

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Examination (Regular and Supplementary), December 2020

Course Code: EE405**Course Name: Electrical System Design**

Max. Marks: 100

Duration: 3 Hours

PART A*Answer all questions, each carries 5 marks.*

Marks

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| 1 | Explain the scope of the following IS codes: IS 732, IS 3043 | (5) |
| 2 | What are the factors to be considered while selecting the type of wiring? | (5) |
| 3 | What is meant by selective coordination in electrical distribution system? | (5) |
| 4 | What is the purpose of earthing in an electrical installation? Distinguish between system earthing and equipment earthing. | (5) |
| 5 | A lamp giving out 1200 lm in all directions is suspended 8 m above the working plane. Calculate the illumination at a point on the working plane 6 m away from the foot of the lamp. | (5) |
| 6 | Discuss the significance of LLF and its components. | (5) |
| 7 | Which are the energy conservation techniques in lighting? | (5) |
| 8 | What is automatic transfer switch? Explain. | (5) |

PART B*Answer any two full questions, each carries 10 marks.*

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| 9 | a) Explain the salient features of electricity act 2003. | (5) |
| | b) Describe electric services in buildings. | (5) |
| 10 | a) A single storied residential building with two bedrooms with attached toilets, one dining room, one living room, kitchen, and sit out. Decide the required number of light points, fan points, 5A socket outlet, 15A socket outlet. Decide the number of sub circuits required. Determine the connected load, type of supply required, sub circuits required, maximum demand. | (10) |
| 11 | a) What are the special features in the electrical installation for a high-rise building than a domestic installation? | (5) |
| | b) Which are the pre-commissioning tests on a domestic installation? | (5) |

PART C

Answer any two full questions, each carries 10 marks.

- 12 a) Which are the main factors to be taken into account for the selection of cables? (5)
Explain.
- b) Fault current anticipated in a location is 8000A. soil resistivity = $10 \Omega\text{-m}$. Earth resistance is limited to 1Ω . Design an earthing system. Fault duration can be taken as 3seconds. Plate electrode of $1.2\text{m}\times 1.2\text{m}\times 12.5\text{mm}$ shall be used. (5)
- 13 a) Which are the pre-commissioning tests on power transformers used in an electrical installation? Explain. (5)
- b) An industrial electrical installation has a demand of 50 kW at a power factor of 0.75 lagging. Determine the rating of the capacitor bank required to improve the power factor to 0.95 lagging. (5)
- 14 a) An outdoor pole mounted 11kV/433 V substation has to be installed for supply to a residential area having a load of 63 kVA. With the help of a neat diagram, make a list of materials required. (5)
- b) Explain the substation earthing system. (5)

PART D

Answer any two full questions, each carries 10 marks.

- 15 a) What are the laws of illumination? Explain with a neat diagram. (5)
- b) A corridor is lighted by 4 lamps spaced 10 m apart and suspended at a height of 5 m above the centre line of the floor. If each lamp gives 200 candle-power in all directions below the horizontal, find the illumination at the point on the floor mid-way between the second and third lamps. (5)
- 16 a) Explain with the help of block diagram the working of automatic main failure system. (5)
- b) Explain with the help of schematic, the necessary protections to be provided for a 100 kVA standby diesel generator installed in an electrical installation. (5)
- 17 What are the design considerations of solar PV system for domestic applications? (10)
