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H – 3262

Reg. No. :

Name :

Eighth Semester B.Tech. Degree Examination, November 2019

(2008 Scheme)

08.803 ENVIRONMENTAL ENGINEERING II (C)

Time : 3 Hours

Max. Marks : 100

PART – A

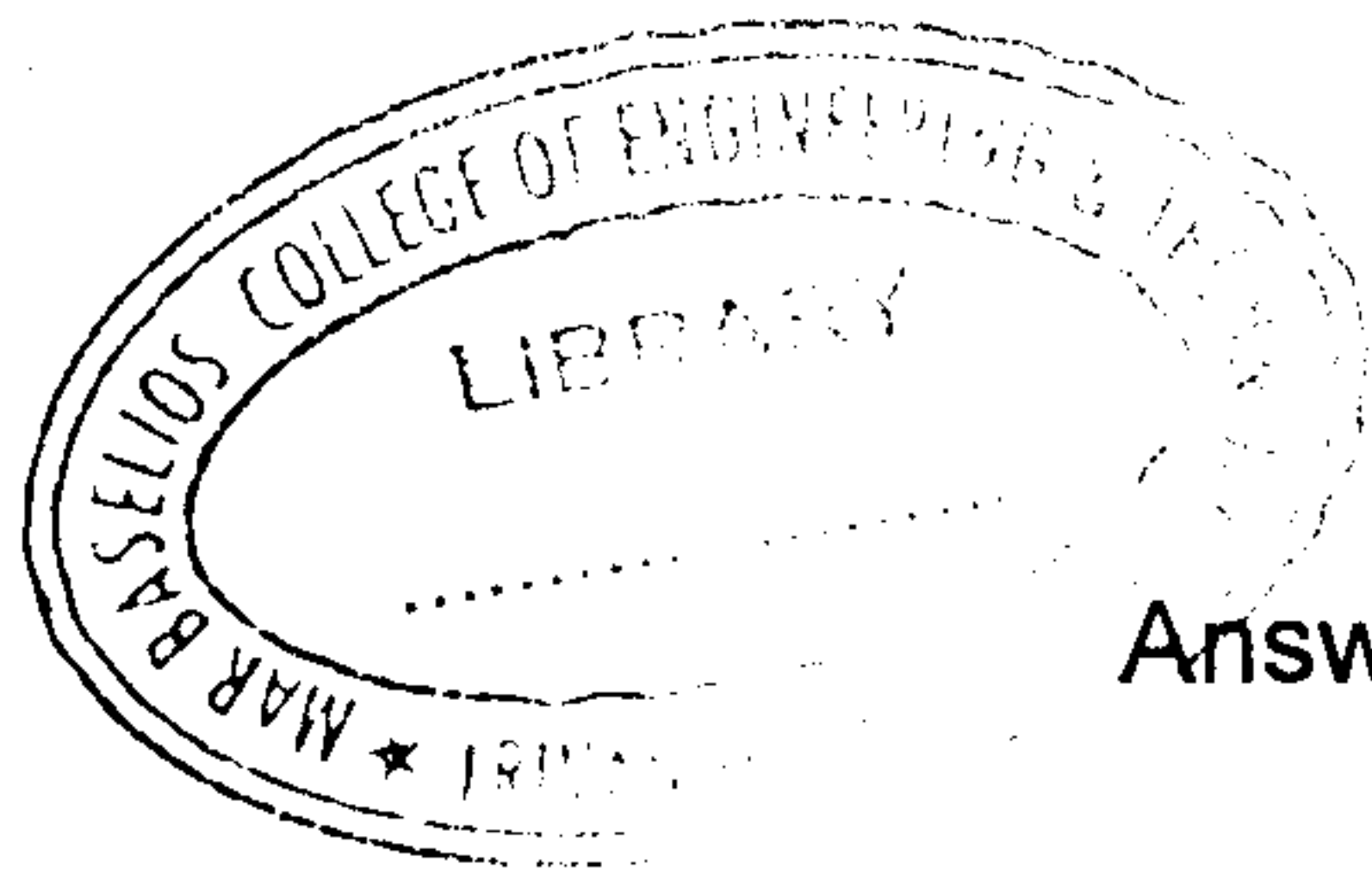
Answer **all** questions. Assume any suitable data if necessary.

