

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular and Supplementary Summer 2024

Course: B. Tech.

Branch : Civil Engineering

Semester : IV

Subject Code & Name: BTCVC402 / BTCIC402 Environmental Engineering

Max Marks: 60

Date: 14/06/2024

Duration: 3 Hr.

Instructions to the Students:

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

(Level/CO) Marks

Q. 1	Solve Any Two of the following.		12
A)	Enlist various methods of population forecasting. Explain any one in detail.	CO1	6
B)	Explain factors affecting rate of water demand.	CO1	6
C)	Write a note on characteristics of water.	CO1	6
Q.2	Solve Any Two of the following.		12
A)	Explain different type of valves in detail with neat sketches.	CO2	6
B)	Write a note on operational filter troubles.	CO2	6
C)	Explain break point of chlorination with figure.	CO2	6
Q. 3	Solve Any Two of the following.		12
A)	Explain systems of water supply with neat sketches.	CO3	6
B)	Write a note on the layout system for water distribution.	CO3	6
C)	Explain hydraulic analysis of distribution system.	CO3	6
Q.4	Solve Any Two of the following.		12
A)	Explain combined system of sewerage.	CO4	6
B)	Write a detailed note on Composting and factors affecting composting.	CO4	6
C)	Explain concept of hazardous waste management.	CO4	6
Q. 5	Solve Any Two of the following.		12
A)	Write a note on Electrostatic Precipitator.	Remember	6
B)	What is Air Pollution? What are the major sources of Air Pollution?	Remember	6
C)	Explain with suitable diagrams: Plume Behaviour.	Remember	6

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular & Supplementary Summer 2024

Course: B. Tech.

Branch : Civil Engineering

Semester :IV

Subject Code & Name : BTCVC403 Structural Mechanics - I

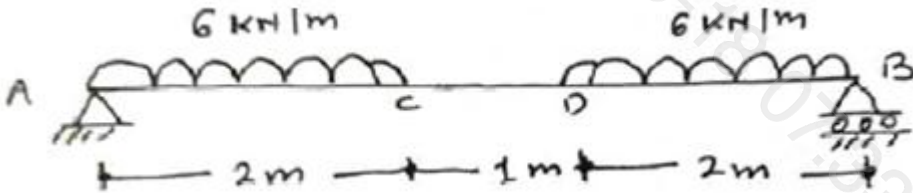
Max Marks: 60

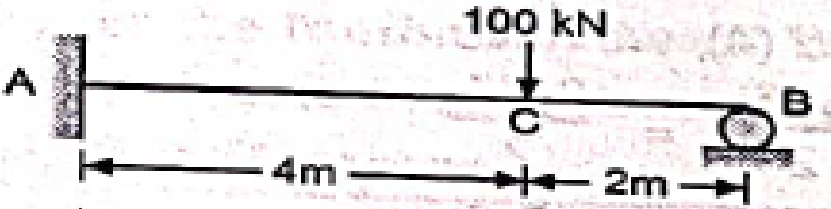
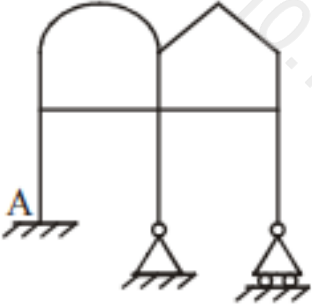
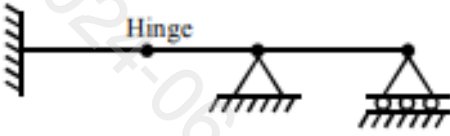
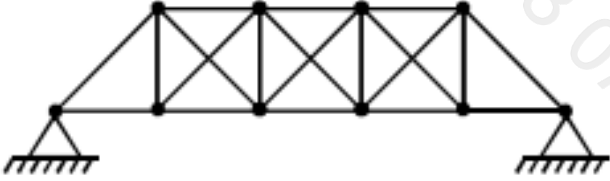
Date: 18/06/2024

Duration: 3 Hr.

Instructions to the Students:

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question.
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4. Assume suitable data wherever necessary and mention it clearly.

