(*b*) Differentiate between attached growth and suspended growth processes used is waste water treatment. 5

7. (*a*) In a laboratory test of an waste water sample following results are available : 5

Initial Do = 6·8 mh/L, Final Do(after 5 days and 20° C)
Incubation = 1·9 mg/L, Dilution factor = 500,
compare 5 days 20° C BOD and ultimate BOD.

(*b*) What are intakes ? What are the various types of intake works ? Describe a river intake with the help of a neat sketch. 5

8. Write short notes on any *two* of the following : 5 × 2

(*i*) Natural Purification of water sources.

(*ii*) Fittings and fixures used is buildings.

(*iii*) Factors affecting per capita water demand.

(*iv*) Aeration Processes.

(Set-Q_1)

B.Arch - 5th
Building Services - I

Full Marks : 70

Time : 3 hours

Answer **Q. No. 1**, which is compulsory and any **five** from the rest

The figures in the right-hand margin indicate marks

1. Answer the following questions : 2 × 10

(*a*) What do you mean by SVI ?

(*b*) What are the functions of sludge digester ?

(*c*) Define oxygen-sag curve.

(*d*) Name four water borne diseases with their causatives.

(*e*) What is air binding ?

(*f*) Write down the function of an intake structure.

(g) What do you mean by self-cleansing and non -scouring velocity in a sewer ?

(h) What is surface loading ?

(i) A circular sewer is to carry 0·07 m^3/s when flowing half full and the slope is 6 m per km with $n = 0·013$, what will be the pipe size ?

(j) What are the components of sedimentation aided with co-agulation ?

2. (a) Define super chlorination and Break point chlorination. 5

(b) Calculate the velocity of flow and corresponding discharge in a sewer of circular crosssection with diameter of 1 m, laid in a gradient of 1 in 500. The sewer runs at 0·6 times depth. Use Manning's formula taking $k = 0·012$. 5

3. (a) Briefly discuss about gravity conduit and pressure conduit. 5

(b) What do you mean by co-agulation ? What are

the common co-agulants used ? Describe the chemical reactions involved and indicate the formulas for chemical reactions, the flocks formed. 5

4. (a) Under what circumstances, pumps are required ? What are the main classification of pumps ? 5

(b) What is partially combined system of sewerage ? Why is it considered most suitable for indian conditions ? 5

5. (a) Differentiate the drainage systems used for low rise and high rise buildings. 5

(b) Design a rapid gravity filter to treat 6 MLD of water. Assume any data needed suitably. 5

6. (a) Design a standard rate trickling filter to treat 10 MLD of sewage having BOD of 10 mg/L and suspended solids concentration of 210 mg/L. It is desired to produce a filter effluent having a BOD of 20 mg/L. Use recirculation ratio as 1·2 and assume any other suitable data. 5