Seat No.

MAR-APR-2024 SUMMER EXAMINATION
B.Tech. CBCS
Sub. Name: Water Resource Engineering-I
Sub. Code: 80763/81000

Day and Date: MAY ,10-05-2024   **Total Marks: 70**
Time: 10:30 AM To 01:00 PM

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
                2. Draw neat labbelet diagrams wherever necessary
                3. Figures to the right indicate full marks
                4. Use of Scientific calculator is allowed

Special Inst.:   Q4 and Q8 are compulsory. In section I Attempt any two questions from
                Q1,Q2 and Q3 and in section II attempt any two questions from Q5, Q6 & Q7

Q1)   a) Explain with sketch automatic type of rain gauge. (Tiping bucket type rain gauge) **[11]**
(5)

b) Explain various methods of estimation of missing precipitation at a raingauge
station (6)

Q2)   a) What is Infiltration ? Explain factors affecting Infiltration ? (5)   **[11]**
b) The rate of rainfall for successive 30 min. periods of a 4h storm are as follows(6)
3.5, 6.5,8.5,7.8,6.4,4.0,4.0,6 cm/h.

Taking the value of Ø index as 4.5cm/h, compute the following
a. Total rainfall
b. Total rainfall excess
c. W index

Q3)   a) Explain various time parameters used in Hydrograph analysis (6)   **[12]**
b) The ordinates of 6 H unit hydrograph are given, calculate ordinates of 3 hours unit
hydrograph (6)

Time(h)	0	03	06	09	12	15	18	21	24	27	30	33	36	39	42
Ordinates (Cumecs)	0	9	20	35	49	43	35	28	22	17	12	9	6	3	0

Q4)   **[12]**
a) Confined and Unconfined aquifer (6)
b) Bandhara Irrigation (6)
c) Assesment of Irrigation water (6)

Q5)   a) Explain in detail with neat sketch.   **[11]**
a) Aquifer b) Aquiclude c) Aquifuge d) Aquitard e) Perched Aquifer (5)

b) Explain in detail constructional features of open well.(6)

Q6) a) Explain in detail general layout, main components & functioning of Percolation **[11]** tank.(5)

b) Explain with neat sketch working of Drip Irrigation. State its advantages and disadvantages.(6)

Q7) a) What do you understand by consumptive use of water?(5) **[12]**

b) Define duty delta and base period ? What is difference between base period and crop period ? Write the releation between duty delta and base period ? (7)

Q8) Write short notes on: (Solve any two) **[12]**
a) Classes and availability of soil water (6)
b) Kolhapur type weir (6)
c) indian crop seasons and crop types (6)

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MAR-APR-2024 SUMMER EXAMINATION
B.Tech. CBCS
Sub. Name: Energy and Environment
Sub. Code: 80768/81005

Day and Date: MAY ,20-05-2024   **Total Marks: 70**
Time: 10:30 AM To 01:00 PM

Instructions: **1. All questions are compulsory**
                         2. Assume suitable data wherever necessary and mention it boldly
                         3. Figures to the right indicate full marks
                         4. Use Sketches/Diagrams wherever necessary

Q1)   Attempt all questions.   **[11]**

   1.   Explain the laws and principles of energy production & utilization.   **[5]**

   2.   Discuss in detail, conventional energy sources of the world.   **[6]**

Q2)   Attempt any Two.   **[12]**

   1.   State different factors affecting on production of biogas.   **[6]**

   2.   State site selection criteria for wind energy utilization.   **[6]**

   3.   What are the merits & demerits of tidal energy?   **[6]**

Q3)   Attempt any Two.   **[12]**

   1.   What are the characteristics of coal?   **[6]**

   2.   State disadvantages of natural gas.   **[6]**

   3.   Enlist principle considered in green building techniques.   **[6]**

Q4)   Attempt all questions   **[11]**

   1.   State the precautions required to prevent the effect of global warming.   **[5]**

   2.   Write a note on Greenhouse effect.   **[6]**

Q5)   Attempt any Two.   **[12]**

   1.   State uses of Environmental Impact Assessment.   **[6]**

2.   Explain the process of EIA.   **[6]**

3.   What are the limitations of EIA?   **[6]**

Q6)   **Attempt any Two.**   **[12]**

1.   Discuss the need of energy audit.   **[6]**

2.   How energy audit system classify?   **[6]**

3.   Explain different phases in energy audit.   **[6]**

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Seat No.