1. Discuss oxygen sag curve.
2. Write a short note about inverted siphon.
3. Calculate the population equivalent of a city given the average sewage from the city is 95×10^6 litres/day, and the average 5-day BOD is 300mg/l.
4. How recirculation factor is different from recirculation ratio in a trickling filter design?
5. Define Sludge age. What is its significance?
6. Explain an Imhoff tank with its important design considerations.
7. Enumerate different sludge disposal methods.
8. What are the important principles of house drainage?

(8 × 5 = 40 Marks)

P.T.O.





PART – B

Answer **any one** full question from each module.

Module – I

9. (a) If the depletion of oxygen is found to be 5 mg/L after incubating 2.5ml of sewage diluted to 250 ml for 5 days at 20°C, determine the BOD of the sewage
- (b) If the period of incubation is 8 days at 20°C in the relative stability test on sewage, calculate the percentage of relative stability. Comment on the result.
- (c) Write a short note on self purification of streams bringing out zones of decomposition and forces causing purification. **(5 + 5 + 10 Marks)**

OR

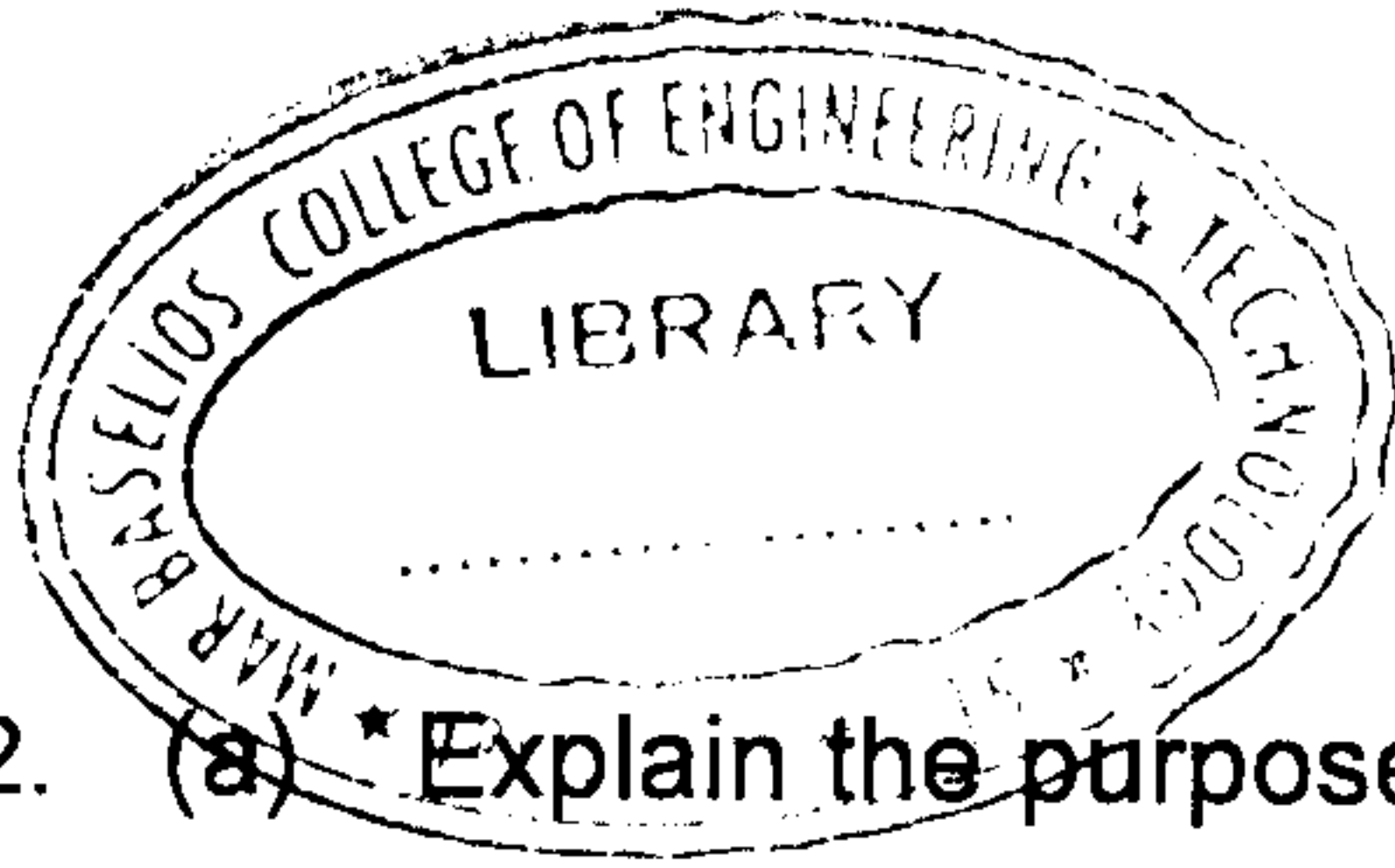
10. A city discharge 100 cumecs of sewage water in to a river, which is fully saturated with oxygen and flowing at the rate of 1500 cumecs during its lean days with a velocity of 0.1 m/sec. The 5-days BOD of the sewage at the given temperature is 280mg/l. Find when and where the critical DO deficit will occur in the downstream portion of the river and what is its amount. Assume coefficient of purification of the stream as 4.0 and coefficient of deoxygenating as 0.1. Saturation DO at the given temperature is 9.2 mg/l. **(20 Marks)**

