

Total No. of Printed Pages:2

SUBJECT CODE NO: E-36
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(Civil) Examination Nov/Dec 2017
Building Construction & Drawing
(OLD)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i. Q.No.1 & Q.No.6 are compulsory.
 - ii. Solve any two questions from Q.No.2 to 5 and any one from Q.No.7 to 8.
 - iii. Figures to right indicate the maximum marks.

Section- A

- | | | |
|-----|--|-----------------------------|
| Q.1 | Attempt any five questions. | 10 |
| | <ol style="list-style-type: none">a) What are the functional requirements of roofs?b) Give the standard sizes of W.C., toilet, kitchen cum store and kitchen cum dining.c) Define building line and control line.d) What are the purposes served by underpinning?e) Enlist the requirement of good foundation.f) Classify the requirement sound absorbents.g) What are the ill effects of noise? | |
| Q.2 | <ol style="list-style-type: none">a) Define partition wall. State its applications and explain any two types of partition walls.b) What are the bylaws to be followed for height of building explain with neat sketch. | <div>08</div> <div>07</div> |
| Q.3 | <ol style="list-style-type: none">a) Enlist the principles of building planning and explain any two in detail.b) Explain with neat sketch pit method of underpinning. | <div>08</div> <div>07</div> |
| Q.4 | <ol style="list-style-type: none">a) Explain how damp proofing is carried out with the help of suitable sketches.b) Define waterproofing. Enlist its methods. Explain any one in detail with neat sketch. | <div>07</div> <div>08</div> |
| Q.5 | Write a short note on: (any three) <ol style="list-style-type: none">a) Load bearing structureb) Energy efficient buildingc) Under-reamed pile foundation in black cotton soild) Setting out of foundatione) Anti-termite treatment | 15 |

Section- B

- Q.6 Draw to the scale of 1:50 a working plan of residential bungalow, section through staircase front elevation for the data given below: 25
- i) Plot size = $14m \times 18m$
 - ii) Both side margins = 1.25m
 - iii) Front margin = 3.0m
 - iv) Rear margin = 2.0m
 - v) Plinth height = 0.45m
 - vi) FSI allowed = 0.80
 - vii) Required components: Ent. Verandah, Living Room, Bedroom = 1 No, master bed = 1 No, separate W.C, bath, kitchen room, dining room, store room & stair case doglegged. Also show schedule of opening and area statement (block plan calculations)
- Q.7 a) Write down the basic requirement of lifts and escalators with their suitability. 07
b) Write a detailed note on raking shore. 08
- Q.8 a) Write down the basic requirements of weather sheds and roofs. 07
b) Write a note on repairs and retrofitting in RCC framed structure. 08

SUBJECT CODE NO:- E-68
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(Civil) Examination Nov/Dec 2017
Fluid Mechanics- II
(OLD)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

N.B

- 1) Q. no 1 & Q.no. 6 are compulsory
- 2) Solve any two question from remaining question from each section
- 3) Assume suitable data if necessary

Section A

Q.1 Solve any five 10

- 1) Define Froude number.
- 2) Define hydro dynamically smooth boundary.
- 3) Define Dynamic Similarity.
- 4) Define gradually varied flow.
- 5) Explain the specific energy of a flowing liquid.
- 6) State Buckingham π Theorem.
- 7) What do you mean by water hammer.
- 8) Give the momentum equation for flow through open channel.
- 9) Define flow in open channel.
- 10) What is a Compound pipe.

Q.2 A) Find an expression for the power transmission through pipes. 07

B) Calculate the discharge through a pipe of diameter 200mm when the difference of pressure head between the two end of a pipe 500m apart is 4m of water. Take the value of $f=0.009$. 08

- Q.3 A) State & prove the condition under which the trapezoidal section of an open channel will be most economical. 07
- B) The discharge of water through a rectangular channel of width 8m, is $15\text{m}^3/\text{sec}$ when the depth of flow is 1.2m. Calculate;- 08
- Specific energy of the flowing water.
 - Critical depth and Critical velocity
 - Value of minimum specific energy
- Q.4 A) The time period (t) of a pendulum depends upon the length [L] of the pendulum and acceleration due to gravity [g]. Derive an expression for the time period using Rayleigh's method. 07
- B) Explain the procedure for solving problems by Buckingham's π Theorem. 08
- Q.5 Write Short notes on:- (Any Three) 15
- Backwater Curve and Afflux
 - Classification of flow in open channels
 - Hydraulic Jump and energy dissipation
 - Slope Profiles

Section B

- Q.6 Solve Any Five 10
- Draw outlet velocity triangles for centrifugal pump.
 - What is reciprocating pump?
 - What precaution should be taken against Cavitation.
 - In a Single acting pump $Q_{th} = 10.45 \text{ lit/sec}$ $C_d = 0.96$, find Q_{act} .
 - Draw ideal indicator diagram.
 - What is basis of selection of turbine at a particular place.
 - Draw inlet velocity triangle for Pelton wheel turbine.
 - Define governing of turbines.
 - Define Similitude.

