

Total No. of Questions : 8]

SEAT No. :

PA-1664

[Total No. of Pages : 2

[5927]-359

B.E. (Electrical)

HIGH VOLTAGE ENGINEERING

(2019 Pattern) (Elective-III) (Semester-VII) (403143C)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q1 or Q2, Q3 or Q4, Q5, or Q6, Q7 or Q8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) You are advised to attempt not more than 6 questions.
- 5) Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.
- 6) Assume suitable data, if necessary.

Q1) a) Describe in detail Lightning phenomenon. [8]

b) Write a short note on insulation co-ordination. [9]

OR

Q2) a) Explain Reynolds & Mason's Theory. [8]

b) State & explain with diagram causes of power frequency over voltages & switching surges. [9]

Q3) a) Explain with suitable Diagram Voltage Doubler circuits for producing high dc voltage. [9]

b) What is the principle of operation of a resonant transformer? List advantages over the cascade connected transformer. [9]

OR

Q4) a) Explain with suitable diagram Impulse Current Generator. Also give the function of different parts of an impulse current generator. [9]

b) A 12 stage impulse generator has  $0.2 \mu\text{F}$  capacitors. The wave front and the wave tail resistance connected are 500 ohms and 4000 ohms respectively. If load capacitor is 1000pF, find the front and tail times of the impulse wave produced. [9]

P.T.O.

- Q5) a) Describe Electro-optical signal converter for EHV system. [8]  
b) Explain how a sphere gap can be used to measure the peak value of voltages. What are factors that influence such voltage measurement? [9]

OR

- Q6) a) Explain the generating voltmeter used for measuring high dc voltages. [8]  
b) With a neat diagram explain capacitive voltage transformer. How it can be used for voltage measurement in power system? [9]

- Q7) a) Describe earthing and shielding of high voltage laboratories. [9]  
b) Describe for bushing  
i) Wet power frequency voltage withstand test  
ii) Momentary power frequency voltage withstand test  
iii) Visible discharge test. [9]

OR

- Q8) a) Discuss following tests carried out on porcelain insulator: [9]  
i) 50% Dry impulse flashover test  
ii) Impulse withstand test  
b) Write a short note on Design, layout and grounding of HV laboratory. [9]