B.E. (Electrical Engineering (Electronics & Power)) Seventh Semester (C.B.S.)
Electrical Installation and Design (EID)

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Notes : 1.   All questions carry marks as indicated.
         2.   Solve Question 1 OR Questions No. 2.
         3.   Solve Question 3 OR Questions No. 4.
         4.   Solve Question 5 OR Questions No. 6.
         5.   Solve Question 7 OR Questions No. 8.
         6.   Solve Question 9 OR Questions No. 10.
         7.   Solve Question 11 OR Questions No. 12.
         8.   Due credit will be given to neatness and adequate dimensions.
         9.   Assume suitable data whenever necessary.
         10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Define and give the exact significance of Demand factor, Diversity factor and load factor. Give their typical values for different category of load. **4**

   b) What is maximum demand? How max. demand is considered for Industrial Installations? **3**

   c) An industrial consumer has connected load of 100HP driven by electric motors. The overall system efficiency is 90% with power factor 0.86 lag. Calculate the maximum demand if demand factor is 0.6. If the industry operates for 500Hrs per month with a load factor of 0.75. Calculate monthly energy consumption. Also calculate monthly energy bill if energy charge is Rs. 4.00kwh and demand charge is Rs. 150 KVA/month. Assume two part tariff. **7**

OR

2. a) Explain various factors important for selection of cable for any electrical power distribution system. **6**

   b) Explain various methods of laying of cables. **8**

3. a) What is moulded case circuit breaker? What are advantages and limitations of MCCB? Compare MCCBs with HRC switch fuse units. **7**

   b) Explain the working of SF6 circuit breaker with constructional dia. **6**

OR

4. a) Explain both current operated & voltage operated ELCB with neat sketch. **8**

   b) Write short note on series Reactors. **5**

5. a) Draw and explain power & control circuit for Star-Delta starter used for starting squirrel Cage Induction motor. **7**

   b) Explain the role of HRC fuse, contactor and overload relay used for the protection of Induction Motors. **6**

6. a) Explain static capacitor method used for p.f. improvement along with its merit and demerits. **4**

b) Calculate value of capacitor bank and payback period for load of; **9**
   a) 2 Nos. of motors of 20kw, 90% efficiency, 0.85 PF.
   b) 2 Nos. of motors of 5HP, 90% efficiency & 0.9 PF.
   c) Lighting load 10kw, 0.9 PF.
   The power factor to be connected at 0.99. The load is connected for 23 Hrs per day. The electricity charges are Rs. 60/KVA and Rs. 10/KW. The capacitor is star connected, 415V. capacitor cost is Rs. 60/KVAR. Annual depreciation cost of capacitor is 15%.

7. Discuss various precommissioning tests and inspections to be carried out on 1500 KVA, 33kv/433v outdoor transformer and substation. **13**

OR

8. a) Explain classification of Substation. **6**

b) Draw neat sketch showing elevation of pole mounted substation along with single line diagram. Show Major Equipments. **7**

9. a) Explain importance of Demand & Diversity factors in electrical load assessment and design of electrical installation. **6**

b) Explain about PCC & MCC. **7**

OR

10. a) Explain various factors deciding selection of Transformer. **8**

b) Explain insulation resistance testing of an installation using Megger. **5**

11. a) Explain pipe type earthing as per IS 3043. **7**

b) Explain measurement of earth resistance using megger. **7**

OR

12. a) Define the following terms as per IE Rules. **6**
   i) Point of commencement of supply.   ii) Bare
   iii) cut-out   iv) Circuit breaker

b) Explain IE rule 35 regarding danger notice. and also IE rule regarding intimation of accidents and cutout on consumer premises. **8**

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