

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIFTH SEMESTER B. TECH (HONOURS) DEGREE EXAMINATION, DECEMBER 2017

Course Code: EE369

Course Name: HIGH VOLTAGE ENGINEERING (EE)

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks.

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| 1 | What are the causes and consequences of voltage stress in power system? | (5) |
| 2 | What are the advantages and disadvantages of high frequency transformer? | (5) |
| 3 | What is the need for generating high impulse currents? | (5) |
| 4 | Draw the circuit for the measurement of peak value of a.c voltages and discuss its advantages? | (5) |
| 5 | What is the importance of RIV measurements for EHV power apparatus? | (5) |
| 6 | What are the atmospheric correction factors and mention their influence in HV testing? | (5) |
| 7 | List the various tests performed on H V cables? | (5) |
| 8 | What are the criteria used in selecting the ratings of the testing equipment for h.v. labs? | (5) |

PART B

Answer any two full questions, each carries 10 marks.

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| 9 | a) Define ripple factor and voltage regulation in voltage multiplier circuits? | (4) |
| | b) Show that the ripple voltage in a rectifier circuit depends on the current and circuit parameters. How the ripple and regulation minimized? | (6) |
| 10 | a) What is a cascade transformer? Draw the equivalent circuit of a 3 stage cascade transformer. Label the power rating of various stages. | (5) |
| | b) Derive the expression for short circuit impedance of a 3-stage cascade transformer. | (5) |
| 11 | a) What is the principle of resonant transformer? Draw the circuit of a series resonant transformer circuit. | (6) |
| | b) What are the advantages and disadvantages of a resonant transformer? | (4) |

PART C

Answer any two full questions, each carries 10 marks.

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| 12 | a) Define impulse voltage? Draw a standard impulse wave form. | (4) |
| | b) Describe the construction and application of a multistage Marx's Surge generator with circuit diagram. | (6) |
| 13 | 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) |
| 14 | Draw the circuit of impulse current generator and prove that for maximum value of current the inductance of the circuit should be low for a given initial energy. | (10) |

PART D

Answer any two full questions, each carries 10 marks.

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| 15 | With a neat diagram explain the impulse testing on the power transformer | (10) |
| 16 | a) Draw the equivalent circuit of an insulating material and derive an expression for the loss tangent, starting from first principles. | (5) |
| | b) Explain with suitable diagrams the principle of wide band circuit and method of partial discharge measurements. | (5) |
| 17 | a) What are the basic classifications of H V laboratories? What are the basic facilities available in each case. | (6) |
| | b) What are the precautions that are to be taken while grounding an impulse generator? | (4) |
