

Total No. of Questions : 8]

SEAT No. :

PA-1459

[Total No. of Pages : 3

[5926]-75

T.E. (Electrical)

**ELECTRICAL INSTALLATION, DESIGN AND CONDITION  
BASED MAINTENANCE**

**(2019 Pattern) (Semester - I) (303144)**

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Solve Q.No.1 or Q.No.2, Q.No.3 or Q.No.4, Q.No.5 or Q.No.6, Q.No.7 or Q.No.8
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.
- 5) Use of non-programmable calculator is allowed.

**Q1) a)** Define and explain its significance with respect to condition monitoring: [9]

- i) Polarization Index
- ii) Dielectric Absorption Ratio.
- iii) Degree of Polymerization.

b) Explain dissolved gas analysis. Illustrate its use for condition monitoring of transformer? [9]

OR

**Q2) a)** List the various fault monitoring methods of Induction Motor and write a note on Motor Current Signature Analysis. [8]

b) How transformer oil gets contaminated? With suitable block diagram explain the reconditioning process of transformer oil. [10]

**Q3) a)** What are the essentials of estimating and costing? How the quantity of material required for internal wiring is determined? [8]

- b) Explain the following terms used in estimating and costing: [9]
- i) Price catalogue
  - ii) Schedule of labor rates
  - iii) Schedule of rates

OR

**Q4) a)** What is a tender? Prepare guidelines for inviting tenders. [9]

b) Suggest qualities of a good estimator. [8]

P.T.O.

- Q5) a)** Write the general rules for the residential and commercial wiring work. [8]  
**b)** Explain the procedure of installation and estimation of underground LT service lines. [9]

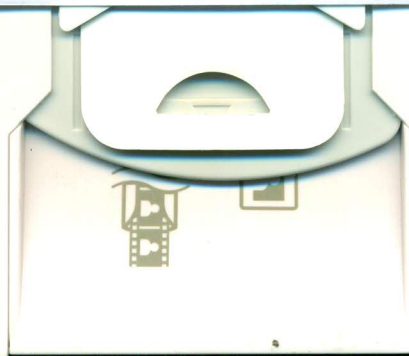
OR

- Q6) a)** A room is to be wired for single phase ac supply directly from mains which has a declared voltage of 200V. The length of the wire from the main switch to light and plug points is 30 meters. If the wire is to carry 5 amps, determine the size of the conductor. [9]

The following standard table may be used.

Size of Conductor		2 Cables D.C. or Single-phases A.C.		3 or 4 Cables of balanced 3-phase		4 Cables D.C.	
Normal area	Number and diameter of wire in mm.	Current rating in run amperes	Approx. length of run for volt-drop in Metres	Current rating in Amperes	Approx. Length of run for 1 volt drop in meters	Current rating in Amperes	Approx. length of run for 1volt drop in metres
1.5	1/1.40	10	2.3	9	2.9	9	2.5
2.5	1/1.80	15	2.5	12	3.6	11	3.4
4.0	1/2.24	20	2.9	17	3.9	15	4.1
6.0	1/2.80	27	3.4	24	4.3	21	4.3
10.0	1/3.55	34	4.3	31	5.4	27	5.4
16.0	7/1.70	43	5.4	38	7.0	35	6.8
25.0	7/2.24	59	6.8	54	8.5	48	8.5
35.0	7/2.50	69	7.2	62	9.3	55	9.0
50.0	1/3.0 19/1.80	91	7.9	82	10.1	69	10.0

- b)** Explain the importance of [8]  
 i) Current carrying capacity and  
 ii) Voltage drop while determining the size of conductor.



- Q7) a) State the different causes of accidents. Explain how these accidents can be prevented and what precautions are to be taken. [9]
- b) Give Classification of hazardous area as per NEC article 505-9, CEC Section 18, EN60079- 10, IEC 60079 - 10 [9]

OR

- Q8) a) Explain the procedure of first aid to be provided while removing casualty from contact with live wire and administering artificial respiration. [9]
- b) Classify and explain CAT ratings and using CAT rated instruments. [9]