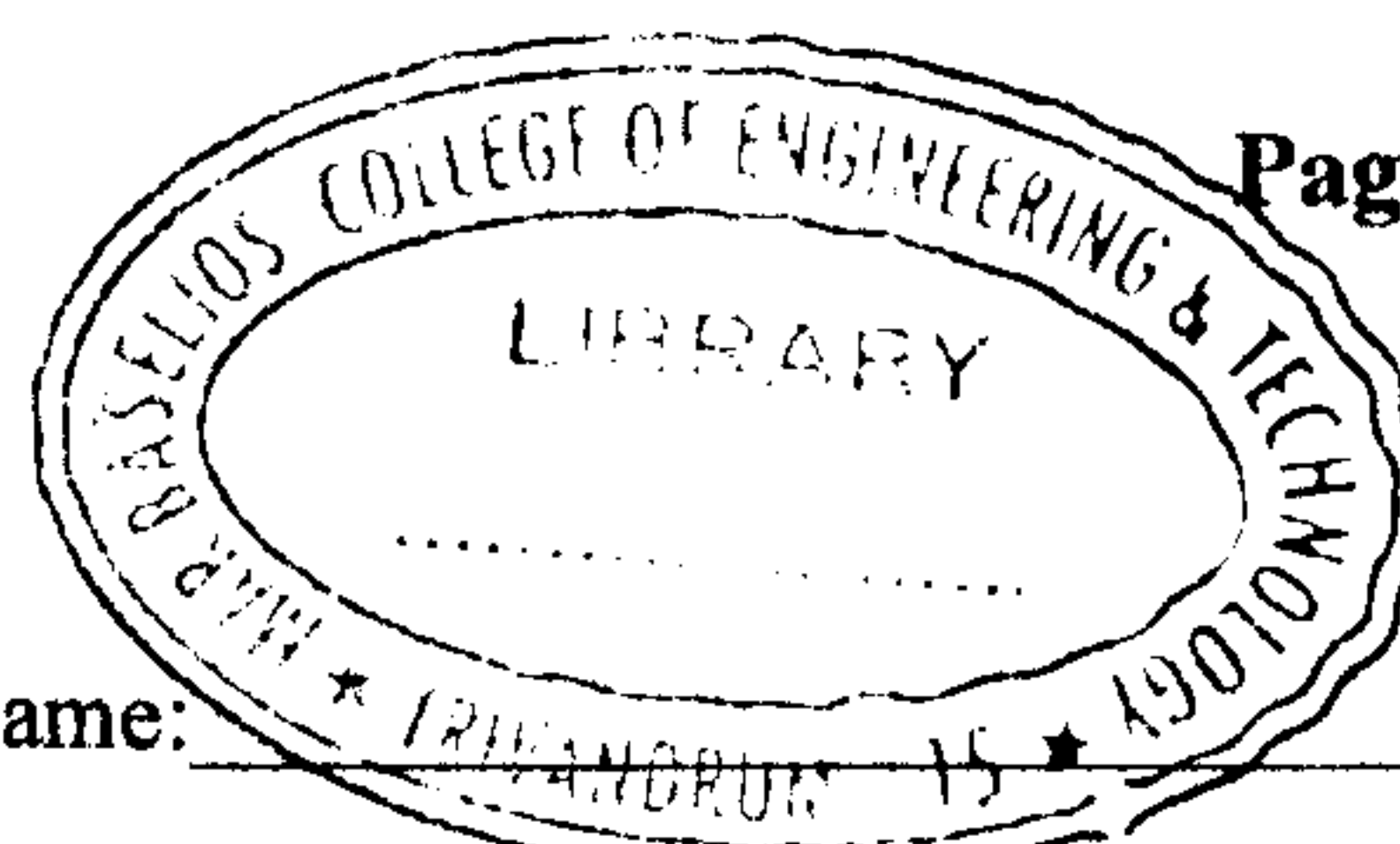


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Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 2019**

**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 | What are the importance of IS 3043, IS 732?   | (5) |
| 2 | Why it is necessary to have pre-commissioning tests of electrical installations.            | (5) |
| 3 | Draw the single line diagram of an indoor substation showing all accessories of the system. | (5) |
| 4 | What is polarity test of a transformer? Why it is important.                                | (5) |
| 5 | What are the requirements of efficient street lighting?                                     | (5) |
| 6 | Mention the features of good lighting scheme for buildings?                                 | (5) |
| 7 | What are the factors to be considered while selecting a standby generator?                  | (5) |
| 8 | Briefly explain need of a solar PV system for domestic application.                         | (5) |

**PART B**

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

- |    |   |      |
|----|---|------|
| 9  | a) What are the safety aspects that have to be considered while doing electrical dwelling in LV and MV installations?   | (6)  |
|    | b) What is NEC? Explain its relevance in electrical installations.  | (4)  |
| 10 | 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. | (10) |
| 11 | A three occupant building has to be electrified independently from a common energy meter. Design the distribution boards with accessories for each resident having 10nos of light circuits, 6 nos of power circuits.  | (10) |

**PART C**

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

- |    |  |     |
|----|--|-----|
| 12 | a) What are the advantages and disadvantages of an outdoor type substation over an indoor type substation? | (6) |
|    | b) What are the classifications of the substations according to its functions?                             | (4) |
| 13 | a) What is the difference between LT and HT Motor? Explain with example.                                   | (4) |
|    | b) Calculate the load current and cable size of 20HP motor of 415V, 50Hz, supply with 80% efficiency.      | (6) |

- 14 a) Draw the single line diagram of pole mounted outdoor substation of 11kV/415V, (7)  
250kVA transformer showing all necessary parts based on loading.  
b) What will the full load current for the above scheme? (3)

**PART D**

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

- 15 A shop 16m x 10m is illuminated with 200w incandescent lamps. If a CU of 0.8 (10)  
and an MF of 0.75 are selected, and an illumination of 260lux is required at the  
work place, calculate the number of luminaires required. Take the mounting  
height as 2m.
- 16 a) What is energy conservation techniques imposed in buildings? Mention its (4)  
necessity.  
b) Distinguish between continuous power, prime power and standby power related (6)  
with standby generator.
- 17 a) Write short notes on generator installation and its protection. (5)  
b) Explain design requirements of high rise buildings. (5)

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