

Bharatiya Vidya Bhavan's
SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)
Munshi Nagar, Andheri (W) Mumbai – 400058



END SEMESTER-EXAMINATION - DECEMBER 2023

Program: S.Y.B.Tech (Civil) *sem III*

Duration: 3 Hours

Course Code: BS-BTC301

Maximum Points: 100

Course Name: Laplace, Linear Algebra and Complex Analysis

Semester: III

21/12/23

Note:

1. Attempt Any Five Questions
2. Answers to the sub questions should be grouped together
3. Use of CALCULATOR is prohibited.

		Questions	Points	CO	BL	Module
1	a	If $f(z) = u(x, y) + iv(x, y)$ is analytic then prove that $\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right) f(z) ^2 = 4 f'(z) ^2$	6	2	BL5	3
	b	Evaluate $L^{-1}\left\{\frac{s+2}{(s^2+4s+8)(s^2+4s+13)}\right\}$	6	1	BL5	2
	c	Find Eigen Values and corresponding Eigen Vectors of $A = \begin{bmatrix} 3 & -2 & 3 \\ 10 & -3 & 5 \\ 5 & -4 & 7 \end{bmatrix}$	8	3	BL3	5
2	a	Verify Cayley Hamilton Theorem for $A = \begin{bmatrix} 3 & -2 & 1 \\ 1 & -3 & -4 \\ 0 & -4 & 5 \end{bmatrix}$	6	2	BL5	5
	b	Reduce the following matrix A to normal form and hence find its rank	6	3	BL2	4



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END SEMESTER-EXAMINATION - DECEMBER 2023

		$A = \begin{bmatrix} 2 & 3 & 4 & 9 \\ 3 & 4 & 5 & 10 \\ 4 & 5 & 6 & 11 \\ 5 & 6 & 7 & 12 \end{bmatrix}$				
	c	Evaluate (i) $L\{te^t\sqrt{1+\sin t}\}$ (ii) $L\left\{\frac{\sin^2 t}{t}\right\}$	8	1	BL3	1
3	a	Find the sum and product of the Eigen Values of A^{-1} where $A = \begin{bmatrix} 2 & 0 & 0 & 0 \\ 3 & 4 & 0 & 0 \\ 4 & -5 & -3 & 0 \\ 5 & 6 & 7 & 1 \end{bmatrix}$	6	3	BL4	5
	b	Prove that $\int_0^{\infty} \frac{e^{-\sqrt{2}t} \sinh t \cdot \sin t}{t} dt = \frac{\pi}{8}$	6	1	BL5	1
	c	Find the analytic function $f(z) = u(x, y) + iv(x, y)$ whose real part is $u(x, y) = \frac{1}{2}x \log(x^2 + y^2) - y \tan^{-1}\left(\frac{y}{x}\right) + \sin x \cdot \cosh y$	8	2	BL5	3
4	a	Evaluate $L\left\{\int_0^t e^{-4u} \cdot \cos 2u du + 2^{3t}\right\}$	6	1	BL5	1
	b	Find the image of the circle $x^2 + y^2 - 4x = 0$ under the transformation $w = \frac{2z+3}{z-4}$	6	2	BL3	3
	c	Find two non-singular matrices P and Q such that PAQ is in the normal form $A = \begin{bmatrix} 2 & -2 & 3 \\ 3 & -1 & 2 \\ 1 & 2 & -1 \end{bmatrix}$	8	3	BL3	4



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END SEMESTER-EXAMINATION - DECEMBER 2023

5	a	Find Eigen Values and corresponding Eigen Vectors of $adjA$ where $A = \begin{bmatrix} 1 & 2 \\ 4 & 3 \end{bmatrix}$	6	3	BL4 ,5	5
	b	Using Convolution Theorem, Evaluate $L^{-1} \left\{ \frac{1}{s^3(s+1)^2} \right\}$	6	1	BL4	2
	c	Prove that the function $v(x, y) = e^x(x \cos y - y \sin y)$ is harmonic and find corresponding harmonic conjugate.	8	2	BL2 BL4	3
6	a	Find the bilinear transformation which maps the points $1, i, -1$ of z -plane on to the points $0, 1, \infty$ of w -plane.	6	2	BL5	3
	b	Show that the transformation $w = \frac{1}{z}$ maps the circle $ z - 2 = 3$ in to the circle $\left w + \frac{2}{5} \right = \frac{3}{5}$	6	2	BL3	3
	c	Using method of Laplace Transform, solve $\frac{d^2y}{dt^2} - 2\frac{dy}{dt} + y = e^t, y(0) = 2, y'(0) = -1$	8	1	BL3 BL5	2
7	a	State and Prove Cauchy-Riemann's Equations in Polar Coordinate.	6	2	BL2 BL3	3
	b	Test the consistency of the following equations and solve them if they are consistent $2x + 3y - z - 2 = 0$ $x + 2y + z + 3 = 0$ $3x + y - 2z - 1 = 0$	6	3	BL5	4
	c	Find the image of the rectangular region bounded by the straight lines $x = 0, x = 1, y = 0, y = 2$ in the z -plane under the transformation $w = (1 + i)z + (2 - i)$. Show the regions graphically	8	2	BL1 BL3	3



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Re-EXAMINATION - February 2023

Program: S.Y.B.Tech (Civil) *Sem III*

Duration: 3 Hours

Course Code: BS-BTC301

Maximum Points: 100

Course Name: Laplace, Linear Algebra and Complex Analysis

Semester: III

Note:

1. Attempt Any Five Questions
2. Answers to the sub questions should be grouped together
3. Use of CALCULATOR is prohibited.

	Questions	Points	CO	BL	Module
1	a If $f(z) = u(x, y) + iv(x, y)$ is analytic then prove that $\left[\frac{\partial}{\partial x} f(z) \right]^2 + \left[\frac{\partial}{\partial y} f(z) \right]^2 = f'(z) ^2$	6	2	BL5	3
	b Evaluate $L^{-1} \left\{ \frac{s}{(s+1)(s+2)(s+3)} \right\}$	6	1	BL5	2
	c Find Eigen Values and corresponding Eigen Vectors of $A = \begin{bmatrix} 2 & 1 & 1 \\ 2 & 3 & 2 \\ 3 & 3 & 4 \end{bmatrix}$	8	3	BL3	5
2	a Verify Cayley Hamilton Theorem for $A = \begin{bmatrix} 2 & -1 & 1 \\ 1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$	6	2	BL5	5
	b Reduce the following matrix A to normal form and hence find its rank	6	3	BL2	4



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Re-EXAMINATION - February 2023

		$A = \begin{bmatrix} 4 & -1 & 2 & 1 \\ 1 & 3 & 1 & 2 \\ -1 & 2 & 4 & 5 \\ 7 & 3 & 8 & 7 \end{bmatrix}$				
	c	Evaluate (i) $L\{te^t \cos 3t\}$ (ii) $L\left\{\frac{\cos at - \cos bt}{t}\right\}$	8	1	BL3	1
3	a	Find the sum and product of the Eigen Values of $adjA$ where $A = \begin{bmatrix} 2 & 0 & 0 & 0 \\ 3 & 5 & 0 & 0 \\ 4 & 7 & 3 & 0 \\ 5 & 6 & 7 & 1 \end{bmatrix}$	6	3	BL4	5
	b	Prove that $\int_0^{\infty} \frac{e^{-\sqrt{2}t} \sinh t \cdot \sin t}{t} dt = \frac{\pi}{8}$	6	1	BL5	1
	c	Find the analytic function $f(z) = u(x, y) + iv(x, y)$ whose real part is $u(x, y) = \frac{1}{2}x \log(x^2 + y^2) - y \tan^{-1}\left(\frac{y}{x}\right) + \sin x \cdot \cosh y$	8	2	BL5	3
4	a	Evaluate $L\left\{\int_0^t e^{-3u} \cdot \sin 2u du + 4^t\right\}$	6	1	BL5	1
	b	Find the image of the infinite strip $\frac{1}{4} < y < \frac{1}{2}$ under the transformation $w = \frac{1}{z}$. Show the region graphically.	6	2	BL3	3
	c	Find two non-singular matrices P and Q such that PAQ is in the normal form $A = \begin{bmatrix} 3 & 2 & 1 & 4 \\ 12 & 4 & 8 & 0 \\ 9 & 5 & 4 & 9 \end{bmatrix}$	8	3	BL3	4



