Seat No.: _____ Enrolment No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BPLAN – SEMESTER V– • EXAMINATION – WINTER 2016

Subject Code: 1055502 Date:22/10/2016

Subject Name: Planning and Management of Utility & Services

Time:10:30 AM to 12:30 PM Total Marks: 50

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Section-I : Theory		**35**
Q-1	Expand the abbreviations:	2
(a)	a) CPHEEO b) GIS	
(b)	What is water shed?	1
(c)	Convert Units: a) 1 hectare equals to how many acres? b) 1 acre equals to how many Sqm? c) 1 cum equals to how many cft? d) 1/4 day equals to how many seconds?	4
(d)	What are the two methods are generally employed for calculating the quality of storm water?	1
(e)	What will be value of "a" and "b" if duration storm is 1212 seconds?	2
Q-2	Write a short note on Hydrological cycle	5
Q-3	Provide illustrative diagram for storm water. List out the general assumptions to be considered while designing storm water system	5
Q-4	For water supply scheme answer the following: Provide purpose of pumps. List out the type of pumps List out the factors governs the choice of pumps. or List the type of methods in water distribution. Explain Gravity and pumping systems Combined in detail.	5
Q-5	Procedure of laying the water supply line or Provide short note on Air Valves & Bib Cocks	5
Q-6	What is Municipal solid waste? Explain components of municipal solid waste in detail. or	5

List various categories of waste water treatment. Explain any one in detail.

Section-II : Sums **15**

Q-7 A township (total area 250 Acres) consist of various surfaces as follow: 5

Type of surface	**% Area**
Area with many building	35
Pavement of Asphalt	30
Area with few building	15
Garden	10
Open Spaces	10

Impermeability factors for above areas are 0.72, 0.87, 0.13, 0.09 & 0.23 respectively.

Find out average runoff coefficient for whole area.

or

Workout the ratio of D.W.F. and W.W.F. of a town having the following particulars:

Area:2000 hectares
Water Supply rate: 175 LPCD
Population Density: 250 persons per hectares
Duration of storm:21 minutes
Average runoff coefficient:0.7
Assume that 55% of water supplies reaches the sewer.

Q-8 A city having catchment area of 35000 hectares and population density of 345 persons per hectare is supplied with water at the rate of 220 litres per capita per day. The intensity of rainfall is 30 mm/hour and average runoff coefficient is 0.73. If 75% of water supplied contributes to the sewage, determine the designed flow for combined sewer. Assume peak discharge factor 1.75. 5

or

A town having population of 0.02 million has sewage of D.W.F. 35 liters per second having average B.O.D. of 600 mg per 2.5 liters. The sewage contains industrial waste to the extent of 2.5 liters per second having total BOD of 240 kg per day. Find out the per capita B.O.D. load in kg per day.

Q-9 A township of 500 acres. The rainfalls on the surface having the following distribution and runoff coefficient: 5

Type of surface	**% Area**	**Runoff coefficient**
Roofs	25	0.90
Pavement of yards	15	0.80
Lawns & Gardens	30	0.15
Macadamized roads	15	0.40
Vacant Plots	15	0.10

a) Calculate the average Impermeable factor for the whole area.
b) Calculate the intensity of rain with rational method if the duration of the storm is 25 minutes.
c) Calculate the total quantity of storm water for whole day that will reach the sewer lines by rational method.

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