Industrial Training Institute

ELECTRICIAN

सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

COMPETENCY BASED CURRICULUM

ELECTRICIAN

(Revised in 2017)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL - 5

SECTOR – ELECTRICAL

Industrial Training Institute

कौशल बलम्
Directorate General of Training

Skill India
कौशल भारत - कुशल भारत

	21.5 Determine the losses (iron loss and copper loss) and the regulation of a single phase transformer at different loads.
	21.6 Measure the current and voltage using CT and PT.
	21.7 Carry out winding for small transformer of 1KVA rating.
	21.8 Test the transformer oil with oil testing kit.
	21.9 Connect 3 single phase transformers for 3 phase operation of - a) delta-delta b) delta-star c) star-star d) star-delta.
	21.10 Connect the given two single phase transformers a) parallel b) series (secondary only) and measure voltage.
	21.11 Connect & test 3 phase transformer in parallel.(Parallel operation)
SEMESTER-III	
22. Plan, Execute commissioning and evaluate performance of DC machines.	22.1 Plan work in compliance with standard safety norms related with DC machines.
	22.2 Determine the load performance of a different type of DC generator on load.
	22.3 Connect, start, run and reverse direction of rotation of different types of DC motors.
	22.4 Conduct the load performance tests on different type of DC motor.
	22.5 Control the speed of a DC motor by different method.
23. Execute testing, and maintenance of DC machines and motor starters.	23.1 Test a DC machine for continuity and insulation resistance.
	23.2 Maintenance, troubleshooting & servicing of DC machines.
	23.3 Test armature by using growler.
	23.4 Maintain, service and trouble shoot the DC motor starter.
24. Plan, Execute commissioning and evaluate performance of AC motors.	24.1 Plan work in compliance with standard safety norms related with AC motors.
	24.2 Draw circuit diagram and connect forward & reverse a 3 phase squirrel cage induction motor.
	24.3 Start, run and reverse an AC 3 phase squirrel cage induction motor by different type of starters.
	24.4 Measure the slip of 3 phase squirrel cage induction motor by tachometer for different output. Draw slip / load characteristics of the motor.
	24.5 Determine the efficiency of 3 phase squirrel cage induction motor by no load test/ blocked rotor test and brake test.
	24.6 Plot the speed torque (Slip/Torque) characteristics of slip ring induction motor.
	24.7 Speed control of 3 phase induction motor.
	24.8 Connect, start and run a 3 phase synchronous motor.
	24.9 Connect start, run, control speed and reverse the DOR of

	different type of single phase motors.
	24.10 Install a single phase AC motor.
25. Execute testing, and maintenance of AC motors and starters.	25.1 Test continuity and insulation of various AC motors.
	25.2 Maintain, service and trouble shoot of three phase AC motors.
	25.3 Maintain, service and trouble shoot of different types of single phase AC motors.
	25.4 Maintain, service and trouble shoot the AC motor starter.
26. Plan, execute testing, evaluate performance and carry out maintenance of Alternator / MG set.	26.1 Plan work in compliance with standard safety norms related with Alternator & MG set.
	26.2 Connect start and run an alternator and build up the voltage.
	26.3 Determine the load performance of a 3 phase alternator.
	26.4 Start and load a MG set with 3 phase induction motor coupled to DC shunt generator and build up the voltage.
	26.5 Alignment of MG set.
	26.6 Preventive and breakdown Maintenance of alternator / MG set.
	26.7 Explain the effect of excitation current in terms of V-curves of synchronous motor.
27. Execute parallel operation of alternators.	27.1Parallel operation of an alternator , a. Bright lamp method c. Dark lamp method b. Bright and dark lamp method
	27.2 Parallel operation of an alternator by using synchroscope.
28. Distinguish, organise and perform motor winding.	28.1 Rewind the field coil & armature winding.
	28.2 a table fan and ceiling fan.
	28.3 Draw winding diagram & rewind a single phase split type motor (Concentric coil winding).
	28.4 Winding diagram & rewind a 3 phase squirrel cage induction motor (single layer distributed winding).
	28.5 Draw winding diagram & rewind a 3 phase induction motor (single layer concentric type half coil connection).
	28.6 Draw winding diagram & rewind a 3 phase squired cage induction motor. (Double layer distributed type winding)
SEMESTER-IV	
29. Assemble simple electronic circuits and test for functioning.	29.1 Practice soldering on components, lug and board with safety.
	29.2 Identify the passive /active components by visual appearance, Code number and test for their condition.
	29.3 Identify the control and functional switches in CRO and measure

	the D.C. & A.C. voltage, frequency and time period.
	29.4 Construct and test a half &full wave rectifiers with and without filter circuits.
	29.5 Construct circuit by using transistor as a switch.
	29.6 Construct and test a UJT as relaxation oscillator & electronic timer.
	29.7 Construct amplifier circuit using Transistor, FET and JFET and test.
	29.8 Construct and test lamp dimmer using TRIAC/DIAC.
	29.9 Test IGBT and use in circuit for suitable operation.
	29.10 Construct and test the universal motor speed controller using SCR with safety.
	29.11 Construct and test logic gate circuits.
30. Assemble accessories and carry out wiring of control cabinets and equipment.	30.1 Draw the layout diagram of 3 phase AC motor control cabinet.
	30.2 Mount the control elements & wiring accessories on the control panel.
	30.3 Practice wiring in control cabinet for local and remote control of induction motor.
	30.4 Draw & wire up the control panel for forward/ reverse operation of induction motor.
	30.5 Practice wiring for automatic start delta starter.
	30.6 Draw & wire up control panel for sequential motor control for three motors.
	30.7 Draw & wire up the control panel for a given circuit diagram and connect the motor.
	30.8 Test the control panel for all the required logics.
31. Perform speed control of AC and DC motors by using solid state devices.	31.1 Control the speed of DC motor by using DC drive.
	31.2 Speed control of universal motor by using SCR.
	31.3 Control speed and reverse the direction of rotation of different type of three phase induction motors using VVVF control /AC drive
32. Detect the faults and troubleshoot inverter, stabilizer, battery charger, emergency light and UPS etc.	32.1 Operation and maintenance of inverter.
	32.2 Troubleshoot, service and maintain a voltage stabilizer.
	32.3 Identify the parts, trace the connection and test the DC regulated power supply with safety.
	32.4 Troubleshoot and service a DC regulated power supply.
	32.5 Test battery charger for its operation.
	32.6 Prepare an emergency light.
	32.7 Carryout maintenance of UPS.

33. Plan, assemble and install solar panel.	33.1 Plan work in compliance with solar panel installation norms.
	33.2 Combination of solar cells for given power requirement
	33.3 Assemble and install solar panel.
	33.4 Check the functionality of solar panel.
34. Erect overhead domestic service line and outline various power plant layout.	34.1 Prepare single line diagram of thermal, hydel, solar and wind power plants.
	34.2 Prepare layout plan and single line diagram of transmission line.
	34.3 Draw an overhead and domestic service line.
	34.4 Erect an overhead service line pole for single phase 240v distribution system.
	34.5 Identify different type of insulator used in HT and LT line
	34.6 Fasten jumper in insulators.
	34.7 Connect feeder cable with domestic service line.
35. Examine the faults and carry out repairing of circuit breakers.	35.1 Prepare layout plan and single line diagram of Distribution substation
	35.2 Illustrate application of relays in control circuits and examine its operation.
	35.3 Identify parts of circuit breaker and check its operation.