

Civil Engineering 2nd Year To 4th Year Apr_May 2025 (CBCS)

S.n	Year	Sem	Course	Dept.	Sub code	Subject	
1	2	III	B Tech	CE	73197	Engineering Mathematics-III	✓
	2	III	B Tech	CE	73198	Surveying-I	✓
2	2	III	B Tech	CE	73199	Strength Of Material-I	✓
	2	III	B Tech	CE	73200	Fluid Mechanics-I	✓
3	2	III	B Tech	CE	73201	Building Constructions & Materials	✓
	2	IV	B Tech	CE	79118	Environmental Studies	✓
4	2	IV	B Tech	CE	79112	Structural Mechanics	✓
	2	IV	B Tech	CE	79113	Surveying-II	✓
5	2	IV	B Tech	CE	79114	Concrete Technology	✓
	2	IV	B Tech	CE	79115	Fluid Mechanics-II	✓
6	2	IV	B Tech	CE	79116	Building Design and Drawing	✓
	3	V	B Tech	CE	80763	Water Resource Engineering-I	✓
7	3	V	B Tech	CE	80764	Design of Steel Structures	✓
	3	V	B Tech	CE	80765	Environmental Engineering-I	✓
8	3	V	B Tech	CE	80766	Geotechnical Engineering - I	✓
	3	V	B Tech	CE	80939	Waste Management	✓
9	3	VI	B Tech	CE	81515	Theory of Structures	✓
	3	VI	B Tech	CE	81518	Geotechnical Engineering - II	✓
10	3	VI	B Tech	CE	81516	Engineering Management	✓
	3	VI	B Tech	CE	81517	Environmental Engineering-II	✓
11	3	VI	B Tech	CE	81519	Soil and Water Conservation Techniques	✓
12	4	VII	B Tech	CE	83732	Design of Concrete Structures-I	✓
	4		BE to B Tech	CE	84012		
13	4	VII	B Tech	CE	83733	Earthquake Engineering	✓
	4		BE to B Tech	CE	84013		
14	4	VII	B Tech	CE	83734	Quantity Survey and Valuation	✓
	4		BE to B Tech	CE	83014		
15	4	VII	B Tech	CE	83735	Transportation Engineering - I	✓
	4		BE to B Tech	CE	84015		
16	4	VII	B Tech	CE	83739	Solid Waste Management	✓
	4		BE to B Tech	CE	84019		
17	4	VIII	B Tech	CE	84745	Design of Concrete Structures-II	✓
	4		BE to B Tech	CE	84930		
18	4	VIII	B Tech	CE	84746	Water Resources Engineering - II	✓
	4		BE to B Tech	CE	84931		
19	4	VIII	B Tech	CE	84747	Transportation Engineering-II	✓
	4		BE to B Tech	CE	84932		
20	4	VIII	B Tech	CE	84753	Advanced Design of Concrete Structures	✓
	4		BE to B Tech	CE	84938		
21	4	VIII	B Tech	CE	84750	Advance Foundation Engineering	✓
22	4	VIII	B Tech	CE	84759	Advanced Construction Techniques	✓
	4		BE to B Tech	CE	84944		

Seat No.	CE-3rd Sem
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Total No. of Pages : 3



S.Y.B.Tech. (Semester – III) (CBCS)
Examination - May 2025
(Civil Engineering)
ENGINEERING MATHEMATICS - III
Sub. Code : 73197/63338/77769

Day and Date : Monday, 05/05/2025

Total Marks : 70

Time : 10.30 am to 01.00 pm

- Instruction : 1)** Attempt any three questions from each section.
2) Figures to the right indicate full marks.
3) Use of Non-Programmable calculator is allowed.

SECTION – I

- Q. 1.** a) Solve $(D^2 + 4D + 4)y = \cosh 2x$. [6]
 b) Solve $(D^3 - D^2 + 3D + 5)y = e^x \cos 3x$. [6]
- Q. 2.** a) Find unit tangent vector to the curve $x = t, y = t^2, z = t^3$ at $t = 1$. [5]
 b) Find the directional derivative of $\phi = 2x^3y - 3y^2z$ at $P(1, 2, -1)$ in the direction of $Q(3, -1, 5)$. In what direction from P is the directional derivative maximum? [6]
- Q. 3.** a) Find the regression coefficients and the coefficient of correlation from the data, $N = 12, \sum x = 120, \sum y = 432, \sum xy = 4992, \sum x^2 = 1392, \sum y^2 = 18252$. [5]

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- b) Fit a straight line to the following data and estimate the value of y corresponding to $x = 6$. [6]

x	0	5	10	15	20	25
y	12	15	17	22	24	30

Q. 4. Attempt any TWO from the following.

- a) Solve $x^2 \frac{d^2y}{dx^2} - 2x \frac{dy}{dx} - 4y = x^2 + 2 \log x$. [6]

- b) Show that the vector field given by, [6]

$\vec{F} = (6xy + z^3)\mathbf{i} + (3x^2 - z)\mathbf{j} + (3xz^2 - y)\mathbf{k}$ is irrotational. Also find the scalar potential ϕ such that $\nabla\phi = \vec{F}$.

