

(3 Hours)

(Total Marks : 80)

N.B. :

- (1) Question no: 1 is Compulsory.
- (2) Solve any three questions out of remaining.
- (3) Assume suitable data if required and Specify the same.

Q 1. Answer the following :-

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- a) Discuss various factors which affect breakdown of gases.
- b) List out various test carried out on insulator.
- c) Explain non-destructive testing of dielectric materials.
- d) Explain the resonant transformer in detail.

Q.2 a) Derive an expression for voltage efficiency of a single stage impulse generator.

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b) Discuss various method of measuring high dc and ac current.

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Q.3 a) Explain clearly various process which explain electric breakdown in vacuum.

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b) In an experiment in a certain gas it was found that the steady state current is  $5.5 \times 10^{-6}$ A at 8 KV at a distance of 0.4cm between the plane electrodes. Keeping the field constant and reducing the distance to 0.1cm results in a current of  $5.5 \times 10^{-6}$ A, Calculate Townsends's Primary Ionization coefficient.

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Q.4a) Explain various test to be carried out on bushing.

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b) Explain clearly the procedure for measurement of 1. Impulse 2. ac high voltages using sphere gap.

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Q.5 a) Describe construction, principle and application of a multistage Marx's generator.

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b) Define ripple voltage. Show that the ripple voltage in a rectifier circuit depends on load current and the circuit parameter.

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Q.6 a) Write short note on:- H V Laboratory Layout ,grounding and Shielding.

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b) Define and explain the following key terms in non-destructive testing techniques?

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- 1) Discharge detectors
- 2) Loss factor
- 3) D.C. Resistivity
- 4) Bridge techniques
- 5) P.D. Measurements.