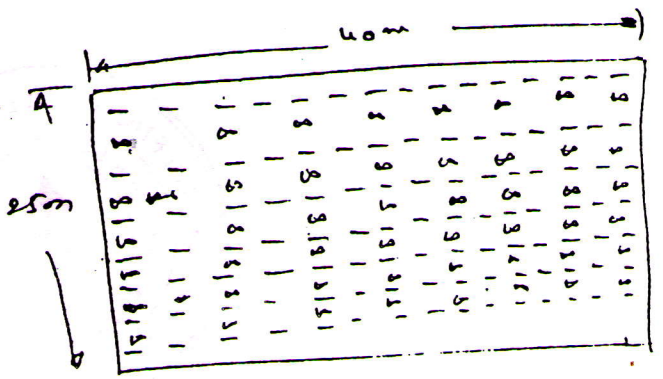



*Or*

(b) A room measuring 15 m. by 20 m. is to be provided with an illuminance of 200 lux over the horizontal plane using florescent lamps. Each lamp gives on output of 3200 lumens, 65 % of which is effective over the working plane. If a maintenance factor of 0.8 is to be allowed for, find the number of lamps required and sketch a plan view of a suitable arrangement for them. Estimate the cost of material required and labour charges.

(15 marks)

IV. (a) The assembly hall of college building 40 m. × 25 m. × 9 m. the plan of which is shown in figure below is to be provided wavelength and forms as indicated. Two 5A, 3 pin plug and socked outlets are to be provided on each switchboard. Draw a neat schematic diagram and determine the connected load of the hall. Enlist the materials required with complete specifications and estimate the cost of providing electrification.




*Or*

(b) A 240 V, three-phase four wire supply is brought at the basement of a 7 storeyed building of 28 flats. The load in each flat is 8.0 kW. Show by diagram how power is distributed to each flat through rising mains. Draw also schematic diagram of the arrangement.

(15 marks)

V. (a) In a village residential load of 10 kW, agriculture load of 25 h.p. and water works of 15 h.p. has to be electrified, select the type of substation to be erected. Make a list of material required for the installation of the proposed substation.

*Or*

(b) An indoor substation 11 kV/415 V, 1500 kVA, is installed in the premises of a factory for feeding three-phase and single-phase power to four workshops. The substation is fed from an 11 kV overhead feeder running near it. Draw the layout of the substation and prepare a list of important material required.

(15 marks)

[4 × 15 = 60 marks]