

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary End Semester Examination – Winter 2023

Course: B. Tech. Branch: Civil Engineering and Allied Branches Semester: IV

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

Max Marks: 60

Date:29/01/2024

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. 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.

- A) Write short notes on: - (CO1) 6
- a. Dendritic drainage pattern
 - b. Sand dune
 - c. Weathering
- B) Write a note on interior of the earth with neat labelled diagram. (CO1) 6
- C) Give detailed note on types of mountains and their origin with suitable examples. (CO1) 6

Q.2 Solve Any Two of the following.

- A) Write a short note on: - (CO2) 6
- a. Marble
 - b. Conglomerate
 - c. Metamorphism
- B) What are the physical properties of minerals useful for the identification of minerals? (CO2) 6
- C) Write the classification of Igneous rocks based on depth, silica and texture. (CO2) 6

Q. 3 Solve Any Two of the following.

- A) Write a short note on: - (CO3) 6
- a. Joints
 - b. Aquifer
 - c. Dyke
- B) Define the term “unconformity” and describe various types of unconformities. (CO1) 6
- C) What are the geological faults and their various types? (CO3) 6

Q.4 Solve Any Two of the following.

- A) Write a short note on: - (CO1) 6
- a. RQD
 - b. Sampling technique
 - c. Surface Investigations
- B) Explain the complete procedure of engineering geological investigation. (CO3) 6
- C) Write a detailed note on various drilling techniques used for the collection of samples. (CO2) 6

Q. 5 Solve Any Two of the following.

- A) Write a short note on: - (CO4) 6
- a. Gravity dam
 - b. Suspension bridge
 - c. Tunnel Boring Machine
- B) What are the major geological factors affecting the selection site for the dam? (CO3) 6
- C) Explain the various favourable and unfavourable geological conditions for reservoir site. (CO4) 6

***** End *****

A)	Define setback. Discuss the setback with reference to plot size. Also explain how they are useful tool to restrict the percentage built up area.	CO2	6
B)	Write a note on 7/12 abstract, its importance and meaning of every term on it.	CO1	6
C)	Plan a dog legged staircase for a building with the following data. i) Vertical distance between the floors = 3.6 m ii) Size of stair hall 2.5 x 5 m iii) Thickness of the floor slab = 140mm iv) Thickness of the waist slab and landing slab =100mm	CO2	6
Q. 3 Solve Any Two of the following.			12
A)	State different methods of rain water harvesting technique. Explain any one with sketch	CO2	6
B)	Explain with neat sketch layout of water supply and drainage system.	CO2	6
C)	Explain the terms i) Fire load ii) Evacuation time iii) Travel distance	CO2	6
Q.4 Solve Any Two of the following.			12
A)	State classification stone masonry and explain coursed rubble masonry and Random rubble masonry	CO3	6
B)	State principles to be observed during construction of composite masonry	CO3	6
C)	Differentiate between English and Flemish Bond.	CO3	6
Q. 5 Solve Any Two of the following.			12
A)	State criteria for selection of different roof.	CO3	6
B)	Explain king post truss and its joints with neat sketch.	CO3	6
C)	Draw neat sketch of two paneled door and frame door (plan, section & elevation)	CO3	6
*** End ***			

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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Winter Examination – 2023

Course: B. Tech.

Branch :Civil & Allied engineering

Semester : IV

Subject Code & Name: (BTCEC401/BTCIC401)Building Planning, Drawing & Construction

Max Marks: 60

Date:16-01-24

Duration: 3 Hr.

