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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST 1 EXAMINATION (February- 2016)
B. Tech. (VI- SEM.)

COURSE CODE: 10B11CE613 MAX. MARKS: 15
COURSE NAME: Sewage Treatment and Disposal
COURSE CREDIT: 4 MAX. TIME: 1 HR

Note: Attempt all Questions. Carrying of mobile phones during exams will be treated as case of unfair means. Assume suitable data if required.

1. A combined sewer of circular section has to serve an area of 200 hectares with a population of 100,000. The rate of water supply is 180 lpcd. The overall runoff coefficient is 0.45 and the time of entry and the time of flow of storm water are 10 and 20 minutes respectively. Assume Manning's constant as 0.013 and slope of 1/6000. Calculate the diameter of sewer. Assume the sewer is for half flow conditions. **(3)**

2. A 60 cm diameter sewer is required to flow at 0.4 depth on a grade ensuring a self cleansing equivalent to velocity of 85 cm/sec at full depth conditions. Calculate the required grade, associated velocity and discharge for full flow conditions and for d/D of 0.4. Assume Manning's coefficient of 0.013 constant with the depth. **(2+2)**

3. Find the minimum velocity and gradient required to transport coarse sand through a sewer of 60 cm diameter with sand particles of 1 mm diameter and specific gravity of 2.65. Assume k = 0.06, f =0.02, and n = 0.012. Assume sewer to run under half full conditions. **(1.5+1.5)**

4. Compare the conditions of CSO and SSO and explain the significance of each **(2)**

5. With a neat sketch, explain the suitability and drawbacks of fan type of collection system **(3)**