MAR-APR-2024 SUMMER EXAMINATION
B.Tech. CBCS
Sub. Name: Concrete Technology
Sub. Code: 63346/79114/79402

Day and Date: MAY ,11-05-2024　　　　　　　　　　**Total Marks: 70**
Time: 02:30 PM To 05:00 PM

Instructions: 　1. All questions are compulsory
　　　　　　　　2. Assume suitable data wherever necessary and mention it boldly
　　　　　　　　3. Draw neat labbelet diagrams wherever necessary
　　　　　　　　4. Figures to the right indicate full marks
　　　　　　　　5. Use of Scientific calculator is allowed

Q1)　Attempt all questions.　　　　　　　　　　　　　　　**[12]**

　A.　Explain the initial and final setting time test on cement.　　**[6]**

　B.　Explain the phenomenon of bulking of sand.　　　　　　**[6]**

Q2)　Attempt the following.　　　　　　　　　　　　　　　**[11]**

　A.　Explain the various methods of curing of concrete.　　　**[6]**

　B.　What is mean by segregation and bleeding? Explain their importance in **[5]**
　　　concrete.

Q3)　**Attempt any Two.**　　　　　　　　　　　　　　　　**[12]**

　A.　Explain in detail Schmidt's Rebound Hammer test on concrete with their **[6]**
　　　limitation.

　B.　Explain how w/c ratio and aggregate/cement ratio influence on workability of **[6]**
　　　fresh concrete.

　C.　What is creep and shrinkage of concrete? List the factors affecting creep and **[6]**
　　　shrinkage of concrete.

Q4)　**Attempt all questions**　　　　　　　　　　　　　　**[15]**

　A.　What are the factors affecting design of concrete mix.　　**[5]**

　B.

Design of M20 concrete mix as per IS:10262-2009

1. Grade Designation: M20
2. Type of cement: OPC 43 grade confirming to IS 8112
3. Maximum nominal size of aggregate: 20 mm
4. Workability: 100 mm slump
5. Exposure condition: Mild for R.C.C.
6. Specific gravity of cement: 3.15
7. Specific gravity of coarse aggregates: 2.8
8. Specific gravity of fine aggregates: 2.7
9. Sieve analysis of fine aggregate: Confirming to Zone I of IS: 383

Table1 : Assumed Standard Deviation		
Sr. No.	Nominal size of Aggregate	Assumed standard deviation in N/mm²
1.	M 10	3.50
2.	M 15	
3.	M 20	4.00
4.	M 25	
5.	M 30	5.00
6.	M 35	
7.	M 40	
8.	M 45	
9.	M 40	

Table 2 : Maximum Water Content per Cubic Meter of Concrete for Nominal Maximum Size of Aggregate		
Sr. No.	Nominal Maximum Size of Aggregate	Maximum Water Content Kg
1	10	208
2	20	186
3	40	165

Table 3 : Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate					
Sr. No.	Nominal Maximum Size of Aggregate	Zone IV	Zone III	Zone II	Zone I
1	10	0.50	0.48	0.46	0.44
2	20	0.66	0.64	0.62	0.60
3	40	0.75	0.73	0.71	0.69

Table 5 : Minimum cement content, Maximum Water cement ratio and Minimum grade of concrete for Different exposures with Normal Weight aggregates of 20 mm Nominal Maximum zise						
		Plain Concrete			Reinforced concrete		
Sr. No.	Exposure	Minimum Cement content Kg/m³	Maximum free Water-cement ratio	Minimum grade of concrete	Minimum Cement content Kg/m³	Maximum free water-cement ratio	Minimum grade of concrete
1	Mild	220	0.60	-	300	0.55	M20
2	Moderate	240	0.60	M15	300	0.50	M25
3	Severe	250	0.50	M20	320	0.45	M30
4	Very Severe	260	0.45	M20	340	0.45	M35
5	Extreme	280	0.40	M25	360	0.40	M40

Q5) Attempt any two. **[8]**

    A. What do you mean by Mineral Admixture? Explain in detail Fly ash? **[4]**

    B. Describe the mechanism of action of plasticizers. **[4]**

    C. Explain use metakaolin in fresh concrete with their advantages. **[4]**

Q6) Attempt any two. **[12]**

    A. Write short notes on a) Self compacting concrete b) High performance concrete. **[6]**

    B. Explain Acid attack on concrete. **[6]**

    C. Explain sulphate attack on concrete in detail. **[6]**

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Seat No.

