

Code: 20EE3601

III B.Tech - II Semester – Regular Examinations – JUNE 2023

**SWITCHGEAR & PROTECTION
(ELECTRICAL & ELECTRONICS ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.

2. All parts of Question must be answered in one place.

BL – Blooms Level

CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1	a)	Discuss the Principle and operation of SF6 circuit breaker and mention the advantages over other types of circuit breakers.	L3	CO2	8 M
	b)	Interpret the phenomenon of resistance switching and define RRRV.	L4	CO4	6 M
OR					
2	a)	Discuss with the help of neat sketch the construction and working of minimum oil Circuit breaker (M.O.C.B).	L3	CO2	8 M
	b)	Analyze the current chopping with a neat diagram.	L4	CO4	6 M
UNIT-II					
3	a)	Discuss the principle of operation of induction cup relay with relevant diagram.	L3	CO2	7 M
	b)	Enumerate the differences between electromagnetic relays and static relays.	L4	CO4	7 M

OR					
4	a)	Discuss the principle and operation of static relay with the help of block diagram.	L3	CO2	7 M
	b)	Infer the operation of an induction disc type over current relay with the help of a neat sketch.	L4	CO4	7 M
UNIT-III					
5	a)	Explain the working principle of a directional over current relay with the help of a neat sketch.	L3	CO2	7 M
	b)	Infer why are differential relays more sensitive than over current relays?	L4	CO4	7 M
OR					
6	a)	Discuss the operational characteristics of mho relay in R-X plane. Explain how you provide direction features to these relays?	L3	CO2	8 M
	b)	Infer the characteristics of instantaneous, DMT & IDMT relays.	L4	CO4	6 M
UNIT-IV					
7	a)	Discuss with a neat circuit diagram of the percentage differential protection scheme to protect Y- Δ transformer.	L3	CO3	8 M
	b)	A 3- \emptyset transformer rated for 33KV/6.6KV is connected star/delta and the protecting current transformers on the low voltage side have a ratio of 400/5. Determine the ratio of the current transformers on H.V.side.	L4	CO4	6 M

OR					
8	a)	Illustrate the rotor faults in an alternator. Briefly discuss the protection schemes employed for these faults.	L3	CO3	8 M
	b)	Infer the operation of differential protection of bus bars with diagram.	L4	CO4	6 M
UNIT-V					
9	a)	Discuss the drawbacks of ungrounded neutral systems. Also enumerate the effects of ungrounded neutral on system performance.	L3	CO3	8 M
	b)	Infer the differences between equipment grounding and system grounding.	L4	CO5	6 M
OR					
10	a)	Illustrate the protection scheme for transmission lines against direct lightning strokes.	L3	CO3	7 M
	b)	Interpret Resistance grounding method in neutral grounding.	L4	CO5	7 M