- c) Fit a curve of the form $y = ab^x$ [6]

Year (x)	1951	1952	1953	1954	1955	1965	1957
Production in tons (y)	201	263	314	395	427	504	612

SECTION - II

- Q. 5. a) A random variable X has the following probability distribution function. [6]

X	0	1	2	3	4	5	6	7
$P(X)$	0	k	$2k$	$2k$	$3k$	k^2	$2k^2$	$7k^2 + k$

- Find :
 i) Value of k
 ii) $P(X \geq 6)$
 iii) $\sum P(0 < X < 5)$

SQ - 13

- b) In a sample of 1000 students the mean and standard derivation of marks obtained by the students in a certain test are 14 and 2.5. Assuming the distribution to be normal, find the number of students getting marks. [6]

- i) Between 12 and 15
- ii) Above 18,
- iii) Below 8

(Given S.N.V.Z. area between $z = 0$ and $z = 0.4$ is 0.1554, that between $z = 0$ and $z = 0.8$ is 0.2881, that between $z = 0$ and $z = 1.6$ is 0.4452, that between $z = 0$ and $z = 2.4$ is 0.4918).

- Q. 6. a) Find the Laplace transform of $\cosh 2t \cdot \cos 2t$. [6]

- b) Find inverse Laplace transform of $\frac{2s+3}{(s+1)^2(s+2)}$. [5]

- Q. 7. a) Evaluate $\int_{-1}^1 \frac{dx}{1+x^2}$ using Trapezoidal rule by dividing the interval into 8 sub intervals. [6]

- b) Evaluate $\int_0^{\pi/2} \sin x \, dx$ by Simpson's $\left(\frac{1}{3}\right)^{rd}$ rule by dividing the interval into 6 sub intervals. [5]

- Q. 8. Attempt any TWO of the following. [12]

- a) Fit a Poisson distribution of the following data.

x	0	1	2	3	4	Total
f	192	100	24	3	1	320

- b) Find inverse Laplace transform of $\frac{1}{(s^2+9)(s^2+4)}$ using Convolution theorem.

- c) Evaluate $\int_{-3}^3 x^4 dx$ by using Simpson's $\left(\frac{3}{8}\right)^{th}$ rule taking 6 equal sub intervals.

Seat No.	CE-3rd Sem
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Total No. of Pages : 3

S.Y.B.Tech. (Part - I) (Semester -III) (CBCS)
Examination, May -2025
CIVIL ENGINEERING
PCC - CV302 Surveying - I
Sub. Code : 73198/63339/77770



Day and Date : Tuesday, 06/05/2025

Total Marks : 70

Time : 10:30 a.m. to 01:00 p.m.

- Instructions :**
- 1) Attempt any three questions from each section.
 - 2) Figures to the right indicate full marks.
 - 3) Assume suitable data if necessary and state them clearly.
 - 4) Use of non-programmable calculator is allowed.

SECTION-I

Q1) Attempt all questions.

- A) Explain curvature correction and refraction correction with neat sketch. [6]
- B) Define Level line, horizontal line and vertical line with neat sketch. [6]

Q2) Attempt any Two.

- A) Explain trapezoidal rule with neat sketch for area calculation. [5]
- B) Explain Simpsons rule with neat sketch for area calculation. [5]
- C) Describe area of zero circle with neat sketch. [6]

Q3) Attempt any Two.

- A) Describe orientation by magnetic needle method. [5]
- B) What are advantages and disadvantages of plane table surveying? [5]
- C) Describe resection method in plane table surveying. [6]

P.T.O.

Q4) Write short notes on Any Three.

[12]

- A) Write note on characteristics of contours.
- B) Write various usage of contour maps.
- C) Explain various types of benchmarks.
- D) Explain factors affecting sensitivity of bubble.

SECTION-II

Q5) Attempt all questions.

- A) The following records are obtained in a traverse survey, where the length and bearing of the last line were not recorded. [8]

LINE	LENGTH IN (M)	BEARING
AB	75.50	30°24'
BC	180.50	110°36'
CD	60.25	210°30'
DA	?	?

Compute the length and bearing of line DA.

- B) Explain procedure of measuring vertical angles with theodolite. [4]

Q6) Attempt any Two.

- A) What are various sources of error in Theodolite? [5]
- B) Explain procedure of balancing traverse with Bowditch rule. [5]
- C) Explain stepwise procedure for carrying out Theodolite traversing. [6]

Q7) Attempt any Two.

- A) What are various usage of ghat tracer. [5]
- B) What are various usage of Box sextant. [5]
- C) What are various usage of abney level and hand level. [6]

Q8) Write short notes on any three.

