

- Q.4 Solve Any Two of the following.** **12**
- A) Explain in details i) Characteristics strength of materials ii) Design values. CO1 **6**
- B) Design a balanced singly reinforced concrete beam section for an applied moment of 60kN-m. The width of the beam is limited to 175 mm. Use M 20 concrete and Fe 415 steel bars. Use LSM. CO3 **6**
- C) Explain in detail i) Properties of Flanged (L and T) ii) Design procedure of Flanged Beams. CO3 **6**
- Q. 5 Solve Any Two of the following.** **12**
- A) A rectangular beam of section 300 mm width and 500 mm depth is reinforced with four 20 mm bars out of which two bars bent at the ends of the beam at 45°. Determine the additional shear reinforcement required if the factored shear force at the critical section is 320 kN. Consider grade of concrete M 25 and steel of grade Fe 415. Use LSM. CO3 **6**
- B) Explain in detail development length for bond stress. Write the expression for the development length in terms of flexure bond. CO3 **6**
- C) What do you get by ‘detailing of reinforcement’? Explain with neat sketch reinforcement detailing for rectangular beam and one way slab. CO1 **6**

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Winter Examination – 2023

Course: B. Tech.

Branch : Civil

Semester :6th

Subject Code & Name: BTCVC601_Y22 & Design of RC Structures

Max Marks: 60

Date:16/01/2024

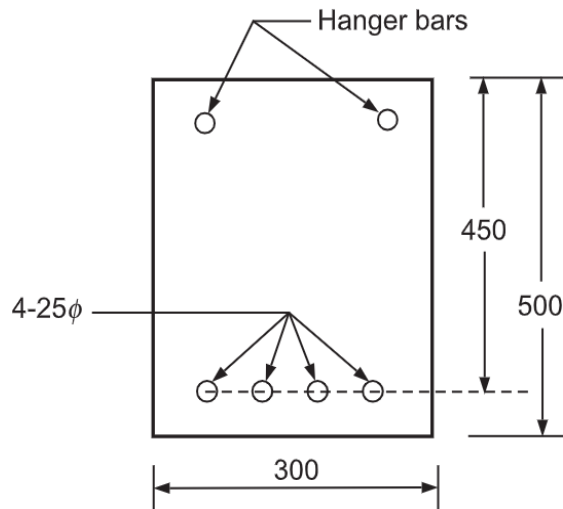
Duration: 3 Hr.

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) Draw stress strain curve of mild steel and define Elastic limit, Yield Point, and Ductility.	CO1	6
B) Write down the assumptions made in Working stress method of design.	CO1	6
C) Discuss the advantages of the limit state method over other design philosophies.	CO1	6
Q.2 Solve Any Two of the following.		12
A) Draw the Stress block diagram and show parameter for working stress method.	CO1	6
B) Define balanced, under reinforced and over reinforced section for working stress method.	CO1	6
C) Write short note on Modulus Ratio(m).	CO1	6
Q. 3 Solve Any Two of the following.		12
A) Write short note on i) characteristic strength ii) characteristic load iii) load factor and partial safety factors	CO1	6
B) Draw the Stress block diagram and show parameter for limit state method.	CO1	6
C) A reinforced concrete beam of rectangular cross-section having width 230 mm and effective depth 400 mm is subjected to a factored shear force of 120 kN. The grade of concrete, main steel, stirrups are M20, Fe415, Fe250 respectively. For the area of main steel provided the design shear stress is 0.48 N/mm ² , the beam is design for collapse in limit state. Find the spacing of 2 legged 8 mm stirrups.	CO1	6
Q.4 Solve Any Two of the following.		12

- A) Determine the Moment of resistance of the beam shown in the figure. Use CO1 6
M20 grade of concrete and Fe 415 grade of steel. Assume suitable data if necessary.



- B) Derive the governing equations of a doubly reinforced beam using LSM. CO1 6
C) Design a simply supported beam of effective span 8 m subjected to imposed CO1 6
loads of 35 kN/m. The beam dimensions and other data are $b=300$ mm,
 $D=700$ mm, M20 concrete and Fe415.

