

**ADAMAS UNIVERSITY, KOLKATA**  
**School of Engineering and Technology**  
**End Semester Examination (July 2020)**

**Name of the Program: B. Tech.**

**Semester: VIII**

**Stream: CE**

**Paper Name: Environmental Engineering II**

**Paper Code: ECE44102**

**Maximum Marks: 40**

**Time duration: 3 hrs**

**Total No of questions: 10**

**Total No of Pages: 02**

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**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
  2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
  3. Assumptions made if any, should be stated clearly at the beginning of your answer.
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***Answer all the Groups***

**GROUP- A**

**Answer all the questions**

**5 x 1 = 5**

1.
  - i) Name the type of wastewater from different sources like bathrooms, kitchens and wash basins.
  - ii) Name the type of sewerage system to be adopted in areas where light rains are uniformly distributed throughout the year.
  - iii) Name the component which reduced to form methane.
  - iv) What is the detention period of a septic tank?
  - v) State the minimum depth of septic tank as per standard design consideration.

**GROUP- B**

**(Short Answer Type Questions)**

Answer *any Three* of the following

**3 x 5 = 15**

2. Define sewerage. Name the three sewerage system types. Which sewerage system type is more acceptable in current scenario and discuss briefly.  $1 + 1\frac{1}{2} + 2\frac{1}{2} = 5$
3. Define (**any Two**) from the following terms in details:  $2\frac{1}{2} + 2\frac{1}{2} = 5$ 
  - (a) Coagulant
  - (c) COD

- (d) Influent  
(e) Activated sludge
4. Calculate velocity of flow and corresponding discharge in circular sewer having diameter of 1m laid at a gradient of 1 in 400. The sewer is running at 0.5m depth. [Take  $N=0.012$  in manning's formula]. 5
5. Write short notes on "algae – bacteria symbiosis" with reference to a facultative stabilization pond. 5
6. State the characteristics of domestic sewage in respect of **any two** of the following:  
 (a) Total solids  
 (b) Settleable solids  
 (c) BOD  $2\frac{1}{2} + 2\frac{1}{2}=5$

### **GROUP– C**

#### **(Long Answer Type Questions)**

Answer **any Two** of the following

**2 x 10 = 20**

7. Write short notes (**any Two**) from the following:  $5+5=10$   
 (a) Trickling filters  
 (b) Aerated lagoons  
 (c) Oxidation ditch  
 (d) MBBR
8. Design a septic tank having the following data: 10  
 Number of users = 200  
 Rate of water supply = 150 lit/head/day  
 Detention period = 18 hours  
 Percolating capacity of filter media =  $1250 \text{ lits/m}^3$
9. What do you mean by Activated sludge? Discuss on the flow scheme and mixing regime for the recent trend with MBR process instead of conventional activated sludge process.  $2+8=10$
10. Describe the disposal process of solid waste by composting method. 10

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**ADAMAS UNIVERSITY**  
**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: B. Tech

Semester: VIII

Stream: CE

PAPER TITLE: Construction Planning & Management

PAPER CODE: ECE44104

Maximum Marks: 40

Time duration: 3 Hours

Total No of questions: 08

Total No of Pages: 02

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- 

***Answer all the Groups***

**Group A**

Answer all the questions of the following

**5 × 1 = 5**

1. a) How do the concrete mixers are specified?  
b) Name some suitable equipment for excavating solid rocks.  
c) What is the expected life of a wheel tractor?  
d) Write full name of PERT.  
e) What are the informations obtained from Gantt Chart?

**GROUP –B**

**(Short Answer Type Questions)**

Answer *any three* of the following

**3 × 5 = 15**

2. Discuss role of decision in project management.
3. Compare PERT and CPM.
4. What are the shortcomings of a bar chart?
5. What are the different types of handling equipments?

