

**INDIRA TECHNICAL EDUCATION SOCIETY,
NASHIK**

**DIPLOMA AIR-CONDITIONING & REFRIGERATION ENGINEERING
SERVICES
(DACRES)**

THEORY PAPER I : Syllabus for this paper is same as Certificate Course in 100 Marks
AIR-CONDITIONING & REFRIGERATION MECHANIC (ACRM)
Refer this syllabus booklet Page No. _____

THEORY PAPER II : Syllabus for this paper is same as Certificate Course in 100 Marks
AIR-CONDITIONING & REFRIGERATION TECHNICIAN (ACRT – II)
Refer this syllabus booklet Page No. _____

THEORY PAPER III : Theory syllabus for this Diploma Paper III is 100 Marks
Printed below

PRACTICAL I & II : Practical No. – I is same as ACRM 100 Marks
Practical No. - II is based on paper II & III with visit report. 100 Marks
(Total – 500 Marks)

(DACRES - PAPER – III)

[DACRES – III / ADACRES - III]

THEORY SYLLABUS

1. REFRIGERANT FLOW CONTROL DEVICES (FLUID):

- 1) Accumulator, Receiver, Heat exchanger, oil separator, Oil heater, Refillable drier, sight glass, By pass valve, check (Non return) valve, Solenoid valve.
- 2) Safety Control: Pressure switches (High & low) fusible plug & pressure relief valve, Anti freezer Thermostat, Oil safety switch, Electrical over lodes, Timers etc.

2. COOLING TOWERS:

- Introduction, Working principle, Construction, Application & maintenance of
- 1) Natural draft cooling towers.
 - 2) Induced draft cooling towers.
 - 3) Forced draft cooling towers.

3. EVAPORATOR:

Study construction & working of following Industrial evaporators dry expansion evaporator & Flooded type evaporator, Bare type, Plate type, Finned type, chiller, shell and tube coil, Tube in tube type flooded evaporator, Direct expansion evaporator, Baud lot evaporator, Tank & coil evaporator.

4. DE-FROSTING:

Evaporator de-frosting, Manual, Spray water, Electrical heater, Hot gun defrosting pump down system, Brine circulation.

5. REFRIGERANT:

Study of various types of Industrial Refrigerants like R-134 A, R-402A, R-717, Ammonia, NH₃, R-744, Carbon dioxide, Halogen free refrigerant, Secondary refrigerant, Anti freeze solutions, Ethylene, Glycol, Glycerin, Methanol, Alcohol.

6. LUBRICATION & INSULATION:

Properties of good lubricants good lubrication oil for refrigeration. Good insulating materials Functions a applications of insulators. Properties of good lubricating materials Methods of Insulations for pipe line, walls, Ducting, Chillers etc.

7. ELECTRICITY:

Introduction to three phase motors squirrel cage & wound rotor. Construction & working Principle of D.O.L & star delta starters. Study of Autotransformer, Slip tangterter, Stabilizer, energy Meter. E.L.C.B, M.C.B, O.L.C.B, Earthling pipe and plate method.

8. FOOD PRESERVATION:

Concept of food preservation, Preservation, Short term & long-term food preservation Frozen food, Immersion, Air blast, Display unit, Deep freezer, Walk-in-cooler, reach-in-Cooler.

9. MULTI TEMP SYSTEM:

Concept of multi-temp system, Applications of multi-temp system, Two compressor, Cascade condenser type & Three compressor & one evaporator type system. Advantages & Disadvantages of multi temp systems.

10. COMMERCIAL AIR-CONDITONING:

Introduction concept of central air-conditioning Building ducting, Air flow, Types of fans, load calculations. Electrical circuit diagram, Control circuit, Package air-conditioning. Use of psychometric chart only introduction.

SCHEME OF EXAMINATION :

Theory Three Papers	3 hours	100 Marks each
Practical No. 1	2 hours	75 Marks Practical
Journal		15 Marks
Oral		10 Marks
Practical No. 2	2 hours	50 Marks Practical
Visit Report		30 Marks
Oral		20 Marks
	Total	500 Marks

GUIDELINE FOR PAPER SETTER (THEORY PAPER – III)

Q. 1 Compulsory Objective 20 Marks.
To set Q. 2 to Q. 8 Each 16 Marks
To solve any five questions