10) Define Euler's number.

- Q.7 A) Find an expression for force exerted by a jet on stationary curved plate. 07
- B) A jet of water having a velocity of 15m/sec strikes a curved vane at centre which is moving with velocity of 5m/sec in the direction of jet. The jet is deflected through an angle of 165° . Assuming the plate is smooth find:- 08
- i) Force exerted on the plate in the direction of jet.
 - ii) Power of jet.
 - iii) Efficiency of jet.
- Q.8 A) Derive an expression for specific speed of a centrifugal pump. 07
- B) What do you understand by the characteristic curve of a turbine? Name the important types of characteristic curves. 08
- Q.9 A) Derive an expression for friction head in suction and delivery pipe of reciprocating pump. 07
- B) A single acting reciprocating pump has piston diameter 12.5cm and stroke length 30cm. The centre of the pump is 4m above the water level in the pump. The diameter and length of suction pipe are 7.5cm and 7m respectively. The separation occurs if the absolute pressure head in the cylinder during suction stroke falls below 2.5m of water. Calculate the maximum speed at which the pump can run without separation. Take atmospheric pressure head = 10.3m of water. 08
- Q.10 Write Short Notes on Any Three 15
- i) Hydraulic Ram
 - ii) Hydraulic Press
 - iii) Hydraulic Crane
 - iv) Hydraulic Lift

SUBJECT CODE NO: E-100
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(Civil Engineering) Examination Nov/Dec 2017
Surveying - II
(Old)

[Time: Three Hours]

[Max.Marks:80]

N.B

Please check whether you have got the right question paper.

- i. Q.no.1 and Q.No.6 are compulsory.
- ii. Attempt any two questions from section A and section B separately.
- iii. Figures to the right indicate full marks.
- iv. Assume suitable data if necessary.

SECTION-A

- | | | |
|------------|--|----------------------------|
| Q.1 | Answer the following (Any Five)
<ol style="list-style-type: none"> i) What do you meant by weight of observation? ii) Explain phase of signal. iii) Differentiate between base line & stations. iv) Give the classification of triangulation system. v) Enlist types of errors in theory of errors. vi) What are the sequences involved in comprehensive route survey? vii) What is city surveying? viii) What are the methods of equal shifts? ix) What are the elements of simple curve? x) What is even radius & even degree curve? | 10 |
| Q.2 | <ol style="list-style-type: none"> a) Describe the method of setting out circular curve by the method of offsets from the long chord with the help of chain & tape. b) What is meant by satellite station and reduction to Centre? Derive the expression when the satellite station is measured from left of true station. | 08

07 |
| Q.3 | <ol style="list-style-type: none"> a) State laws of weight. b) Explain : i) Systems of triangulation
ii) Elements of reverse curves. | 08

07 |
| Q.4 | <ol style="list-style-type: none"> a) Explain computation of sides of spherical triangle by spherical trigonometry. b) What is phase of signal? Derive formula for the correction to be applied to cylindrical signal when the bright portion is bisected. | 08

07 |

Q.5 Write short notes on the following (Any three)

15

- i) Signals & Towers.
- ii) Characteristics of transition curve & its components.
- iii) Figure adjustment.
- iv) Route Survey
- v) Principles of least square.

SECTION-B

Q.6 Answer the following questions (Any Five)

10

- i) What is a 5° curve?
- ii) Differentiate between Aerial photograph & map.
- iii) What is hydrographic Surveying?
- iv) Enlist methods of Soundings.
- v) What do you mean by Stereoscope?
- vi) What is geodimeter & tellurometer?
- vii) Explain crab & drift.
- viii) Enlist types of horizontal curve.
- ix) What are the elements of a simple circular curve?
- x) What is trigonometrical leveling?

Q.7 a) What are the methods by which length of transition curve is determined? Explain rate of change of radial acceleration method.

08

b) Explain step by step procedure for setting out the combined curve by deflection angles.

07

Q.8 a) Derive the setting of simple circular curve by offsets from long chord.