MAR-APR-2024 SUMMER EXAMINATION
B.Tech. CBCS
Sub. Name: Environmental Engineering-II
Sub. Code: 66877/81517/81794

Day and Date: MAY ,18-05-2024   **Total Marks: 70**
Time: 02:30 PM To 05:00 PM

Instructions: 1. All questions are compulsory
                    2. Assume suitable data wherever necessary and mention it boldly
                    3. Draw neat labbelet diagrams wherever necessary
                    4. Figures to the right indicate full marks

Q1)   Solve the following   **[11]**

  1.   Explain types of sewers in detail.   **[5]**

  2.   Following observations were made on 3 % dilution of wastewater,   **[6]**
           DO of aerated water = 3 mg/l.
           DO of diluted water sample after 5 days of incubation = 0.8 mg/l.
           DO of wastewater sample = 0.6 mg/l.
           Calculate 5 days BOD & Ultimate BOD. Given KD = 0.10

Q2)   **Answer any two of the following.**   **[12]**

  1.   Explain trickling filter along with its biological process of attached growth.   **[6]**

  2.   Explain the sewer appurtenances with respect to their function.   **[6]**

  3.   Explain the activated sludge process with respect to its modifications.   **[6]**

Q3)   **Answer any two of the following**   **[12]**

  1.   Enlist all Low cost treatment methods and Explain any one in detail. **[6]**

  2.   Give the types, advantages and limitations of waste stabilization pond.   **[6]**

  3.   Give the design parameters for septic tank.   **[6]**

Q4)   **Solve the following**   **[11]**

  1.   Explain the concept of self purification and DO sag curve.   **[5]**

  2.   Give the effluent standards for stream and land disposal as per MPCB and CPCB   **[6]**
           standards.

Q5) **Answer any two of the following** **[12]**

    1. Explain types of solid waste in detail. **[6]**

    2. Explain the concept of 'Hazardous Waste Management'. **[6]**

    3. Write short note on Incineration with sketch. **[6]**

Q6) **Answer any two of the following** **[12]**

    1. Discuss the issue of 'Global Warming' due to air pollution. **[6]**

    2. What are various types of noises and their acceptable limits? **[6]**

    3. What is the effect of air pollution on man, material and vegetation? **[6]**

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MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS
Sub. Name: Theory of Structures
Sub. Code: 81515/81792

Day and Date: MAY ,10-05-2024   **Total Marks: 70**
Time: 02:30 PM To 05:00 PM

Instructions:

Special Inst.:   **1) Q. No. 1 & Q. No. 5 are compulsory questions.**

2) Solve any two questions from Q. No. 2 to Q. No. 4 and any two questions from Q. No. 6 to Q. No. 8.

3) Figures to the right indicate full marks.

4) Assume suitable data if necessary and state them clearly.

5) Use of non-programmable calculator is allowed.

