SEAT No. :

PB-12

[6268]-206
S.E. (Electrical) (Insem)
POWER SYSTEMS - I
(2019 Pattern) (Semester - IV) (203145)

Time : 1 Hour]   *[Max. Marks : 30*

Instructions to the candidates:
1) *Answer Q1 or Q2, Q3 or Q4.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to the right side indicate full marks.*
4) *Assume Suitable data if necessary.*

Q1) a) Define following factors associated with generating stations   **[6]**

    i) Load factor

    ii) Demand factor

    iii) Diversity factor

   b) Write a short note on H.T and L.T consumers.   **[4]**

   c) The load on a power plant on a typical day is   **[5]**

Time	Load (MW)
12-6 A.M	10
6-10 A.M	30
10 A.M-6 P.M	60
6-10PM	90
10PM-12AM	10

Plot daily load curve and load duration curve. Also find energy supplied by the plant in 24 hours.

OR

Q2) a) State the following statement are true or false   **[4]**

    i) Diversity factor is always greater than unity.

    ii) Area under the load duration curve can be used to calculate total number of units(kWh) generated.

    iii) Cost per unit generation is high in base load plant than the peak load plant.

    iv) Two-part tariff is mostly used for industrial load.

P.T.O.

b) Write a short note on time of the day tariff. **[5]**

c) A generating station supplies different customer groups : **[6]**

Industrial consumers : 700 MW load

Commercial consumers : 300 MW load

Domestic customer : 200 MW load

The maximum demand on station is 1000 MW and number of MWh generated per year is $50* 10^5$. Determine i) Diversity factor ii) Average load iii) Annual load factor

Q3) a) Explain in short, the necessity of following equipment's used in substation
i) Bus bar ii) Isolator iii) Alternator iv) Control panel **[8]**

b) Explain the meaning of grading of cables and list out different methods of grading **[3]**

c) Find maximum and minimum stresses in the insulation of a single core cable working on a voltage of 33kV(rms) which has conductor diameter 1.2 cm and sheath inside diameter of 3.8 cm. **[4]**

OR

Q4) a) Discuss the necessity of excitation system for alternators. Explain any one type of excitation system in detail with neat diagram. **[6]**

b) Give the classification of underground cables. **[4]**

c) Prove that in case of single core cable **[5]**

$$\frac{g_{max}}{g_{min}} = \frac{D}{d}$$

where 'D' is inner diameter of lead sheath and 'd' is diameter of core of cable

❧❧❧