[12]

- A) Hydrographic surveying
- B) Latitude and Departure
- C) Tunnel surveying
- D) Uses of Vernier Thodolite

QP-5608

Seat No. CE-304 Sem

Total No. of Pages : 2

MAR/APR 2025 SUMMER EXAMINATION

11731 Bachelor of Technology (NEP-2.0)

Sub. Name: Strength Of Material-I

Sub. Code: 63340/73199/77771



Day and Date: MAY, 07-05-2025

Total Marks: 70

Time: 10:30 AM To 01:00 PM

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

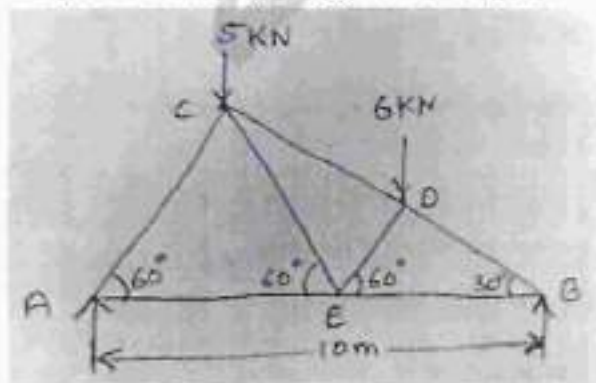
Special Inst.: Question no. 1 and Question no. 5 are compulsory.
 From Question no.2, Question no.3 and Question no.4 solve any two.
 And from Question no.6, Question no.7, Question no. 8 solve any two.

- Q1) A.** Define the term strain and explain the different types of strains. [3]
B. Explain point of i) contra flexure, ii) SFD and BMD. [3]
C. Define : i) Perfect frame and ii) Imperfect frame. [3]

- Q2)** A rectangular bar of 50mm x 30mm x 1 m carries axial tensile force of 100KN in the direction of length. Modulus of elasticity is 200GPa. [13]
 Find : i) Tensile stress, ii) Strain, iii) Change in length.

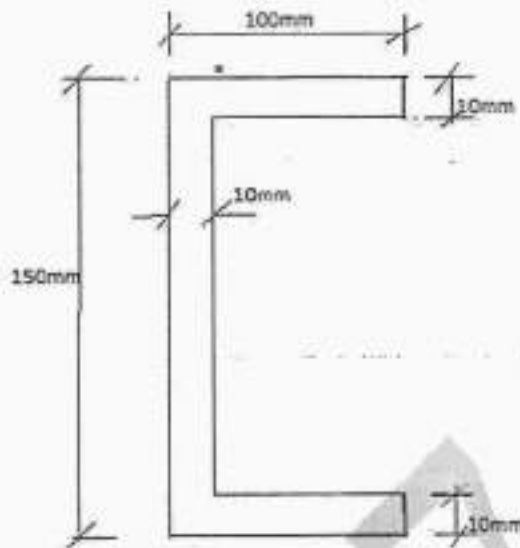
- Q3)** Draw the shear force and bending moment diagram indicating principal values for an overhanging beam ABC with AB=6m and BC=3m. It is loaded with udl of intensity 2KN/m all over the span in addition to a point load 5KN at free end C. Also locate the point of contraflexure [13]

- Q4)** Analyse the truss by using method of joint. [13]



- Q5) A.** Calculate section modulus for rectangular and circular section. [3]
B. Draw shear stress distribution of rectangular, I-section. [3]
C. Explain i) Resilience, ii) Proof Resilience. [3]

- Q6)** A cantilever is 2m long, and subjected to a udl of 2kN/m. The cross section of a [13]
cantilever is a tee section with flange of 80 x 10 mm and web of 10mm x 120mm
such that its total depth is 130mm. The flange is at the top and the web is vertical.
Determine the maximum tensile and compressive stresses developed and their
position.
- Q7)** A channel section as shown in figure is used as a beam and carries a shearing [13]
force of 40 kN. Calculate the maximum shear stress and sketch the shear stress
distribution diagram.



- Q8)** A bar of length 1m and diameter 20 mm, is subjected to a load of 1kN which is [13]
dropped from a height of 500 mm on to the collar attached at the lower end of a
bar. Determine the instantaneous stress induced due to this impact load, elongation
and strain energy stored in bar if $E = 200\text{GPa}$.

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

- 1) (101) Bachelor of Engineering (63340) Strength Of Material-I Part 2 SEM 3
- 2) (101) Bachelor of Engineering (77771) Strength Of Material-I Part 2 SEM 3
- 3) (1154) B.Tech. CBCS (73199) Strength Of Material-I Part 2 SEM 3

Seat No. CE-384 sem

Total No. of Pages : 3

MAR/APR 2025 SUMMER EXAMINATION**11731 Bachelor of Technology (NEP-2.0)****Sub. Name: Fluid Mech-I****Sub. Code: 63341/73200/77772****Total Marks: 70****Day and Date: MAY ,08-05-2025****Time: 10:30 AM To 01:00 PM**

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
 2. Figures to the right indicate full marks

Special Inst.: Attempt ANY THREE questions from each section**Q1) Solve the following [11]**

- a. Explain properties Capillarity and Compressibility with their SI Unit [5]
- b. A plate having an area of 0.5 m² is sliding down the inclined plane at 45° to the horizontal with a velocity of 0.3 m/s. There is a cushion of fluid 1.5 mm thick between the plane and the plate. Find the viscosity of the fluid if the weight of the plate is 300 N [6]

Q2) Solve the following [12]

- a. Derive formula for Total Pressure and Centre of Pressure for Plane vertical surface immersed into liquid [6]
- b. A Square plate 4 meters side is immersed vertically and is 1.5 metre below it. Find: (i) Total pressure on the plate, and (ii) Position of centre of pressure [6]

Q3) Solve the following [11]