Q1)   Write a short Note on following   **[7]**

A) Explain in detail Degrees of freedom of the structure.   **[2]**

B) Explain in detail Clapeyron's theorem of three moments.   **[3]**

C) What is Unit load method explain in detail.   **[2]**

Q2)   Analyse the propped cantilever beam loaded as shown in the figure by using **[14]** Consistent
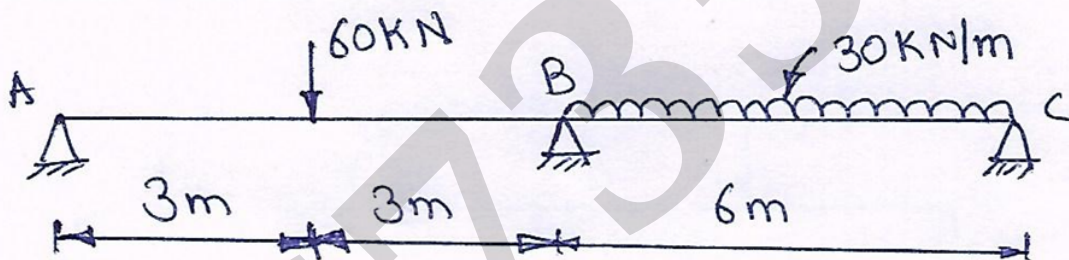deformation method. Also draw SFD and BMD.
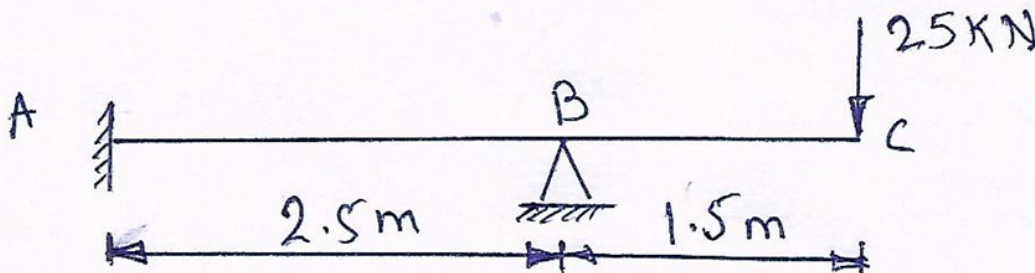
Figure

Q3) A continuous beam ABC is loaded as shown in the figure below. Find out supports **[14]** moments and reactions by using Clapeyron's theorem of three moments. Also draw BMD.
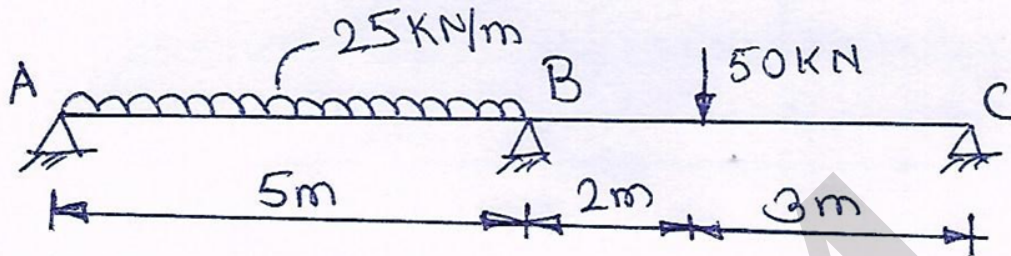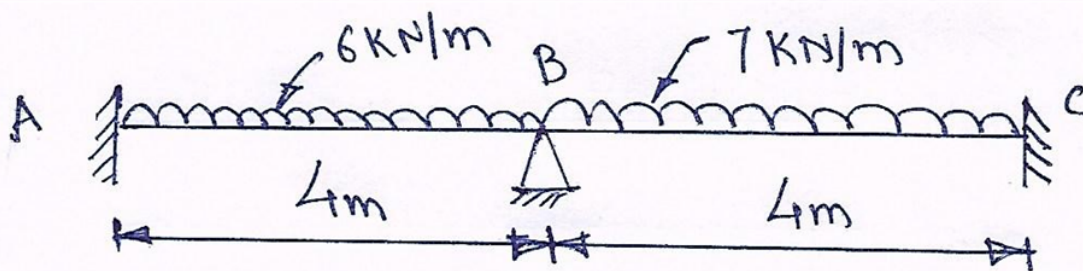

Figure

Q4) A continuous beam ABC is loaded as shown in the figure below. Find out supports **[14]** moments and reactions by using Castiglione's theorem. Also draw BMD.
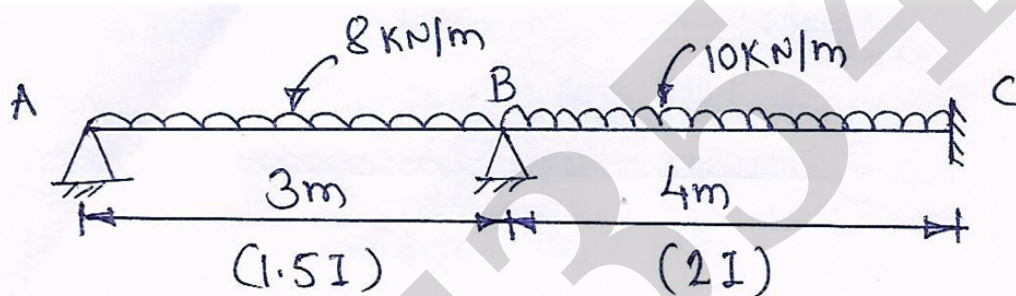