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Re-EXAMINATION - February 2023

5	a	Find Eigen Values and corresponding Eigen Vectors of A^{-1} where $A = \begin{bmatrix} 1 & 2 \\ 4 & 3 \end{bmatrix}$	6	3	BL4 ,5	5
	b	Using Convolution Theorem, Evaluate $L^{-1} \left\{ \frac{1}{s^2(s-1)^3} \right\}$	6	1	BL4	2
	c	Prove that the function $u(x, y) = e^x(x \cos y - y \sin y)$ is harmonic and find corresponding harmonic conjugate.	8	2	BL2 BL4	3
6	a	Find the bilinear transformation which maps the points 1, i , -1 of z -plane on to the points i , 0, $-i$ of w -plane.	6	2	BL5	3
	b	Show that the transformation $w = \frac{1}{z}$ maps the circle $ z-3 =5$ in to the circle $\left w + \frac{3}{16}\right = \frac{5}{16}$	6	2	BL3	3
	c	Using method of Laplace Transform, solve $\frac{d^2y}{dt^2} - 3\frac{dy}{dt} + 2y = 4e^{2t}$, $y(0) = -3$, $y'(0) = 5$	8	1	BL3 BL5	2
7	a	State and Prove Cauchy-Riemann's Equations in Polar Coordinate.	6	2	BL2 BL3	3
	b	Test the consistency of the following equations and solve them if they are consistent $3x - y + 2z = 1$, $x - 2y + 3z = 3$, $x - y + z = -1$, $x + 2y - z = 3$	6	3	BL5	4
	c	Find the image of the rectangular region bounded by the straight lines $x = 0$, $x = 1$, $y = 0$, $y = 2$ in the z -plane under the transformation $w = (1+i)z + (2-i)$. Show the regions graphically	8	2	BL1 BL3	3

**END SEMESTER EXAMINATION DECEMBER 2023**Program: *S.Y.* B. Tech Civil Engineering *Exam III*

Duration: 3 Hr.

Course Code: ES BTC302

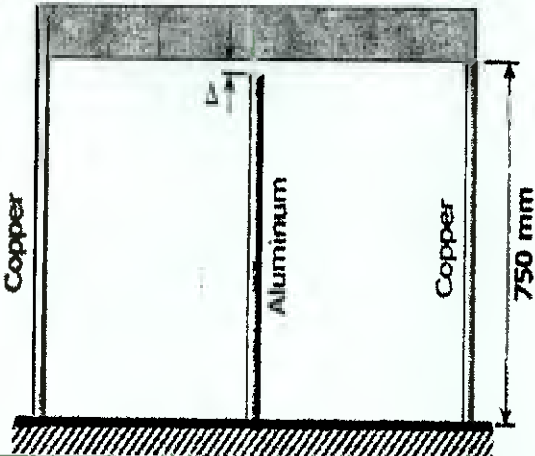
Maximum Points: 100

Course Name: Mechanics of Materials

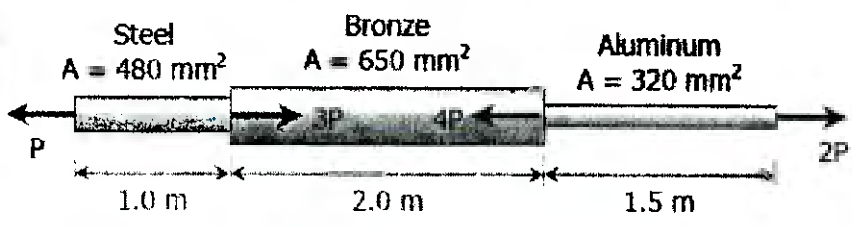
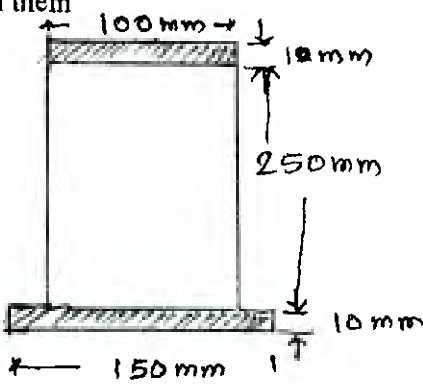
Semester: III

Notes: Solve any 5 questions

26/12/23

Q.No.	Questions	Points	CO	BL	Module No.
1(a)	A solid cylinder of diameter d carries an axial load P . Show that its change in diameter is $4P\nu / \pi Ed$.	07	2	3	1
1(b)	<p>There is a gap between the aluminum bar and the rigid slab that is supported by two copper bars. At 10°C, $\Delta = 0.18$ mm. Neglecting the mass of the slab, calculate the stress in each rod when the temperature in the assembly is increased to 95°C. For each copper bar, $A = 500$ mm², $E = 120$ GPa, and $\alpha = 16.8$ $\mu\text{m}/(\text{m}\cdot^\circ\text{C})$. For the aluminum bar, $A = 400$ mm², $E = 70$ GPa, and $\alpha = 23.1$ $\mu\text{m}/(\text{m}\cdot^\circ\text{C})$.</p> 	13	2	3	1
2(a)	A cylindrical thin drum 70cm in diameter and 3m long has a shell thickness of 1cm. If the drum is subjected to an internal pressure of 3.0 N/mm ² , determine (i) change in diameter (ii) change in length and (iii) change in volume $E=2 \times 10^5$ N/mm ² and poisson's ratio=0.25	08	3	3	7

**END SEMESTER EXAMINATION DECEMBER 2023**

2(b)	<p>A bronze bar is fastened between a steel bar and an aluminum bar as shown in Fig. Axial loads are applied at the positions indicated. Find the largest value of P that will not exceed an overall deformation of 3.0 mm, or the following stresses: 140 MPa in the steel, 120 MPa in the bronze, and 80 MPa in the aluminum. Assume that the assembly is suitably braced to prevent buckling. Use $E_s = 200$ GPa, $E_b = 70$ GPa, and $E_a = 83$ GPa.</p> 	12	2	3	1						
3(a)	<p>Steel plates are used to strengthen 100 mm by 250 mm timber beam. The materials are fastened firmly as shown so that there will be no relative movement between them</p>  <p>Given the following material properties:</p> <table border="1" data-bbox="199 1587 1053 1723"> <thead> <tr> <th>Allowable Bending Stress, F_b</th> <th>Modulus of Elasticity, E</th> </tr> </thead> <tbody> <tr> <td>Steel = 120 MPa</td> <td>Steel = 200 GPa</td> </tr> <tr> <td>Wood = 10 MPa</td> <td>Wood = 10 GPa</td> </tr> </tbody> </table> <p>Find the safe resisting moment of the beam in kN·m.</p>	Allowable Bending Stress, F_b	Modulus of Elasticity, E	Steel = 120 MPa	Steel = 200 GPa	Wood = 10 MPa	Wood = 10 GPa	10	2	3	3
Allowable Bending Stress, F_b	Modulus of Elasticity, E										
Steel = 120 MPa	Steel = 200 GPa										
Wood = 10 MPa	Wood = 10 GPa										

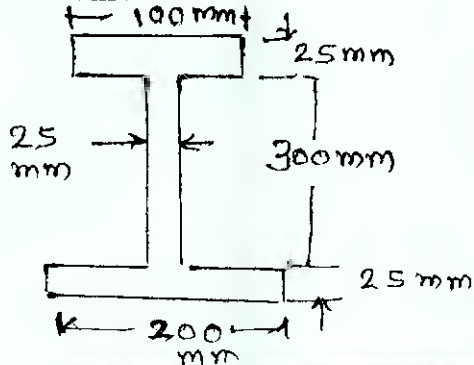


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END SEMESTER EXAMINATION DECEMBER 2023

