

DEPARTMENT OF ELECTRICAL ENGINEERING

VISION:

To produce Electrical Engineer professionals who can contribute for socio-economic and technological development to meet global needs.

MISSION:

M1 - To strengthen academic infrastructure leading to quality professional by using modern technical tools and technologies.

M2 - To impart innovative knowledge among the students and make more industry-institution programs to make them successful professionals for serving the society.

M3 - To provide a learning environment to improve problem solving abilities, leadership abilities, ethical responsibilities and lifelong learning.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

PEO1: Apply electrical engineering knowledge and practical skills to solve well-defined engineering problems using modern tools and techniques.

PEO2: Perform effectively in industry and society as competent junior engineer, supervisors, or entrepreneurs with ethical and sustainable engineering practices.

PEO3: Demonstrate teamwork, communication, leadership, and project management skills in professional engineering activities.

PEO4: Engage in lifelong learning and adapt to emerging technologies for career growth and higher education.

PROGRAM SPECIFIC OUTCOMES

The electrical diploma engineers will be able to:

PSO1:- Apply the fundamentals of mathematics, science and engineering knowledge to identify, formulate, design and investigate engineering problems of electric circuits, analog and digital electronics, control system, electrical machines and power system.

PSO2:- Apply the appropriate techniques and modern engineering hardware and software tools in electrical engineering to engage in life-long learning and to successfully adapt in multidisciplinary environments.

PSO3:- Work professionally in power systems engineering, Electrical machinery and electrical circuit.

GOVERNMENT POLYTECHNIC ,BARGARH

Department Of Electrical Engineering

Semester: 6th. DIPLOMA
 Subject: SGPD
 Branch: Electrical Engineering

Session: (Summer)
 No of Period :75 (60 L+ 15 T)
 Name of Faculty: NITESH KU. ACHARYA

Week	Period	Topics to be covered
1	1	INTRODUCTION TO SWITCHGEAR: - Essential Features of switchgear.
	2	Switchgear Equipment
	3	Bus-Bar Arrangement. Switchgear Accommodation.
	4	Short Circuit
	5	Recall of period no. 1 to 4
2	6	Faults in a power system
	7	FAULT CALCULATION Symmetrical faults on 3-phase system.
	8	Limitation of fault current. Percentage Reactance.
	9	Percentage Reactance and Base KVA.
	10	Recall of period no. 6 to 9
3	11	Short – circuit KVA. Reactor control of short circuit currents.
	12	Location of reactors.
	13	Steps for symmetrical Fault calculations.
	14	Solve numerical problems on symmetrical fault.
	15	Recall of period no. 11 to 14
	16	Solve numerical problems on symmetrical fault.

4	17	FUSES Desirable characteristics of fuse element. Fuse Element materials.
	18	Types of Fuses and important terms used for fuses.
	19	Low and High voltage fuses
	20	Recall of period no. 16 to 19
5	21	Current carrying capacity of fuse element. Difference Between a Fuse and Circuit Breaker.
	22	CIRCUIT BREAKERS Definition and principle of Circuit Breaker
	23	Arc phenomenon and principle of Arc Extinction.
	24	Methods of Arc Extinction.
	25	Recall of period no. 21 to 24
6	26	Definitions of Arc voltage, Re-striking voltage and Recovery voltage.
	27	Classification of circuit Breakers. Oil circuit Breaker and its classification
	28	Plain brake oil circuit breaker.
	29	Arc control oil circuit breaker.
	30	Recall of period no. 26 to 29
7	31	Low oil circuit breaker Maintenance of oil circuit breaker.
	32	Air-Blast circuit breaker and its classification
	33	Sulphur Hexa-fluoride (SF6) circuit breaker.
	34	Vacuum circuit breakers.
	35	Recall of period no. 31 to 34
8	36	Switchgear component.
	37	Problems of circuit interruption
	38	Resistance switching. Circuit Breaker Rating.

	39	PROTECTIVE RELAYS Definition of Protective Relay, Fundamental requirement of protective relay.
	40	Recall of period no. 36 to 39
9	41	Basic Relay operation Electromagnetic Attraction type & Induction type
	42	Definition of following important terms. Pick-up current. Current setting. Plug setting Multiplier. Time setting Multiplier
	43	Classification of functional relays
	44	Induction type over current relay (non-directional)
	45	Recall of period no. 41 to 44
	46	Induction type directional power relay.
10	47	Induction type directional over current relay.
	48	Differential relay Current differential relay Voltage balance differential relay
	49	Types of protection
	50	Recall of period no. 46 to 49
	51	PROTECTION OF ELECTRICAL POWER EQUIPMENT AND LINES Protection of alternator, Differential protection of alternators
11	52	Balanced earth fault protection.
	53	Protection systems for transformer
	54	Buchholz relay
	55	Recall of period no. 51 to 54
	56	Protection of Bus bar. Protection of Transmission line.
12	57	Different pilot wire protection (Merz-price voltage Balance system)
	58	Explain protection of feeder by over current and earth fault relay
	59	PROTECTION AGAINST OVER VOLTAGE AND LIGHTING Voltage surge and causes of over voltage
	60	Recall of period no. 56 to 59
	61	Internal cause of over voltage. External cause of over voltage (lighting)