- a. Explain various types of Flows [5]
- b. Examine whether these velocity components represent a physically possible two-dimensional flow; if so whether the flow is rotational or irrotational? Given that, [6]

$$u = -4ax(x^2 - 3y^2)$$

$$v = 4ay(3x^2 - y^2)$$

Q4) Write a Short Note on (Attempt any Three) [12]

- a. Surface tension
- b. Pressure Diagram and its use

- c. Flow Net- (Properties and Uses)
- d. Stability conditions of Floating Bodies
- e. Vapour pressure and Cavitation

Q5) Solve the following [11]

- a. Write Bernoulli's Theorem Limitations and modification [5]
- b. A 300 mm × 150 mm venturimeter is provided in a vertical pipe carrying water, flowing in the upward direction. A differential mercury manometer connected to the inlet and throat gives a reading of 180 mm. Find the rate of flow. Assume $C_d = 0.98$. [6]

Q6) Solve the following [12]

- a. Explain Hydraulically Smooth and Rough Boundaries with neat sketch. [6]
- b. What power required per km length of pipeline to overcome viscous resistance of flow of oil of sp. gravity 0.85 and viscosity 1.5 poise through horizontal pipe of 100 mm dia at a rate of 600 LPH ? [6]

Q7) Solve the following [11]

- a. Explain Pipe in series and pipe in parallel [5]
- b. Two reservoirs are connected by a series of pipes consist three pipes of lengths 200 m , 500 m , and 400 m and of diameter 10 cm , 50 cm and 20 cm respectively . Find Equivalent pipe diameter to carry same discharge. [6]

Q8) Write a Short Note on (Attempt any Three) [12]

- a. Concept of HGL and TEL
- b. Laminar Flow and Turbulent Flow
- c. Control of Separation of Boundary Layer
- d. Displacement thickness , Momentum thickness , Energy thickness
- e. Surge Tank and its Uses

SQ-48

Total No. of Pages:2

Seat No	CE-374 Sem
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S.Y.B.Tech. (Semester - III) (CBCS)

Examination, May- 2025

Civil Engineering

PCC-CV 305 Building Construction and Materials

Sub. Code : 73201 63342 / 77773



Day and Date : Friday, 09/05/2025

Total Marks :70

Time : 10.30 a.m. to 1.30 p.m.

- Instructions :
- 1) Section I: Solve any three questions.
 - 2) Section II : Q. 5 and Q. 6 are compulsory. Solve any one question from Q. 7 & Q. 8.
 - 3) Figures to the right indicates full marks.
 - 4) Assume data wherever necessary & mention it neatly.

SECTION - I

- Q.1) a) What are the characteristics of good timber? What are the common uses of timber in building industry? (6)
- b) What are the requirements of good building stone? (5)
- Q.2) a) List the requirements of a building as a whole and explain any three in details. (6)
- b) If one of the column lies just at the edge of property line (plot boundary) then which foundation is more suitable? Explain with neat sketch. (6)
- Q.3) a) Enlist different types of bonds in brick masonry. Draw neat sketches of any two bond types. (6)
- b) What are factors to be considered for the selection of stone for stone masonry? (5)

Q.4) Write short notes on

(12)

- i) Composite Masonry
- ii) Seasoning of Timber
- iii) Dressing of Stone

Section II

Q.5) Draw sectional plan and Elevation for a T.W. Framed Paneled door with (12)
following data:

- a) Clear opening : 900×2100 mm
- b) frame size : 75×125 mm
- c) No of shutters: 2 Nos
- d) No Panels : 4
- a) Assume suitable data.

Q.6) Design and draw the plan and sectional elevation of R.C.C. Dog legged (18)
stair case for public building for following data:

- a) Story height -3.60 m
- b) width of stair -1.50 m

Q.7) Differentiate between king post truss and queen post truss. (5)

Q.8) State different types of lintels. Explain any one. (5)

QP-5805

Total No. of Pages : 5



Seat No. CE-Lithi-son

MAR-APR 2025 SUMMER EXAMINATION

2354 Bachelor of Science

Sub. Name: ENVIRONMENTAL STUDIES

Sub. Code: 94282/91270/67043/78928/79089

/79118/83229/84775/91147/91155 /91166/91246/91270/91294/91308

/91437/91457/91555/91656/91966 /92943/93227/77942/93448/93546

/94220/94787/94884/96146/83818

Day and Date: MAY ,11-05-2025

Total Marks: 70

Time: 02:30 PM To 05:30 PM

- Instructions: 1. All questions are compulsory
 2. Draw neat labelled diagrams wherever necessary
 3. Figures to the right indicate full marks

Q1) Solve following MCQ.

