CONTACT PERIODS: 4 (LECTURE) PER WEEK

DURATION OF EXAM : 3 HRS

THEORY MARKS: 100

PROGRESSIVE MARKS : 50

Objective:

To impart the knowledge and skills required for understanding the building services of water supply and sanitation and their integration with architectural design.

Outline:

Water Supply – Introduction, sources of water supply, qualitative and quantitative aspects, impurities, purification – sedimentation, coagulants, filtration, disinfection, water softening and miscellaneous treatment of water. Sources of water pollution and preventive measures. Public water distribution system, methods of layout of distribution pipes.

Pipe sizes, fittings, valves, types of taps, wash basins, sink, bath tubs, flushing cistern. Domestic water supply systems – mains, ferrules, service pipe, water meter, sump, pumps, overhead tank, distribution pipes, cold water and hot water supply for single and multistoried buildings,. Provision for fire fighting – fire hydrants. Study of solar heating systems, gas and electric geysers.

Sanitation – Introduction, importance and purpose of sanitation, definitions – bacteria, invert, sewer, sewerage, types of refuse, collection and disposal of refuse, systems of drainage – separate, combined and partially separate system, advantages and disadvantages of each system. Sanitary requirements for various types of buildings, types of pipes.

Man holes – drop manholes, manhole with intercepting trap, inspection chambers, self cleansing velocity, drains on sloping sites, sub soil drainage, storm water disposal – catch basins, inlets, storm water regulators.

Importance of pumps and sewage pumping stations, septic tanks – soak pit, soak well, design aspects, disposal of effluent.

House drainage – principles, traps-floor trap, multi-trap, gully trap, grease and oil trap, urinals, Indian, European, Anglo Indian type of water closet, squatting urinal, bidet

Definitions – Siphonage, anti-siphonage pipe, cowl, fresh air inlet, soil and waste pipes, vent pipe

Systems of plumbing – single stack, one pipe, one pipe partially ventilated, two pipe disposal of waste water from buildings – typical plan of residence with garage – showing all the traps, inspection chambers, pipes connected to public sewer line – alternatively connecting the same layout of pipes to septic tank.

Testing of drains and drain pipes

Brief study - Natural methods of sewage disposal – by dilution and land treatment, self purification of natural waters, oxidation, sewage treatment, oxidation ponds, aqua privy, garage drainage and layout of simple drainage systems, sewers, materials, laying and testing of sewers, ventilation of sewers, surface drains, sewer, cleaning of sewers, re-cycling of sewage water. Rain water harvesting.

Rural sanitation, biogas, different methods of collection and disposal of dry refuse and night soil

Site visits – Water treatment plant, sewage treatment plant, multistoried apartments for studying water supply and sanitary arrangements.

References:

1) “Sanitary Engineering – (Vol I and II)” by RS Deshpande

2) “Water supply and Sanitary Engineering” by S Birdii

3) “Relevant IS Codes of India”