Enrollment No: _____ Exam Seat No: _____

C.U.SHAH UNIVERSITY

Summer Examination-2019

Subject Name: Switchgear and Protection
Subject Code: 4TE06SGP1 **Branch:** B.Tech (**Electrical)**
Semester: 6 **Date: 20/04/2019** **Time: 10:30 To 01:30** **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)**

1) State the difference between equipment earthing and neutral earthing.

2) Give any two desirable characterisitcs of a fuse element.

3) Low pressure air is used in Air Blast Circuit Breaker. Determine whether the given statement is True or False.

4) Give any two chemical properties of SF_6 gas.

5) Give any two drawbacks of Bulk oil circuit breaker.

6) What should be the pressure of mercury to obtain high vaccum?

7) Draw the inverse, very inverse and extremely inverse characterisitcs of relay.

8) Thermal relay can be used to obtain overload protection. Determine whether the given statement is True or False.

9) Distance relay are mainly used for the protection of_____.(Transmission Line/Generator)

10) Restraining coil in Differential protection is used for detection of ____ fault. (Internal/Through)

11) Buchholz relay are used for the protection of_____.fault(Incipient/Regular)

12) Relay operates when restraining torque is greater than operating torque. Determine whether the given statement is True or False.

13) Give any two desirable qualities of relay.

14) What is the basic difference between directional and non-directional relay?

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

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

	(a)	Discuss the effect of natural frequency and power factor on transient recovery voltage (TRV)	**07**
	(b)	Explain the high resistance methods for arc interruption in circuit breakers.	**07**
Q-3		**Attempt all questions**	**(14)**
	(a)	With neat sketch describe the arc extinction process in air break circuit breaker.	**07**
	(b)	Draw the neat sketch of single pressure puffer type SF_6 circuit breaker and explain the process of arc extinction.	**07**
Q-4		**Attempt all questions**	**(14)**
	(a)	Draw the cross section of vaccum interruption and explain the function of each parts.	**07**
	(b)	Explain the principle of core balance CT for earth fault protection.	**07**
Q-5		**Attempt all questions**	**(14)**
	(a)	Draw the sketch and explain the working principle of the below relays. i) Attracted Armature Type Relay ii) Balanced Beam Relay	**07**
	(b)	With neat sketch,explain the principle of arc quenching process in Bulk Oil Circuit Breaker.	**07**
Q-6		**Attempt all questions**	**(14)**
	(a)	Draw the over current protection connection with three over current relays and explain its principle of operation.	**07**
	(b)	Draw and explain the principle of circulating current Differential (MERZ-PRIZE) protection.	**07**
Q-7		**Attempt all questions**	**(14)**
	(a)	Draw the R-X diagram of plain impedance relay and explain its characterisitcs on R-X plane.	**07**
	(b)	Draw the structure of Buchholz relay and explain its principle of operation.	**07**
Q-8		**Attempt all questions**	**(14)**
	(a)	Explain how overload protection is achieved for induction motor.	**07**
	(b)	Draw the neat sketch of differential protection for busbars and explain its operating principle.	**07**