('85')

BE(ELEC) sem-8 (C-Scheme) May 25

13/05/25

Duration: - 03 Hours **Marks:-80**

NOTE

1. **Question No 1 is Compulsory**
2. **Solve any Three Questions out of the remaining**
3. Assume suitable data if required and specify the same

Q No 1. Solve any Four

a. State the various steps followed in estimation Procedure. **[5]**
b. State the criteria for selection of LT switch gear. **[5]**
c. State the features of temporary power supply. **[5]**
d. State the various features of Energy Conservation ACT 2001. **[5]**
e. Explain targeting in energy conservation **[5]**
f. State the energy potential of BLDC fan. **[5]**

Q No 2A. Explain the design features of any two type of electrical plans. **[10]**

Q No 2B. Explain the design of protection system. **[10]**

Q No 3A Find the KVA rating of the transformer required which is feeding following three phase loads. Specify the various specifications required for transformer and its criteria's for the selection. **[10]**

Load No	Rating KW	LF	DF	Efficiency	Power Factor
1	150	0.8	0.7	0.7	0.95
2	350	0.75	0.6	0.8	0.9
3	250	0.75	0.6	0.9	0.85
4	450	0.8	0.5	0.9	0.7

Q No 3B. Why load management is required ? Discuss various electrical load management techniques **[10]**

Q No 4A. A 50 KW heater, rated for 415V, 3phase, 50Hz is connected to PCC by a cable of length 20m. Two other cables are running in a cable tray. Ambient temperature is 40^0C. Fault level is 20 KA. Grouping factor is 0.87 and ambient temperature correction factor is 0.82. **Calculate the cable current only.** Justify the various assumptions in the calculations and selection of cable conductor. **(Data Sheet Not Required)** **[10]**

Q No 4B A reading room measuring (43m (L) + 18m (B) + 5m (H) requires an average illumination of 350 lux. State the various assumptions in design of lighting system for this room. Calculate the number of lamps required. Draw the lighting layout.**(Data Sheet provided)** **[10]**

Q No 5A Explain the terms optimizing input energy and Bench marking in energy audit **[10]**

Q No 5B Explain the assessment of consumption energy in lighting system. **[10]**

Q No 6A Explain the Smart lighting system as an energy efficient technology for outdoor application [10]

Q No 6B Explain the implementation of Building Management system (BMS) and Energy management system (EMS) [10]

Data for Lighting System Designing

K	$R_C = 0.7$			$R_C = 0.5$			$R_C = 0.3$		
	$R_W = 0.5$	$R_W = 0.3$	$R_W = 0.1$	$R_W = 0.5$	$R_W = 0.3$	$R_W = 0.1$	$R_W = 0.5$	$R_W = 0.3$	$R_W = 0.1$
0	0	0	0	0	0	0	0	0	0
0.6	0.43	0.39	0.36	0.42	0.38	0.36	0.41	0.38	0.36
0.8	0.45	0.41	0.38	0.44	0.40	0.38	0.43	0.40	0.38
1.00	0.51	0.47	0.44	0.55	0.47	0.44	0.49	0.46	0.40
1.25	0.55	0.51	0.49	0.53	0.50	0.48	0.52	0.50	0.48
1.50	0.57	0.54	0.52	0.56	0.53	0.51	0.54	0.52	0.50
2.00	0.61	0.58	0.56	0.59	0.57	0.55	0.57	0.56	0.54
2.50	0.63	0.61	0.59	0.61	0.59	0.57	0.59	0.58	0.56
3.00	0.65	0.63	0.61	0.63	0.61	0.59	0.61	0.59	0.58
4.00	0.67	0.65	0.63	0.64	0.63	0.62	0.62	0.61	0.59
5.00	0.68	0.67	0.65	0.65	0.64	0.63	0.63	0.62	0.61

Lamp Data

Sr. No.	Type of Lamp	Wattage	Lumen output
1.	Fluorescent (T8/T5)	18 (Halo phosphate)	1015
		36 (Halo phosphate)	2450
		18 (82/84/86)	1300
		36 (82/84/86)	3250
		28 (T5)	2800
2.	CFL	9	600
		11	760
		13	920
		18	1200

Sr. No	Type of Cable	Value of k (Cu)	Value of k (AL)
a)	PVC cable ≤ 300mm^2	115	76
b)	PVC cable > 300mm^2	103	68
c)	XLPE cable	114	92