CLASS: BE   SEMESTER: VII
BRANCH: PROD./BIOTECH   SESSION : MO/2018

SUBJECT : CE7021 ENVIRONMENTAL ENGINEERING

TIME: 1.5 HOURS   FULL MARKS: 25

INSTRUCTIONS:
1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

Q1 (a) What is relationship between alkalinity and hardness?   [2]
   (b) Explain the process of coagulation.   [3]

Q2 (a) Give schematic to describe sewage treatment processes. Brief.   [2]
   (b) Explain activated sludge process (ASP) with the help of diagram.   [3]

Q3 (a) What is importance of chemical characteristics of municipal solid waste (MSW)? [2]
   (b) Discuss physical characteristics of MSW.   [3]

Q4 (a) Estimate the moisture content of a solid waste (100kg) with the following data: [2]

Component	Food wastes	Paper	Cardboard	Textile	Plastics	Wood	Garden wastes	Tin cans
Percent by Mass	14	40	9	7	9	6	10	5
Moisture content (%)	70	6	5	5	2	20	60	3

   (b) Using the data given below for a 1,000 kg MSW sample (ash content 5%), moisture content [3]
        (20%). calculate unit energy content (kJ/kg) on (i) discarded (ii) dry basis and (iii) ash-free
        dry basis.

Component	Food wastes	Paper	Cardboard	Textile	Plastics	Wood	Garden wastes	Tin cans
Percent by Mass	14	40	9	7	9	6	10	5
Energy Content (kJ/kg)	4800	16900	16500	18000	32500	18500	7200	700

Q5 (a) Explain Photochemical smog.   [2]
   (b) What is chemistry of ozone depletion? What is threat related with ozone depletion? [3]

Q6 (a) Calculate settling velocity of aspherical droplet of water with diameter 3 µm and estimate [2]
        the residence time of such particles if they are uniformly distributed in the lower 900 m of
        atmosphere and their removal rate is determined by how fast they settle in still air. Viscosity
        of air is 0.0172 g/m.s, g is 9.80 m/s^2.
   (b) What is greenhouse effect? What are the different greenhouse gases? What is their role? [3]

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