		(Level/CO)	Marks
Q.1	Solve Any Two of the following.		12
A)	List out the different methods to find slope and deflection and explain them in detail?	CO2	6
B)	Derive an expression for slope and deflection for simply supported beam with a UDL throughout span using double integration method?	CO2	6
C)	Compute the max deflection of beam shown in fig below. Take $E = 2 \times 10^5$ Mpa and $I = 3 \times 10^7$ mm ⁴ . Use conjugate beam method. 	CO2	6
Q.2	Solve Any Two of the following.		12
A)	Using strain energy method and determine the deflection at free end of cantilever of length L subjected to a concentrated load 'P' at the free end.	CO2	6
B)	A simply supported beam of span 9m carries two point loads, each 50KN at 3m from each support. Using castigliano's first theorem. Find the deflection at mid span. Take $EI = 25 \times 10^3$ KN-m ² .	CO2	6
C)	Determine reaction at B for the propped cantilever AB as shown in fig below. Assuming constant flexural rigidity (EI)	CO2	6

			
Q.3	Solve Any Two of the following.		12
A)	A fixed beam of span 'L' subjected to a UDL of W KN/m for a span of 'a' from left support. Determine the end moments developed.	CO2	6
B)	<p>Determine the indeterminacy for the following.</p> <p>i) Determine the degree of freedom of the following frame from fig 1.</p> <p>ii) The degree of indeterminacy of the beam in fig 2 is.</p> <p>iii) The total degree of indeterminacy (both internal and external) for the bridge truss shown in the given fig 3 is</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Fig 1</p> </div> <div style="text-align: center;">  <p>Fig 2</p> </div> </div> <div style="text-align: center; margin-top: 20px;">  <p>Fig 3</p> </div>	CO1, CO3	6
C)	A continuous beam ABCD is simply supported over three spans, such that AB=8m, BC=12m and CD=5m. It carries a UDL of 4KN/m in span AB, 3KN/m in span BC and 6KN/m in span CD. Find the support moments over supports B and C. Assuming constant EI draw shear force and bending moment diagram.	CO2, CO3	6
Q.4	Solve Any Two of the following.		12
A)	<p>Define the following terms:</p> <p>a) Carry over factor b) Distribution factor</p> <p>c) Carry over moment d) Relative stiffness.</p>	CO2	6
B)	Analyze the continuous beam as shown below and draw BMD using moment distribution method	CO2	6

C)	<p>Analyze the frame shown below for moments at the ends of members. Draw BMD. EI is same for all the members. Use Moment distribution method.</p>	CO2	6
Q.5 Solve Any Two of the following.			12
A)	<p>Determine the support moments for the continuous beam shown below. Draw BMD. Use slope deflection method.</p>	CO2	6
B)	<p>Determine the support moments for the continuous beam shown below. Draw BMD. Use slope deflection method</p>	CO2	6
C)	<p>Analyse the frame given in figure by moment distribution method and draw the B.M.D&S.F.D</p>	CO2	6
*** End ***			

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular & Supplementary Summer 2024

Course: B. Tech
Semester: IV

Branch: Civil Engineering/Civil and Infrastructure Engineering/Civil and Environmental Engineering

Subject Name: Water Resources Engineering Subject Code: BTCVC404 / BTCIC404 / BTCEC404

Max Marks: 60

Duration: -3 Hrs.

Date: 20/06/2024

Instructions to the Students:

1. All questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mentioned it clearly.

	Level/CO	Marks
Q. 1 Solve any TWO of the following		12
(A) Define irrigation and discuss its necessity. Enlist the ill-effects and advantages of irrigation.	CO 1	06
(B) Derive relationship between duty and delta.	CO1	06
(C) Explain the factors affecting duty of water.	CO1	06
Q.2 Solve any TWO of the following		12
(A) State the factors governing on the selection of site for reservoir.	CO1	06
(B) Explain with neat sketch various zones in storage reservoir.	CO2	06
(C) Explain elementary profile of gravity dam.	CO2	06
Q. 3 Solve any TWO of the following		12
(A) Explain Bligh's creep theory and state its limitations.	CO2	06
(B) Explain Lacey's silt theory	CO2	06
(C) Determine the section of Lacey's regime channel to carry 10 m ³ /s of water in an alluvium of 0.50 mm.	CO2	06
Q. 4 Solve any TWO of the following		12
(A) Explain with neat sketch hydrological Cycle.	CO1	06
(B) Define hydrograph. Explain in detail components of hydrograph.	CO1	06
(C) There are four rain gauge stations existing in the catchment of a river. The average annual rainfall values at these stations are 780, 640, 400, 520 mm. Allowable percentage error in mean value of rainfall is 10%. Calculate optimum number of rain gauges in the catchment.	CO2	06
Q. 5 Solve any TWO of the following		12
(A) Describe the methods of controlling water logging.	CO1	06
(B) What do you mean by lift irrigation scheme? State its necessity.	CO3	06
(C) Explain with neat sketch rain water harvesting.	CO2	06

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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular & Supplementary Summer Examination – 2024

Course: B. Tech.

Branch: Civil Engineering

Semester: IV

Subject Code & Name: BTCVC405 Hydraulics - II

Max Marks: 60

Date: 24/06/2024

Duration: 3 Hr.