Figure

Q5) Write short note on following **[7]**

A) Explain Slope and deflection method in detail. [2]

B) Explain Stiffness factor used in Moment distribution method. [2]

C) Write down properties of the stiffness matrix. [3]

Q6) A continuous beam is loaded as shown in the figure below. Find out supports **[14]** moments and reactions by using slope and deflection equation. Also draw BMD.
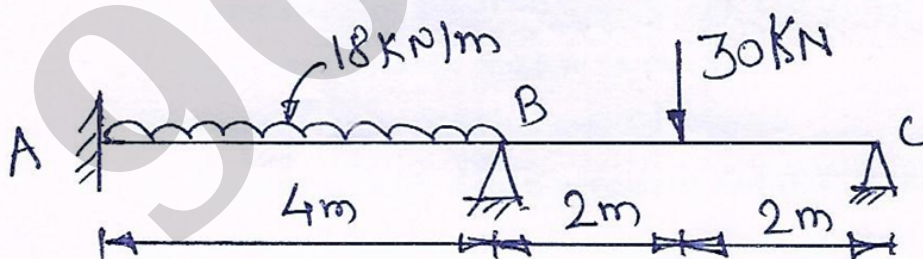
Figure

Q7) A continuous beam ABC is loaded as shown in the figure below. Find out supports **[14]** moments and reactions by using moment distribution method. Also draw BMD.

Figure

Q8) A continuous beam is loaded as shown in the figure below. Find out supports **[14]** moments and reactions by using stiffness matrix method. Also draw BMD.

Figure

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[3]

Seat No.	

**T.Y. B.Tech. (Civil Engineering) (Semester - V) (CBCS)
Examination, December - 2023
PCC-CV503 : GEOTECHNICAL ENGINEERING - I
Sub. Code : 80766**

Day and Date : Monday, 04 - 12 - 2023   **Total Marks : 70**
Time : 10.30 a.m. to 1.00 p.m.

Instructions :   1)   **All questions are compulsory.**
                          2)   **Figures to the right indicate full marks.**
                          3)   **Assume suitable data if necessary and state them clearly.**
                          4)   **Answer shall be supported by adequate sketches.**

SECTION - I

Q1) Attempt any two questions.   **[12]**

   a)   Explain with sketch phase diagrams for the partially saturated soil and dry soil.

   b)   What is meant by consistency of soil? Draw a plasticity chart.

   c)   The specific gravity and void ratio of a sample of clay are 0.73 and 2.7 respectively. If the voids are 90% saturated find bulk density, dry density and water content.

Q2) Attempt any two questions.   **[12]**

   a)   Differentiate between seepage velocity and discharge velocity.

   b)   Explain laboratory method for determination of coefficient of permeability for coarse grained soil with equation and sketch.

   c)   Calculate effective stress, pore pressure and total stress at 6m below ground level where water table is at 3m below ground level. For following properties of soil, dry unit weight of soil 16.5 KN/cum, moisture content of soil above water table 15% and specific gravity of soil 2.7.

                                                                        P.T.O.

Q3) Attempt all questions. **[11]**

a) Explain standard proctor test with neat sketch.

b) List types of compaction equipment's and their suitability.

SECTION - II

Q4) Attempt any two questions. **[12]**

a) Find intensity of vertical pressure at a point 3 m directly below 25 KN point load acting on a horizontal ground surface. What will be the vertical pressure at a point 2m horizontally away from the axis of loading and at same depth of 3 m? Use Boussinesq's equation.

b) State the assumptions made in Westergards analysis in stress distribution.

c) Discuss Equivalent point load method.

Q5) Attempt all questions. **[11]**

a) Discuss the classification of shear test based on drainage conditions.

b) Explain triaxial shear test with merits and demerits.

Q6) Attempt any two questions. **[12]**

a) Compute intensities of active and passive earth pressure at a depth of 8m in cohesion less soil with $\phi = 30°$ and $\gamma d = 18KN/cum$. What will be active and passive pressure.

b) Differentiate between Rankine's and Coulombs theories of earth pressure.

c) What are different types of earth Pressure?

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