[10]

- i. A species not definitely located in the wild and never sighted even once in the last 50 years is called----

ज्या प्रजाती जंगलात निश्चितपणे नसतात आणि गेल्या 50 वर्षात एकदाही न पाहिलेल्या प्रजातीला म्हणतात ----

- A. exotic
परस्थ
B. Extinct
नामशेषत्व / विनाश झालेले
C. Endangered
अस्तित्व धोक्यात असलेले
D. Rare
दुर्मिळ

- ii. Noise is measured using sound meter and the unit is-----

ध्वनी मीटर वापरून आवाज मोजला जातो आणि युनिट ----- आहे

- A. Hertz
हर्ट्झ
B. Kilogram
किलोग्राम
C. Joule
जूल
D. Decibel
डेसिबल

- iii. The darker zone in lakes where light penetration is negligible is called

तलावांमध्ये गडद क्षेत्र जेथे प्रकाश आत प्रवेश करणे नगण्य आहे असे म्हणतात

- A. Limnetic zone
खुले क्षेत्र

- B. Littoral zone
किनाऱ्याचे मूलस्थान क्षेत्र
- C. Profundal zone
खोल क्षेत्र
- D. None of the above
वरीलपैकी काहीही नाही

iv. The study of interrelationship between living and non-living organisms and environment is called

सजीव आणि निर्जीव जीव आणि पर्यावरण यांच्यातील परस्परसंबंधांच्या अभ्यासाला ----- म्हणतात

- A. Ecosystem
परिसंस्था
- B. Environment
पर्यावरण
- C. Ecology
परिस्थितीकी
- D. All of the above
वरील सर्व

v. The food chain starts with dead organic matter is-----

मृत सैद्धीय पदार्थासह हि अन्नसाखळी सुरु होते

- A. Detritus food chain
मृतोपजीवी अन्नसाखळी
- B. Grazing food chain
चराऊ अन्नसाखळी
- C. uniform food chain
समांतर अन्नसाखळी
- D. None of the above
वरीलपैकी काहीही नाही

vi. The development of a bare area without any life form is called-----

जेथे जीवाचे अस्तित्व नाही अशा ओसाड जागेच्या विकासाची प्रक्रिया म्हणजे -----

- A. Reaction
प्रतिक्रिया
- B. Nudation
ओसाड जागेचा विकास
- C. competition
स्पर्धा
- D. stabilisation
स्थिरीकरण

vii. 'Smog' is a mixture of-----

स्मॉग ----- चे मिश्रण आहे

- A. Dust and Gas
धूळ आणि वायू
- B. Smoke and dust

- धूर आणि धूळ
C. Snow and fog
बर्फ आणि धुके
D. Smoke and fog
धूर आणि धुके

viii. Noise pollution limits at silent area in night is-----

रात्री शांत परिसरात ध्वनी प्रदूषणाची मर्यादा आहे -----

- A. 45 dB
B. 85 dB
C. 55 dB
D. 25 dB

ix. D.O. in water stands for-----

पाण्याच्या संदर्भात D.O. म्हणजे-----

- A. Degraded Oxygen
B. Degraded organic
C. Dissolved Oxygen
D. None of the above

x. Following is example of National Park in India-----

भारतातील राष्ट्रीय उद्यानाचे उदाहरण खालीलप्रमाणे आहे-----

- A. Kaziranga from Assam
आसाममधील काझीरंगा
B. Nanda Devi from Uttarakhand
उत्तराखंडमधील नंदा देवी
C. Anamalai area from Tamil Nadu
तामिळनाडूतील अनामलाई क्षेत्र
D. None of the above
वरीलपैकी काहीही नाही

Q2) Answer any three from the following खालीलपैकी कोणतेही तीन उत्तर द्या

[15]

- a. Q1. Define natural resources & add a note on non-renewable resources.
Q2. Write a note on ecological pyramids of Biomass.
Q3. Discuss environmental ethics and resource use.
Q4. Briefly explain water harvesting and watershed management.
Q5. Explain genetic, species and ecosystem diversity with examples.

प्रश्न १. नैसर्गिक संसाधनांची व्याख्या करा आणि नूतनीकरणीय संसाधनांवर एक टीप जोडा.

प्रश्न २. जैववस्तुमानाच्या मनोऱ्याबद्दल एक टीप लिहा.

प्रश्न ३. पर्यावरणीय नीतिमत्ता आणि संसाधनांचा वापर यावर चर्चा करा.

प्रश्न ४. पाणी संकलन आणि पाणलोट क्षेत्र व्यवस्थापन थोडक्यात सांगा.

प्रश्न ५. उदाहरणांसह जनुकीय विविधता, प्रजातीय विविधता व परिसंस्था विविधता स्पष्ट करा.

Q3) Write Short note on any three कोणत्याही तीनवर लहान टीप लिहा

- a. Q1. Disaster Management
Q2. Climate change
Q3. Population explosion
Q4. Noise pollution
Q5. Biomass energy
Q1. आपत्ती व्यवस्थापन
Q2. हवामान बदल
Q3. लोकसंख्येचा स्फोट
Q4. ध्वनी प्रदूषण
Q5. जैववस्तुमानीय ऊर्जा

Q4) List the functions of producers, consumers and decomposers in an ecosystem with examples [10]

OR

Describe the threats to biodiversity and the various methods used in the Conservation of Biodiversity.

परिसंस्थेतील उत्पादक, ग्राहक आणि विघटक यांची कार्ये उदाहरणांसह सूचीबद्ध करा.

किंवा

जैवविविधतेला असलेले धोके आणि जैवविविधतेच्या संवर्धनासाठी वापरल्या जाणाऱ्या विविध पद्धतींचे वर्णन करा.

Q5) Explain in detail the Water (Prevention and Control of Pollution) Act [10]
OR

Give an account of Ecological succession concerning causes and types.

पाणी (प्रदूषण प्रतिबंध आणि नियंत्रण) कायद्याचे तपशीलवार वर्णन करा.