3(b)	A simply supported beam of span 6.0 m is subjected to udl of 40 Kn/m and point load of 50 Kn at centre of span, if permissible stress in flexure is 100 Mpa and allowable shear stress 10 MPa calculate beam depth to be provided if width beam is 250 mm	10	02	3	3
4(a)	Determine the maximum torque that can be applied to a hollow circular steel shaft of 100-mm outside diameter and an 80-mm inside diameter without exceeding a shearing stress of 60 MPa or a twist of 0.5 deg/m. Use $G = 83$ GPa.	08	02	04	5
4(b)	A 5-m steel shaft rotating at 2 Hz has 70 kW applied at a gear at B that is 2 m from the left end A where 20 kW are removed. At the right end D, 30 kW are removed and another 20 kW leaves the shaft at 1.5 m from the right end at C. (a) Find the uniform shaft diameter so that the shearing stress will not exceed 60 MPa. (b) If a uniform shaft diameter of 100 mm is specified, determine the angle by which one end of the shaft lags behind the other end. Use $G = 83$ GPa.	12	02	03	5
5(a)	Calculate and draw shear stress distribution for unequal I beam shown subjected to maximum shear force for a beam of 5 m span loaded with udl of 30 kn/m. 	10	02	03	4

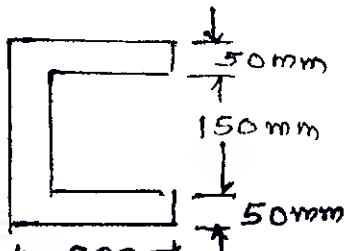
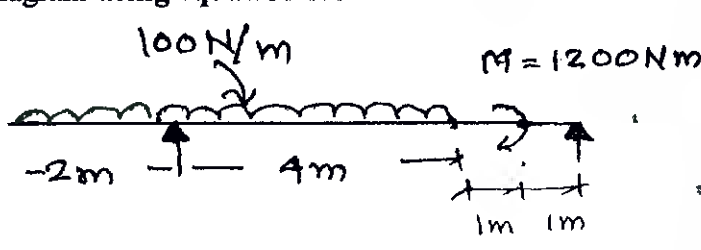
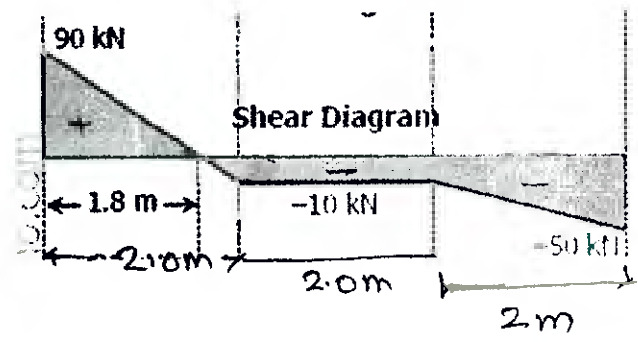


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END SEMESTER EXAMINATION DECEMBER 2023

5(b)	<p>Calculate shear center for channel section shown and Calculate shear stress distribution for channel, if maximum shear force is 70 Kn. (Use shear flow for calculations, using basic principles)</p> 	10	04	03	4
6(a)	<p>For the beam shown, draw shear force diagram and bending moment diagram using equation method.</p> 	10	1	3	2
6(b)	<p>For the given shear force diagram, draw loading diagram and draw bending moment diagram by area method.</p> 	10	1	3	2

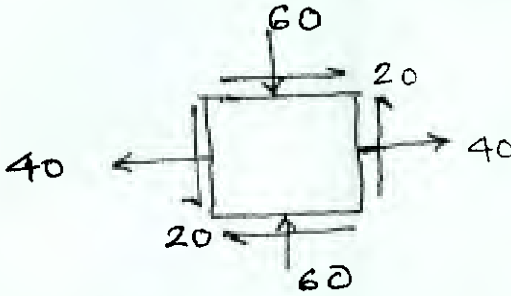


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END SEMESTER EXAMINATION DECEMBER 2023

7(a)	 <p>For the given element with stresses as shown, calculate state of stress if an element is rotated by 30° clockwise. Use transformation equations. Also find out values of principle stresses and maximum shear stress.</p>	10	2	04	6
7(b)	<p>For the element with state of stress given as</p> $\sigma = \begin{bmatrix} 20 & -10 \\ -10 & 50 \end{bmatrix} \text{ MPa}$ <p>Find state of stress if an element is rotated by 30° anticlockwise using Mohr's circle.. Also find out values of principle stresses and maximum shear stress.</p>	10	2	04	6

Program: B. Tech Civil Engineering *SEM III*

Duration: 3 Hr.

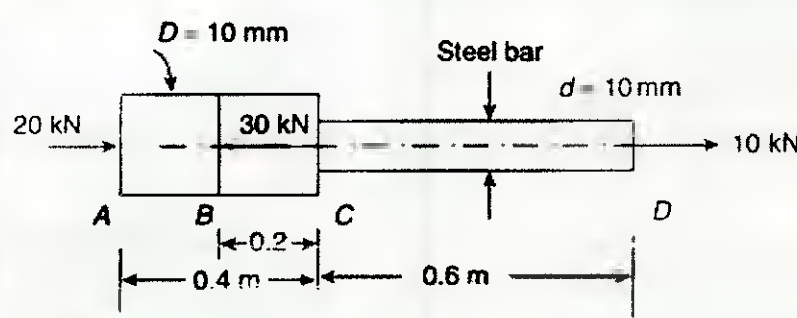
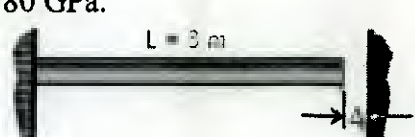
Course Code: ES BTC302

Maximum Points: 100

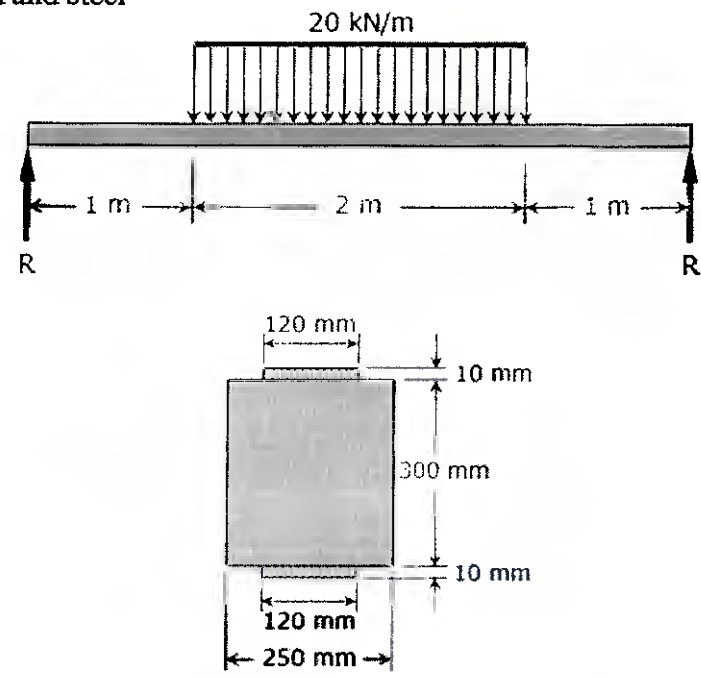
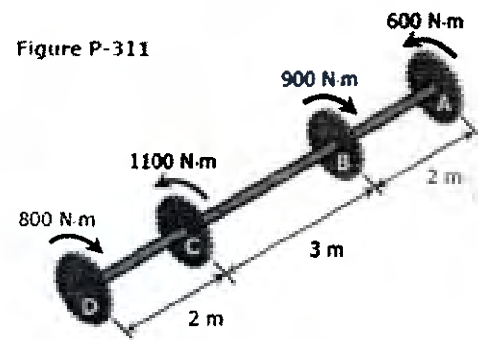
Course Name: Mechanics of Materials