**GROUP –C**

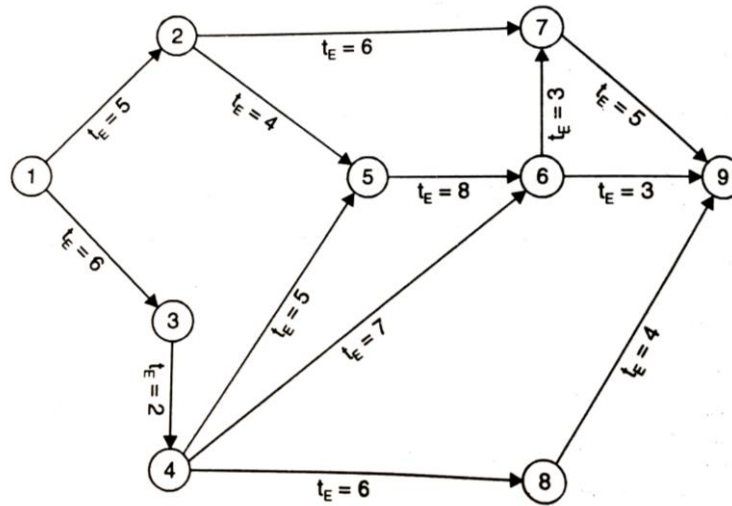
**(Long Answer Type Questions)**

Answer *any two* of the following

**2 × 10 = 20**

6. a) What do you understand by 'Dummy'? What are its use? [3+2+5=10]  
b) A project consists of 8 activities M, N, O, P, Q, R, S and T. Draw the network diagram and number the events if:  
i) Activities M, N and Q can start concurrently.  
ii) Activities O and P are concurrent, and depend on the completion of both M and N.  
iii) Activities R and S are concurrent and depend on the completion of O.  
iv) Activity T depends upon the completion of P, Q and R.  
v) The project is complete when S and T are done.
7. What is WBS? How is this helpful in planning, monitoring and controlling the programme of projects?

8. a) What are the factors affecting Earth Moving Equipment? [3+7=10]  
b) A network is shown in the following fig. with the expected time of completion of each activity. Determine the earliest expected time and latest allowable occurrence time for each event.





**ADAMAS UNIVERSITY**  
**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: B. Tech

Semester: VIII

Stream: CE

PAPER TITLE: Foundation Engineering

PAPER CODE: ECE44110

Maximum Marks: 40

Time duration: 3 Hours

Total No of questions: 08

Total No of Pages: 02

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***Answer all the Groups***

**Group A**

Answer all the questions of the following

**5 × 1 = 5**

1.
  - a) Give a short description of Box Caisson.
  - b) Write the ENR formula for Dynamic analysis of Pile foundation.
  - c) Calculate the Grip Length ( $L_G$ ) of the well foundation, if the maximum scour depth is 18 m. Follow IRC method.
  - d) Define negative skin friction of pile.
  - e) What is Recovery Ratio ( $L_r$ ) of the soil sampler?

**GROUP –B**

**(Short Answer Type Questions)**

Answer any three of the following

**3 × 5 = 15**

2. Describe the reinforcement details, recommended for design of RCC steining of well.
3. Define Area Ratio ( $A_R$ ) of the soil sampler. And according to this ratio, recommend the allowable Degree of disturbance of soil samples.
4. Write equation for Allowable bearing pressure of well according to Teng.
5. A river discharging 4000 cumec of water and the average particle size of river bed is 0.1 mm. If the diameter of the caisson is 6 m, then find out the Maximum Scour depth.

