

**B.Tech (CE) -3<sup>rd</sup> SEMESTER EXAMINATIONS; DECEMBER - 2017**  
**(SUB.: STRENGTH OF MATERIAL; PAPER CODE- 13010306)**

Time: 3 Hours

Maximum Marks: 50

**Instructions:**

1. Write your Roll No. on the Question Paper.
2. Candidates should ensure that they have been provided with the correct question paper. Complaints in this regards, if any, should be made within 15 minutes of the commencements of Exam. No complaints will be entertained thereafter.
3. Attempt **FIVE** (05) questions in all and Question No.-01 is compulsory. Students are required to attempt **FOUR** (04) question selecting one question from each Unit in addition to Q.No.1. Marks are indicated against each question.
4. Draw diagram wherever required.

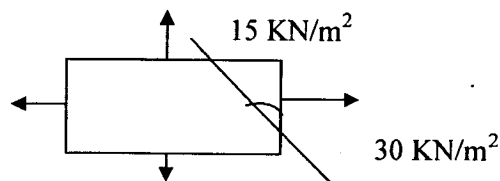
**Q.1. Write short notes on all of the following question:**

- a) Draw Stress-Strain diagram for ductile material?
- b) Write bending equation and torsion equation?
- c) A solid round bar 6 cm in dia. And 2.5 m long is used as a strut. One end of the strut is fixed while other is hinged. Find the safe compressive load for the strut using Euler's formula. Assume E and take factor of safety = 3.
- d) Calculate the Young modulus of elasticity if load of 70 KN is applied on a hollow bar of length 56 m having external and internal diameters 30 mm and 15 mm respectively and there is 1.5 mm extension in the bar.

(10)

**UNIT-I**

- Q.2. a)** For the principle stress systems shown, below, determine the intensities of normal and resultant stresses on a plane inclined at  $50^\circ$  the horizontal axis i.e axis of major principle stress.



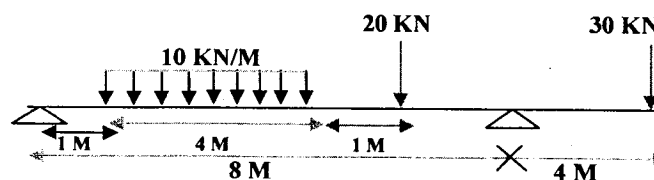
(5)

- b) Drive the torsion equation.

(5)

**OR**

- Q.3.** Draw shear force and bending moment diagram for a beam shown in fig.



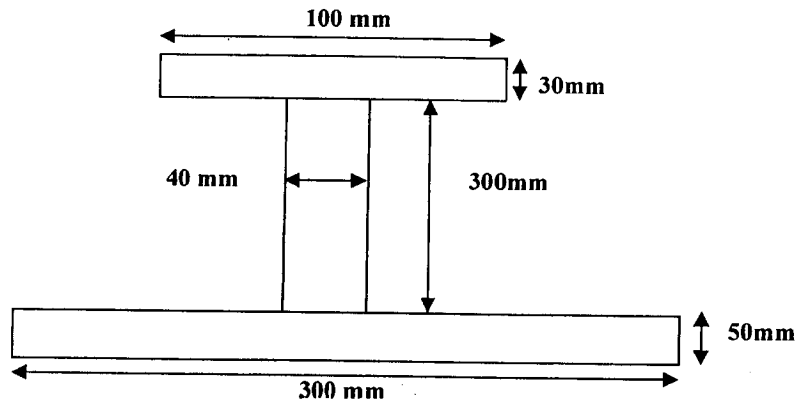
(10)

UNIT-II

Q.4. Calculate the diameter of a shaft if the torque of 12000 N-m is applied on it with permissible stress of  $60 \text{ N/mm}^2$  and angle of twist is  $1^\circ$ , length of the shaft is used as 25 times the diameter. Take  $G = .8 \times 10^5 \text{ N/mm}^2$ . (10)

OR

Q.5. Calculate moment of an I-section given in fig. If allowable stress for the section is  $80 \text{ N/mm}^2$  (10)



UNIT-III

Q.6. Write Castigaliano 1<sup>st</sup> and 2<sup>nd</sup> theorem & derive the expression. (10)

OR

Q.7. Draw influence line diagram for shear force and bending moment at a section 6m from left hand side support of simply supported beam 15 m long. Hence calculate Maximum S.F and B.M for the uniformly distributed load of 50 KN/m over 5m from right hand side support. (10)

