

CBSE | DEPARTMENT OF SKILL EDUCATION

CURRICULUM FOR SESSION 2020-2021

AIR CONDITIONING & REFRIGERATION (SUB. CODE – 827)
JOB ROLE: SERVICE TECHNICIAN

RATIONALIZED CURRICULUM FOR CLASS XII

SESSION 2020-2021

Total Marks: 100 (Theory-60 + Practical-40)

	UNITS	NO. OF HOURS for Theory and Practical		MAX. MARKS for Theory and Practical
		Theory	Practical	Marks
Part A	Employability Skills			
	Unit 1 : Communication Skills-III	10		10
	Unit 2 : Self-Management Skills-III	10		
	Unit 3 : ICT Skills-III	10		
	Unit 4 : Entrepreneurial Skills-III	15		
	Unit 5 : Green Skills-III	05		
	Total	50		
Part B	Subject Specific Skills			
	Unit 1: Psychrometry	22	08	06
	Unit 2: Heat transfer and Air Distribution	25	10	07
	Unit 3: Components of Refrigeration Systems	35	15	14
	Unit 4: Electric controls	25	10	07
	Unit 5: Commercial Applications	24	06	08
	Unit 6: Air-Conditioning Systems & Maintenance	24	06	08
	Total	155	55	50
Part C	Practical Work			
	Practical Examination			15
	Written Test			10
	Viva Voce			05
	Total			30
Part D	Project Work/Field Visit			
	Practical File/Student Portfolio			10
	Total			10
	GRAND TOTAL	260		100

DETAILED CURRICULUM/ TOPICS FOR CLASS XII

PART-A: EMPLOYABILITY SKILLS

S. No.	Units	Duration in Hours
1.	Unit 1: Communication Skills-IV	10
2.	Unit 2: Self-management Skills-IV	10
3.	Unit 3: Information and Communication Technology Skills-IV	10
4.	Unit 4: Entrepreneurial Skills-IV	15
5.	Unit 5: Green Skills-IV	05
	TOTAL DURATION	50

NOTE: For Detailed Curriculum/ Topics to be covered under Part A: Employability Skills can be downloaded from CBSE website.

PART-B – SUBJECT SPECIFIC SKILLS

- ❖ Unit 1: Psychrometry
- ❖ Unit 2: Heat transfer and Air Distribution
- ❖ Unit 3: Components of Refrigeration Systems
- ❖ Unit 4: Electric controls
- ❖ Unit 5 : Commercial Applications
- ❖ Unit 6: Air-Conditioning Systems & Maintenance

UNIT 1 - PSYCHROMETRY

Psychrometric Processes – Sensible Cooling, Sensible Heating, Cooling with de-humidification, Cooling with adiabatic Humidification, Chemical-dehumidification, heating and humidification, Mixing of air- streams, **Air Washers. (To be assessed through practical only)**

UNIT 2 – HEAT TRANSFER AND AIR-DISTRIBUTION

1. Principles of heat transfer, Conduction, Convection and Radiation. Properties of insulating materials.
2. Air Distribution, Systems of air distribution, Duct systems, **cooling load and air-quantities pressure inducts, (To be assessed through practical only)** duct layout & construction.

UNIT 3 - COMPONENTS OF REFRIGERATION SYSTEMS

1. Condensers, Air cooled and water cooled, Evaporative Condensers, Heat Rejected in condensers, construction of condensers, Driers, receivers, Purging, Cleaning of Condensers.
2. Refrigerant Controls, Types of expansion devices and sensible heat factor, construction and operation of Automatic expansion valve, thermostatic expansion valve, and capillary tube, low side float valve, High Side float valve.
Solenoid valves, testing and adjusting thermostatic expansion valves. (To be assessed through practical only).
3. Evaporators, types of evaporators- Dry and flooded, Heat absorbed in evaporators, water chillers, brine coolers, **Methods of defrosting.(To be assessed through practical only).**
4. Refrigerants, their properties and nomenclature- R11, R12, R22, R502, R113, R114, R134A, ammonia, and carbon dioxide.

UNIT 4 – ELECTRIC CONTROLS

1. Refrigeration Controls, H.P. and L.P. cutouts, **Oil Pressure failure safety switch. (To be assessed through practical only).**
2. **Motor Starters, capacitors (To be assessed through practical only),** Relays, over load protectors and **servicing of motors. (To be assessed through practical only).**

UNIT 5 – COMMERCIAL APPLICATIONS

1. Ice-Manufacture, cold-storage, **Ice-Cream manufacture (To be assessed through practical only),** Dairy refrigeration etc.

UNIT 6 – AIR-CONDITIONING SYSTEMS AND MAINTENANCE

1. Air-Conditioning systems and equipments, classification of air-conditioning systems-all air systems, all water system types, Fans, Blowers, grills, resistors, filters, compressors, cooling coils, condensers Air-Handling Units, Fan coil Units, Central Air Conditioning plants. **Ventilation Systems. (To be assessed through practical only).**
2. **Leak Detection, Pressure testing and charging. (To be assessed through practical only).**