

GOVERNMENT POLYTECHNIC KORAPUT

(a) Th4. Testing and Maintenance of Electrical Machine

Name of the Course: Diploma in Electrical Engineering			
Faculty: Mahesh Kumar Biswal		Semester WEF - 10/03/2022 - 10/6/2022	
Course code:	Th4	Semester	6 th
Total Period:	75		
Theory periods:	4P/week	Examination	3hrs
Tutorial:	1 P / week	Internal Assessment :	20
Maximum marks:	100	End Semester Examination:	80

DEPARTMENT OF ELECTRICAL

Vision:-

To create competent and industry ready Electrical diploma engineers with professional and social values to meet future challenges.

Mission:-

- To prepare diploma holders through "qualitative competency based education system" to compete with national requirement along with core values
- To produce dynamic Electrical Engineers to serve the society and industry.
- To develop leadership qualities, communication skills, critical thinking and attitude for lifelong learning.

Program educational objectives:-

PEO1:	Apply technical knowledge and skills learned in the field of Electrical Engineering to excel in professional and/or higher education.
PEO2:	to provide students an excellent academic environment and make them aware the needs of Society and Industry to become a successful Professional/Entrepreneur.
PEO3:	To engage in lifelong learning, career enhancement to adopt emerging technologies

Course outcomes:-

Co1	Acquire knowledge of installation testing and demonstration of DC and AC Machines
Co2	To know about, safety measures and precautions during installation of different machine.
Co3	To learn the design, planning installation of indoor and outdoor substation.
Co4	Apply modern engineering tools to plan & carryout the different type of maintenance.



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TOPIC WISE DISTRIBUTION OF PERIODS

Sl. No.	Topics	Periods
1.	Installation, Commissioning and Testing of Machine	15
2.	Installation, Commissioning and Testing of Transformer	15
3.	Installation, Commissioning and Testing of substation	15
4.	Maintenance	15
TOTAL		60

LESSON PLAN

Week	Day	Theory topic
1 st	1 st	Installation, Commissioning and Testing of Machine: Inspection of arrival of machine and inspection procedure before its installation
	2 nd	Generalized procedure of installation of Electrical machines
	3 rd	Electric wiring for motors and switch gears
	4 th	General requirement for Electric Installation according to Indian Electricity rules
	5 th (Tutorial class)	Necessity of starters for DC machine
2 nd	1 st	Necessity of relays for AC machines
	2 nd	Necessity of starters for DC machine
	3 rd	Necessity of starters for AC machine
	4 th	Testing before giving supply to dc machine
	5 th (Tutorial class)	Testing before giving supply to ac machine
3 rd	1 st	Testing report of machine
	2 nd	Installation Commissioning and Testing of Transformer: introduction on transformer
	3 rd	Basic idea on dispatch, inspection of transformer.
	4 th	Basic idea on storage and handling of transformer.
	5 th (Tutorial class)	Civil construction feature regarding connection of transformer
4 th	1 st	Ventilation and noise level, space for free movement of transformer
	2 nd	Foundation and drainage of oil.
	3 rd	Cabling and cable box for transformer
	4 th	Provision for fire protection
	5 th (Tutorial class)	Provision for bushing support location of switch gear
5 th	1 st	Steps for commissioning fitting of all accessories

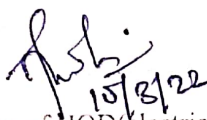
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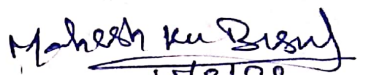
	2 nd	Filling of oil, drying out.
	3 rd	Charging the breather with fresh silica gel.
	4 th	Cleaning of bushing
	5 th (Tutorial class)	fixing of conductor & cables
6 th	1 st	fixing of conductor & cables, earthing of tank and cover, neutral earthing.
	2 nd	Fixing of protection circuits
	3 rd	setting of relays.
	4 th	Installation, Commissioning & Testing of Sub-station: Design and planning of indoor substation
	5 th (Tutorial class)	General requirement of layout of indoor substation with key diagram.
7 th	1 st	Consideration of safe operation of substation
	2 nd	Installation of outdoor substation
	3 rd	Selection of site, transport & receipt of transformer
	4 th	Checking of insulation resistance of the winding
	5 th (Tutorial class)	Testing of transformer oil, protection fittings, construction of mounting.
8 th	1 st	earthing arrangement and final commissioning.
	2 nd	Testing of substation.
	3 rd	Commissioning of substation.
	4 th	Installation of control panels
	5 th (Tutorial class)	Installation of relay panels
9 th	1 st	Preliminary preparation.
	2 nd	Sequence card for erection of switch gear equipments.
	3 rd	Location of place
	4 th	Unpacking
	5 th (Tutorial class)	Foundation
10 th	1 st	Erection
	2 nd	Relays
	3 rd	Bus-bar earthing connection
	4 th	Earthing.
	5 th (Tutorial class)	Connection to main cable.
11 th	1 st	Safety precaution
	2 nd	Installation of outdoor circuit breaker:
	3 rd	Receipt and storage
	4 th	Civil works for substation
	5 th (Tutorial class)	Various steps for installation of substation
12 th	1 st	Pre-commissioning tests
	2 nd	Maintenance: Fundamental of maintenance.
	3 rd	Preventive maintenance and planning.
	4 th	[Daily, Weekly, Monthly, Half-yearly and Yearly maintenance.]
	5 th (Tutorial class)	Advantages of Preventive maintenance



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13 th	1 st	Breakdown maintenance: List of tools
	2 nd	Instrumentation and materials used for maintenance.
	3 rd	Preparing Maintenance schedule of DC machines
	4 th	Preparing Maintenance schedule of Induction machine
	5 th (Tutorial class)	Preparing Maintenance schedule of Synchronous machines
14 th	1 st	Preparing Maintenance schedule of Transformer, and underground cable
	2 nd	Preparing Maintenance schedule of Transmission line, Distribution lines
	3 rd	Preparing Maintenance schedule of circuit breaker, SF6 circuit breaker
	4 th	Preparing Maintenance schedule Switch gear and protective relays and substations
	5 th (Tutorial class)	Batteries in substation
15 th	1 st	Revision of chapter 1
	2 nd	Revision of chapter 2
	3 rd	Revision of chapter 3
	4 th	Revision of chapter 4
	5 th (Tutorial class)	Previous year question paper discussion


Signature of HOD (Electrical)


Signature of Faculty