

**INDIRA TECHNICAL EDUCATION SOCIETY,  
NASHIK**

**ADVANCE DIPLOMA AIR-CONDITIONING & REFRIGERATION  
ENGINEERING SERVICES  
( ADACRES )**

<b>THEORY PAPER I :</b>	Theory syllabus for this Diploma Paper I is same as AIR-CONDITIONING & REFRIGERATION MECHANIC (ACRM / DACRES – I ) Refer this syllabus booklet Page No. _____	100 Marks
<b>THEORY PAPER II :</b>	Theory syllabus for this Diploma Paper II is same as AIR-CONDITIONING & REFRIGERATION TECHNICIAN (ACRT – II / DACRES – II ) Refer this syllabus booklet Page No. _____	100 Marks
<b>THEORY PAPER III :</b>	Theory syllabus for this Diploma Paper III is same as DIPLOMA AIR-CONDITIONING & REFRIGERATION ENGINEERING SERVICES (DACRES – III) Refer this syllabus booklet Page No. _____	100 Marks
<b>THEORY PAPER IV :</b>	Theory syllabus for this Diploma Paper IV is Printed below.	100 Marks
<b>PRACTICAL I &amp; II :</b>	Practical No. – I is same as ACRM Practical No. – II is based on Paper II & III	100 Marks 100 Marks

**( Total : 600 Marks )**

**( ADACRES - PAPER – IV )**

**THEORY SYLLABUS**

**SECTION - I**

- AIR-CONDITIONING :**
  - ❖ Definition application of air-conditioning.
  - ❖ Applications of air-conditioning.
- BODY COMFORT :**
  - ❖ Generation of heat in human body.
  - ❖ Heat rejected by convection, radiation and evaporation by body.
  - ❖ Various condition affecting body heat like temperature humidity, air movement etc.
- AIR CYCLE :**
  - ❖ Describe typical cycle for cool air too hot air, too wet air, too dry air.
  - ❖ Various terms related to air cycle winter operations, summers operation.
  - ❖ Cooling and removal of moisture.

### **REFRIGERATION CYCLE :**

- ❖ Describe refrigeration cycle, Cooling coil, Compressor. Suction. Discharge, Condenser expansion devices.

## **2. PSYCHROMETRY AND PSYCHROMETRIC CHART :**

### **PSYCHROMETRY :**

- ❖ Various terms related to psychrometry.
- ❖ Dry bulb temperature, wet bulb temperature,
- ❖ Relative humidity
- ❖ Dew point, grains of moisture
- ❖ Relationship between various terms

### **PSYCHROMETRIC CHART :**

- ❖ Study of Psychrometric chart.
- ❖ Identification of lines and scales and other components in the chart.
- ❖ Application of the chart in air conditioning.
- ❖ Simple calculation with the help of chart

### **PSYCHROMETRIC PROCESS :**

- ❖ Latent heat, Sensible heat, Specific heat, Specific volume, Enthalpy, Entropy.

## **3. PRINCIPLE OF LOAD ESTIMATION :**

- ❖ Sources of heat, Ventilation, Infiltration, light and walls.

### **ESTIMATING AIR CONDITIONING LOAD :**

- ❖ Factors affecting the load like, building design, size, shape material etc.
- ❖ Simple problems are expected (calculations)

## **4. AIR DISTRIBUTION :**

- ❖ Methods of air distribution
- ❖ Ducting, fan, outlets
- ❖ Types of ducting.
- ❖ Material used for ducting
- ❖ Factors affecting, designing of ducting, Calculation of duct size,
- ❖ Air velocity calculation.

## **SECTION - II**

### **A) AUTOMOBILE AIR-CONDITIONING :**

- ❖ Introduction, Purpose of automobile A/C. Application of auto air-conditioning.
- ❖ Operating conditions (summer & winter)
- ❖ Heating & Cooling Capacity of Car A/C.
- ❖ Operating controls & their functions.
- ❖ Various systems used in car A/C.

### **B) COMMERCIAL REFRIGERATION :**

- ❖ Food preservation by refrigeration
- ❖ Advantageous method of food preservation.
- ❖ Commercial and industrial systems of food preservation.
- ❖ Display units.
- ❖ Walking coolers.
- ❖ Reach in refrigeration
- ❖ Deep freezer etc.
- ❖ Cold storage and cold rooms.
- ❖ Simple Designing and Cole designing.

**C) HEATING, VENTILATION AND AIR CONDITIONING (HVAC)**

- ❖ Concept of HVAC
- ❖ Desire range of air temperature acceptable humidity
- ❖ Bacteria and odor level.
- ❖ Air motion.
- ❖ Sensible heating and cooling.
- ❖ Dehumidification.