Table 5.1 Values of f_{sc} and ϵ_{sc}

Stress level	Fe 415		Fe 500	
	Strain ϵ_{sc}	Stress f_{sc} (N/mm ²)	Strain ϵ_{sc}	Stress f_{sc} (N/mm ²)
0.80 f_{yd}	0.00144	288.7	0.00174	347.8
0.85 f_{yd}	0.00163	306.7	0.00195	369.6
0.90 f_{yd}	0.00192	324.8	0.00226	391.3
0.95 f_{yd}	0.00241	342.8	0.00277	413.0
0.975 f_{yd}	0.00276	351.8	0.00312	423.9
1.0 f_{yd}	0.00380	360.9	0.00417	434.8

Linear interpolation may be done for intermediate values.

- Q. 5 Solve Any Two of the following.** 12
- A) Discuss the limitations of interaction curve. CO1 6
B) Name and explain three modes of failures of short, rectangular and CO1 6
symmetrically reinforced concrete column subjected to axial load P_u and
uniaxial moment M_u .
C) Draw the compressive stress block of concrete of a short, rectangular and CO1 6
symmetrically reinforced concrete column subjected to axial load P_u and
uniaxial moment M_u , when the neutral axis lies outside the section.

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Winter Examination – 2023

Course: B. Tech.

Branch : Civil

Semester :6th

Subject Code & Name:BTCVC602_Y22 & Foundation 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) Describe the methods used for soil exploration.	CO1	6
B) Outline a step-by-step test procedure for conducting a field test to evaluate bearing capacity. Discuss the limitations associated with this procedure.	CO1	6
C) Why is soil exploration considered a crucial step in the foundation design process? Discuss its necessity and importance.	CO1	6
Q.2 Solve Any Two of the following.		12
A) Elaborate on Terzaghi's original bearing capacity equations and the assumptions underlying his analysis.	CO1	6
B) Discuss the specialized applications of Terzaghi's equations for different types of foundations and soil conditions.	CO1	6
C) A strip footing of width 2.5 m is to be founded at a depth of 1.5 m in a well drained sand stratum having the following properties: $\phi' = 38^\circ$, $C = 0$, $\gamma = 18$ kN/m ³ . Determine the ultimate bearing capacity using Terzaghi's bearing capacity equation.	CO1	6
Q. 3 Solve Any Two of the following.		12
A) List preventive measures for dealing with expansive soils	CO1	6
B) Explain ground improvement methods suitable for cohesionless soils.	CO1	6
C) Enumerate the factors influencing the choice between shallow and deep foundations	CO1	6
Q.4 Solve Any Two of the following.		12
A) Discuss the advantages and limitations of dynamic formulae in pile design	CO3	6
B) Discuss the key considerations in the design of open caissons	CO3	6

- C) A square pile group of 9 piles of 25 cm diameter is arranged with a pile spacing of 1 m. The length of the piles is 9 m. Unit cohesion of the clay is 75 Kn/m². Neglecting bearing at the tip of the piles determine the group capacity. Assume adhesion factor of 0.75. CO3 6

Q. 5 Solve Any Two of the following. 12

- A) Enumerate and describe common types of slope failures. CO2 6
- B) Discuss the key factors influencing the stability of an infinite slope of cohesive soils. CO2 6
- C) Discuss the impact of construction activities on slope stability. CO2 6

Dr. Babasaheb Ambedkar Technological University, Lonere

Supplementary Semester Examination – Winter 2023

Course: B. Tech.

Branch: Civil Engineering

Semester: VI

Subject Code & Name: BTCVC602_Y 18 *Foundation Engineering*

Max Marks: 60

Date: 18/01/2024

Time: 2:00 to 5:00 PM

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 <u>any two</u> of the following.		12
A) What are the stages of site investigation? State objectives of each stage?		06
B) Describe, with a neat sketch, the wash boring method. In what field conditions would you recommend this method?		06
C) C.1) A SPT was conducted in a dense sand deposit at a depth of 22 m, and a value of 48 was observed for N. The density of the sand was 15 kN/m ² . What is the value of N, corrected for overburden pressure?		06
C.2) Compute the area ratio of a thin-walled tube samples having an external diameter of 6 cm and a wall thickness of 2.25 mm. Do you recommend the sampler for obtaining undisturbed soil samples? Why?		
Q.2 Solve <u>any two</u> following questions.		12
A) What are the common modes of bearing capacity failure of a footing. Explain in detail with Sketches?		06
B) A strip footing of width 3 m is founded at a depth of 2 m below the ground surface in a (c - ϕ) soil having a cohesion $c = 30$ kN/m ² and angle of shearing resistance $\phi = 35^\circ$. The water table is at a depth of 5 m below ground level. The moist weight of soil above the water table is 17.2 5 kN/m ³ . Determine (a) Ultimate bearing capacity of the soil, (b) Net bearing capacity, and (c) Net allowable bearing pressure and the load/m for a factor of safety of 3. Use the general shear failure theory of Terzaghi. $\phi = 35^\circ$ $N_c = 57.8$, $N_q = 41.4$ and $N_\gamma = 42.4$		06
C) If the water table in Q.2 B) rises to the ground level, determine the net safe bearing pressure of the footing. All the other data given in Q.2 B) remains the same. Assume the saturated unit weight of the soil γ_{sat} is 18.5 kN/m ³ .		06