08

b) State the properties of electro manila waves.

07

Q.9 a) Explain transferring the level underground in case of tunnel.

08

b) Compare geodimeter with tellurometer.

07

Q.10 Write a short notes (any three)

15

- i) Total station.
- ii) Remote sensing platforms.
- iii) Axis signal corrections.
- iv) Modulation in EDM.
- v) Parallax bar.

SUBJECT CODE NO:- E-169
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(CIVIL) Examination Nov/Dec 2017
Theory of Structure-I
(OLD)

[Time: Three Hours]

[Max.Marks:80]

N.B

Please check whether you have got the right question paper.

- (i) Attempt any three questions from each section.
- (ii) Assume suitable data, If any.
- (iii) Figures to right indicate the maximum marks.
- (iv) Non-programmable Calculator is allowed.

Section - A

Q.1 Draw the SFD & BMD for the fixed beam as shown in figure 1.

14

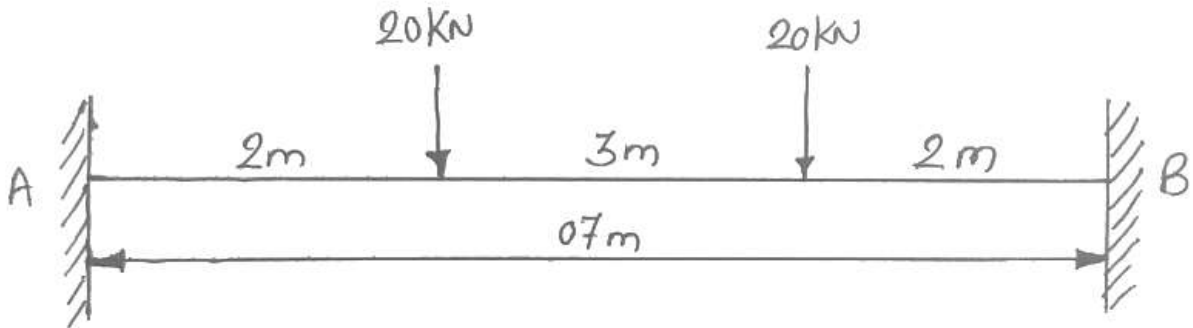


Figure No ①

- Q.2 A beam of length 6m is simply supported at its ends as shown in following figure 2. Determine the deflection of the beam at its midpoint and also the position of maximum deflection. Take $E = 200 \times 10^3 \text{ N/mm}^2$ and $I = 4.3 \times 10^8 \text{ mm}^4$. 13

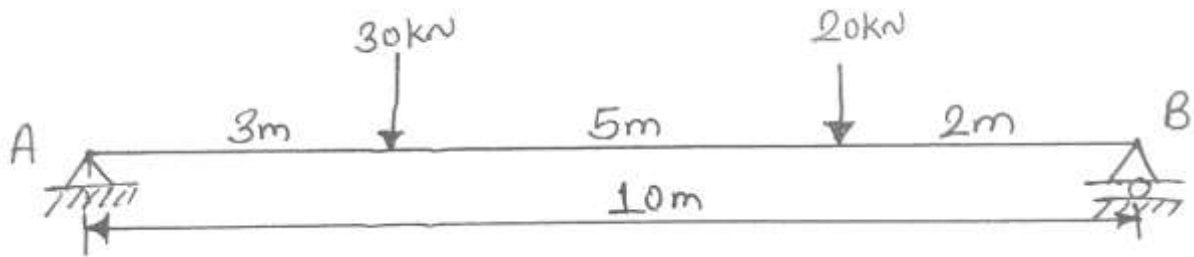


Figure No. ②

- Q.3 Two rod AC & BC are hinged at C and carrying a load of 60 kN at C as shown in fig. 3. Determine vertical & horizontal deflection at joint C. area of AC = 800 mm^2 & of BC = 1000 mm^2 . $E = 200 \text{ GPa}$. 13