Semester: III

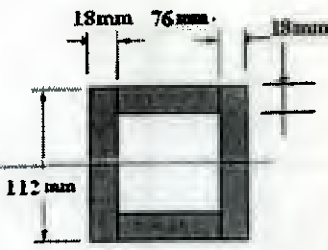
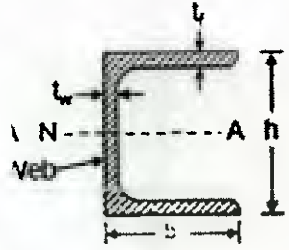
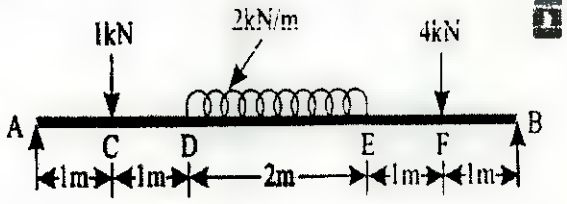
Note: Solve any 5 questions.

Q. No.	Questions	Points	CO	BL	Module No.
1(a)	Draw a stress strain diagram for mild steel explaining all the salient points on stress strain curve	10	2	3	1
1(b)	<p>A 1-m-long stepped steel bar is subjected to axial loads as shown in Fig. 1.50. The diameters of two steps are 20 and 10mm, respectively. If $E = 200$ GPa, calculate the stresses in each portion AB, BC and CD. What is the total change in length of the bar?</p> 	10	2	3	1
2(a)	A cylindrical shell, 0.8 m in a diameter and 3 m long is having 10 mm wall thickness. If the shell is subjected to an internal pressure of 2.5 N/mm ² , determine change in diameter, change in length, and change in volume. Take $E = 200$ GPa and Poisson's ratio = 0.25.	12	3	3	7
2(b)	<p>A bronze bar 3 m long with a cross sectional area of 320 mm² is placed between two rigid walls as shown in Fig. At a temperature of -20°C, the gap $\Delta = 25$ mm. Find the temperature at which the compressive stress in the bar will be 35 MPa. Use $\alpha = 18.0 \times 10^{-6}$ m/(m\cdot°C) and $E = 80$ GPa.</p> 	08	2	3	1
3(a)	Calculate beam depth to be provided, for a simply supported beam of span 5.0 m subjected to point load of 75 Kn at centre of span, if permissible stress in flexure is 100 Mpa and allowable shear stress is 30 Mpa ,width of beam provided is 200 mm.	08	2	3	3/4

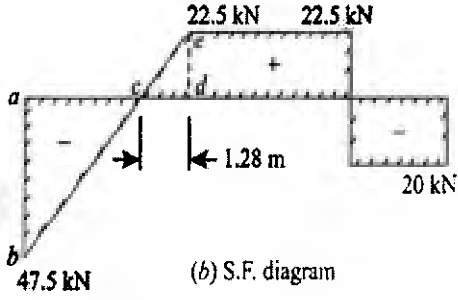
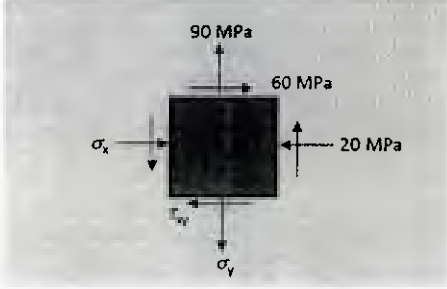


3(b)	<p>A simply supported beam 4 m long has the cross section shown in Fig. It carries a uniformly distributed load of 20 kN/m over the middle half of the span. Compute the maximum stresses in the wood and steel</p>  <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>Modulus of Elasticity, E Steel = 200 GPa Wood = 13.3 GPa</p> </div>	12	2	3	3
4(a)	<p>A solid steel shaft in a rolling mill transmits 20 kW of power at 2 Hz. Determine the smallest safe diameter of the shaft if the shear stress τ_w is not to exceed 40 MPa and the angle of twist θ is limited to 6° in a length of 3 m. Use $G = 83$ GPa.</p>	10	2	3	5
4(b)	<p>An aluminium shaft with a constant diameter of 50 mm is loaded by torques applied to gears attached to it as shown in Fig. Using $G = 28$ GPa, determine the relative angle of twist of gear D relative to gear A.</p> 	10	2	3	5



5(a)	<p>Square box beam constructed from four planks. Spacing between nails is 44 mm and Vertical shear force $V = 2.7$ kN. Find shearing force in each nail</p> 	07	2	3	4
5(b)	<p>Calculate shear center for channel section shown using fundamental principles and Calculate shear stress distribution for channel, if maximum shear force is 70 Kn.</p>  <p>$b_{\text{flange}} = 200$ mm $t_f = 8$ mm , $t_w = 10$ mm , $h = 250$ mm</p>	13	4	3	4
6(a)	<p>For the beam shown, draw shear force diagram and bending moment diagram using equation method or using area method</p> 	12	1	3	2
6(b)	<p>For the given shear force diagram, draw loading diagram and draw bending moment diagram by area method.</p>	08	1	3	2



	 <p>(b) S.F. diagram</p>				
7(a)	 <p>For the given element with stresses as shown, calculate state of stress if an element is rotated by 30° clockwise. Use transformation equations Also calculate Principal stresses and maximum shear stress using equations</p>	12	2	3	6
7(b)	<p>For the element with state of stress given as</p> $\begin{bmatrix} 10 & -5 \\ -5 & 30 \end{bmatrix} \text{ Mpa}$ <p>Find state of stress if an element is rotated by 60° anticlockwise, plotting Mohr's circle. Also find out values of principle stresses and maximum shear stress.</p>	08	2	3	6



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End Semester Examination December 2023

Program: B. Tech. Civil Engineering *S.Y. Sem III*

Duration: 3 hrs.

Course Code: PE-BTC303

Maximum Points: 100

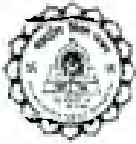
Course Name: Basics of Surveying

Semester: III

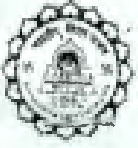
Notes:

1. There are TOTAL SEVEN MAIN questions, each of 20 points.
2. QUESTION 1 is COMPULSORY. Solve any FOUR from remaining SIX QUESTIONS.
3. Write answer to each MAIN QUESTION on a new page.
4. Answers to be accompanied with appropriate sketches/facts & figures/table or chart/graph/diagram/flowchart wherever necessary or required.
5. Assume suitable data wherever needed and state it clearly.

