

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Scheme of Valuation/Answer Key

Scheme of evaluation (marks in brackets) and answers of problems/key

SEVENTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: EE405

Course Name: Electrical System Design

Max. Marks: 100

Duration: 3 Hours

PART A

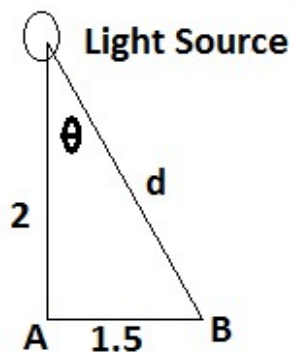
Answer all questions, each carries 5 marks.

		Marks
1	Detailing Electricity acts	(5)
2	Explaining how CB acts in overload and Short circuit	(2)
	Stating Difference with MCB and ELCB	(3)
3	Line diagram	(2)
	Various factors (Min 3 Nos)	(3)
4	Various tests done on transformers (Min 3 Nos)	(5)
5		(5)

Point A vertically below lamp, illuminance $E = 63.5$ lux

$$E = \frac{I}{(\text{distance})^2}; \text{ distance} = 2; I = E \times (\text{distance})^2$$

$$I = 63.5 \times (2)^2 = 254 \text{ lumen}$$



Point B, 1.5m away from A, Illuminance $E = \frac{I}{d^2} \cos\theta$,

$$\text{where } d = \sqrt{(2^2 + 1.5^2)} = 2.5, \text{ where } \cos\theta = \frac{1.5}{d} = \frac{1.5}{2.5} = 0.6$$

$$E = \frac{254}{2.5^2} \times 0.6 = 24.384 \text{ lux}$$

6	Various luminaries (min 5 Nos)	(5)
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- 7 Various methods (min 5 Nos) (5)
- 8 Detailing AMF panel (5)

PART B

Answer any two full questions, each carries 9 marks.

- 9 a) Detailing of Earthing, ELCB (4)
- b) Explaining Various services (Min 4 Nos) (6)
- 10 a) Naming (Min 4 Nos) (2)
- Detailing (Min 4 Nos) (6)
- b) Detailing Selection process (4)
- 11 a) Locating various parameters in fig (3)
- Drawing Schematic and explaining (7)

PART C

Answer any two full questions, each carries 9 marks.

- 12 a) Line diagram (4)
- Designing of each units in primary and secondary (6)
- 13 a) Line diagram (with designed values of installations substituted) (6)
- b) 40HP Induction motor, Assume pf = 0.8, efficiency = 80% = 0.8 (4)

Assume three phase

$$I_{FL} = \frac{\text{output in hp} \times 746}{\sqrt{3}V \times \text{pf} \times \text{efficiency}} = \frac{40 \times 746}{\sqrt{3} \times 415 \times 0.8 \times 0.8} = 64A$$

Starting current = 1.5 x 64 = 96 A

Main switch : 100A , 415V, ICTP SFU / Isolator (4 pole)
starter - auto transformer

- 14 a) Design considerations of earth mat (3)
- Importance (2)
- b) Various tests (min 3 Nos) (5)

PART D

Answer any two full questions, each carries 12 marks.

- 15 a) A = (30 x 15) m² (10)
- E = 240 lux
- O = 5600 lumens

$$CU = 0.6$$

$$MF = 0.8$$

$$N = \frac{E \times A}{O \times CU \times MF} = 40 \text{ Nos}$$

- 16 a) Raising Mains (2)
Raising Buses (2)
- b) Street Light Design (3)
Flood light design (3)
- 17 Selection of standby generator (3)
Line Diagram and Explanation (7)

