Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Winter Examination-2018

Subject Name: High Voltage Engineering

Subject Code: 4TE06HVE1 **Branch: B.Tech (Electrical)**

Semester: 6 **Date: 24/10/2018** **Time: 02:30 To 05:30** **Marks: 70**

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 **Attempt the following questions:** **(14)**

a)	Write different form of high voltages.	**(1)**
b)	Define partial discharge.	**(1)**
c)	Write equation of Paschen's law.	**(1)**
d)	List different methods of generating high d.c. voltages.	**(1)**
e)	Write different application of high voltage engineering.	**(1)**
f)	List different methods of measuring high voltage d.c.	**(1)**
g)	What do you meant by suspended partical mechanism?	**(1)**
h)	Draw voltage doubler circuit.	**(1)**
i)	List out different testing methods on transformer.	**(1)**
j)	What do you meant by bubble theory?	**(1)**
k)	Write equation of wave front and wave tail time of impulse wave.	**(1)**
l)	Define internal discharge.	**(1)**
m)	Write properties of epoxy resins.	**(1)**
n)	List out different testing methods on cables.	**(1)**

Attempt any four questions from Q-2 to Q-8

Q-2 **Attempt all questions** **(14)**

(a)	Explain liquid purification system with test cell.	**(07)**
(b)	What are 'Treeing' and 'Tracking'? Explain clearly the two processes in solid dielectrics.	**(07)**

Q-3 **Attempt all questions** **(14)**

(a)	Define Townsend's first and second ionization coefficients. Explain the Townsends criterion for a spark.	**(07)**
(b)	Explain thermal breakdown in solid dielectrics. How this mechanism is more significant than the other mechanisms?	**(07)**

Q-4		**Attempt all questions**	**(14)**
	(a)	Explain with neat sketches Cockcroft-Walton voltage multiplier circuit. Explain clearly its operation when the circuit is (i) unloaded (ii) loaded.	**(07)**
	(b)	Explain the series-parallel resonant circuit and discuss its advantages and disadvantages.	**(07)**
Q-5		**Attempt all questions**	**(14)**
	(a)	What is a cascaded transformer? Explain why cascading is done? Describe with neat diagram a three stage cascaded transformer. Label the power ratings of various stages of the transformer.	**(07)**
	(b)	Describe the construction, principle of operation and application of a multistage Marx's Generator.	**(07)**
Q-6		**Attempt all questions**	**(14)**
	(a)	Explain with neat diagram the principle of operation of an Electrostatic Voltmeter. Discuss its advantages and limitations for high voltage measurements.	**(07)**
	(b)	Explain clearly the procedure for measurement of (i) impulse; (ii) a.c. high voltages using sphere gap.	**(07)**
Q-7		**Attempt all questions**	**(14)**
	(a)	Write short note on deltatron circuits.	**(07)**
	(b)	Derive an expression for ripple voltage of a multistage Cockroft-Walton Circuit.	**(07)**
Q-8		**Attempt all questions**	**(14)**
	(a)	List out various tests to be carried out on insulator and give a brief account of each test.	**(07)**
	(b)	Explain the operation of high voltage Schering bridge when the test specimen (i) Grounded (ii) high loss factor.	**(07)**