Q. No.	Questions	Points	CO	BL																		
1	Answer the following:	20	1,2,3,4	1,2,3																		
	1. Distinguish between magnetic declination and local attraction in a compass survey. (2)																					
	2. State the conversion rule from whole circle bearing to reduced bearing. (2)																					
	3. State the essential difference between dumpy level and automatic level. (2)																					
	4. Define, with a neat sketch, contour interval and horizontal equivalent (2)																					
	5. Distinguish between swinging the telescope and transiting the telescope in a theodolite. (2)																					
	6. Explain, in short, why it is necessary to take both face observations in a theodolite. (2)																					
	7. State the major difference between electronic theodolite and total station. (2)																					
	8. State one merit and one application of radiation method of plane table surveying. (2)																					
	9. State the major difference between Trapezoidal rule and Simpson's rule for area computation. (2)																					
10. Two distances of 20m and 100m were accurately measured out and the intercepts on the staff were 0.196m at the former distance and 0.996 at the later. Calculate the tacheometric constants. (2)																						
2.A	Explain, with a proper sketch, what the 'Closing error' is in a compass traverse (3) and how to compute the error. (2)	5	1,2	1,2,3																		
2.B	Adjust the following traverse ABCDEA by correcting the latitudes and departures using Bowditch's rule.	15	1,3,4	1,2,3																		
	<table border="1"> <thead> <tr> <th>Side</th> <th>Length (m)</th> <th>Whole Circle Bearing (WCB)</th> </tr> </thead> <tbody> <tr> <td>AB</td> <td>89.31</td> <td>45° 10'</td> </tr> <tr> <td>BC</td> <td>219.76</td> <td>72° 05'</td> </tr> <tr> <td>CD</td> <td>151.18</td> <td>161° 52'</td> </tr> <tr> <td>DE</td> <td>159.10</td> <td>228° 43'</td> </tr> <tr> <td>EA</td> <td>232.26</td> <td>300° 42'</td> </tr> </tbody> </table>				Side	Length (m)	Whole Circle Bearing (WCB)	AB	89.31	45° 10'	BC	219.76	72° 05'	CD	151.18	161° 52'	DE	159.10	228° 43'	EA	232.26	300° 42'
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**End Semester Examination December 2023**

	<ol style="list-style-type: none"> 1. Draw the traverse. (2) 2. Prepare Gales Traverse Table. (2) 3. Calculate Observed latitude and departures. (3) 4. Calculate the Closing error. (3) 5. Corrected latitude and departures. (3) 6. Independent coordinates. (2) [Assume Independent coordinates (X and Y) at A as 1000.00m both] 														
3.A	<p>Following readings were taken with a level and 4m staff. Draw up a level book page (2) and reduce the levels (8) along with checks (2) by height of instrument (HI) method.</p> <p>0.683, 1.109, 1.838, 3.399, (3.877 and 0.451) Change point (CP), 1.405, 1.896, 2.676, 3.478, (3.999 and 1.834) CP, 0.649, 1.706.</p> <p>The benchmark (BM) at the first point is 36.545m.</p>	12	1,3	1,2,3											
3.B	<p>Explain, with a neat sketch, the principle and procedure involved in reciprocal leveling. Provide a step-by-step description of the reciprocal leveling process (6) and provide a real-world example where reciprocal leveling would be particularly applicable. (2)</p>	8	1,3	1,2,3											
4.A	<p>To determine the gradient between two points A and B, a tacheometer was set up at another station O and the following observations were taken keeping the staff vertical. Draw the sketch. (1)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Instrument station</th> <th>Staff station</th> <th>Vertical Angle</th> <th>Stadia readings</th> </tr> </thead> <tbody> <tr> <td rowspan="2" style="text-align: center;">O</td> <td style="text-align: center;">A</td> <td style="text-align: center;">$+4^{\circ} 20' 00''$</td> <td style="text-align: center;">1.300, 1.610, 1.920</td> </tr> <tr> <td style="text-align: center;">B</td> <td style="text-align: center;">$+0^{\circ} 10' 40''$</td> <td style="text-align: center;">1.100, 1.410, 1.720</td> </tr> </tbody> </table> <p>If the horizontal angle AOB is $35^{\circ} 20'$, determine:</p> <ol style="list-style-type: none"> 1. Horizontal Distance AB (3) 2. Vertical distance at A and B (3) 3. R.L. at A and B (3) 4. Gradient between A and B (2) <p>Reduced level (R.L.) at O is 100.00m and the height of instrument is 1.5m. Take $K = 100$ and $C = 0.00$.</p>	Instrument station	Staff station	Vertical Angle	Stadia readings	O	A	$+4^{\circ} 20' 00''$	1.300, 1.610, 1.920	B	$+0^{\circ} 10' 40''$	1.100, 1.410, 1.720	12	1,3	1,2,3
Instrument station	Staff station	Vertical Angle	Stadia readings												
O	A	$+4^{\circ} 20' 00''$	1.300, 1.610, 1.920												
	B	$+0^{\circ} 10' 40''$	1.100, 1.410, 1.720												
4.B	<p>Provide an overview of Electronic Distance Measuring (EDM) and Electronic theodolite, highlighting their key features, applications, and advantages over traditional instruments. (6) Additionally, explain how these modern instruments contribute to increased accuracy, efficiency, and data precision in surveying projects. (2)</p>	8	1,2	1,2,3											
5.A	<p>Provide a step-by-step procedure on how a surveyor would conduct a Plane Table traverse. Support your answer with proper sketch. (6)</p>	6	1,2,4	1,2,3											
5.B	<p>Discuss the advantages and limitations of Plane Table traversing in comparison to other surveying methods. (4)</p>	4	1,2,4	1,2,3											
5.C	<p>Following perpendicular offsets were taken at 10m intervals from a survey line to an</p>	10	1,3	1,2,3											



End Semester Examination December 2023

	irregular boundary line: 3.25, 5.60, 4.20, 6.65, 8.75, 6.20, 3.25, 4.20, 5.65 Draw the plot (1) and calculate the area enclosed between the survey line and the irregular boundary line and the first and last offsets by: 1. Average ordinate rule (3) 2. Trapezoidal rule (4) Find the difference in the calculated areas by both the methods and comment. (2)			
6.A	Give the steps of operation for establishment of control points of a traverse by using a theodolite. (2) Define 'Closed Traverse - Open loop'. (2)	4	1,3,4	1,2,3
6.B	With a proper sketch, state the fundamental lines of a Level (3) and give the relationship between these fundamental lines. (3)	6	1,2	1,2,3
6.C	With a neat sketch, provide a step-by-step process for determining the tacheometry constants, including the necessary equations and variables involved. (6)	6	1,2	1,2,3
6.D	Explain the purpose and functioning of a planimeter in surveying. (2) State the major difference between polar and roller planimeter. (2)	4	1,2	1,2,3
7.A	Explain in detail the principle characteristics of contour lines.	6	1,4	1,2,3
7.B	Explain the functionality and applications of Total Station as a modern surveying instrument. (4) Discuss at least two specific applications where Total Station proves advantageous in surveying projects. (2)	6	1,2	1,2,3
7.C	State the need of computation of volume of earthwork for civil engineering projects. (2) And explain, with a neat sketch, the computation of volume of earthwork from spot heights. (6)	8	1,2	1,2,3

-----X--X--X-----



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RE- EXAMINATION-FEB-2024

Program: Civil Engineering

Duration: 3.00 hrs.

Course Code: ES-BTC-304

Maximum Points: 100

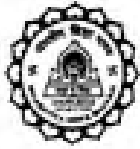
Course Name: Building Drawing with CAD

Semester: III

Notes:

1. Q.1 is compulsory & attempts any four out of remaining six.
2. Illustrate answer with neat sketches wherever required.
3. Make suitable assumptions where necessary and state them clearly.

Q.No	Questions	Marks	BL	CO	PO	PI Code
1	Draw to a suitable scale ground floor plan of G+1 storey bungalow for a Resident Doctor in a site of the data given below. 1. Plot size: 30M x 34M. 2. Road is on southern side parallel to 30 M direction 3. Wind direction is S-SW-W & climatic zone is hot and humid. 4. Requirements a. Small Clinic b. Master bed room c. Living room d. Children bed room e. Kitchen cum dining room f. Guest bed room g. Staircase/bath/WC/store/verandah are to be provided A) Draw developed plan for ground floor B) Draw line plan of terrace plan	15+05	1	1-3	1	1.3.1
2	A. Draw to a suitable scale line plan of first floor for Q.1. B. State: Built up area, carpet area, super built up area, FSI for Q.1.	15+05	2	1	1	1.3.1
3	Draw to a suitable scale line plans of Central Library in College building in a site given below 1. (30m x 50m) - Student capacity : 240	20	3	3	1,2	1.3.1/ 2.1.3
4	A. Explain the duties & responsibilities of Contractor/Builder & buyer under Real estate regulation act, 2016. B. Explain how Sanitation and Furniture is to be maintained in a planning of residential building.	10+10	2	2	1	1.3.1
5	A. Draw to a suitable scale Site plan for Q.1. B. Explain how to fix a height of building and byelaws for Minimum sizes of units.	10+10	3	3	1,2	1.3.1/ 2.1.3



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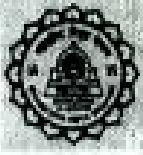
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6	A. Draw to a suitable scale Foundation plan for Q.1. B. Draw to a suitable scale sectional elevation for Q.1.	10+10	2	1-3	1,2	1.3.1/ 2.1.3
7	A. Draw to a suitable scale Water supply & Drainage plan for Q.1. B. Draw to a suitable scale Electricity & Furniture plan for Q.1.	10+10	2	1-3	1,2	1.3.1/ 2.1.3



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S.Y. END SEMESTER EXAMINATION-DEC-2023

Program: *Civil Engineering Sem III*

Duration: 3.00 hrs.