UNIT-IV

Q.8. If a load of 8 KN is applied on a hollow bar of length 5 m with external & internal diameter 50 mm and 25 mm respectively. There is expansion of .56 mm then calculate buckling load if bar is used with one end hinged and other is fixed. (10)

OR

Q.9. a) Drive the expression for the buckling load of column with both ends of column is fixed. (8)  
b) Write Rankine formula for the above case (2)

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**B.TECH.(CE) – 3<sup>rd</sup> SEMESTER EXAMINATIONS; DECEMBER - 2017**  
**(SUB:- SURVEYING; PAPER CODE:-13010307)**

**TIME: 03:00 Hrs.****Max Marks:50****Instructions:-**

1. Write your Roll No. on the Question Paper.
2. Candidates should ensure that they have been provided with correct question paper. Complaints in this regard, if any should be made within 15 minutes of the commencement of the exam. No complaint(s) will be entertained thereafter.
3. Attempt **five (05)** questions in all, **Q1.** is compulsory. Students are required to attempt **(04)** questions, selecting **(01)** question from each unit in addition to Q.1. Marks are indicated against each question.
4. Draw the diagram wherever required.

**Q.1. Solve the following:-****(2X5=10)**

- a) Contours.
- b) Plain table, Alidade and Clinometer.
- c) Correction for refraction and curvature.
- d) Vertical curve.
- e) Level line, Line of sight, Horizontal line & plumb line.

**UNIT-I**

**Q.2. a)** What do you understand by chain surveying? Explain any one method of recording Chain survey data in the field book. **(4)**

**b)** Following bearings were observed while traversing with a compass. **(6)**

LINE	F.B.	B.B.
AB	S 37° 30'E	N 37° 30'W
BC	S 43° 15'W	N 44° 15'E
CD	N 73° 00'W	S 72° 15'E
DE	N 12° 45'E	N 13° 15'E
EA	N 60° 00'E	S 59° 00'E

Mention which stations were affected by local attraction and determine the corrected bearings.

**OR**

**Q.3. a)** Explain on what principle Electronic Distance Measurement (EDM) work? **(4)**

**b)** The following bearings were observed with a compass. **(6)**

Calculate the interior angles.

Lines	Fore Bearing
AB	60° 30'
BC	122° 00'
CD	46° 00'
DE	205° 30'
EA	300° 00'

Checks the results with theoretical sum of interior angles.

**UNIT-II**

**Q.4. a)** Find the RL of points P & Q with following data. **(7)**

Use rise and fall method or height of instrument method.

P.T.O.

Stn.	BS	IS	FS	RL	Remark
1	1.622				
2	1.874		0.354		
3	2.032		1.780		
4		2.362			
5	0.984		1.122		
6	1.900		2.824		
7			2.036	83.500	BM

- Checks the correctness of the results.
- b) Explain profile (longitudinal) leveling & cross sectional leveling. (3)

**OR**

- Q.5. a) What do you understand by Aneroid Barometer? Where they are used to judge the level above mean sea level? (3)
- b) Find the average elevation of point P by observation from two adjacent stations A & B (aligned in same vertical plain with that of staff station) of a tachometric survey. The staff was held vertically upon the point. The instrument is fixed with analecticlens, the multiplication constant of instrument is 100. (7)

Inst. Station	Height of Axis	Staff Point	Vertical angle	Staff readings			Elevation of station
				Bottom	Centre	Top	
	M			M	M	M	M
A	1.420	P	+2° 24'	1.320	2.055	2.880	77.750
B	1.400	P	-3° 36'	0.785	1.800	2.815	97.135

**UNIT-III**

- Q.6. a) Explain in detail Global Positioning System (GPS) in modern surveying. (5)
- b) Derive Prismoidal Formula for calculating volume. (5)

**OR**

- Q.7. a) What do you understand by transit curve? (5)
- b) Explain elements of simple curve with the help of sketch and their formulae. (5)

**UNIT-IV**

- Q.8. a) Explain difference between Plain & Geodetic Surveying? (3)
- b) Derive expressions for the Axis Signal correction for angle of depression and elevation. (7)

**OR**

- Q.9. a) Explain the working of the Colby Apparatus. (4)
- b) Two triangulation stations A and B are 60 kilometers apart and have elevation 240 meter 280 meter respectively. Find the minimum height of the signal required at B so that the line of sight may not pass near the ground than 2 meters. (6)
- The intervening ground may be assumed to have an average elevation of 200 meters.