किंवा

कारणे आणि प्रकारांच्या संदर्भात परिस्थितीय बदलांचा लेखाजोखा द्या/ वर्णन करा.

Q6) Discuss any two environmental movements in India. [10]
OR

What is Solid waste Management? Explain its Causes, effects and control measures

भारतातील कोणत्याही दोन पर्यावरण चळवळींची चर्चा करा.

किंवा

घनकचरा व्यवस्थापन म्हणजे काय ? त्याची कारणे, परिणाम आणि नियंत्रण उपाय स्पष्ट करा.

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

SQ-54

Total No. of Pages : 2

Seat No.	CE 4th Sem
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S. Y. B. Tech. (CBCS) (Semester - IV)

Examination, May - 2025

(Civil Engineering)

(ESE-CV 401) STRUCTURAL MECHANICS

Sub. Code : 79112

Day and Date : Tuesday, 13/05/2025

Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :
- 1) Question 1 and five are compulsory and solve any 2. questions from each section.
 - 2) Figures to the right indicate full marks.
 - 3) Assume suitable data if necessary and state them clearly.
 - 4) Use of non programmable calculator is permissible.

SECTION-I

- Q.1 A) Explain Obliquity and its formula. [3]
 B) Establish the condition of no tension for Rectangular section. [3]
 C) Explain the uses of Influence line diagram. [3]
- Q.2 An element in a stressed material has a tensile stress of 500 MPa and compressive stress of 350 MPa acting on two mutually perpendicular planes and equal shear stress of 100 MPa on these planes. Find the principal stresses and the position of the principal planes. Also find the maximum shear stresses. [13]
- Q.3 A retaining wall of trapezoidal section is 10 m high and retains earth which is level upto the top. The width at the top 2 m and at the bottom 8 m and the exposed face is vertical. Find the maximum and minimum intensities of normal stress at the base. (Take Density of earth = 16 kN/m³, Density of masonry = 24 kN/m³, Angle of Repose = 30°) [13]

- Q.4** In the overhang beam ABC, $AB = 4$ m and $BC = 1$ m simply supported at A and B. Draw ILD for R_A , R_B , S.F and B.M. at a point 2 m From A. [13]

SECTION - II

- Q.5** A) Explain the different types of end conditions. [3]
B) Explain the suitability of Conjugate Beam Method. [3]
C) Write the Torsion formula and its notations. [3]
- Q.6** A cast iron column of hollow circular cross section is 5 m long, with both ends firmly built in. It safely carries an axial load of 800 kN. Determine the section of the column, using factor of safety 3. Assume internal diameter of column as 80% of the external diameter. Use Rankine's formula with ($\sigma_c = 550 \text{ N/mm}^2$ and $a = 1/6400$.) [13]
- Q.7** A simply supported beam ACB of 6 m long is loaded with a point load of 300 kN and clockwise moment of 150 kN.m at a distance of 4 m from left simple support A. Find deflection at point C at a distance of 4 m from left simple support A. (Take $EI = 8 \times 10^4 \text{ kN.m}^2$) [13]
- Q.8** A hollow shaft of diameter ratio $3/8$ is required to transmit 600 kW at 110 rpm. The maximum torque being 20% greater than mean. Shear stress is not exceeds 63 MPa and the twist in a length of 3 m not to exceed 1.4 degrees. Calculate the external diameter of shaft, which would satisfy these conditions. (Take modulus of rigidity = 84 GPa.) [13]
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SQ-59

Total No. of Pages : 2

Seat No.	CE-4th Sem CE-IV 2
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S. Y. B. Tech. (Civil Engineering) (CBCS) (Semester - IV)

Examination, May - 2025

(PCC-CV402) SURVEYING - II

Sub. Code : 79113

Day and Date : Thursday, 15/05/2025

Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :
- 1) Attempt Any Three questions from each section.
 - 2) Figures to the right indicate full marks.
 - 3) Assume suitable data if necessary and state them clearly.
 - 4) Use of non-programmable calculator is allowed.

SECTION - I

Q.1 a) What are the methods of Tacheometry? Explain any one. [06]

b) A Tacheometer was set up at a Station C and the following readings were obtained on a Staff Vertically Held [06]

Inst Station	Staff Station	Vertical Angle	Hair Readings			Remark
C	BM	$-5^{\circ}20'$	1.150	1.800	2.450	RL of
C	D	$+8^{\circ}12'$	0.750	1.500	2.250	BM=750.50m

Calculate the Horizontal Distance CD and RL of D, when the Constants of Instrument are 100 and 0.15.

Q.2 a) Explain the classification of signals. [05]

b) Explain the classification of triangulation system. [06]

Q.3 a) What are the various uses of total station in civil engineering? [05]

b) What is reconnaissance survey? Explain in detail. [06]

Q.4 Write short notes on any THREE.

[12]

- a) Criteria's for selection of station.
- b) Subtense Bar.
- c) Principal of Triangulation.
- d) Principle of EDM.