Module – II

11. (a) Compare the design and performance of a high rate trickling filter with that of a standard rate trickling filter.
- (b) An average operating data for conventional activated sludge treatment plant is as follows. Wastewater flow = 35000m³/d, Volume of aeration tank = 10900 m³, Influent BOD = 250mg/L, Effluent BOD = 20mg/L, Mixed liquor suspended solids(MLSS) = 2500mg/L, Effluent suspended solids = 30mg/L, Waste sludge suspended solids = 9700mg/L, Quantity of waste sludge = 220 m³/d. Based on these information determine.
- (i) F/M ratio
- (ii) Percentage efficiency of BOD removal
- (iii) Sludge age **(8 + 12 Marks)**

OR





12. (a) * Explain the purpose and working of a skimming tank in sewage treatment.
- (b) What are Screens in waste water treatment? How are they classified?
- (c) Design a septic tank for a population of 150 person provided with a water supply 180 litres per capita per day. **(5 + 5 + 10 Marks)**

Module – III

13. (a) Design an oxidation pond for treating sewage from a hot climatic residential colony with 5000 persons, contributing sewage @ 120 litres per capita per day. The 5 day BOD of sewage is 300mg/L.
- (b) Discuss different systems of plumbing in a building.
- (c) A circular sewer 2m diameter has to discharge of 2 m³/sec when flowing nearly full. What is the minimum required slope to initiate the flow? Assume Manning's n=0.015. **(10 + 5 + 5 Marks)**

OR

14. (a) Write a short note on sludge drying beds.
- (b) Discuss importance of moisture reduction in sludge treatment.
- (c) Design a sludge digestion tank for 20,000 people. The sludge content per capita per day is 0.068kg. The moisture of the sludge is 93%. The sp.gravity of the wet sludge is 1.02 and 4 percent of the digester volume is daily filled with the fresh sludge, which is mixed with the digested sludge.

(5 + 5 + 10 Marks)