Instructions to the Students:

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

	(Level/CO)	Marks
Q. 1 Solve Any Two of the following.		12
A) Explain open channel flow and state difference between open channel flow and pipe flow.	Understand	6
B) Derive an expression for discharge through triangular notch with neat diagram.	CO1	6
C) A reservoir $4.65 \times 10^4 \text{ m}^2$ in area is to be controlled by a rectangular weir with its crest level at El. 30 m. it is intended to provide such a length of weir that will lower the water level from El. 31.2 m to El. 30.6 m in half an hour time. Determine the length of the weir. The discharge over the weir is given by the formula $Q = 1.9 LH^{3/2}$, where Q is discharge in cumec, L is crest length in meters and H is head over the weir in meters.	CO1	6
Q.2 Solve Any Two of the following.		12
A) Define the term most economical section of channel. Derive the conditions for the most economical triangular channel section?	CO1	6
B) Define specific energy and give detailed explanation about specific energy curve with neat labelled sketch.	Remember	6
C) Design the most economical trapezoidal canal section having one side vertical and other side slope 1.5 H:1 V to carry the discharge of $10 \text{ m}^3/\text{s}$. Take Manning's coefficient $n = 0.015$ and bed slope = $1/3500$.	Create	6
Q. 3 Solve Any Two of the following.		12
A) Derive the dynamic equation for gradually varied flow with assumptions in	CO2	6

the form:
$$\frac{dy}{dx} = \frac{S_0 - S_f}{1 - F_r^2}$$

- B) With usual notation in hydraulic jump, prove the following relation for hydraulic jump in rectangular channel CO2 6

$$\frac{y_2}{y_1} = \frac{1}{2} \left[-1 + \sqrt{1 + 8F_{r1}^2} \right]$$

- C) A jet of water 5 cm in diameter having a velocity of 25 m/s strikes normally a smooth flat plate. Determine the thrust when CO3 6
- i. The plate is stationary.
 - ii. The plate is moving with a velocity of 5 m/s away from jet along the line of jet.
- What is the work done per second by the jet in each case?

Q.4 Solve Any Two of the following. 12

- A) Enlist types of turbines. Describe components of Francis Turbine with neat labelled sketch. Remember 6
- B) Discuss the criteria considered for the selection of turbines. Understand 6
- C) Give description about draft tube and its function. Remember 6

Q. 5 Solve Any Two of the following. 12

- A) What are different component parts of a centrifugal pump? Explain their function with neat sketch. Remember 6
- B) Why priming is necessary for centrifugal pump? Enlist & describe priming devices used for priming. Understand 6
- C) Explain Remember 6
- i) Submersible pump
 - ii) Multistage pump

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular and Supplementary Examination – Summer 2024

Course: B. Tech.

Branch: Civil Engineering & Allied

Semester: IV

Subject Code & Name: BTCVC406 / BTCIC406 / BTCEC406 Engineering Geology

Max Marks: 60

Date: 26/06/2024

Duration: 3.00 Hr.

Instructions to the Students:

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question.
3. Draw a suitable diagram wherever necessary.

Marks

Q.1 Solve Any Two of the following.

- A) Write short notes on: - 6
- a. Meandering
 - b. Tectonic mountains
 - c. Strato-volcano
- B) Write a detailed note on various types of tectonic plate boundaries with neat labelled diagrams. 6
- C) Explain working of river system with various types of drainage patterns. 6

Q.2 Solve Any Two of the following.

- A) Write a short note on: - 6
- a. Gneissose texture
 - b. Batholith
 - c. Cataclastic metamorphism
- B) Write the classification of igneous rocks based on depth, silica and texture. 6
- C) Define sedimentary rock and classification based on grain size and origin. 6

Q.3 Solve Any Two of the following.

- A) Write a short note on:- 6
- a. Chevron fold
 - b. Graben fault
 - c. Porosity
- B) What is the difference between a confined aquifer and unconfined aquifer? 6
- C) Explain various types of joints and civil engineering significance. 6

Q.4 Solve Any Two of the following.

- A) Write a short note on: - **6**
a. Desk study
b. Rock Quality Designation
c. Core box design and arrangements
- B) Explain trial pit sample collection method with its advantages and disadvantages. **6**
- C) What are the various drilling techniques used for the collection of samples? **6**

Q.5 Solve Any Two of the following.

- A) Write a short note on: - **6**
a. Tunnel Boring Machine
b. Earthen dam
c. Immersed tunnel
- B) Explain the various favourable and unfavourable geological conditions for dam site. **6**
- C) Explain various types of bridges and their components. **6**

***** End *****