Reg. No.												

Question Paper Code	12235

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2023

Seventh Semester

Electrical and Electronics Engineering

20EEEL710 - POWER SYSTEM PROTECTION AND SWITCHGEAR

(Regulations 2020)

Duration: 3 Hours Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	Define dead spot in zones of protection.	*2,K1,CO1*
2.	List the different types of effectively grounded system and non effectively grounded system.	*2,K1,CO1*
3.	What is the Universal torque equation?	*2,K1,CO2*
4.	Define differential relay.	*2,K1,CO2*
5.	Compare magnetizing inrush current and short circuit current in a transformer.	*2,K2,CO3*
6.	Outline the reason for fault in bus zone.	*2,K2,CO3*
7.	What is the function of sample and hold circuit in numerical protection?	*2,K1,CO4*
8.	List the applications of static relay.	*2,K1,CO4*
9.	Outline the expression of time at which maximum restrike occurs.	*2,K2,CO5*
10.	List the factors responsible for the increase in arc resistance.	*2,K1,CO5*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	(i) Explain about arc suppression coil grounding.	*7,K2,CO1*
		(ii) A 132 kV, 3 phases, 50 cycles overhead line, 50 Km long, has a capacitance to earth for each line of 0.0157 **μ**F per Km. Find the inductance and kVA rating of the arc suppression coil.	*6,K2,CO1*
		OR	
	b)	(i) Explain the importance of overlapping of protective zones with neat sketch.	*7,K2,CO1*
		(ii) Illustrate a Protective system and its attributes with a neat sketch.	*6,K2,CO1*
12.	a)	Explain the construction and working principle of electromagnetic relay.	*13,K2,CO2*
		OR	
	b)	Explain negative sequence relay and frequency relay.	*13,K2,CO2*

13. a) Explain a suitable protection scheme of a transformer against incipient fault. *13,K2,CO3*

OR

b) A generator is protected by restricted earth fault protection. The generator ratings are 13.2 kV and 10 MVA. The percentage of winding protected against phase to ground fault is 85%. The relay setting is such that it trips for 20% out of balance. Infer the resistance to be added in the neutral to ground connection. *13,K2,CO3*

14. a) Outline cosine type of phase comparator for synthesis of reactance relay. *13,K2,CO4*

OR

b) Explain numerical distance protection of transmission lines. *13,K2,CO4*

15. a) Summarize the phenomenon of interruption of capacitive current in a circuit breaker. *13,K2,CO5*

OR

b) Explain in detail the constructional features, principle of working, advantages and applications of SF6 circuit breaker with a neat diagram. *13,K2,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) (i) Infer the average RRRV of 132 kV CB with neutral earthed. Short Circuit Data are as follows: Broken current is symmetrical. Restriking voltage has frequency 20 kHz. P.F=0.15. Fault is earthed. *10,K2,CO5*

(ii) Explain static over current relay. *5,K2,CO4*

OR

b) (i) In Short circuit test on a 3 pole, 132 kV circuit breaker, the following observations are made. P.F for fault =0.4, recovery voltage 0.9 times full line value. Breaking current is symmetrical. Frequency of oscillation of restriking voltage 16 kHz. Assume neutral is grounded and fault is not grounded, Infer the RRRV. *10,K2,CO5*

(ii) Explain static differential relay. *5,K2,CO4*