- Q. 3 Solve any two of the following.** **12**
- A) What is swelling soils? Explain in detail the characteristics of swelling soils? **06**
- B) Define and explain the following terms: **06**
 A) Swelling Potential B) Swelling Pressure C) Free Swell
- C) Enlist & explain the essential steps involved in the final choice of the type of foundation? **06**
- Q.4 Solve any two of the following.** **12**
- A) Classify and explain the types of Piles: **06**
 a) Based on purpose
 b) Based on load transfer
 c) Based on method of construction
- B) Enlist the different methods to estimate the load carrying capacity of piles and explain in detail static formulae method. **06**
- C) **C.1)** A timber pile was driven by a **drop hammer** weighing 30 kN with a free fall of 1.2 m. The average penetration of the last few blows was 5 mm. What is the **capacity of the pile** according to Engineering News Formula? **06**
C.2) A pile is driven with a single acting **steam hammer** of weight 15 kN with a free fall of 900 mm. The final set, the average of the last three blows, is 27.5 mm. Find the **safe load** using the Engineering News Formula?
- Q. 5 Solve any two of the following.** **12**
- A) Enlist the different methods for the analysis of finite slopes and explain in detail the stability number method. **06**
- B) Enlist and explain in detail the different types of slope failures? **06**
- C) An embankment is inclined at an angle of 35° and its height is 15 m. The angle of shearing resistance is 15° and the cohesion intercept is 200 kN/m^2 . The unit weight of soil is 18.0 kN/m^3 . If Taylor's stability number is 0.06, find the factor of safety with respect to cohesion. **06**

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Winter Examination – 2023

Course: B. Tech.

Branch : Civil Engineering

Semester : VI

Subject Code & Name: Concrete Technology (BTCVC603_Y18)

Max Marks: 60

Date: 20/01/2024

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. Assume suitable data whenever necessary.

	(CO)	Marks														
Q.1 Solve Any Two of the following.		12														
A) Write a short note on Sulphate attack on concrete.	CO 3	6														
B) Explain procedure for finding Standard Consistency of Cement.	CO 1	6														
C) Explain procedure for finding Bulking of Sand in detail.	CO 1	6														
Q.2 Solve Any Two of the following.		12														
A) Define Workability. Explain Compaction factor test.	CO 3	6														
B) Explain procedure for finding Fineness of Cement.	CO 1	6														
C) Find Fineness Modulus and Specify type of Sand.																
<table border="1"><thead><tr><th>Sieve Size</th><td>4.75 mm</td><td>2.36 mm</td><td>1.18mm</td><td>600 μ</td><td>300 μ</td><td>150 μ</td></tr></thead><tbody><tr><td>Weight Retained</td><td>30 gm</td><td>250 gm</td><td>220 gm</td><td>200 gm</td><td>150 gm</td><td>50 gm</td></tr></tbody></table>	Sieve Size	4.75 mm	2.36 mm	1.18mm	600 μ	300 μ	150 μ	Weight Retained	30 gm	250 gm	220 gm	200 gm	150 gm	50 gm	CO 2	6
Sieve Size	4.75 mm	2.36 mm	1.18mm	600 μ	300 μ	150 μ										
Weight Retained	30 gm	250 gm	220 gm	200 gm	150 gm	50 gm										
Q.3 Solve Any Two of the following.		12														
A) Define : a) Durability b) Hardened Concrete c) Segregation d) Bleeding e) Characteristic Strength f) Compressive Strength	CO 3	6														
B) Define Concrete. Explain types of concrete.	CO 2	6														
C) Explain difference between Weight Batching & Volume Batching.	CO 2	6														
Q.4 Solve Any Two of the following.		12														
A) Write short note on Needle Vibrator.	CO 3	6														
B) Explain rebound hammer test in detail with neat sketch.	CO 3	6														
C) Explain Ponding Method of Curing.	CO 1	6														