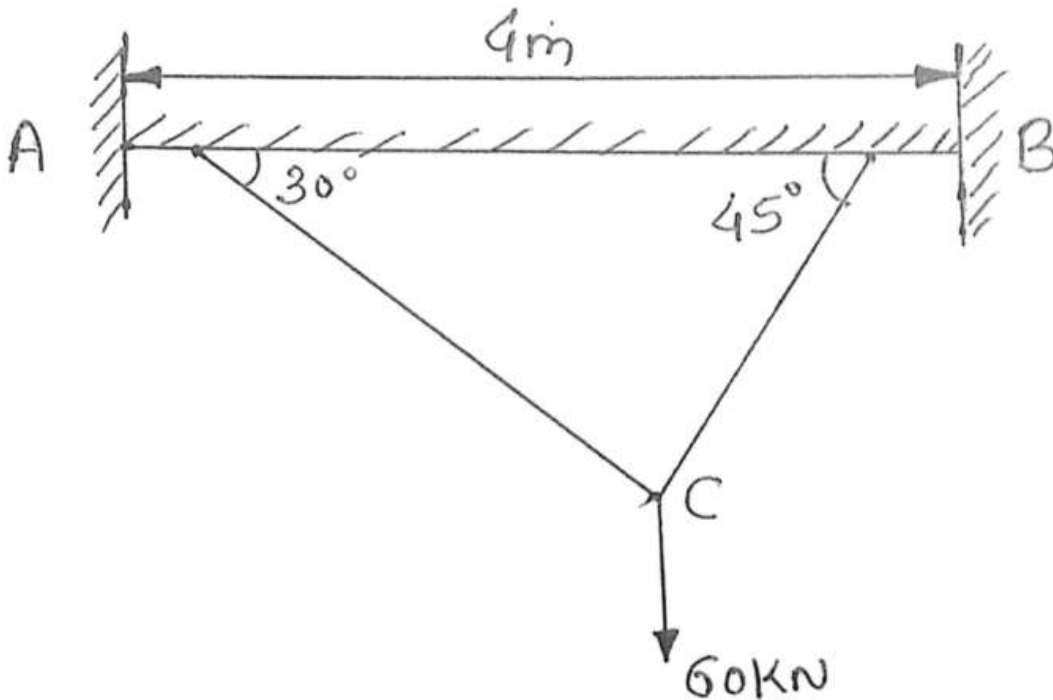
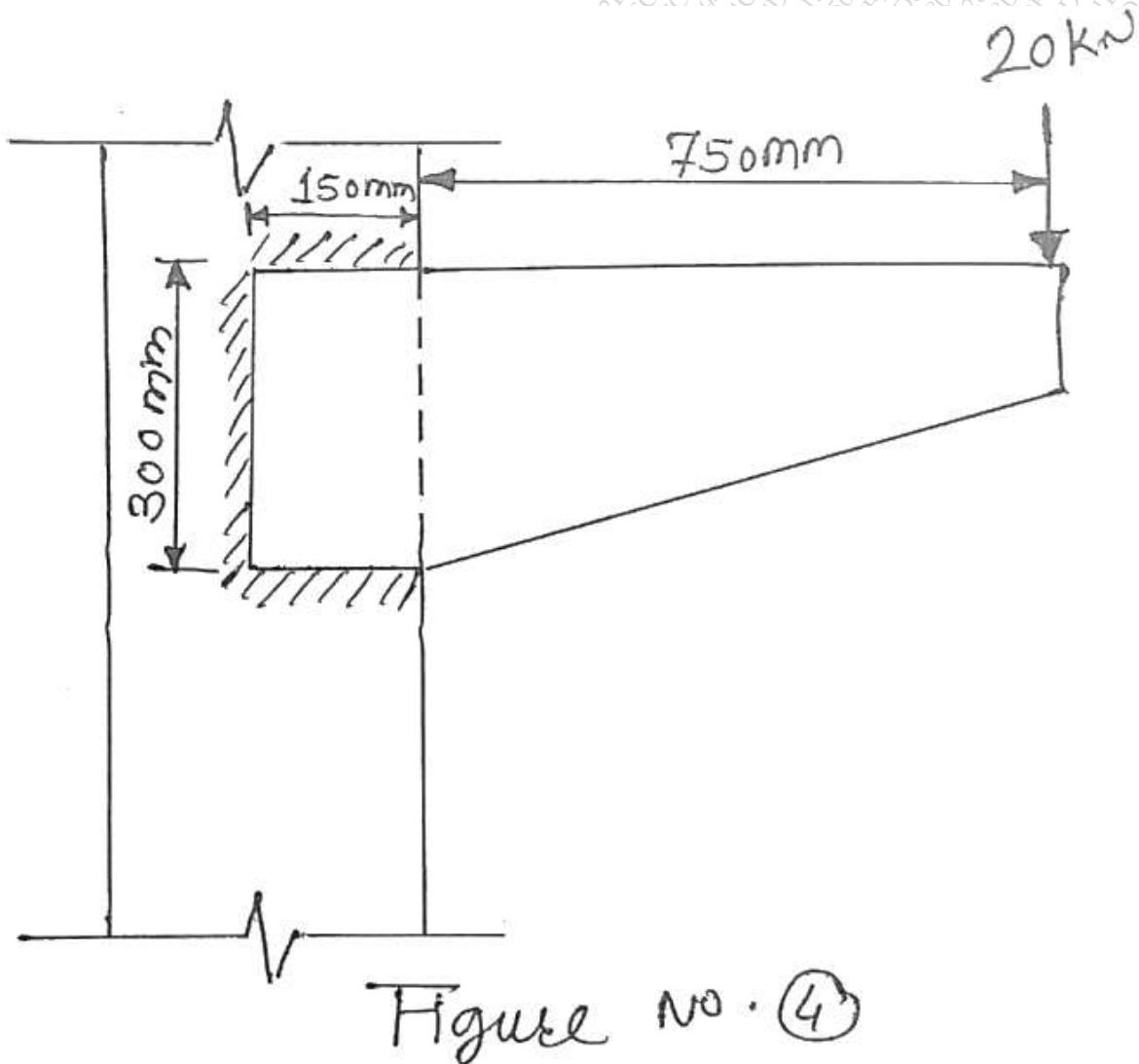


