KATHMANDU UNIVERSITY
INTERNAL EXAMINATION I

Level : B.E. CE I-2 Course : ENVE 101
Time : 1 hrs 10 mins F.M. : 20 PM:8

**Attempt *ALL* questions. Make a logical assumption wherever required.**

(4 marks × 5Q = 20)

1. Define engineering project .What are the parameters considered while taking engineering decisions for a successful completion of engineering project?

   OR

   Define Recycle, Bypass and Purge stream with flow diagram.

2. A bar with volume 500 $m^3$ has 50 smokers in it, each smoking 2 cigarettes per hour. An individual cigarette emits, among other things about 1.4 mg of formaldehyde. Formaldehyde converts to carbon dioxide with reaction rate coefficient k = 0.40/hr. Fresh air enters the bar at the rate of 1000 $m^3$/hr and stale air leaves at the same rate. Assume the complete mixing (CSTR) and steady state conditions. Calculate the Output concentration ($C_{out}$) of the mixture.

3. A watershed system covers a surface area of 150 hectares and receives an average monthly precipitation of 1.5 inches. Calculate the average monthly evaporation (m/mo) from the system, given that the inflow to the system is 0.45 $m^3$/s and the outflow from the system is 0.38 $m^3$/s. The net change in water storage within the system is 25,000 $m^3$ over the month. Assume there is no seepage from the system.

4. Determine the combined discharge from the following data.

   Permeability = 40%
   Area to be served = 6, 00,000 sq. m.
   Population density = 1084 per ha.
   Rate of water supply = 120 lpcd
   Wastewater generation rate = 80% of rate of water supply
   Time of concentration = 23 mins
   Peak factor = 3

   If the velocity of flow is 1.5 m/s calculate the diameter of the pipe required in inches?

5. Describe the components of a typical water supply system with schematic diagram.

   OR

   Describe the components of sewer system with schematic diagram.