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**B.TECH. (CE) – 3<sup>rd</sup> SEMESTER EXAMINATION, DECEMBER.-2017**  
**(SUBJECT- FLUID MECHANICS: PAPER CODE- 13010308)**

Time : 03:00 Hours

Maximum Marks – 50

**Instruction :**

1. Write your Roll No. on the question paper.
2. Candidate should ensure that they have been provided with correct question paper. Complaints in this regard, if any, should be reported to the invigilator on duty in the examination hall within 15 minutes of the commencement of the exams. No complaints shall be entertained thereafter.
3. Attempt five (05) questions in all Q.No.1. is compulsory. Students are required to attempt four questions selecting one from each unit in addition to Q.No.1. Marks are indicated against each
4. Draw diagram whenever required.

- Q1 . Explain followings:** (10)
- a) Compressibility
  - b) Most economical section
  - c) Continuity equation
  - d) Steady and Unsteady flow
  - e) Dimensional analysis

**UNIT-I**

- Q2 .** A plate 0.025 mm distant from a fixed plate, moves at 60 cm/s and require a force of 2 N per unit area i.e.  $2 \text{ n/m}^2$  to maintain this speed. Determine this speed. Determine the fluid viscosity between the plates. (10)

OR

- Q3 .** Find the kinematic viscosity of an oil having density  $981 \text{ kg/m}^3$ . The shear stress at a point in oil is  $0.2452 \text{ N/m}^2$  and velocity gradient at that point is 0.2 per second. (10)

**UNIT-II**

- Q4 .** Explain the terms: (a) Rapidly varied flow (b) Gradually varied flow (10)

OR

- Q5 .** Find the slope of the bed of a rectangular channel of width 5 m when depth of water is 2m and rate of flow is given as  $20 \text{ m}^3/\text{s}$ . Take Chezy's constant,  $C=50$  (10)

**UNIT-III**

- Q6 .** Give the expression for boundary layer thickness and displacement thickness. (10)

OR

- Q7.** Define laminar and turbulent boundary layer also give expression for momentum thickness. (10)

**UNIT-IV**

- Q8.** Define the terms dimensional analysis and model analysis, also describe fundamental units (10)

OR

- Q9 .** Give dimensionless numbers for (10)
- a) Reynolds's Number (Re)
  - b) Froude's Number (Fe)
  - c) Mach model law
  - d) (d) Weber model law

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**B.TECH.(CE) – 3<sup>rd</sup> SEMESTER EXAMINATIONS; DECEMBER - 2017**  
**(SUB:- BUILDING CONSTRUCTION & MATERIAL; PAPER CODE:-13010309)**

**TIME: 03:00 Hrs.****Max Marks:50****Instructions:-**

1. Write your Roll No. on the Question Paper.
2. Candidates should ensure that they have been provided with correct question paper. Complaints in this regard, if any should be made within 15 minutes of the commencement of the exam. No complaint(s) will be entertained thereafter.
3. Attempt **five (05)** questions in all, **Q1.** is compulsory. Students are required to attempt **(04)** questions, selecting **(01)** question from each unit. Marks are indicated against each question.
4. Draw the diagram wherever required.

**Q.1. Discuss the following terms:-****(10x1=10)**

- a) Mitred closer
- b) Efflorescence
- c) Sill
- d) Gable roof
- e) Header course
- f) Dutch bond
- g) Common rafter
- h) Ridge
- i) Cornice
- j) Quoins

**UNIT-I****Q.2. Classify various type of rubble masonry. Draw typical sketches to illustrate the same. (10)****OR****Q.3. Explain with the help of sketches the method of constructing mosaic flooring and terrazzo flooring? (10)****UNIT-II****Q.4. Explain the process of thatch roof covering and wood shingle roof covering. Give sketches and compare the two. (10)****OR****Q.5. What is dampness? Describe various method of damp proofing course. What are the effect of dampness? (10)****UNIT-III****Q.6. Explain in brief the object of plastering. Explain various type of plaster finishes and requirement of good plaster. (10)****OR****Q.7. Compare brick and stone masonry. Explain the type of bonds provided in brick masonry. (10)****UNIT-IV****Q.8. Describe the properties of bricks. Briefly explain the tests conducted on bricks for their suitability for construction work. (10)****OR****Q.9. Explain deterioration of a structure. Explain the factor responsible for deterioration of structures. (10)**