Figure No. ③

- Q.4 (a) Explain different types of welded joints with sketches. 05
- (b) Find the size of the fillet weld required to connect the back d plate to the column as shown in fig: 04. The permissible stresses in weld is 110 N/mm^2 . 08



- Q.5 Write a short notes on (Any Four)
- (a) Analysis & Design of Structures. 04
- (b) Castigliano's theorem. 03
- (c) Williot diagram 03
- (d) Advantages and disadvantages of riveted joints. 03
- (e) Difference in between fixed and simply supported beam 03

SECTION – B

- Q.6 Draw BMD of fixed beam as shown in figure 1 by using three moment theorem. 14
- Q.7 A train of a wheel load as shown in fig. 5 crosses a simply supported beam of span 25m from left to right with point loading. Using influence line diagram, determine the maximum bending moment under central load. 13

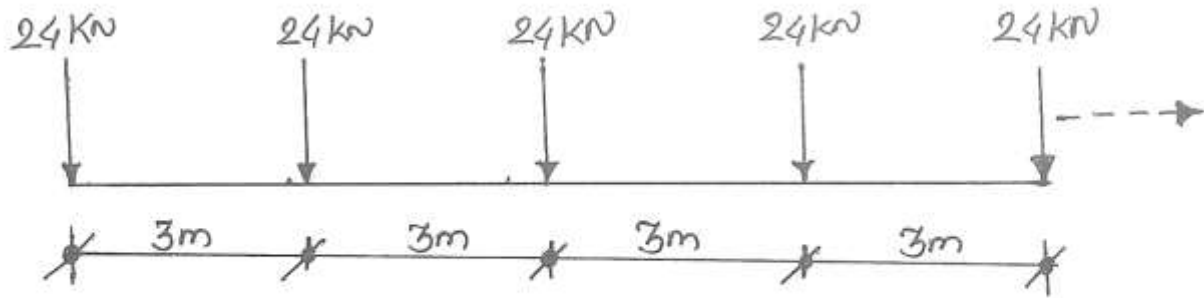


Figure No ⑤

- Q.8 A three hinged parabolic arch of span 24m and central rise of 5m carries UDL of 20kN/m over the left half span and a point load of 125 kN at 16m from left support. Find normal thrust, radial shear, & BM at distance of 6m from left support. 13
- Q.9 For a cable suspension bridge with span 300m & central dip of 30m, which is stiffened by three hinged stiffening girder. The girder carries two point load of 50 kN and 75kN at distance of 70m & 250m from left support. Draw the bending moment diagram. 13
- Q.10 Write a short notes on (any Four)
- (a) Normal thrust and Radial shear. 04
 - (b) Difference between Straight beam and arch beam 03
 - (c) Difference between fixed beam and continuous beam. 03
 - (d) Construction feature of suspension bridge. 03
 - (e) Influence line diagram. 03

Total No. of Printed Pages:02

SUBJECT CODE NO:- E-211
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(CIVIL) Examination Nov/Dec 2017
Engineering Geology
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