Instructions to the Students:

- 1. 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.*
- 2. Use of non-programmable scientific calculators is allowed.*
- 3. Assume suitable data wherever necessary and mention it clearly.*

(Level/CO) Marks

Q. 1 Solve Any Two of the following.	12
A) Describe the design factors affecting Indian climatic conditions?	6
B) Explain aspect & prospect as a principles of planning?	6
C) Mention bye laws used for minimum area & size for habitable room?	6
Q.2 Solve Any Two of the following.	12
A) Which documents are required to take building permission?	6
B) Explain importance of sun path diagram?	6
C) What are the criteria for Green Building?	6
Q. 3 Solve Any Two of the following.	12
A) Explain various traps used in drainage system with sketches?	6
B) Describe advantages & dis advantages of conduit wiring?	6
C) Write a note on firefighting system in a building?	6
Q.4 Solve Any Two of the following.	12
A) Describe comparison between stone masonry & brick masonry?	6
B) Describe any two types of partition wall with sketch?	6
C) Draw a plan of 1 ½ Brick thick wall ('L'shape) in English bond?	6
Q. 5 Solve Any Two of the following.	12
A) Draw a typical elevation & section of frame & paneled door?	6
B) Explain any three types of flooring?	6
C) Draw a labelled sketch of king post truss?	6

***** End *****

A)	Define setback. Discuss the setback with reference to plot size. Also explain how they are useful tool to restrict the percentage built up area.	CO2	6
B)	Write a note on 7/12 abstract, its importance and meaning of every term on it.	CO1	6
C)	Mention any six bye -laws required to design a residential building.	CO2	6
Q. 3	Solve Any Two of the following.		12
A)	State different methods of rain water harvesting technique. Explain any one with sketch	CO2	6
B)	Explain with neat sketch layout of water supply and drainage system.	CO2	6
C)	Explain the terms i) Fire load ii) Evacuation time iii) Travel distance	CO2	6
Q.4	Solve Any Two of the following.		12
A)	Draw a working sketch of air conditioning system.	CO3	6
B)	Write a short note on thermal insulation.	CO3	6
C)	Explain Sabine's formula with an example.	CO3	6
Q. 5	Solve Any Two of the following.		12
A)	Describe various methods of noise control.	CO3	6
B)	Write a short note on Green building.	CO3	6
C)	What are the criteria's of Griha Evaluation System in green building.	CO3	6
*** End ***			

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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Winter Examination – 2023

Course: B. Tech. Branch : Civil Engineering/Civil and Infrastructure Engineering

Semester : FOURTH

Subject Code & Name: BTCVC402/BTCIC402 Environmental Engineering

Max Marks: 60

Date:18-01-2024

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) Write a note on physical characteristics of water.	CO1	6
B) What is demand? Mention factors affecting demand.	CO1	6
C) Give Indian Standards for quality of potable water.	CO1	6
Q.2 Solve Any Two of the following.		12
A) What is aeration? List different types of aerators with neat sketch.	CO1	6
B) Write a note on coagulation and different types of coagulants used.	CO2	6
C) Describe Lime Soda method of softening of water	CO1	6
Q. 3 Solve Any Two of the following.		12
A) Write a short note on (i) Dead end system and (ii) Grid iron system	CO1	6
B) Differentiate between gravity system and pumping system.	CO1	6
C) State different layouts of water distribution system	CO1	6
Q.4 Solve Any Two of the following.		12
A) State characteristic of municipal waste water.	CO3	6
B) Differentiate between Municipal and Industrial waste water	CO3	6
C) Write a note on Composting.	CO4	6
Q. 5 Solve Any Two of the following.		12
A) Describe sources and effects of air pollution	CO2	6
B) List different types of plume behavior with a neat sketch.	CO2	6
C) Write a short note on control measures of air pollution	CO3	6

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Winter Examination – 2023

Course: B. Tech.

Branch: Civil Engineering

Semester: IV

Subject Code & Name: Structural Mechanics -I (BTCVC 403)

Max Marks: 60

Date: 20/01/2024

Duration: 3 Hrs.