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**B.TECH. (CE/ME) – 3<sup>rd</sup> SEMESTER EXAMINATION, DECEMBER.-2017**  
**(SUBJECT- COMPLEX ANALYSIS AND PROGRAMMING: PAPER CODE- 13010305/13030302)**

Time : 03:00 Hours

Maximum Marks – 50

**Instruction :**

1. Write your Roll No. on the question paper.
2. Candidate should ensure that they have been provided with correct question paper. Complaints in this regard, if any, should be reported to the invigilator on duty in the examination hall within 15 minutes of the commencement of the exams. No complaints shall be entertained thereafter.
3. Attempt five (05) questions in all Q.No.1. is compulsory. Students are required to attempt four questions selecting one from each unit in addition to Q.No.1. Marks are indicated against each
4. Draw diagram whenever required.

- Q1 . a) What is a Linear programming problems? How to formulate a Linear programming problem?
- b) Find  $p$  such that the function  $f(z)$  expressed in polar coordinates as  $f(z) = r^2 \cos 2\theta + ir^2 \sin p^\theta$  is analytic.
- c) Expand  $\cos z$  in a Taylor's series about  $z = \frac{\pi}{4}$
- d) What is the optimal solution of a L.P.P.
- e) Separate into real and imaginary parts  $\text{Log}(6 + 8i)$ . (5x2=10)

UNIT-I

- Q2 . Using Simplex Method solve the following L.P.P.

Maximize  $z = 2x_1 + x_2 - x_3$  subject to

$$x_1 + x_2 \leq 1$$

$$x_1 - 2x_2 - x_3 \geq -2$$

$$x_1, x_2, x_3 \geq 0$$

- Q3 . Using Dual Simplex Method solve the following L.P.P
- (10)

$$3x_1 + x_2 \geq 3$$

$$4x_1 + 3x_2 \geq 6$$

Minimize  $Z = 2x_1 + x_2$  subject to

$$x_1 + 2x_2 \leq 3$$

$$x_1, x_2 \geq 0$$

UNIT-II

- Q4 . a) Prove that  $\tan^{-1} x = \frac{1}{2i} \log \left( \frac{1+ix}{1-ix} \right)$  (6)
- b) If  $\sin(A+iB) = x + iy$ , prove that

(i)  $\frac{x^2}{\cosh^2 B} + \frac{y^2}{\sinh^2 B} = 1$       (ii)  $x^2 \operatorname{cosec}^2 A - y^2 \sec^2 A = 1$  (4)

P.T.O.

- Q5. a) Determine the analytic function whose real part is  $e^{2x} (x \cos 2y - y \sin 2y)$  (6)
- b) Prove that  $\frac{(1+i)^{1-i}}{(1+i)^{1+i}} = \sin(\log 2) + i \cos(\log 2)$ . (4)

UNIT-III

- Q6. a) Evaluate, using Cauchy's integral formula:  $\int_C \frac{\sin^6 z}{(z-\frac{\pi}{6})^3} dz$  where C is the circle  $|z|=1$
- b) Evaluate  $\int_0^{2+i} (\bar{z})^2 dz$ , along
- a) the real axis to 2 and then vertically to 2+i. (4)
- b) along the line  $2y = x$
- Q7. a) Evaluate the following integral by contour integration:  $\int_0^{2\pi} \frac{d\theta}{5-3\cos\theta}$  (6)
- b) Evaluate  $\oint_C \frac{2z-1}{z(z+1)(z-3)} dz$ , where C is the circle  $|z|=2$  (4)

UNIT-IV

- Q8. a) The 9 items of a sample have the following values 45,47,50,52,48,47,49,53,51  
Does the mean of these values differ significantly from the assumed mean 47.5. (6)
- b) Intelligent tests were given to two groups of boys and girls.

	Mean	S.D	size
Girls	75	8	60
Boys	73	10	100

- Examine of the difference between mean scores is significant. (4)
- Q9. a) In a lottery, m tickets are drawn at time out of n tickets numbered from 1 to n. Find the expected value of the sum of the numbers on the tickets drawn. (6)
- b) Find the mean of the Binomial distribution  $B\left(4, \frac{1}{3}\right)$ . (4)

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