- N.B Please check whether you have got the right question paper.
- i) Q.1 is compulsory and solve any two from the remaining question from section “A”
 - ii) Q.6 is compulsory and solve any two from the remaining question from section “B”
 - iii) Neat diagram must be drawn whenever necessary.
- Section A**
- | | | |
|-----|---|----|
| Q.1 | Write short Notes (any five) | 10 |
| | a) P-wave | |
| | b) Reverse fault | |
| | c) Angular unconformity | |
| | d) Symmetrical fold | |
| | e) Thermal metamorphism | |
| | f) Earthquake | |
| | g) Volcano | |
| Q.2 | A) What is metamorphic rock? Give the classification of metamorphic rock with the example of each type. | 07 |
| | B) What is Joints? Explain types of Joints | 08 |
| Q.3 | A) Discuss origin, distribution, classification, economic importance of Deccan trap formation | 07 |
| | B) What is fault? Explain various types of fault. | 08 |
| Q.4 | A) What is unconformity? Explain three types of unconformity | 07 |
| | B) Write at length on Moh's scale of hardness | 08 |
| Q.5 | Distinguish between the following | 15 |
| | a) Love wave and S-wave | |
| | b) Primary minerals and secondary minerals | |
| | c) Strike fault and Dip fault. | |

Section B

- Q.6 Write short Notes on (any five) 10
- a) Water tightness of basalt
 - b) Water loss during drilling
 - c) Types of drilling
 - d) Basalt as road metal
 - e) water table
 - f) Tunnel
 - g) Landslides
- Q.7 A) What types of treatment of leaky rocks are used when condition are 08
- i) Joints
 - ii) Fold zone
 - iii) Fault zone
- B) Explain the factors that help in selecting the rocks for building purpose 07
- Q.8 A) What is the rain harvesting? Give the importance of rain harvesting. 08
- B) Discuss the geological factors such as fold zone, inclined strata, swelling rocks which affect the tunneling 07
- Q.9 A) What happened when 08
- i) lime stone bed occurs in the reservoir
 - ii) Tunneling though compact Basalt.
- B) What difficulties have to be faced if 07
- i) Dams on fault rock
 - ii) Dams on Jointed rock.
- Q.10 A) Explain importance of Geology in Civil Engineering. 08
- B) What is drilling? Explain different types of drilling. 07

Total No. of Printed Pages:4

SUBJECT CODE NO: E-223
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(CIVIL) Examination Nov/Dec 2017
Strength of Materials
(OLD)

[Time: 3 Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

N.B

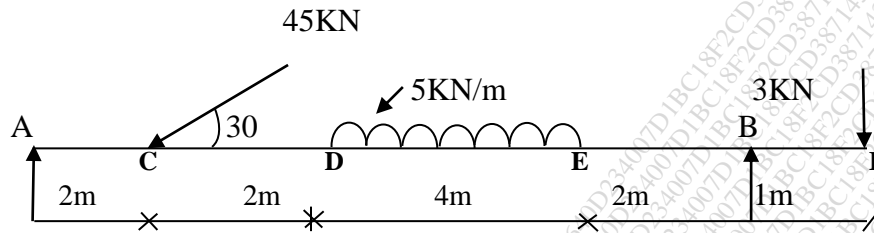
- 1) Question No. 01 & 06 is compulsory.
- 2) Solve any two questions for 30 marks from remaining questions of each section.
- 3) Figure to the right indicate full marks.
- 4) Assume suitable data if required & state it clearly.

SECTION A

- Q.1 Attempt any five. 10
- a) Define shear force & bending moment at a section.
 - b) Enlist the number of elastic constant for an isotropic elastic material & define any one.
 - c) Write down the expression showing relation between SF, BM & load intensity.
 - d) Draw the loading diagram for a beam shaving some portion subjected to pure bending.
 - e) Derive $\delta_L = PL / AE$.
 - f) Draw shear stress distribution diagram for the 'T' & 'I' section.
 - g) State principle of superposition.
- Q.2 a) Draw possible SFD & BMD. For the beam subjected to its self-weight only. Write down the value of maximum shear force & bending moment. 03
- b) Enlist different types of support with possible number of reaction in terms of moment, horizontal reaction & vertical reaction. 02

C)

10



Draw SFD & BMD for the beam as shown in figure. Locate position of point of contra shear & point of contra flexure. If any.