**GROUP –C**

**(Long Answer Type Questions)**

Answer any two of the following

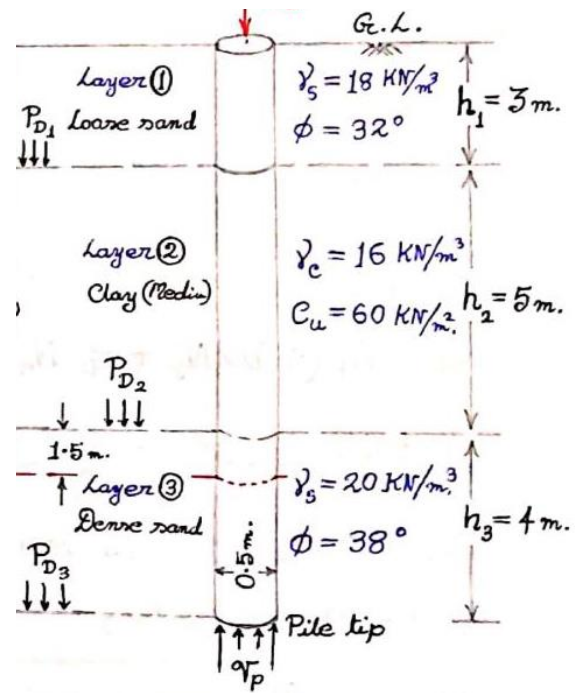
**2 × 10 = 20**

6. Calculate the total Moment of Inertia of a circular well of inner and outer diameter of 6 m. and 9 m. respectively. It is constructed upto 18 m. depth below the scour depth and the allowable bearing capacity of the subgrade of 50 tonnes / m<sup>2</sup>. The properties of soil are  $\gamma_{\text{sat}} = 18 \text{ kN/m}^3$ ,  $\phi = 30^\circ$ ,  $\delta = 20^\circ$ ,  $K_A = 0.24$  and  $K_P = 7$ . Consider,  $W = 15000 \text{ kN}$ ,  $H = 3000 \text{ kN}$  and  $M = 30000 \text{ kN-m}$ . Use Ultimate soil resistance method.
7. Write short notes on the following topics (any two):  
  - (a) Pressure bulb of pile
  - (b) Auger boring

(c) Pile load test

8. A 500 mm diameter pile is casted upto 12 m. depth below G.L. It is passed through three different soil layers as shown in the figure given.

Calculate the End bearing resistance of the pile as per IS 2911 (Part 1/ sec 2): 2010.





**ADAMAS UNIVERSITY**  
**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: B. Tech  
Stream: CE  
PAPER TITLE: Advance R C C Design  
Maximum Marks: 40  
Total No of questions: 08

Semester: VIII  
PAPER CODE: ECE44114  
Time duration: 3 Hours  
Total No of Pages: 02

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- 

***Answer all the Groups***

**Group A**

Answer all the questions of the following

**5 × 1 = 5**

1. a) What do you mean by Grade of Concrete?  
b) State Working Stress Method.  
c) What are the types of elevated water tank?  
d) How to calculate the live load on RC structure?  
e) How does the shape of structure impacts on wind load calculation?

**GROUP –B**

**(Short Answer Type Questions)**

Answer *any three* of the following

**3 × 5 = 15**

2. Design a section to resist a direct tensile force of 150kN/m width. Use M30 concrete and Fe-415 grade steel.
3. Design a section to resist a bending moment of 15kN-m per meter width producing tension on the water face. Use M30 concrete and Fe-415 grade steel. Use cracked theory.
4. Design a section to resist a pull of 50kN and a bending moment equal to 10kN-m per meter width producing tension to the water face. Use M30 concrete and Fe-415 grade steel.
5. Write the advantages and disadvantages of 'Flat Slab'.

**GROUP –C**

**(Long Answer Type Questions)**

Answer *any two* of the following

**2 × 10 = 20**

6. Design the top dome and top ring beam of an Intze type water tank. Adopt grade of concrete is M20 and Fe-415 grade of steel. Inside diameter of the tank is 12m. The design of the top dome and top ring beam of the water tank should conform to the stress specified in IS:3370 and IS :456.
7. Design a square tank having inner dimension of 7.5×7.5×2.5 m with walls fixed at the base and sides but free at top. The tank is directly supported on the earth. Free board is 15cm . Use M30 grade concrete and Fe-415 grade steel. Use IS:3370 & IS:456.
8. A ribbed slab is continuous over a number of spans of 7.5 m each. Assuming the dead load to be 5kN/m<sup>2</sup> including self weight & superimposed load . D.L.+L.L.=3kN/m<sup>2</sup>, Design the ribbed slab

spanning in one direction. Consider spacing of ribs as 600 mm. Use M25 concrete and Fe-500 grade steel.

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