

**DEMAND****PAVIATH INTEGRATED SOLUTION****CIVIL ENGG****CIVIL POLY****WATER RESOURCES MANAGEMENT****Paviath ONLINE****◆ CIVIL POLY ◆ III YEAR ELECTIVE ◆ CODE CEM53.4****OBJECTIVE**

- IDENTIFY THE COMPONENTS OF HYDROLOGICAL CYCLE AND HYDROGRAPH.

- EXPLAIN MEASUREMENT OF RAINFALL.

- EXPLAIN THE OCCURRENCE OF GROUND WATER AND GROUND WATER EXPLORATION METHODS.

- DESCRIBE THE GROUND WATER BASIN MANAGEMENT CONCEPT.

- EXPLAIN THE CLASSIFICATION OF RIVERS AND RIVER TRAINING WORKS.

- IDENTIFY THE DIFFERENT TYPES OF STORAGE WORKS AND DAM STRUCTURE.

- SKETCH THE DISTRIBUTION SYSTEM OF CANALS AND MANAGEMENT OF CANAL IRRIGATION.

- LIST OUT THE CONCEPT OF WATER SHED MANAGEMENT INCLUDING DIS APPROACH.

- EXPLAIN THE TYPES OF DETENTION BASINS AND RECLAMATION OF WATER LOGGED LANDS.

- DESCRIBE THE WATER RESOURCE POTENTIAL IN INDIA AND NEED FOR WATER RESOURCES MANAGEMENT.

1.1 INTRODUCTION

WATER RESOURCES - WORLD WATER INVENTORY - IMPORTANCE OF WATER RESOURCES - NECESSITY FOR CONSERVATION AND DEVELOPMENT OF WATER RESOURCES - WATER RESOURCES OF INDIA - WATER RESOURCES MANAGEMENT - PURPOSE - FACTORS INVOLVED IN WATER RESOURCES MANAGEMENT.

1.2 HYDROLOGY

INTRODUCTION - DEFINITION - APPLICATION OF HYDROLOGY IN ENGINEERING - HYDROLOGICAL CYCLE - PRECIPITATION - FORMS OF PRECIPITATION - MEASUREMENTS OF RAINFALL - RAIN GAUGE - TYPES OF RAIN GAUGES RAIN GAUGE NETWORK - MEAN RAINFALL OVER A DRAINAGE BASIN - METHODS RADAR AND SATELLITE MEASUREMENTS OF RAINFALL - HYDROGRAPH

1.3 RUNOFF

RUNOFF - RUNOFF CYCLE - RUNOFF COMPONENTS - FACTORS AFFECTING RUNOFF - MONTHLY AND ANNUAL ESTIMATION OF RUNOFF - LOSSES

2.1 GROUND WATER

GROUND WATER RESOURCES - ZONES OF GROUND WATER - AQUIFER - TYPES - TERMS USED - POROSITY, PERMEABILITY, YIELD, SPECIFIC YIELD, SPECIFIC RETENTION, COEFFICIENT OF STORAGE, SPECIFIC CAPACITY - DARCY'S LAW-MEASUREMENT OF YIELD OF WELL - PUMPING TEST - RECUPERATION TEST - GROUND WATER EXPLORATION - GEOPHYSICAL METHODS - ELECTRICAL RESISTIVITY METHOD - SEISMIC RESISTIVITY METHOD - LOGS.

2.2 MANAGEMENT OF GROUND WATER

CONCEPT OF BASIN MANAGEMENT - GROUND WATER BASIN INVESTIGATIONS - DATA COLLECTION AND FIELD WORK - MINING YIELD - PERENNIAL YIELD - SALT BALANCE - BASIN MANAGEMENT BY CONJUNCTIVE USE - ARTIFICIAL RECHARGE OF GROUND WATER - RECHARGE METHODS

3.1 SEEPAGE ANALYSIS AND SEEPAGE BELOW HYDRAULIC STRUCTURE

SEEPAGE ANALYSIS - INTRODUCTION - HEAD, GRADIENT AND POTENTIAL - HYDRAULIC GRADIENT - SEEPAGE PRESSURE - UPWARD FLOW (QUICK CONDITION OR QUICK SAND) - TYPES OF FLOW LINES - TYPES OF FLOW (DEFINITION ONLY) - TWO DIMENSIONAL FLOW (LAPLACE EQUATION) - VELOCITY POTENTIAL - PROPERTIES OF FLOW NET - USES OF FLOW NET - SEEPAGE BELOW HYDRAULICS STRUCTURES - INTRODUCTION - HYDRAULIC GRADIENT - PIPING - EXIT GRADIENT - KHOSLA'S THEORY - SEEPAGE FLOW NETS BELOW HYDRAULIC STRUCTURES.