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) Derive the differential equation for Slope and Deflection.	CO-1	6
B) A wooden beam 140 mm wide and 240 mm deep has a span of 4 m. Determine the load, that can be placed at center to cause deflection of 10 mm. Take E as 6 GPa.	CO-1	6
C) A Horizontal girder having uniform cross section is 14 m long and is simply supported at its end. It carries two concentrated loads as shown in fig. no. 1 Calculate the deflection of the beams under the loads C and D. Take E = 200 GPa and I = 160 x 10 ⁶ mm ⁴ .	CO-1	6

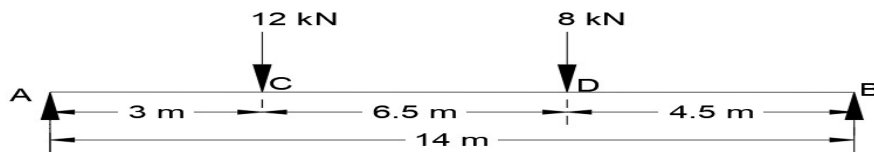
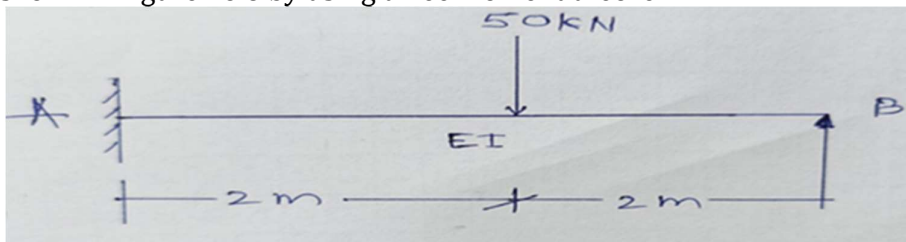


Fig. No. 1

Q.2 Solve Any Two of the following.		12
A) State and explain the Maxwell's reciprocal Theorem.	CO-2	6
B) Using energy theorem, find the deflection at free end of cantilever beam of span l carries a point load at the free end and mid span.	CO-2	6
C) A rolled steel joist ISMB 250 x 125 mm as shown in fig. carries a single concentrated load of 20 kN at the right third point over a simply supported span of 9 m. if the values of I _{xx} for the beam is 51.316 x 10 ⁶ mm ⁴ and the values of E for the material is 200 GPa, Calculate by the use of conjugate beam method Deflection under the load	CO-2	6

Q.3 Solve Any Two of the following.		12
A) Define determinacy and indeterminacy of structures. Explain in detail with examples	CO-3	6
B) Calculate the support moment and draw BMD and SFD for a beam as shown in figure no 6 by using three moment theorem.	CO-3	6



- C) A fixed beam of span 'L' subjected to an external clockwise moment 'M' at a distance 'a' from one of its fixed supports and at a distance 'b' from other end fixed support. Determine the end moments developed. CO-3 6

Q.4 Solve Any Two of the following. **12**

- A) Explain the following terms CO-4 6
 i) Carry Over Factor
 ii) Distribution factor
 iii) Stiffness Factor.
- B) Analyze the frame shown fig. no. 3 for moments at the ends of members. Draw BMD. EI is same for all the members. Use Moment distribution method. CO-4 6

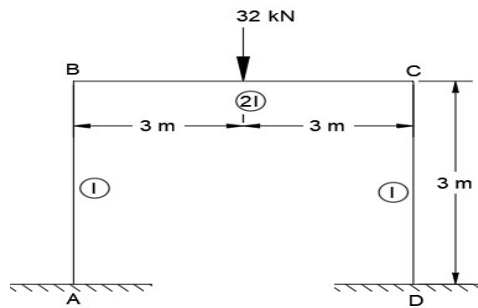


Fig. No. 3

- C) Calculate support moments by moment distribution method for given continuous as shown in fig. CO-4 6