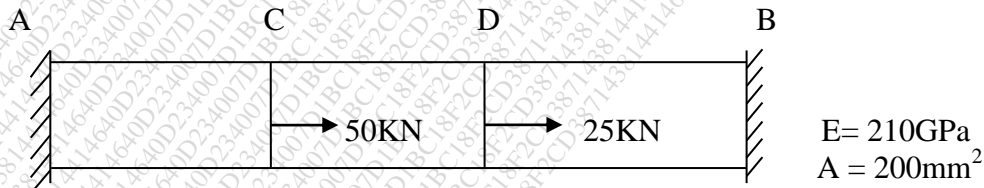
Q.3 a) What are the assumptions in theory of pure bending? 05

b) A beam of length 5m is of rectangular section supports a load of 20kN over its span uniformly distributed if depth of the beam is twice the width & maximum tensile stress is not to exceed 7MPa. Find the dimensions of the beam section. 10

Q.4 a) Draw shear stress distribution diagram for rectangular section, I section, 'T' section, □ (channel section) & circular section. Show the maximum & average value of shear stresses. 05

b) The cross-section of beam is a circle of diameter D. If τ is the total shear stress at a distance of 'y'. For the neutral axis is $= \frac{16F}{3\pi D^2} \left[1 - \left(\frac{2y}{D} \right)^2 \right]$ 10

Q.5 a) 10



Find the forces in each portion & corresponding stresses.

b) Explain stress-strain curve for mild steel bar. Discuss the significance of each point. 05

SECTION : B

Q.6 Attempt any five. 10

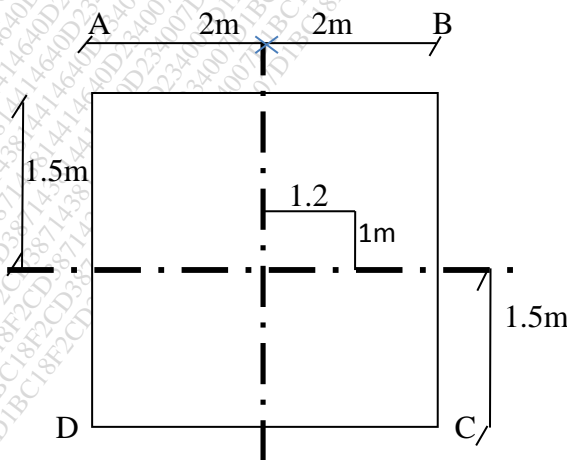
a) Write down the value of minimum or limiting value of eccentricity for no tension condition for a rectangular & circular section.

b) What is slenderness ratio?

c) What is polar moment of Inertia? Write down the expression for circular section.

- d) Classify the types of column based on slenderness ratio.
- e) Define kern of section.
- f) Write the expression of torsional formula. State the terms included.
- g) Define resilience & Proof resilience.

- Q.7
- a) Calculate the maximum value of shear stress induced in solid shaft of 100mm diameter, 8m long transmitting 112.5 kw power at 150 rpm. Take $G = 80 \text{ kN/mm}^2$. 08
 - b) A cylindrical shell 3m long, 1m in diameter & the thickness of metal is 10mm. Calculate the change in dimension, change in volume, & maximum intensity of shear stress induced. If it is subjected to internal pressure of 150 N/cm^2 . $E = 200 \text{ GPa}$ & Poisson's ratio = 0.3. 07
- Q.8
- a) Find the limiting value of eccentricity for no tension condition for a rectangular section if bending takes place about y-axis. 02
 - b) Calculate the strain energy stored in a bar 2m long, 50mm wide & 40mm thick when it is subjected to gradual tensile load of 60kN. Take $E = 200 \text{ GPa}$. 05
 - c) A masonry pier $3\text{m} \times 4\text{m}$. Supports a load of 600kN. At a point showing in fig below. 08
 - i) Find the stresses at the corners of the pier.
 - ii) What additional load should be applied at the corner of pier 50 that there is no tension in the pier section?



- Q.9 Find Euler critical load for a hollow cylinder GI column 200mm external diameter & 25mm thick. If it is 6m long & hinged at both ends Take $E = 80\text{GPa}$. Compare the same load with Rankine's critical load take $6c = 550\text{ N/mm}^2$ & $\alpha = 1/1600$. For what length of column the loads by Eulers & Rankines formula be equal?
- Q.10 The stresses at a point in a component are 120N/mm^2 (Tensile) & 60 N/mm^2 (compressive). Determine the magnitude of normal & shear stresses on a plane inclined at an angle of 25° with major force. Also determine the direction of resultant stress & the magnitude of maximum intensity of shear stress.

SUBJECT CODE NO: E-224
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(CIVIL) (CGPA) Examination Nov/Dec 2017
Strength of Materials
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- Question No. 1 and 6 are compulsory. Attempt any two from remaining from each section.
 - Figures to the right indicate full marks.
 - Assume suitable data, if necessary.