Q. 5	Solve Any Two of the following.		12
A)	What is Admixture? Illustrate difference between Accelerator & Retarder.	CO 2	6
B)	Write a short note on transportation of Concrete.	CO 1	6
C)	Explain procedure for Concrete Mix Design by Indian Standard Method.	CO 3	6

*** END***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Winter Examination – 2023

Course: B. Tech.

Branch: Civil Engineering

Semester: VI

Subject Code & Name: BTCVC604_Y18 & Project Management

Max Marks: 60

Date: 23/01/2024

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) Explain Bar chart, its aspects, advantages, and disadvantages.	CO1	6																																						
B) Explain rules of network diagram	CO1	6																																						
C) Explain resource allocation	CO2	6																																						
Q.2 Solve Any Two of the following.		12																																						
A) Differentiate between CPM and PERT.	CO1	6																																						
B) Draw the network diagram, determine the project duration, and find the Z value for completing the project in 25 days.	CO3	6																																						
<table border="1"><thead><tr><th>Activity</th><th>1-2</th><th>1-3</th><th>2-4</th><th>3-4</th><th>3-5</th><th>2-6</th><th>4-6</th><th>5-6</th></tr></thead><tbody><tr><td>to</td><td>6</td><td>3</td><td>2</td><td>4</td><td>1</td><td>5</td><td>7</td><td>1</td></tr><tr><td>tm</td><td>9</td><td>4</td><td>5</td><td>6</td><td>2</td><td>6</td><td>8</td><td>2</td></tr><tr><td>tp</td><td>12</td><td>11</td><td>14</td><td>8</td><td>5</td><td>7</td><td>15</td><td>3</td></tr></tbody></table>			Activity	1-2	1-3	2-4	3-4	3-5	2-6	4-6	5-6	to	6	3	2	4	1	5	7	1	tm	9	4	5	6	2	6	8	2	tp	12	11	14	8	5	7	15	3		
Activity	1-2	1-3	2-4	3-4	3-5	2-6	4-6	5-6																																
to	6	3	2	4	1	5	7	1																																
tm	9	4	5	6	2	6	8	2																																
tp	12	11	14	8	5	7	15	3																																
C) Explain types of interests	CO4	6																																						
Q. 3 Solve Any Two of the following.		12																																						
A) Explain break - even analysis	CO5	6																																						
B) Explain the quality control concept	CO5	6																																						
C) Explain Demand and supply	CO4	6																																						
Q.4 Solve Any Two of the following.		12																																						
A) Explain the importance of economics in the construction industry	CO4	6																																						
B) Explain graphical representation of cost slope	CO2	6																																						

- C) Explain in detail updating, data required for updating and procedure of updating. **CO3** **6**

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

- A) Discuss Philosophy of Demings **CO6** **6**

- B) The time cost data of a project are given below; the project indirect cost is 60/- per week. Determine the optimum time duration of the project and cost as with this duration by crashing of activities. **CO2** **6**

Activity	1-2	1-3	2-4	2-5	3-4	4-5
Normal time	8	4	2	10	5	3
Normal cost	100	150	50	100	100	80
Crash time	6	2	1	5	1	1
Crash cost	200	350	90	400	200	100