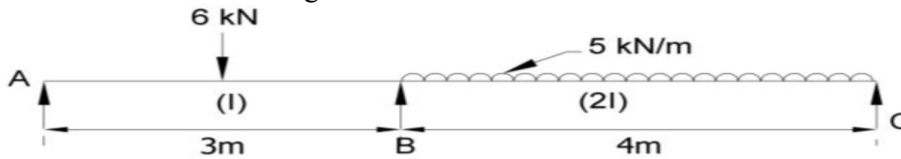
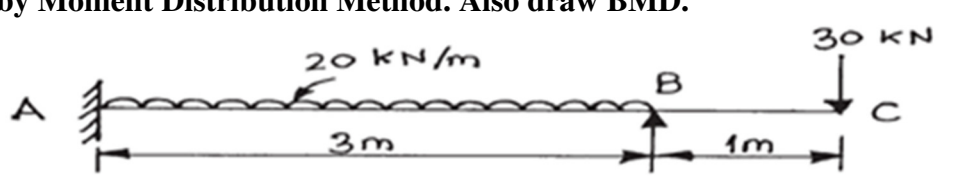


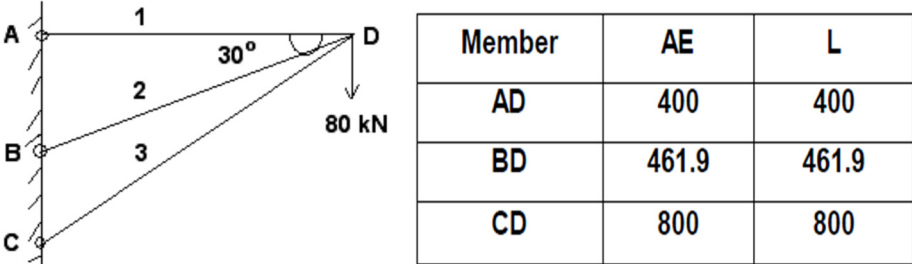
Fig. No. 4

Q.5 Solve Any Two of the following. **12**

- A) State the assumptions made in slope and deflection method for determining the support moments. CO-5 6
- B) A continuous beam ABC is fixed at A and simply supported at B and C. The Span AB of 6 m and carries a UDL of 100 kN/m. The span BC is 4m carries a UDL of 300 kN/m . Determine the support moments. CO-5 6
- C) Explain the procedure for analyzing a statical indeterminate structure using slope and deflection method. CO-5 6

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE Supplementary Winter Examination – 2023 Course: B. Tech. Branch: Civil & Allied Engineering Semester: IV Subject Code & Name: Structural Mechanics (BTCIC403/BTCEC403) Max Marks: 60 Date: 20/01/2024 Duration: 3 Hrs.		
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)	Derive the equation for Slope and deflection for the following beams using Double Integration Method A simply supported beam of span L subjected to uniformly distributed load over entire span.	CO-1 6
B)	A simply supported beam AB of 2.8 m span carries a point load of 60 kN at a distance of 1 m from the left hand support A. Determine the position of the maximum deflection of beam. Also find the magnitude of the deflection under the load. Take $EI = 4 \times 10^{12}$ N-mm ² .	CO-1 6
C)	Derive the expression for stresses in a thin cylindrical shell.	CO-1 6
Q.2	Solve Any Two of the following.	12
A)	State and explain the Static and Kinematic Indeterminacy.	CO-2 6
B)	A propped cantilever beam 3 m long has 100 mm wide and 150 mm deep cross section. If the allowable bending stress and the deflection at the center is 45 MPa and 2.5 mm respectively. Determine the safe UDL the cantilever can carry. Take $E = 210$ GPa.	CO-2 6
C)	State the procedure to find out the slope and deflection by conjugate method of a fixed beam carrying a UDL	CO-2 6
Q. 3	Solve Any Two of the following.	12
A)	Explain the following terms i) Stiffness Factor. ii) Distribution factor.	CO-3 6
B)	Calculate support moment of continuous beam as shown in fig. No. 1 by Moment Distribution Method. Also draw BMD.	CO-3 6
 <p style="text-align: center;">Fig. No. 1</p>		
C)	A fixed beam of span 'L' subjected to an external clockwise moment 'M' at a distance 'a' from one of its fixed supports and at a distance 'b' from other end fixed support. Determine the end moments developed.	CO-3 6
Q.4	Solve Any Two of the following.	12
A)	Derive the equation for the Horizontal thrust and tension in the cable.	CO-4 6
B)	Sketch the shapes of the influence lines for the support reaction and the hogging moment at the continuous support B of a two span continuous beam ABC. Assume the extreme ends A and C to be fully fixed.	CO-4 6

