TED(21)-5033C **REVISION 2021**

Model Question Paper I

SWITCH GEAR & PROTECTION

Time: 3 Hour *Max.Marks: 75*

PART A

I. Answer **all** questions in one word or one sentence. Each question carries 1 mark.

1	Define fusing factor.	M1.02	R
2	What is an arc.	M1.03	R
3	Define pick up current in a relay.	M2.01	R
4	What is meant by relay operating time.	M2.01	R
5	List the name of any one type of electromagnetic relay.	M2.02	R
6	List any two motor faults.	M3.04	R
7	Name any two types of stator winding faults in an alternator.	M3.02	R
8	Define the term pilot wires with respect to transmission line protection.	M4.02	R
9	List any one cause of over voltage transients.	M4.03	R

PART B

II. Answer any **eight** questions from the following, each question carries 3 marks.

1	Outline any six advantages of SF6 circuit breaker.	M1.04	U
2	List the essential features of switch gears.	M1.01	R
3	Outline the basic requirements of protective relay.	M2.01	U
4	Compare primary and backup protection.	M2.01	U
5	Compare static and electromagnetic relays.	M2.04	U

6	Explain the overload protection of induction motors.	M3.04	U
7	What are the causes of overspeed and how alternators are protected from it.	M3.02	R
8	What is time graded overcurrent protection of parallel feeder.	M4.02	R
9	What are the requirements of transmission line protection systems.	M4.02	R
10	What are the bus bar faults and its scheme of protection?	M4.01	R

PART C

Answer ALL questions. Each question carries 7 marks.

III	Compare fuse and circuit breaker.	M1.02	U
	OR		
IV	Explain the construction and working of vacuum circuit breaker with a neat sketch.	M1.04	U
V	Illustrate the working of SF6 circuit breaker in detail with diagram.	M1.04	U
	OR		
VI	Outline the factors affecting the current carrying capacity of fuse element.	M1.02	U
VII	Explain construction and working of induction type overcurrent relay (non directional) with diagram.	M2.02	U
	OR		
VIII	Explain attracted armature type relay with diagram.	M2.02	U
IX	Explain differential protection of alternator with diagram.	M3.02	U
	OR		
X	Explain the Merz price circulating current protection of transformers.	M3.03	U
XI	Illustrate the working of Buchholz relay with diagram.	M3.03	U
	OR		
XII	Explain the short circuit protection of Motors.	M3.04	U

XIII	Explain the working of horn gap lightning arrester with diagram.	M4.03	U
	OR		
XIV	List the problems in busbar differential protection.	M4.01	R

TED(21)-5033C **REVISION 2021**

Model Question Paper II

SWITCH GEAR & PROTECTION

Time: 3 Hour *Max.Marks: 75*

PART A

III. Answer **all** questions in one word or one sentence. Each question carries 1 mark.

1	Define prospective current of a fuse.	M1.02	R
2	What is RRRV with respect to circuit breakers.	M1.04	R
3	What is selectivity of a relay.	M2.01	R
4	List an example of distance relay.	M2.03	R
5	The operating time of backup protection relay will be more than that of primary protection relays. Interpret the statement.	M2.01	U
6	List any one limitation of Buchholz relay.	M3.03	R
7	Name the relay used for overload protection of motors.	M3.04	R
8	What are the two types of lightning strokes.	M4.03	R
9	What is the working principle of time graded over current protection of feeders.	M4.02	R

PART B

IV. Answer any **eight** questions from the following, each question carries 3 marks.

1	List two methods of arc interruption in circuit breakers.	M1.03	R
2	Explain the classification of fuses.	M1.02	U
3	List any three features of directional relay.	M2.02	R
4	Classify relays based on time of operation.	M2.01	U
5	Draw and interpret the inverse time characteristic curve of a relay.	M2.01	U
6	Outline the various faults that would affect an alternator.	M3.02	U
7	List any three limitations of Buchholz relay.	M3.03	R
8	List three causes of bus bar faults.	M4.01	R
9	Explain time graded overcurrent protection for radial feeders.	M4.02	U
10	List any three harmful effect of lightning surges in power system.	M4.03	R

PART C

Answer ALL questions. Each question carries 7 marks.

III	Illustrate the construction and working of an oil circuit breaker with diagram.	M1.04	U
	OR		
IV	Explain the construction of HRC fuse with diagram.	M1.02	U
V	List the factors responsible for maintenance of arc in a circuit breaker and how to extinguish it.	M1.03	R
	OR		
VI	Explain the need of current limiting reactors and their arrangements.	M1.01	U
VII	Explain the working principle of distance relay.	M2.03	U
	OR		
VIII	Explain solenoid type electromagnetic relay with figure.	M2.02	U
IX	Explain the rotor earth fault protection in alternators.	M3.02	U
	OR		
X	Explain the limitations of Merz-Price protection.	M3.03	U
XI	Explain earth fault protection of a power transformer.	M3.03	U
	OR		
XII	Explain single phase preventer in three phase induction motors.	M3.04	U
XIII	Explain microprocessor based overcurrent relay with a block diagram.	M4.04	U
	OR		
XIV	Explain lightning protection by using overhead ground wires.	M4.03	U