SUBJECT: DOMESTIC WIRING AND MOTOR INSTALLATION (DWMI)

CLASS XII
SEMESTER - III

THEORY

FULL MARKS – 20

(MCQ Type Question)

UNIT	Topic	No of periods assigned	Marks
1	**Safety**	9	4
2	**Classification of Electrical Engineering Materials**	9	4
3	**Symbols, Diagram & Rules**	9	4
4	**Different Tools and Equipment**	9	4
5	**Different Types of Wires and Protective Devices**	9	4

DETAIL SYLLABUS

UNIT	Topic / Sub Topic	No of periods assigned
1.	**Unit-1: Safety:** Safety Practices; Fires in electrical Circuits & Precautions, Classes of fire; Fire Extinguishers & its Types, GeneralSafety of Tools &equipment, Rescue of person who is in contact with live wire, Treat a person for electric shock/injury	9
2.	**Unit-2: Classification of Electrical Engineering Materials:** Classification of electrical materials, Properties of conducting materials, Name different conducting materials used for electrical engineering. 1. Different dielectric materials and Factors affecting dielectric strength. 2. General properties of insulating material, Name different insulating materials used for electrical purposes. 3. Introduction to Electronics: Familiarization of working with electronic components like resistors, Capacitor, Choke coil, Diode, Transistor.	9
3.	**Unit-3: Symbols, Diagram & Rules:** Studies of diagram & Symbols used in basic Electrical Circuits, Wiring & installations 1. Colour Code of carbon Resistors, different types of capacitors available and their rating and use.	9
4.	**Unit-4: Different Tools and Equipment:** 1. Screw driver pliers, cutting pliers, nose pliers,hammer, hand drill, hacksaw, wooden saw, knife ,chisel , files, wrench & spanner, pipe wrench, standard wire gauge, bench vice, pipe vices, conduitpipe cutters, micrometer, plumb bob, max puller , hand gloves blow lamp, Earthing rod with chain, test lamp, neon tester, Crimping Tools, Ammeter, Tung tester, voltmeter, multimeter (AVO). 2. Soldering iron, De-soldering pump.	9

5.	**Unit-5: Different Types of Wires and Protective Devices:** Types of wires, size of wire, Concept of gauge of wire, current carrying capacity, comparison between copper and aluminium wire, Choice of conductor material. 1. Different types of switches for electrical purposes. 2. Ordinary fuse, cartridge fuse, HRC fuse, cutout, Determination of Fuse size according to the load of circuit and its location, Use of Miniature circuit breaker (MCB), Earth leakage circuit breaker (ELCB).	9
	Total	**45**

SUBJECT: DOMESTIC WIRING AND MOTOR INSTALLATION

CLASS XII
SEMESTER - IV

THEORY

FULL MARKS – 30

(LAQ and SAQ Type Question)

UNIT	Topic	No of periods assigned	Marks
1	**Different Wiring System**	12	6
2	**Domestic Wiring Installation**	9	4
3	**Testing of Installation**	9	4
4	**Illumination**	12	6
5	**Electrical Installation of Motors**	12	6
6	**Electrical Earthing**	9	4

DETAIL SYLLABUS

UNIT	Topic / Sub Topic	No of periods assigned
1.	**DifferentWiringSystem:** 1. Cleat wiring, PVC casing and capping wiring, Concealed conduit and Surface conduit wiring. 2. Comparative discussion of above types of wiring and selection of specific type.	12
2.	**DomesticWiringInstallation:** 1. Wiring accessories, Main switch, Distribution board, Junction box, Switch board. 2. Sub-circuit, Positioning of wiring accessories, Simple light & Fan circuit, Power circuit, Stair case lighting circuits, Electrical wiring installation in buildings. 3. Estimation of wiring materials. (For domestic wiring upto two rooms)	9
3.	**Testing of Installation:** 1. Insulation resistance test between installation & earth, Insulation resistance test between conductors. 2. Polarity test of single poles witch, Earth continuity test, Earth resistance test. 3. Use of test lamp and meggar in fault location	9
4.	**Illumination:** 1. Laws of illumination, Luminous intensity, Illuminance, Luminous flux. 2. Factors affecting good illumination, Computation of illuminance at any point on working plane. 3. Different lighting schemes, Connection diagram of: Fluorescent lamp, high pressure sodium vapour lamp & high pressure Mercury vapour discharge lamp.	12
5.	**Electrical Installation of Motors:** 1. I.E. Rules for installation of power circuit, Guidelines for power circuit wiring in small industries. 2. Concept of three phase supply, Phase voltage, line voltage, testing of three phase voltage with test lamp and multimeter.	12

	3. Wiring diagram and single line diagram for A.C. motor installation, Materials required for single phase & 3-phase A.C. motor (upto 5HP) installation.	
6	**Electrical Earthing:** 1. Leakage current, Cause of earthing. Resistance of earth conductor. 2. Pipe earthing, Plate earthing.	9
	Total	**63**

Practical/ Project: 144 Periods [Practical – 40, Project – 10]

1. To make a chart of different fire extinguishers, and their use
2. To make a chart showing Dos and Don'ts of working with Electricity.
3. To make a chart of different tools used by a wireman and write their respective use. Identify the tools with actual.
4. To make a chart of different types of wires and protective devices used in electrical connection of residential places. Identify them in actual.
5. To calculate resistance values of colour coded resistors and check the values using a multimeter
6. To Skin different types of cable ends, Making various joints like twist joint, married joint, Tee joint in stranded conductors, Prepare T.W. Board for fixing Flush type accessories.
7. To assemble and make connection for single and twin fluorescent tube with electrical and electronic choke. Understand various faults and their remedies.
8. To make necessary connection for a ceiling fan and run it with necessary power supply, understand various faults and their remedies
9. To make wiring of lighting & power circuits using batten wiring. Test the installation before giving supply.
10. To make wiring of lighting & power circuits using conduit wiring. Test the installation before giving supply.
11. To make connections for controlling of light/ fan load from two or more points.
12. Measurement of earth resistance by earth tester.
13. To make wiring of single phase A.C. motor using D.O.L. starter and run the motor.
14. To measure phase and line voltage of a three phase supply and measure three phase current with a tong tester.
15. To make wiring of 3-phase A.C. motor (up to 5 HP) using D.O.L. starter and run the motor.
16. Measurement of illuminance at different working places by Lux meter. Hence make a comparative table from the above study.
17. To make the electrical connections of sodium vapour lamp & mercury vapour lamp.
18. To install and connect MCB, ELCB
19. Take the plan of two consecutive class rooms of your Institution with lights and fans as placed. Draw the wiring diagram (batten /conduit) of the two rooms for electrification starting from mains and make a list of the materials with specification required for the wiring.
20. Install an A.C. single phase one H.P motor using D.O.L starter & run it. The distance of the motor is 2 m. from the main distribution board. Draw the installation plan & make a list of materials with specification required for the installation.
21. Draw diagram of pipe earthing and plate earthing and show different parts in it.