Register No: …… Name: .....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

EIGHTH SEMESTER B.TECH DEGREE EXAMINATION(R), MAY 2024

B. Tech. Electrical and Electronics Engineering

(2020 SCHEME)

Course Code : 20EET402

Course Name : Electrical System Design and Estimation

Max. Marks : 100 **Duration:3 Hours**

Scientific calculator and Electrical system design data handbook is allowed in the examination hall.

PART A

(Answer all questions. Each question carries 3 marks)

1. State the purpose of Electricity Act, 2003.
2. Draw the standard symbols for i) Direct On-Line starter, ii) Circuit breaker, iii) Transformer.
3. State the advantages of metal halide lamps.
4. Define the terms: (i) luminous flux, (ii) luminous intensity, (iii) lumen.
5. Explain about the protective devices used in domestic installation.
6. Explain common power ratings of domestic gadgets.
7. What are the classifications of the substations according to its functions?
8. What are the factors which decide the power distribution architecture in an electrical installation of an industry?
9. What are the advantages of Automatic Power Factor Correction (APFC) panel?
10. Explain the need of standby generator in high rise buildings.

PART B

(Answer one full question from each module, each question carries 14 marks)

MODULE I

11. Discuss the short circuit calculations pertaining to the National Electric Code 2011. 14

OR

12. (a) Describe any six safety measures incorporated in electrical system design. 7
    (b) Describe the importance of IS 3043, IS 732, IS 2026, IS 3646, IS 5216. 7

MODULE II

13. Discuss the design criteria for public area lighting. 14

OR

14. (a) Define space to mounting height ratio and explain its significance. 5
    (b) Describe the average lumen method of illumination design. 9

MODULE III

15. Explain the Pre-commissioning tests to be carried out for domestic installation of electrical wiring. 14

OR

16. In a residential building, having 45 nos of light points, 10 fan points, 20 nos of 5 ampere plug socket, 6 nos of 15 ampere power plug socket and 1.5 HP single phase motor pump set (assume DOL starting). Calculate the total connected load, the no. of sub-circuits required, and select the conductors used for each sub-circuits. 14

MODULE IV

17.	Which are the pre-commissioning tests on power transformers used in an electrical installation. Explain briefly.	14

OR

18.	A small workshop 30m x20m has to be equipped with the following machinery: i. One 5hp, 415V, 3phase induction motor ii. One 3hp, 415V, 3phase induction motor iii. One 0.5 hp, 230V, 1 phase motor. Draw the wiring diagram and list the quantity of materials required.	14

MODULE V

19.	a) Explain the routing of cables in high rise buildings .	7
	b) Explain high rise buildings and its connected load calculation in the substation.	7

OR

20.	a) Draw the block diagram representation of an off-grid and on-grid solar PV system.	7
	b) Explain the steps in the design of solar pv system.	7

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