Course Code: ES-BTC-304

Maximum Points: 100

Course Name: Building Drawing with CAD

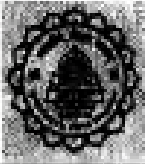
Semester: III

Notes:

1. Q.1 is compulsory & attempts any four out of remaining six.
2. Illustrate answer with neat sketches wherever required.
3. Make suitable assumptions where necessary and state them clearly.

STPM

Q.No	Questions	Mark s	BL	C O	PO
1.	A) Draw to a suitable scale developed plan for ground floor of G+1 storey bungalow for a resident medical officer in a site of the data given below. 1. Plot size: 20 M x 24 M. (FSI: 1.1) 2. Road is on south side parallel to 20 M direction 3. Wind direction is E-SW-W & climatic zone is cold 4. Requirements of officer a. Consulting room b. Master bed room c. Living room d. Children bed room e. Kitchen cum dining room f. Guest bed room g. Staircase/bath/WC/store/verandah are to be provided B) Draw terrace plan for above question.	15+05	L4	1-5	1/3/ 5
2	A. Draw to a suitable scale line plan of first floor for Q.1A. B. State: Built up area, Rera carpet area, carpet area, super built up area, FSI for Q.1A.	15+05	L2	1-5	1/5
3	A. Draw to a suitable scale, line plan of Bank building opening on a plot size 1000 Sq.Ft.	20	L3	2-5	1,2
4	A. Explain Real estate regulation act, 2016 with following points, 1. Pillars of RERA Act, 2016. 2. Responsibilities of buyer. B. Explain following principles of planning in detail, 1. Aspect 2. Grouping	10+10	L2	2	1
5	A. Explain following building bylaws with neat sketch: 1. Open space 2. Frontage	10+10	L2/ 3	2-5	1/3/ 5



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	B. Draw a sectional elevational plan for Q.1A				
6	A. B. Draw to a suitable scale Foundation plan for Q.1A. Draw to a suitable scale site plan for Q.1A.	15+05	L3	1-3	1/3/ 5
7	A. Draw to a suitable scale Water supply & Drainage plan for Q.1A. B. Draw to a suitable scale Electricity & Furniture plan for Q.1A.	10+10	L3	1-3	1/3/ 5



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END SEMESTER EXAMINATION DECEMBER 2023

Program: S.Y. B.Tech. Civil Engineering *Sem III*

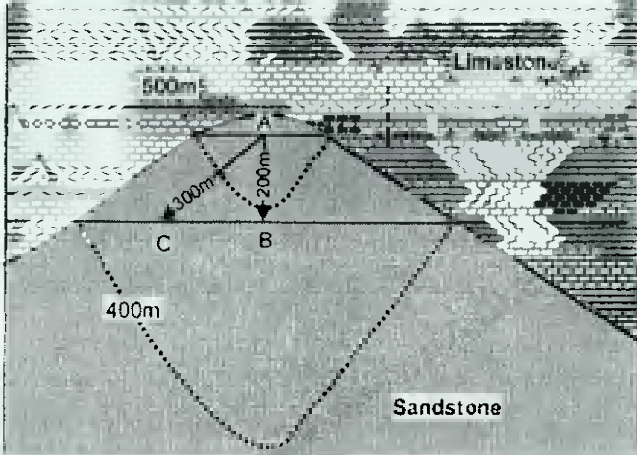
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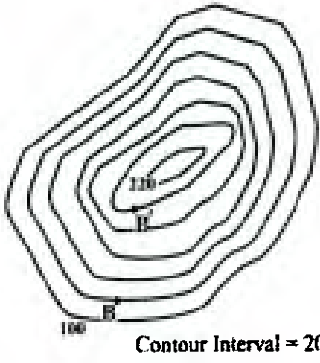
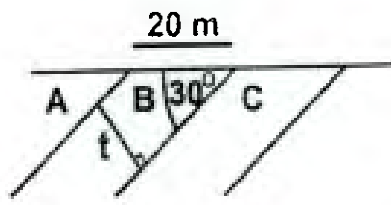
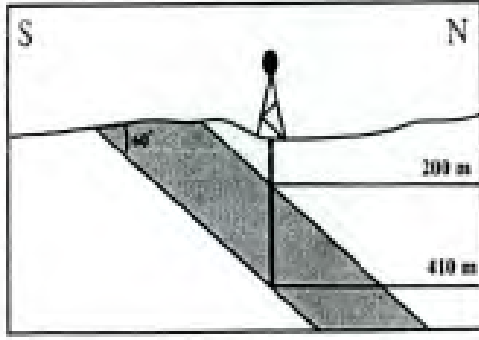
Course Code: BS-BTC 305

Maximum Points: 100

Course Name: Engineering Geology

Semester: III *11/12*

Q. No.	Questions	Points	CO	BL	Module No.
1	a) Write short notes on all of the following- (2 marks each) i) Rayleigh Wave ii) Oxbow Lake iii) Weathering due to temperature changes iv) Vertical and lateral erosion by river v) Wind transportation	2 x 5 = 10	1	2	I
2	a) What is a seismogram? Explain how a simple seismograph measures horizontal and vertical ground movements caused by an earthquake. b) Describe the mechanism of formation of a sand dune with a neat diagram.	1+4 = 5 4+1 = 5	1	2	I
3	a) Explain the rock cycle with a neat, labelled diagram. b) Describe <u>any two</u> laws of stratigraphy. What is the difference between peninsular and extra-peninsular India?	5 2x2+1 = 5	1	2	3 4
4a	The geological map shows the contact between sandstone and limestone. The two dotted curves are the contours of 400 m and 500 m, respectively. The difference between the dip angles of the contact surface along the AB and AC directions is _____ degree (rounded off to two decimal places). 	5	1	3	4

Q. No.	Questions	Points	CO	BL	Module No.
4b	<p>B and B' are two points on the topographic map shown below. The distance between B and B' along the linear traverse BB' is 220m. The angle of the slope along this traverse is _____ degree (give answer in two decimal places).</p>  <p style="text-align: center;">Contour Interval = 20m</p>	5	1	3	4
5	<p>a) A bed with a strike of 045° and a dip angle of 20° in the SE direction is rotated 60° counterclockwise about a vertical axis. What is the value of the strike direction after rotation of the bed?</p> <p>b) A fault displaces a sandstone bed such that the component of displacement along the dip of the fault is 3m and the component of displacement along the strike of the fault is 4m. What is the net displacement?</p> <p>c) The true thickness (t, in m) of bed B in the given diagram is _____</p> <p style="text-align: center;">Profile view</p> 	4 3 3	1	3	4
6a	<p>As shown in the following figure, a vertical well intersects the top and bottom of an inclined bed at 200 m and 410 m depths, respectively. If the true dip of the bed is 60° to the north, the true thickness of the bed is _____ metres.</p> 	5	1	3	4

