

# C.U.SHAH UNIVERSITY

## Summer Examination-2022

**Subject Name: Switchgear and Protection**

**Subject Code: 4TE06SGP1**

**Branch: B.Tech (Electrical)**

**Semester: 6**

**Date: 04/05/2022**

**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.
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- Q-1 Attempt the following questions: (14)**
- a) A relay is used to (1)**  
(a) Break the fault current (b) Sense the fault  
(c) Sense the fault and direct to trip the circuit breaker (d) All of these
- b) The basic problem in a circuit breaker is to (1)**  
(a) Maintain the arc (b) Emit ionization electrons  
(c) Extinguish the arc (d) None of these
- c) Basic quantity measured in a distance relay is (1)**  
(a) Impedance (b) Current difference  
(c) Voltage difference (d) None of these
- d) Buchholz relay is used for the protection of (1)**  
(a) Alternators (b) Transmission line  
(c) Switch yard (d) None of above
- e) Circuit Breaker can be operated in which mode? (1)**  
(a) Automatic (b) Manually  
(c) Both (d) None of this
- f) SF<sub>6</sub> gas (1)**  
(a) Is yellow in colour (b) Is lighter than air  
(c) Is nontoxic (d) Has pungent smell
- g) Basic relay connection requirement is that the relay must operate for (1)**  
(a) Load (b) Internal faults  
(c) Both (a) and (b) (d) None of these
- h) The main function of a fuse is to (1)**  
(a) Protect the line (b) Open the circuit  
(c) Prevent excessive currents (d) None of the above.
- i) Which of the following medium is employed for the extinction of arc in air circuit breaker? (1)**  
(a) Water (b) Oil  
(c) Air (d) SF<sub>6</sub>
- j) SF<sub>6</sub> is which type of gas? (1)**  
(a) Electro positive (b) Electro negative



- (c) Both (a) and (b) (d) None of these
- k) Give name of any two types of circuit breaker used in substation. (1)
  - l) OCB means \_\_\_\_\_. ( Oil Circuit Breaker/ Operative Circuit Breaker / Overhead Circuit Breaker) (1)
  - m) State the name of any two types of relay used for transformer protection. (1)
  - n) Isolator must operate on.....load condition. (On/Off) (1)

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

- Q-2 Attempt all questions (14)**
- (a) Describe the essential qualities of protection system. (07)
  - (b) Write short note on zones of protection of system. (07)
- Q-3 Attempt all questions (14)**
- (a) Explain protection of parallel feeders and protection of ring mains system. (07)
  - (b) Clearly give the classification of protective schemes. (07)
- Q-4 Attempt all questions (14)**
- (a) Explain time-current characteristics of overcurrent protection system. (07)
  - (b) Write short note on automatic reclosing. (07)
- Q-5 Attempt all questions (14)**
- (a) Write the advantages and limitations of static relay. (07)
  - (b) Write short note on need for protective systems. (07)
- Q-6 Attempt all questions (14)**
- (a) Explain briefly about SF<sub>6</sub> Circuit Breaker. (07)
  - (b) What are applications of CT & PT? Enlist the factors affecting it. (07)
- Q-7 Attempt all questions (14)**
- (a) Explain briefly vacuum circuit breaker. (07)
  - (b) Write advantages and properties of SF<sub>6</sub> Circuit breaker. (07)
- Q-8 Attempt all questions (14)**
- (a) Write short note on transmission line protection system. (07)
  - (b) What you mean by differential protection? Explain generator differential protection system. (07)

