

GANPAT UNIVERSITY
B.TECH SEM-V (ELECTRICAL)
REGULAR EXAMINATION NOV-DEC-2014
2EE502:-HIGH VOLTAGE ENGINEERING

Time: 3 Hours

Total Marks:-70

- Instructions:** - 1. Attempt all questions.
 2. Make suitable assumptions wherever necessary.
 3. Answer to two sections must be written in separate answer books.
 4. Figures to the right indicate full marks.

SECTION-I

- Que.-1 (A)** Draw the horizontal sphere gap configuration for peak value measurement. Discuss the effect of various factors on performance of sphere gap measurement. [06]
- (B)** If the indicating meter used in a generating voltmeter designed to measure DC voltage for a range from 20 to 200 kV reads a minimum current of 1 μ A and maximum current of 25 μ A. What should the capacitance of the generating voltmeter if synchronously driving motor operates at 1500 RPM? [06]

OR

- Que.-1 (A)** Illustrate the operating principle and construction of generating voltmeter with schematic diagram and calibration curves. [07]
- (B)** An impulse currents of 10000A is measured by a rogowski coil having a rate of change of current of 1000×10^8 A/s. The current is read by a VTVM as a potential drop across the integrating circuit connected to the secondary. Estimate the values of mutual inductance, resistance and capacitance to be connected, if the meter reading is to be 10 V for full scale deflection. [05]

- Que.-2 (A)** What is a need of cascaded transformer? Describe a three stage cascaded transformer with neat diagram. [06]
- (B)** A 12 stage impulse generator has 0.126 μ F condensers. The wave front and the wave tail resistances connected are 800 ohms and 5000 ohms respectively. If the load condenser is 1000pF, find the front time and wave time of impulse wave produced. [05]

OR

- Que.-2 (A)** Explain with neat diagram (i) series & (ii) parallel resonant circuits for generating high a.c. voltages. [05]
- (B)** What do you mean by impulse voltage? Give the tolerance for lightning impulse and discuss the effect of resistance on impulse generator circuit output. [06]

Que.-3

Attempt any two:

[12]

- (A) Draw the Mark's circuit and describe the modification in Mark's circuit with its advantage and disadvantages.
- (B) Analyze tesla coil used for high frequency ac voltage generation and also discuss its advantages.
- (C) Define switching surge. Elaborate the production of switching surges with circuit diagram and waveform.

SECTION-II

Que.-4

(A) Draw layout of UHV Laboratories.

[05]

(B) List different purification methods and their role for purification of any liquid dielectrics.

[05]

(C) Define: (a) Creepage Distance (b) Hundred percent flashover voltage.

[02]

OR

Que.-4

(A) Write on the streamer breakdown phenomena affecting the performance of solid dielectrics.

[04]

(B) Explain breakdown in Electro negative Gases.

[05]

(C) Discuss the power frequency tests performed on Bushings.

[03]

Que.-5

(A) Compare different types of Liquid dielectrics.

[06]

(B) A Schering bridge was used to measure the capacitance and loss angle for an H.V. bushing. At balance, the readings are: Standard capacitance = 100pF, $R_3 = 3180 \text{ Ohm}$, $C_3 = 0.00125 \text{ micro F}$ and $R_4 = 636 \text{ Ohm}$. Find C_x and $\tan \delta$ with proper diagram.

[05]

OR

Que.-5

(A) Give the brief view about measuring cells for Solids and Liquids with figure for Non-destructive testing.

[05]

(B) Explain Ionization by Collision for gases insulation media.

[06]

Que.-6

Attempt any two:

[12]

(A) Write down Short note on "Grounding of impulse testing laboratories"

(B) Discuss the high voltage testing of circuit breaker.

(C) Drive and Explain Paschen's Law.

END OF PAPER