3.2 BEARING CAPACITY AND SETTLEMENT OF FOUNDATION
BEARING CAPACITY - INTRODUCTION - TERMINOLOGY - FACTORS AFFECTING BEARING CAPACITY OF SOILS - METHODS OF DETERMINING BEARING CAPACITY - TYPES OF FAILURE IN SOIL - GENERAL, LOCAL AND PUNCHING SHEAR FAILURE - ANALYTICAL METHODS RANKINE ANALYSIS - TERZAGHI'S ANALYSIS - ASSUMPTION AND LIMITATIONS - EFFECT OF WATER TABLE - METHODS OF IMPROVING BEARING CAPACITY OF SOIL - SETTLEMENT OF FOUNDATION - INTRODUCTION - CAUSES AND EFFECT OF SETTLEMENT - PLATE LOAD TEST - SIMPLE PROBLEMS.

4.1 DISTRIBUTION WORKS

IRRIGATION CANAL - TYPICAL CROSS SECTION OF CANAL - COMPONENTS OF CANAL SECTION - CLASSIFICATION OF CANAL - ALIGNMENT OF CANAL - CANAL HEAD WORKS - TYPES - COMPONENTS OF DIVERSION HEAD WORKS - CROSS DRAINAGE WORKS - TYPES - CANAL LOSSES - LINING OF CANAL - NECESSITY - TYPES OF LINING.

4.2 MANAGEMENT OF CANAL IRRIGATION

5.1 INTRODUCTION
WATERSHED DEFINITION - CLASSIFICATION - BASIC FACTORS INFLUENCING WATERSHED DEVELOPMENT - CHARACTERISTICS OF WATERSHED MANAGEMENT - WATERSHED WORK PLAN.

5.2 WATERSHED MANAGEMENT

ROLE OF REMOTE SENSING AND GIS IN WATERSHED MANAGEMENT - SOIL AND WATER CONSERVATION - NECESSITY - SOIL EROSION - CAUSE - EFFECTS - REMEDIAL MEASURE AGAINST EROSION - CONTOUR BUNDING - STRIP CROPPING - BENCH TERRACING - CHECK DAMS - VEGETATED WATER WAY - AFFORESTATION - CROP RESIDUE - LAND DRAINAGE - SURFACE DRAINS - SUB SURFACE DRAIN.

5.3 WATER HARVESTING AND RECYCLING**TEXT BOOK:**

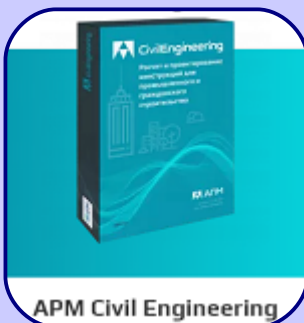
1. B.C.PUNMIA, "SOIL MECHANICS AND FOUNDATION ENGINEERING", LAXMI PUBLICATIONS (P) LTD., 2005

2. SWAMISARAN, "ANALYSIS AND DESIGN OF SUBSTRUCTURES" (LSD) - SECOND EDITION 2010

REFERENCE BOOK:

1. V.N SMURTHY, "SOIL MECHANICS & FOUNDATION ENGINEERING" - SAI KRIPA TECHNICAL CONSULTANTS

2. DR S.B. SEHGAL, "A TEXT BOOK OF SOIL MECHANICS", CBS PUBLISHERS & DISTRIBUTORS WAYNE C.T. "FOUNDATION DESIGN", PRENTICE HALL OF INDIA (P) LTD.,

**APM Civil Engineering****STC APM**

**SYLLABUS COACHING
TRAINING - 2/UNIT TRAINING
SELF - 4/UNIT ASSIGNMENT
PRESENTATION - 2/UNIT
SHOWTIME - 2/UNIT**

MATHS ILLUSTRATION - GEOMETRY EXPRESSIONS**ASCON RENG**

**SYLLABUS PERIOD
TRAINING - 2/2 HRS/UNIT
REMOTE - 2/2 HRS/UNIT
DURATION - SEMESTER
ONLINE/REMOTE ACCESS**

MECHANICAL EXPRESSIONS - ANALYTIX CAMS**ARCADIA BIM**

**FEATURES
TRAINING BY IND. PROFESSIONAL
INDUSTRY APPLICATION
TRAINER OPPORTUNITY
CERTIFICATION**