C)	A truck with axle loads of 40 kN and 60 kN on a wheelbase of 5 m rolls across a 10-m span. Compute the maximum bending moment and the maximum shearing force.	CO-4	6												
Q. 5	Solve Any Two of the following.		12												
A)	State and explain the Matrix methods	CO-5	6												
B)	<p>Using matrix stiffness method, analyze the truss for the member forces in the truss loaded as shown in figure. AE and L are tabulated below for all the three members.</p>  <table border="1" data-bbox="671 479 1168 728"> <thead> <tr> <th>Member</th> <th>AE</th> <th>L</th> </tr> </thead> <tbody> <tr> <td>AD</td> <td>400</td> <td>400</td> </tr> <tr> <td>BD</td> <td>461.9</td> <td>461.9</td> </tr> <tr> <td>CD</td> <td>800</td> <td>800</td> </tr> </tbody> </table>	Member	AE	L	AD	400	400	BD	461.9	461.9	CD	800	800	CO-5	6
Member	AE	L													
AD	400	400													
BD	461.9	461.9													
CD	800	800													
C)	Differentiate flexibility method and stiffness method.	CO-5	6												
*** End ***															

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Winter Examination – 2023

Course: B. Tech.

Branch: Civil Engineering

Semester: IV

Subject Name: Hydraulics - II

Subject Code: BTCVC405

Max Marks: 60

Date: 25/01/2024

Duration: 3 Hrs.

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.	Remember	6
B) Find an expression for the discharge over a rectangular weir using neat labelled diagram.	Remember	6
C) Find the time required to lower the water level from 3 m to 1.5 m in reservoir of dimension 70 m X 70 m, by (i) a rectangular notch of length 2.0 m, (ii) a right angled V notch is used. Take $C_d = 0.60$. Take all other data same.	CO 1	6
Q.2 Solve Any Two of the following.		12
A) Define - most economical section of channel and derive conditions for most efficient triangular channel section.	CO 1	6
B) Explain Specific energy and Specific energy curve with neat diagram.	Understand	6
C) Show that, for maximum discharge in a rectangular channel, the depth of flow is $2/3$ of the specific energy.	CO 1	6
Q. 3 Solve Any Two of the following.		12
A) State the gradually varied flow assumptions and derive the dynamic equation of gradually varied flow.	CO 2	6
B) Enlist and give description about types of hydraulic jump.	CO 2	6
C) A jet of water, 10 cm diameter moves with a velocity of 25 m/s and strikes a series of flat plates fixed on the periphery of wheel. If due to impact the wheel rotates at 100 rpm, calculate (i) Force exerted by jet on plate, (ii) Work done on the plate/sec, (iii) Torque exerted on wheel if the radial distance at which jet strikes the plate and axis of wheel is 1 m.	CO 3	6
Q.4 Solve Any Two of the following.		12
A) Elaborate major component parts of Pelton wheel, Francis and Kaplan Turbine with neat sketch.	Remember	6

B) A Pelton wheel turbine having a mean bucket diameter of 1.2 m is running at 1000 r.p.m. The net head is 840 m. If the side clearance angle is 150 and discharge $Q = 0.12 \text{ m}^3/\text{s}$. Determine power available at the nozzle and efficiency of a Pelton wheel. Take data - $C_v = 1$. **CO 2** **6**

C) Write a note on selection of turbines. **Understand** **6**

Q. 5 Solve Any Two of the following. **12**

A) How pumps are generally classified and explain in detail working of a centrifugal pump. **CO 2** **6**

B) Explain i) Efficiencies of pump **CO 2** **6**
ii) Reciprocating pump.

C) Describe performance characteristics of centrifugal pumps. **CO 2** **6**

***** End *****