- C) Explain use of Computers in Project Management. **CO6** **6**

***** End *****

	<table border="1"> <thead> <tr> <th colspan="2"></th> <th colspan="4">Destination</th> <th></th> </tr> <tr> <th colspan="2"></th> <th>D1</th> <th>D2</th> <th>D3</th> <th>D4</th> <th>Supply</th> </tr> </thead> <tbody> <tr> <th rowspan="3">Source</th> <th>O1</th> <td>3</td> <td>1</td> <td>7</td> <td>4</td> <td>300</td> </tr> <tr> <th>O2</th> <td>2</td> <td>6</td> <td>5</td> <td>9</td> <td>400</td> </tr> <tr> <th>O3</th> <td>8</td> <td>3</td> <td>3</td> <td>2</td> <td>500</td> </tr> <tr> <th colspan="2">Demand:</th> <td>250</td> <td>350</td> <td>400</td> <td>200</td> <td>1200</td> </tr> </tbody> </table>			Destination							D1	D2	D3	D4	Supply	Source	O1	3	1	7	4	300	O2	2	6	5	9	400	O3	8	3	3	2	500	Demand:		250	350	400	200	1200		
		Destination																																									
		D1	D2	D3	D4	Supply																																					
Source	O1	3	1	7	4	300																																					
	O2	2	6	5	9	400																																					
	O3	8	3	3	2	500																																					
Demand:		250	350	400	200	1200																																					
C)	Explain Monte-Carlo simulation	L3/3	6																																								
Q. 5	Solve Any Two of the following.		12																																								
A)	Explain functions of Material Management,	L2/4	6																																								
B)	Explain Safety Stocks.	L2/4	6																																								
C)	Explain EOQ Analysis with a suitable sketch.	L3/4	6																																								
*** End ***																																											

The grid and the borders of the table will be hidden before final printing.

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Winter Examination – 2023

Course: B. Tech. Branch: Civil Engineering Semester: VI

Subject Code & Name: BTCVOE605J & Planning for Sustainable Development

Max Marks: 60

Date: 25/01/2024

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 short note on sustainable development?	CO1	6
B) Explain in detail what are the ideas of sustainable development	CO2	6
C) List down the objectives of sustainable development	CO1	6
Q.2 Solve Any Two of the following.		12
A) Explain the main principle of sustainable development	CO2	6
B) Elaborate relationship between poverty and environment degradation	CO2	6
C) Explain the strategies for promoting the sustainable development	CO3	6
Q. 3 Solve Any Two of the following.		12
A) What are the issues according to the concept of sustainable development and explain the alternative approaches for it	CO3	6
B) Explain institutional sustainability in detail	CO5	6
C) Write short note on ideas of innovation for sustainable development	CO4	6
Q.4 Solve Any Two of the following.		12
A) State and explain the areas of debate in relation with sustainable development	CO3	6
B) Explain Societal transformations in brief	CO5	6
C) Explain Research methods for Sustainability	CO5	6
Q. 5 Solve Any Two of the following.		12
A) Explain environmental management strategies	CO4	6
B) State and explain the example of innovation for sustainable development	CO4	6
C) Explain the government polices to protect the environment	CO5	6

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary End Semester Examination – Winter 2023

Course: B. Tech. Branch: Civil Engineering Semester: VIth Semester

Subject Code & Name: BTCVE605D Advanced Engineering Geology

Max Marks: 60

Date: 25/01/2024

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.*

Marks

Q. 1 Solve Any Two of the following.

- A) Write short notes on: - **6**
- a. Principle of Uniformitarianism
 - b. Peninsular India
 - c. Law of superposition
- B) Describe the Gondwana supergroup with detailed lithostratigraphic succession and economic importance. **6**
- C) Describe in detail about geological time scale and major extinctions in Earth's history. **6**

Q.2 Solve Any Two of the following.

- A) Write a short note on: - **6**
- a. Artesian well
 - b. Auger drilling
 - c. Confined aquifer
- B) Write a detailed note on trial pit sampling method with its pros and cons. **6**
- C) Describe the procedure of measurement and advantages of rock quality designation (RQD) index. **6**

Q. 3 Solve Any Two of the following.

- A) Write a short note on: - **6**
- a. Civil engineering properties of laterite rock.
 - b. Effect of hydrothermal alteration.
 - c. Civil engineering properties of volcanic breccia.
- B) Describe various types of basalts with their engineering properties. **6**
- C) Write a detailed note on columnar joints and associated problems. **6**

Q.4 Solve Any Two of the following.

- A) Write a short note on: - **6**
- a. Magnetic method
 - b. Pedogenesis
 - c. Regur soil
- B) Write a detailed note on textural classification of soil with neat suitable diagram. **6**
- C) Explain the difference between transported and residual soil with neat labeled diagram of both soil profiles. **6**

Q. 5 Solve Any Two of the following.

- A) Write a short note on: - **6**
- a. Divergent plate boundary
 - b. Shear Strength of rocks
 - c. Koyana dam earthquake
- B) Explain the difference between Wenner and Schlumberger configuration? **6**
- C) Write a detailed note on seismic zones in India with neat labeled diagram. **6**

***** End *****