SECTION - II

Q.5 a) What is transition curve? Write characteristics of transition curve. **[05]**

- b) Two tangents intersect at a chainage of 1250 m. The deflection angle is 30° . Calculate all the data necessary for setting out a curve of radius 250 m by Rankine's method, take peg interval as 20 m. **[07]**

Q.6 a) Explain scale of vertical photographs. **[05]**

- b) A line AB measures 11.00 cm on a photograph taken with a camera having a focal length of 21.5 cm. The same line measures 3.00 cm on a map drawn to scale of 1/45000, calculate the flying height of the aircraft, if the average altitude is 350m. **[06]**

Q.7 a) Explain GPS in detail. **[05]**

- b) Explain applications of GIS in civil engineering. **[06]**

Q.8 Write short notes on. (any THREE) **[12]**

- a) Vertical Curves
- b) Compound curve
- c) Drift and Crab
- d) Remote sensing

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SQ-60

Total No. of Pages :3

Seat No	CE-4th Sem
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S.Y.B. Tech. (Semester - IV) (CBCS)

Examination, May- 2025

Civil Engineering

PCC-CV403- CONCRETE TECHNOLOGY

Sub. Code : 79114/63346 / 79402



Day and Date : Monday, 19/05/2025

Total Marks :70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :
1. All questions are compulsory.
 2. Figures to the right indicate full marks.
 3. Assume suitable data wherever necessary.
 4. Answer shall be supported by adequate sketches.

SECTION-I

Q.1) Attempt all questions. (12)

- a) Enlist the types of cement. Explain the suitability of any two types.
- b) Explain the test procedure to calculate fineness modulus (F.M.) of sand.

Q.2) Attempt the following. (11)

- a) Enlist the test for measurement of workability and explain compaction factor test.
- b) Describe the various methods of mixing of concrete.

OR

- c) Explain segregation and bleeding of fresh concrete.

Q.3) Attempt any Two. (12)

- a) Explain in detail Schmidt's Rebound Hammer to test concrete.
- b) Explain the maturity concept of concrete.
- c) Explain the effect of w/c ratio and gel space ratio on strength of concrete.

SECTION II

Q.4) Attempt all questions.

(15)

- a) What are the factors affecting design of concrete mix?
- b) Design of M30 concrete mix as per IS:10262:2009
 - a) Grade Designation: M30
 - b) Type of cement- O.P.C 43 Grade
 - c) Maximum nominal size of aggregate- 20 mm
 - d) Workability- 100 mm slump
 - e) Exposure- Severe for R.C.C.
 - f) Specific gravity of cement- 3.15
 - g) Specific gravity of coarse aggregate- 2.8
 - h) Specific gravity of fine aggregate- 2.7
 - i) Sieve analysis of Fine aggregate: Conforming to Zone I of IS:383

Table 1: Assumed Standard Deviation

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

Table 2: Maximum Water Content per Cubic Meter of Concrete for Nominal Maximum Size of Aggregate

Sr. No.	Nominal Maximum size of Aggregate	Maximum Water Content Kg
1	10	208
2	20	186
3	40	165

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

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

Q.5) Attempt any Two.

(8)

- Explain fly ash as admixture in concrete.
- Write a short note on Air entraining agents.
- Explain in detail effect of superplasticizers on concrete.

Q.6. Attempt any Two.

(12)

- Write short note on
 - Self-compacting concrete
 - High Performance concrete.
- Explain acid attack on concrete in detail.
- Explain effect of permeability on concrete.

SQ-69

Total No. of Pages: 2

Seat No.	CE-4th Sem CE-IV 2
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S. Y. B. Tech. (CBCS) (Semester - IV)

Examination, May - 2025

(Civil Engineering)

(ESE-CV 404) FLUID MECHANICS - II

Sub. Code : 79115

Day and Date : Wednesday, 21/05/2025

Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :
- 1) Attempt any three questions from each section.
 - 2) Q. 4 and Q. 8 are compulsory.
 - 3) Figures to the right indicate full marks.
 - 4) Assume suitable data if necessary and state them clearly.
 - 5) Answer shall be supported by adequate sketches.

SECTION-I

Q.1 Solve the following :

- a) Enlist the types of flow in open channel. What do you understand by uniform and nonuniform flow in the case of channels? 5
- b) Define most economical channel section. Derive the formula for most efficient rectangular section. 6

OR

- c) A trapezoidal channel has a side slope of 3 Horizontal to 4 Vertical and bed slope 1 in 2000.
Determine the dimensions of best section, if it is to carry water at $0.5 \text{ m}^3/\text{s}$.
[Take $C = 80$]

Q.2 Solve the following :

- a) What are the assumptions of GVF? 6
- b) Derive dynamic equation of GVF and give the assumptions. 6

OR

- c) A channel of rectangular section 8 m wide has a uniform depth of flow 1.8 m. The bed slope of the channel is 1 in 3000. The water surface at the particular section is raised by 1 m due to weir constructed at the down end of the channel. Determine the water surface slope, classify profile.
[Take Manning's constant $n = 0.02$.]

Q.3 Solve the following :

- a) Define hydraulic jump and state its applications. 5
b) Derive an expression for loss of energy due to hydraulic jump in rectangular channel is in the form of 6

$$\Delta E = \frac{(y_2 - y_1)^3}{4y_1 y_2}$$

OR

- c) A sluice gate discharges water into a horizontal rectangular channel with velocity of 5m/sec and depth of flow 0.35m, width of channel is 7m. Determine whether hydraulic jump will occur and if so, determine the type of jump, its height and loss of energy per newton of water. Determine also power lost in kW.

