

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2025**

**ELECTRICAL INSTALLATION DESIGN AND ESTIMATION**

[Maximum Marks: 75]

[Time: 3 Hours]

**PART-A**

**I. Answer any 5 questions. Each question carries 3 marks.**

**(5 x 3 = 15 Marks)**

		Module Outcome	Cognitive level
1.	Write any three general rules for internal wiring.	M1.01	R
2.	Draw the symbols of the following: (a) Lamp (b) Single pole switch (c) Ceiling fan	M1.01	U
3.	State the laws of illumination.	M2.02	R
4.	Mention the factors which affect illumination on workplace.	M2.04	U
5.	Explain the purpose of earthing in an electrical installation.	M3.01	U
6.	Describe the necessity of starters for a motor.	M3.02	R
7.	Explain any three major components of overhead lines.	M4.02	U

**PART-B**

**Answer ONE question from each set. Each question carries 15 marks.**

Module Outcome Cognitive level

II.	<p>Figure 1 shows the plan of a small flat. The flat is to be provided with electrical connections. The position of the light and fan points and switch boards have been as shown in figure.</p> <p>(a) Decide the number of sub-circuits and show this in installation plan. (7 Marks)</p> <p>(b) Calculate the size and length of the wire required for wiring installation. (8 marks)</p> <p>Figure 1</p> <p><b>OR</b></p>	M1.02	A
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III.	Determine the number of sub-circuits for the following loads and calculate the rating of main switch and RCCB. Fans 80W - 6 Nos; 5A socket 100W - 4 Nos; Refrigerator 100W- 4Nos; Lamp 60W-7Nos; single phase ½ hp motor 1 No; Induction cooker 2500W - 1No. (15 marks)	M1.02	A
IV.	(a) An illumination of 50 lux is to be produced on the floor of a room 12m x 9m. 36 lamps are required to produce illumination in the room, if 50% of the emitted light falls on the floor. What is the power of lamp in candela? (7 Marks)  (b) A room 30m x 15m is illuminated by 40W fluorescent lamps of lumen output 2700Lumens. The average illumination required at the work place is 200 lux. Calculate the number of lights Fitted in the room Assume the coefficient of utilization is to be 0.6 and depreciation factor 1.25. (8 marks) <b>OR</b>	M2.03  M2.03	A  A
V.	In a street light scheme lamps having luminous intensity of 300 candela are hung at a height of 5 m. The distance between two lamp posts is 10 m. (a) Find the illumination under the lamp. (7 Marks) (b) Find the illumination at the Centre in between two lamp post. (8 Marks)	M2.04	A
VI.	Estimate the list of materials and their cost for a plate earthing with a neat sketch. (15 Marks) <b>OR</b>	M3.01	A
VII.	Estimate the quantity of materials required for a control panel in small workshop having 3 machines (10HP - 1No; 5HP - 2No) $V_L$ 440V, $PF$ 0.85, $\eta$ 0.9 (15 Marks)	M3.02	A
VIII.	Draw a neat sketch of 100 kVA 11kV/400V pole mounted substation and prepare a list of materials for erecting this substation. (15 marks) <b>OR</b>	M4.04	A
IX.	Estimate the material and cost for extending a single-phase distribution line of 230V over a distance of 500m using 9m pole. Take span as 100m, using 7/2.59 AAC conductor. Draw the single-line diagram of the extension. (15 Marks)	M4.02	A

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