Q. No.	Questions	Points	CO	BL	Module No.
6b	A dam with an axis of E-W is to be constructed in a narrow valley between two elevated areas/abutments of strong, hard rocks running N-S. If the foundation rocks are not very strong, suggest the type of dam that should be constructed in this case. Should the rocks in the elevated areas be in the N-S or E-W direction? Should they dip upstream or downstream? Draw a diagram to support your answer.	5	3	4	6
7	a) Describe <u>any two</u> methods of surface geological investigation. State <u>one</u> significance of photogeology in civil engineering. b) Draw a diagram showing the Wenner and Schlumberger arrangements of spacing of electrodes of the resistivity method of investigation. c) State the principle of the resistivity method of geological investigation.	2x2+1=5 4 1	1	3 2 2	5
8	a) Explain <u>any one</u> method of drilling with a diagram. b) A coal bed dips in the direction 180° (whole-bearing form). Find its strike direction. If the coal bed lies at an elevation of 1150m above the mean sea level, in what direction should a borewell be drilled so that it intersects the coal bed? At what depth will the borewell and the coal bed intersect?	4+1=5 5	1 2	2 5	5
9	a) What is the difference between geological drilling and geological logging? Explain the neutron logging method of geological investigation. b) What is the importance of geological drilling in civil engineering? c) A densely populated area requires the drilling of a borewell to install a drainage pipe beneath the settlements. What measure can be used for drilling without adversely affecting the populated area? Justify your answer by adding <u>any two</u> advantages of this drilling method over the conventional drilling method.	5 1 4	1 1 3	2 3 6	

Q. No.	Questions	Points	CO	BL	Module No.
10	a) Describe the conditions where overbreak along a tunnel occurs.	3	1	2	6
	b) A bed dips an angle of 80° towards the direction N85E. This bed is intruded by another bed that strikes at an angle of N87E, are the two beds roughly perpendicular or parallel to each other?	5	1	5	
	c) Your village has a severe water scarcity problem. You as a student of civil engineering decide to do something for the holistic well-being of your village. Mention one method of how you will perform artificial recharge of the groundwater level of your village.	2	3	6	



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END SEMESTER RE-EXAMINATION FEBRUARY 2024

Program: S.Y. B.Tech. Civil Engineering *Sem III*

Duration: 3 hours

Course Code: BS-BTC 305

Maximum Points: 100

Course Name: Engineering Geology

Semester: III *14/2/24*

NOTE- Answer any FIVE of the following-

Q. No.	Questions	Points	CO	BL	Module No.
1	a) Write short notes on any four of the following with suitable diagrams- (5 marks each) i) Love waves ii) Mantle of the earth iii) Dip and strike of a geological feature iv) Meandering River v) Pedestal rock and ventifact	5x4=20	1	2	1
2	a) Explain any one process of physical weathering and any one process of chemical weathering. b) State any one impact of weathering on civil engineering structures. What is the difference between attrition and abrasion by a river? Draw diagrams to support your answer. c) Describe any one process of erosion by a river and one process of transportation by a river. Draw diagrams. d) Draw the hydrologic cycle/water cycle.	5 1+4=5 5 5	1	2 3 2 2	1 1 1 6
3	a) If the strike of a bed is N20W, what is the dip direction of the bed? b) How will you recognize a fold in the field? You are assigned the task of constructing a tunnel in a region where folded rocks are abundant. State whether you will construct the tunnel where an antiform is present or where a synform is present. Support your answer by giving reasons for your decision.	5 5+5=10	1 3	3 4	4 4, 6
	c) 1cm of fine mud is deposited in 1000 years in an area. How many million years will be required for the deposition of 1km of fine mud in the area?	5	2	3	1



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END SEMESTER RE-EXAMINATION FEBRUARY 2024

4	a) An object is spotted at N20E from an observer. If the position of the object is changed by 180degree clockwise, what is the new position of the object? b) Explain <u>any one method</u> of geological drilling and <u>one method</u> of surface geological exploration with <u>suitable diagrams</u> .	5 10+5=15	1 1	3 2	4 5
5	a) Draw a diagram showing an unconfined and a confined aquifer. b) Draw the apparatus/set up used for resistivity method of geological investigation. c) Mention <u>any two</u> events of the Paleozoic Era and <u>two events</u> of the Cenozoic Era. d) What is photogeology? What is the importance of photogeology in civil engineering?	5 5 5	1 1 3	2 2 3	6 5 4 5
6	a) What is directional drilling? Why is it more advantageous than conventional drilling? Draw diagrams. b) Describe the parts of a typical dam with a neat diagram.	2+8=10 10	3 2	4 2	5 6
7	a) Explain the effect of different orientations of beds on tunnel construction with diagrams. b) If the strikes of two limbs of a fold are N55E and S70E, what is the angle between the limbs of the fold? c) Explain the zones of groundwater using a neat diagram.	10 5 5	1 1 1	3 3 2	6 4 6



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END SEMESTER EXAMINATION -DEC-2023

Program: Civil Engg. *S. Y. Sem III*

Duration: 3 hrs.

Course Code: PC-BTC-306

Maximum Points: 100

Course Name: Fluid Mechanics

Semester: III

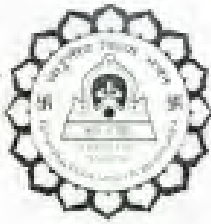
Notes:

1. Question no 1 is compulsory & attempt any four out of remaining six questions. *3/1/23*
2. Illustrate answer with neat sketches wherever required.
3. Make suitable assumptions where necessary and state them clearly.

Q. No.	Questions	Points	CO	BL	PI
1.	Write a short note on: (any Four) 1. Viscosity 2. Meta centre 3. U-tube manometer. 4. HGL & TEL 5. Venturimeter 6. Types of Flow lines	20	1-3	II	1.3.1
2.A.	Derive an expression for pressure head.	06	1	II	1.3.1
2.B	Derive expression for Total pressure & Centre of pressure, when it acts on flat vertical plane surface under fully submerged conditions.	08	2	II	1.3.1
2.C.	1) Calculate Kinematic Viscosity if Sp. Gravity is 0.9, when viscosity of water is 0.02 poise. 2) Calculate weight density, specific volume, specific gravity of 1 liter of oil weighs 8.4 N.	06	2	II/V	2.1.3
3.A	State & Prove Pascal law when fluid is at rest. Explain the following properties of fluid, 1) Surface tension 2) Capillary Action	08	2	II	1.3.1
3.B	Water flows through pipe AB 1.2 m diameter at 2.0 m/sec & then passes through a pipe BC 3.5 m diameter. At C, the pipe branches into CD & CE. The branch CD is 0.8 m diameter & carries one-third flow in AB. The flow velocity in branch CE is 2.0 m/sec. Find the volume rate of flow in AB & also velocity in BC & CD by using continuity equation.	06	2	II	2.1.3
3.C	A triangular plate of height 3.5 m and base 2.2 m is submerged in an oil of sp. gravity 0.85 in such way that its plane makes an angle 45 degree with free surface of oil. The base of the plate is parallel to the oil surface and at a depth 1.5	04	2	v	2.1.3