Q.4 Write Short Notes on (Any Three)**[12]**

- a) Factors affecting Manning's roughness coefficient 'n'
b) M1 and C3 Curves
c) Direct Step Method of GVF computation
d) Spatially varied flow
e) Assumptions made in determination of hydraulic jump

SECTION-II**Q.5 Solve the following :**

- a) Give the classification of notches and weir. 5
b) A sharp edged, rectangular notch 80 cm long is to be used for gauging a discharge estimated to be 30 lit/sec. Find the percentage error in computing discharge that would be introduced by an error of 2mm in observing the head over the notch. [Take $c_d = 0.62$.] 6

OR

- c) Water is flowing in a rectangular channel of 1m wide and 0.75m deep. Find the discharge over a rectangular weir of crest length 60cm, if the head of water over the crest of weir is 20cm and water from channel flows over the weir. [Take $C_d = 0.62$. Neglect end contractions. Take velocity of approach into consideration.]

Q.6 Solve the following :

- a) Derive an equation for the force exerted on Flat Fixed Plate, Jet impacting normal to plate. 6
- b) Derive an equation for the force exerted by Jet on series of flat plates mounted on periphery of wheel. 6

OR

- c) A nozzle of 50 mm diameter delivers a stream of water at 20m/sec perpendicular to a plate that moves away from the jet at 5m/sec. Find :
- i) The force on the plate
- ii) The work done
- iii) The efficiency of jet.

Q.7 Solve the following :

- a) Give the Classification of Turbines. 5
- b) Write a short note on priming of a centrifugal pump. 6

OR

- c) What are the major components of Hydro-Power plant? Draw and explain typical layout of Hydroelectric power plant.

Q.8 Write Short Notes on (Any Three) [12]

- a) End Contraction and Velocity of approach
- b) Cipolletti Weir
- c) Impact of JET
- d) Draft tube and its functions
- e) Impulse momentum principle

Seat No. CE-411750

Total No. of Pages : 3

MAR-APR 2025 SUMMER EXAMINATION**11731 Bachelor of Technology (NEP-2.0)****Sub. Name: Building Design and Drawing****Sub. Code: 63348/79116/79404****Day and Date: MAY, 23-05-2025****Total Marks: 70****Time: 10:30 AM To 01:30 PM**

- Instructions:**
1. Assume suitable data wherever necessary and mention it boldly
 2. Draw neat labelled diagrams wherever necessary
 3. Figures to the right indicate full marks

- Special Inst.:**
- 1) Attempt any two questions from Q.1, Q.3 and Q.4
 - 2) Attempt any two question from Q.5, Q.6 and Q.7
 - 3) Q. 2 & Q. 8 are compulsory from section I & section II resp.

Q1) Answer all questions**[7]**

- a. List out the principles of planning & explain 'Privacy' as a principle of planning a building. **[4]**

- b. Explain the significance of sun diagram. **[3]**

OR

Explain the various factors to be considered in selection of good site for residential building.

Q2) Attempt compulsory**[21]**

- a. Design a residential bungalow (G+1,) for consulting Engineer is to be constructed on a plot having size 25m x 35m. Plot width 35 m facing on 9.0m wide road on South side. Design bungalow for following data : **[21]**

- i. Office with toilet : 1
- ii. Living Room : 1
- iii. Kitchen cum Dinning : 1
- iv. Store room : 1
- v. Utility : 1
- vi. Master Bed Room: 2 Nos
- vii. Children Bed Room : 1
- viii. Guest Bed Room : 1
- ix. Staircase
- x. Sanitary Block as per requirement

The necessary verandah, porch should be provided in the design.

Show North Direction and write construction notes

Draw with the scale 1:100

1. Draw detail plan of Ground Floor

2. Draw detail plan of First Floor
3. Give Area Statement.

Q3) Answer all questions [7]

a. Explain the terms: [3]

1. Maintenance
2. Repair
3. Rehabilitation of structure

b. Explain in detail Low cost housing with advantages & disadvantages. [4]

OR

Explain Green building rating systems in India in detail.

Q4) Answer all questions [7]

a. Write in detail objectives or principles of green building. [3]

b. List out the principles of planning & explain 'Roominess' as a principle of planning a building. [4]

OR

Explain types of maintenance job of a building.

Q5) Answer all questions [12]

a. Write a detailed note on Septic tank [6]

b. Explain various fire resisting materials [6]

Q6) Answer all questions [12]

a. Write in detail classification of Air Conditioning system. [6]

b. What is the necessity of ventilation and what are the factors affecting Ventilation?. [6]

Q7) Answer all questions [12]

a. Enlist the various types of Pointing with sketches. [6]

b. Explain characteristics of good paint. [6]

Q8) Attempt compulsory all questions [11]

a. Write in detail types of wiring. [4]

- b. What is Sound insulation & give the advantages of sound insulation? [4]
- c. Write a note on Objectives of plastering. [3]

OR

Write note on Gypsum Plaster

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

- 1] (1154) B.Tech. GBCS (79116) Building Design and Drawing Part 2 SEM 4
- 2] (101) Bachelor of Engineering (79404) Building Design and Drawing Part 2 SEM 4
- 3] (101) Bachelor of Engineering (63348) Building Design & Drawing Part 2 SEM 4