

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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

FIFTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

**Course Code: EE 369**

Max. Marks: 100

Duration: 3 Hours

**PART A****Course Name: HIGH VOLTAGE ENGINEERING**

Marks

- |   |  |     |
|---|--|-----|
| 1 | Explain the generation of high voltage DC voltage using rectifier circuit              | (5) |
| 2 | How are damped high frequency oscillations obtained from a Tesla Coil?                 | (5) |
| 3 | Explain the working of single stage impulse generator. What are its limitations?       | (5) |
| 4 | Why capacitance voltage dividers are preferred for high AC voltage measurements?       | (5) |
| 5 | What is loss factor? Explain its significance.   | (5) |
| 6 | What are the atmospheric correction factors and mention their influence in HV testing? | (5) |
| 7 | Give the classification of type tests for testing of circuit breakers.                 | (5) |
| 8 | Why is grounding essential in a H.V laboratory?  | (5) |

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

- |    |  |      |
|----|--|------|
| 9  | Derive the expression for voltage regulation in voltage multiplier circuits?                                 | (10) |
| 10 | a) Describe the principle of operation, application and limitations of a Van de Graf generator.              | (6)  |
|    | b) Explain the working of a 3 stage cascade transformer with neat diagram.                                   | (4)  |
| 11 | a) What is the principle of resonant transformer? Draw the circuit of a series resonant transformer circuit. | (4)  |

- b) An impulse generator has 12 capacitors of  $0.12\mu\text{f}$  and  $200\text{kV}$  rating. The wave front and wave tail resistances are  $1.25\Omega$  and  $4\text{ k}\Omega$  respectively. If the load capacitance including that of test object is  $10,000\text{pF}$ , find the wave front and wave tail times and the peak voltage of impulse produced. (6)

### PART C

*Answer any twofull questions, each carries 10 marks.*

- 12 a) Explain the method of measurement of very high voltages using sphere gaps. Mention its merits and demerits. (6)
- b) Explain the principle of operation of Electrostatic voltmeter? (4)
- 13 a) Explain the working of impulse current generator with neat diagram (6)
- b) Describe the construction and application of a multistage Marx's Generator. (4)
- 14 a) With a circuit diagram explain the working of generating voltmeters. (6)
- b) What are the problems associated with peak voltmeter circuit using passive elements? (4)

### PART D

*Answer any twofull questions, each carries 10 marks.*

- 15 a) Explain the procedure for impulse testing of power transformer. (5)
- b) What are the short circuit tests performed on circuit breakers? Explain each test. (5)
- 16 a) What are the objectives of high voltage testing? (5)
- b) Explain partial discharge measurement with neat circuit. (5)
- 17 a) Explain the size and dimensions of the equipments in high voltage laboratories. (5)
- b) What are the extra precautions that are to be taken while grounding an impulse current generator? (5)

\*\*\*\*