2006COCHIN UNIVERSITY OF SCIENCE & TECHNOLOGY

B.TECH ELECTRICAL AND ELECTRONICS ENGINEERING
POWER SYSTEM

ANSWER ANY SIX QUESTION
ALL QUESTIONS CARRY EQUAL MARKS

MARK [6*15]

1a. Explain how hydro-electric power plants are classified

b. Draw the schematic layout of a hydro electric plant

c. What do you understand by the term "available head"?

2a. Define the terms connected load, maximum demand and diversity factor

b. A domestic lighting installation having fifteen, 60W lamps is operated as follows:

5 lamps from 6pm till 8pm

10 lamps from 8pm till 10pm

6 lamps from 10pm till 12pm

i) Determine the connected load, the maximum demand, demand factor and the daily factor

ii) Also determine the improved load factor if a 2KW heater is used from 1pm till 5pm and a 2KW heater from 8pm till 11pm

3a. Explain the methods of equlizing the potential across each unit of a string insulator

b. A three phase 66KV transmission line is carried by strings of 5 supension insulators. The capacitance of each unit insulation to the capacitance relative to earth is 4:1. Calculate the potential across each unit and the string efficiency. Assume that there is no leakage

4a. Explain the advantages of high transmission voltage

b. An overhead line with two poles 200m apart having a distance in level of 10ms. The conductor diameter is 2.0cm and weighs 2.3Kg/m length. Calculate the sag at the lower suport under the conditions if wind provides a pressure of 57.5Kg/square meter of the projected area. Factor of safety-4, Maximum tensile strength of the copper 4220Kg/sq.cm

5a. Explain the terms GMD and GMR in the calculation of single phase transmission lines with composite conductors

b. A single phase overhead line 25KM long is to be constructed of conductors of 1.5cm diameter. Calculate the maximum spacing between the conductors in order that loop inductance of conductor is no more than 0.0486H.

6a. Explain the different methods of grading of cables

b. Acable having conductor diameter of 1cm and an insulation thickness of 1.5cm is subjected to a pressure of 33KV. Find the maximum field strength

7a. What is meant by radial and ring main distribution system?

b. A 2 wire d.c distributor cable is 2KM long and supplies loads of 100A,150A,200A and 50A situated 500m, 1000m, 1600m and 2000m from the feeding point A. The resistance of the conductor is 0.01 ohm per Km. Calculate voltage at each load point if a voltage of 300V is maintained at point A

8a. Explain the advantages of per-unit system

b. Draw a typical single line diagram of a power syatem. Mark the different components. Mention typical voltages of generation, transmission and distribution

9a. Derive the ABCD constants of a mediun transmission line and draw the phaser diagram assuming T-configuration.

b. Explain the Ferranti effect on transmission line

10a.Explain the advantages and limitations of HVDC and HVAC transmission

b. Give a brief account on Corona in HVDC lines

c. Explain any two methods of voltage control on transmission lines