**END SEMESTER EXAMINATION –DEC-2023**

	m below the oil surface. Find the Total pressure force on plate & position of centre of pressure				
4.A	“Pressure gradient in the direction of flow is equal to the shear gradient in the direction normal to the direction of flow” Prove the above statement. State the formulae for flow of viscous fluid between two parallel plates.	06+03	2	II	1.3.1
4.B	Compare law of fluid friction for laminar and turbulent flow.	05	2	V	2.1.3
4.C	The left limb of a U- Tube mercury manometer is connected to a pipe line conveying water, the level of mercury in the limb being 0.75 m below the centre of pipe line and the right leg is open to atmosphere. The level of mercury in right limb is 0.60 m above that in left limb and the space above mercury in the right limb contains benzene (sp. gravity 0.88) to a height of 0.45 m. find the pressure in the pipe.	06	2	V	2.1.3
5.A	What is Reynolds number? Derive an expression for head loss in pipes due to friction by Darcy-Weisbach equation	10	3	V	2.4.1
5.B	Explain the different types of fluid motion in fluid kinematics.	04	3	II	1.3.1
5.C	Define: Pitot Tube. Derive an expression for velocity of flow at any point in pipes or channel.	06	3	V	2.1.3
6.A	Define the conservation of mass & equation of continuity. Obtain an expression for the continuity equation for a three dimensional flow in Cartesian co-ordinate system.	08	3	V	2.1.3
6.B	In fluid the velocity vector is given by $V = 4x^3i - 10x^2yj + 2tk$. Determine: 1. The velocity components u, v, w at any point in the flow field. 2. Speed at point (1,1,1) 3. Speed at time t=2 sec.at a point (0,0,2). Also classify the velocity field is steady/ unsteady/ 1D/ 2D/ 3D/ uniform/ non-uniform flow.	06	3	II	2.4.1
6.C	Write a short note on velocity potential function and stream function.	06	3	II	2.4.1
7.A	Define: Bernoulli's Theorem. State assumptions and prove Bernoulli's theorem for flow liquids.	10	3	V	2.1.3
7.B	Explain the classification fluid flows in fluid kinematics.	06	3	V	2.4.1
7.C	State hydraulic coefficients used orifice.	04	3	V	2.4.1



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Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai - 400058



Re- Examinations Feb 2024

Program: *S.Y.* Civil Engineering *Sem III*

Duration: 3hr

Course Code: PC-BTC306

Maximum Points: 100

Course Name: Fluid Mechanics

Semester: III

Instructions

1. Attempt any 5 questions out of 7 questions.
2. Neat diagrams must be drawn wherever necessary.
3. Assume Suitable data if necessary and state it clearly.

Q. No.	Questions	Points	CO	BL	PI
1a	Define capillarity.	8	CO1	BL3	2.3.1
	Mention any 4 examples involving surface tension. Derive expression for Capillary rise in case of small glass tube.				
1b	Define metacenter and metacenter along with different conditions of equilibrium.	6	CO2	BL1	1.2.1
1c	Calculate the pressure due to column of 0.3 m of	6	CO3	BL3	1.2.1
	a) Water column				
	b) Mercury column of sp. Gravity 13.6 c) Oil of Sp. Gravity of 0.8, density of water 1000kg/m ³ .				
2a	A hydraulic press has a ram of 20 cm diameter.	6	CO1	BL3	1.3.1
	And a plunger of 4 cm diameter. It is used for lifting a weight of 40 kN. Find the force required at the plunger.				
2b	State and explain Pascal's law of and derive the equation for the same	8	CO1	BL2	1.2.1
2c	The right limb of simple U tube manometer	6	CO1	BL2	1.2.1
	Containing mercury is open to atmosphere, while left limb is connected to a pipe having liquid of sp. Gravity=0.9. The center of pipe is 12 cm below the level of mercury in the right limb. Find the pressure of fluid in the pipe if the difference of mercury level in the two limbs is 20 cm.				
3a	The diameter of pipe at section 1 is 20 cm and section 2 is 25 cm.	6	CO3	BL2	1.2.1
	Find the discharge through the pipe if the velocity of water flowing through the pipe at section 1 is 5m/s. Also determine velocity at section 2.				
3b	Explain in detail classification of fluids.	8	CO2	BL4	2.4.1
3c	Find kinematic viscosity of an oil having density 981 kg/m ³ . The shear stress at a point in oil is 0.2452N/m ² and velocity gradient at that point is 0.2per second.	6	CO1	BL1	1.3.1
4a	The following cases represent the two velocity components	8	CO2	BL4	1.4.1

	$u = y^2 + z^2 + x^2, v = xy^2 - yz^2 + xy,$ $v = 2y^2, w = 2xyz$ <p>Determine the third component of velocity such that they satisfy the continuity equation.</p>				
4b	Determine the total pressure on one face of the plate and position of the center of pressure when The upper edge is 2m below free surface. Plane rectangular surface 3m X 4m deep lies in water in such a way that its plane makes an angle of 30 degrees with the free surface of water.	7	CO1	BL3	
4c	Write down the Bernoulli's equation for the real fluid and state the assumptions made in the derivation of Bernoulli's theorem.	5	CO1	BL2	1.2.1
5a	Find the metacentric height of the block if its size is 2m X 1m X 0.8 m (l x b x h) The specific gravity of the wood block is =0.7 which floats in water	8	CO1	BL3	1.4.1
5b	Define coefficient of discharge, coefficient of velocity and coefficient of contraction and derive relation between them.	6	CO2	BL2	1.2.1
5c	Prove that equipotential lines are orthogonal to stream lines at all points of intersection.	6	CO2	BL2	1.2.1
6a	Discuss with diagram stream tube, stream line and streak line.	6	CO1	BL2	1.3.1
6b	Discuss the applications of Bernoulli's theorem.	6	CO2	BL3	1.4.1
6c	Discuss laminar boundary layer, turbulent boundary layer, laminar sub layer and boundary layer thickness.	8	CO1	BL2	2.1.2
7a	Discuss the characteristics of turbulent flow.	4	CO1	BL2	2.1.2
7b	Explain the types of fluid flows.	8	CO1	BL2	2.1.2
7c	Prove that pressure gradient in the direction of flow is equal to the shear gradient in the direction normal to the direction of flow.	8	CO1	BL2	1.3.1



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S.Y. RE-EXAMINATION FEBRUARY 2024

Program: B.Tech. Civil Engineering *Level III*

Duration: Three hours

Course Code: PC-BTC307

Maximum Points: 100

Course Name: Building Materials and Construction

Semester: III

Instructions:

1. Attempt any five out of seven Questions
2. Draw neat diagrams wherever required
3. Assume suitable data if necessary and state them clearly.

20/2/24

Q. No.	Questions	Points	CO	BL	PI
1					
a	What are the quality requirements of Burnt bricks?	07	1	1	2.3.2
b	Discuss the importance Safe bearing capacity of soil.	04	1	2	1.3.1
c	Explain the functions of mortar in building construction.	04	3	2	2.3.1
d	State the uses of Portland cement	05	1	2	1.3.1
2.					
a	What are the objectives of preservations of timber? Discuss the various methods of timber preservation.	10	2	1	1.3.1
b	Explain the workability of concrete using slump test.	05	3	3	2.3.2
c	What are the requirements of building stone?	05	2	1	1.2.1
3					
a	How will you detect the defects in paint?	06	2	2	1.2.1
b	Explain with neat sketch parts of timber with their functions.	08	1	1	1.3.1
c	What are the methods of DPC?	06	1	3	1.2.1
4					
a	What are the precautions to be taken during construction of Cavity wall?	06	1	1	2.3.2
b	Differentiate between load bearing and non-load bearing wall	04	1	1	1.3.1
c	Explain in detail the process of internal plaster with cm 1:4.	10	4	2	2.3.1
5 a	What is dead shore? Where it is used?	07	2	1	1.2.1
b.	What are the requirement of good stair?	06	4	2	2.3.1
c.	It is proposed to construct a residential building in a hot climate; Suggest the different sustainable material to be used to make it energy efficient.	07	2	2	1.3.1



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RE-EXAMINATION FEBRUARY 2024

6					
a.	What are the characteristics of good mortar?	05	3	2	2.3.1
b.	Explain the different types of formwork with suitability.	06	2	1	1.3.1
c.	Draw neat sketch of an arch; show different elements and explain their functions.	05	2	2	1.2.1
d.	List out any five green materials used in construction.	04	3	1	1.1.2
7	<i>Write short Notes on (Any four)</i>				
a	Bouge's compound	05	1	3	1.3.1
b	Quick lime	05	1	1	1.3.1
c	Components of paint	05	2	2	1.3.1
d	Defects in timber	05	1	2	1.3.1
e	Masonry blocks	05	2	2	1.3.1
f	Batching of concrete	05	2	2	1.3.1