

Total No. of printed pages = 5

**END SEMESTER REGULAR / RETEST  
EXAMINATION, JULY - 2023**

Branch : Electrical

Semester : 6th

Subject Code : EL - 602

**AC DISTRIBUTION AND UTILIZATION**

Full Marks - 70

Time - Three hours

The figures in the margin indicate full marks  
for the questions.

**Instructions :**

- (i) *All* questions of PART-A are compulsory.
- (ii) Answer any *five* questions from PART-B.

**PART - A**

Marks - 25

1. Fill in the blanks : 1×10=10
  - (a) In a transmission system the feeder supplies power to \_\_\_\_\_.
  - (b) Feeder is designed mainly from the point of view of \_\_\_\_\_.
  - (c) Underground system is \_\_\_\_\_ flexible than overhead system.

[Turn over

- (d) SCADA stands for \_\_\_\_\_.
- (e) High voltage cables have operating voltage upto \_\_\_\_\_.
- (f) \_\_\_\_\_ interface a SCADA system with sensor.
- (g) If power factor is one, then current to the load is \_\_\_\_\_ with the voltage across it.
- (h) For arc heating, the electrodes used are made of \_\_\_\_\_.
- (i) The method of heating used for non conducting materials is \_\_\_\_\_.
- (j) AC drive is also called \_\_\_\_\_.

2. State True or False : 1×5=5

- (a) Commonly used primary distribution voltage is 132 kV.
- (b) The initial cost of underground system is more expensive than overhead system.
- (c) Low power factor accounts for small size of the equipment.
- (d) Direct arc furnaces have unity power factor.

(e) Direct laying of underground cables is the cheapest method.

3. Choose the correct answers : 1×5=5

- (a) The interconnected system decreases / increases the reserve capacity of the systems.
- (b) Automatic temperature control can be provided in direct / indirect resistance heating.
- (c) The motor used for elevator is induction motor / synchronous motor.
- (d) Outdoor sub-station requires more / less space.
- (e) The process of providing an oxide film is known as electroplating / anodising / electroforming.

4. Match the following columns : 1×5=5

Column-A	Column-B
(a) Fixed loss	(i) Wrong tariff
(b) Variable loss	(ii) Improve power factor
(c) Non technical loss	(iii) Corona loss
(d) Synchronous condenser	(iv) Power factor tariff
(e) Sliding scale tariff	(v) Long distribution lines

PART - B

Marks - 45

5. (a) What is a ring main system? What are the advantages? 3

(b) A single phase distributor 2km long supplies a load of 120A at 0.8 pf lagging at its far end and a load of 80A at 0.9 pf lagging at its midpoint. Both power factors are referred to the voltage at the far end. If the voltage at the far end is maintained at 230V, calculate voltage at the sending end.

The resistance and reactance per km are  $0.05\Omega$  and  $0.1\Omega$  respectively. 6

6. (a) Discuss the disadvantages of low power factor. 5

(b) A single phase motor connected to 200V, 50 Hz supply takes 31.7A at a power factor of 0.7 lagging. Calculate the capacitance required in parallel with motor to raise the power factor to 0.9 lagging. 4

7. (a) What are the advantages of underground cables over overhead lines? 3

(b) Describe the Murray loop test method for detecting underground cable fault. 6

8. (a) What do you understand by electric heating? 2

(b) What are the advantages of electric heating over other system of heating? 5

(c) Mention the approximate ranges of frequency and voltage in dielectric heating. 2

9. (a) Explain the term Luminous flux and Candle power. 2

(b) A lamp has mean spherical C.P. of 25. Calculate the total flux of light from the lamp. 2

(c) Mention the different types of scheme of lightning. 3

(d) What is 'Proper lighting'? Write down the factors affecting 'proper lighting'. 2

10. Write short notes on any three :  $3 \times 3 = 9$

(a) Distribution system losses

(b) SCADA system

(c) Electric drives

(d) Faraday's law of electrolysis.