

**Subject Code: XXXXX**

**Roll No:**

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**BTECH**  
**(SEM-7) POWER SYSTEM PROTECTION 2021-22**

**TIME:3 HOUR**

**Total Marks: 100**

**Instruction:** Attempt the questions as per the given instructions. Assume missing data suitably.

**SECTION - A**

Attempt *All Parts* in Brief

**2\*10 = 20**

<b>Q1</b>	<b>Questions</b>	<b>Marks</b>
(a)	Need for protective systems.	2
(b)	Essential qualities of protection.	2
(c)	What are the different types of induction relay ?	2
(d)	What do you understand by the term "Current Chopping"?	2
(e)	What do you mean by reverse power protection?	2
(f)	What do you understand by pilot wire protection scheme ?	2
(g)	What is re-striking voltage transient ?	2
(h)	Explain basic concept of DC circuit breaker.	2
(i)	Differentiate between static and dynamic overcurrent relay.	2
(j)	Explain how the phase comparator is different from amplitude comparator.	2

**SECTION - B**

Attempt Any Three of the following

3\*10 = 30

Q2	Questions	Marks
(a)	Explain what you understand by pick up and reset value of the actuating quantity.	10
(b)	Describe the various types and working principle of differential relays.	10
(c)	What is a carrier blocking scheme? Discuss its merits and demerits over other types of carrier aided distance protection.	10
(d)	Discuss the recovery rate theory and energy balance theory of are interruption in a circuit breaker.	10
(e)	How can a quadrilateral distance relay be realized using a microprocessor ?	10

### SECTION - C

Attempt Any One of the following

5\*10 = 50

Q3	Questions	Marks
(a)	Find the output of CT having a transformation ratio of 100/5 and secondary resistance of 0.1 ohm. Its secondary terminals are connected to a relay whose burden is 4.5 VA. The resistance of the connecting leads is 0.15 ohm.	10
(b)	Describe briefly various method of fault detection.	10
Q4	Questions	Marks
(a)	An earth-fault starting relay has a setting of 30 %, and a current rating of 5 A. It is connected to a CT of ratio 500/5. Calculate pick up current in primary for which the earth fault relay operates.	10
(b)	How a MHO characteristic is realized using a sampling comparator ?	10
Q5	Questions	Marks
(a)	Explain the term overvoltage factor, protective ratio, protective angle, protective zone and coupling factor.	10
(b)	What do you understand by the term protection of bus? Explain different types of protection of bus techniques.	10
Q6	Questions	Marks
(a)	What are the advantages of an air blast circuit breaker over the oil circuit breaker?	10
(b)	Discuss how making capacity and breaking capacity of a circuit breaker are tested in a laboratory type testing station.	10

Q7	Questions	Marks
(a)	How is relay reliability described ? What are the advantages of fast fault clearing ?	10
(b)	Write short notes on : i. Level detectors ii. Logic and training circuits	10