

Indian Institute of Technology, Kharagpur

Mid-Spring Semester Examination
Session 2010-2011
Subject No. AR22004
Subject name: Water Supply and Sanitation

Second Year B.Arch.
Time: 2 hours
Full Marks: 60
February, 2010

Question 1:

A real estate project on a 13 hectare site contains:

- a) 10 High-rise apartment buildings each with ground coverage of 3% of the site area and houses a residential population of 20,000. 40% of the site area is for landscaped gardens, and parks. The rest of the area is for roads and open parking. The site experiences rainfall of 1580 mm annually.
- i) Making necessary assumptions determine the surface runoff from the site after a heavy rainfall of 110 mm in two hours.
- ii) If the total surface runoff from annual rainfall on the site could be harvested will it be enough to meet the annual fire demand and the demand for public uses for this real estate project.

(10+10) = 20

Question 2:

Write short notes with supporting sketches wherever possible on:

- i) Location and storage capacity of impounded reservoirs.
- ii) Different types of intake.

(10+10) = 20

Question 3:

- a) Define porosity and permeability.
- b) Write a short note with supporting sketches on Dug/ Draw Well and explain with the help of Darcy's law, cone of depression for a dug well.
- c) During recuperation test the water level in an open well was depressed by pumping by 2.5 meters and is recuperated by an amount of 1.4 meters in 60 minutes. Determine the yield from the well if the diameter of the well is 2.5 meters under a depression head of 2 meters.

(6+6+8) = 20