Section A

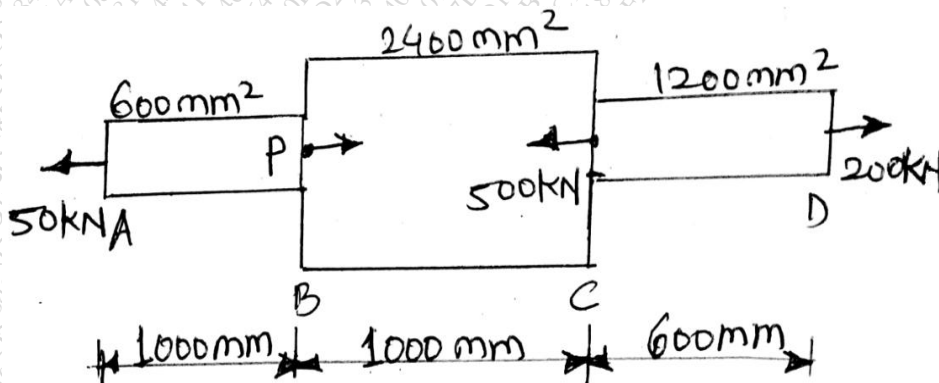
Q.1 Attempt any five.

10

- State Hooke's law.
- Write flexure formula.
- Define Poisson's ratio.
- Define point of contraflexure.
- Explain types of stresses.
- Define modular ratio.
- Define modulus of Rigidity.
- Define Young's modulus.

Q.2 a) A member ABCD is subjected to point Load as shown in Fig. Determine force 'P' and total elongation of member.

Take $E = 210 \times 10^3 \text{ N/mm}^2$

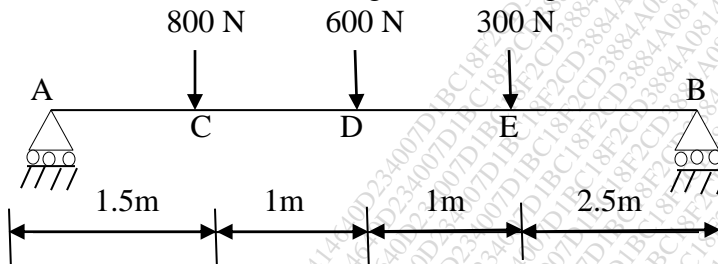


- b) A concrete column of cross-section area $400 \text{ mm} \times 400 \text{ mm}$ is reinforced by four longitudinal 50 mm diameter round bars of steel placed at each corner. If columns carries a load of 300 kN . Determine load carried by each bar and stresses produced in the concrete and steel bars.

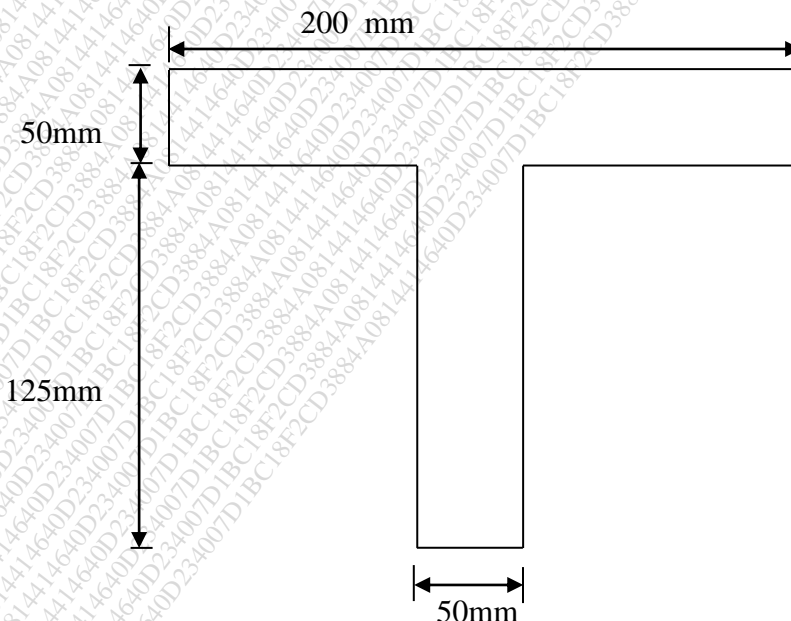
Young's modulus of elasticity of steel is 15 times that of concrete.

Q.3 a) What are the types of beam. 07

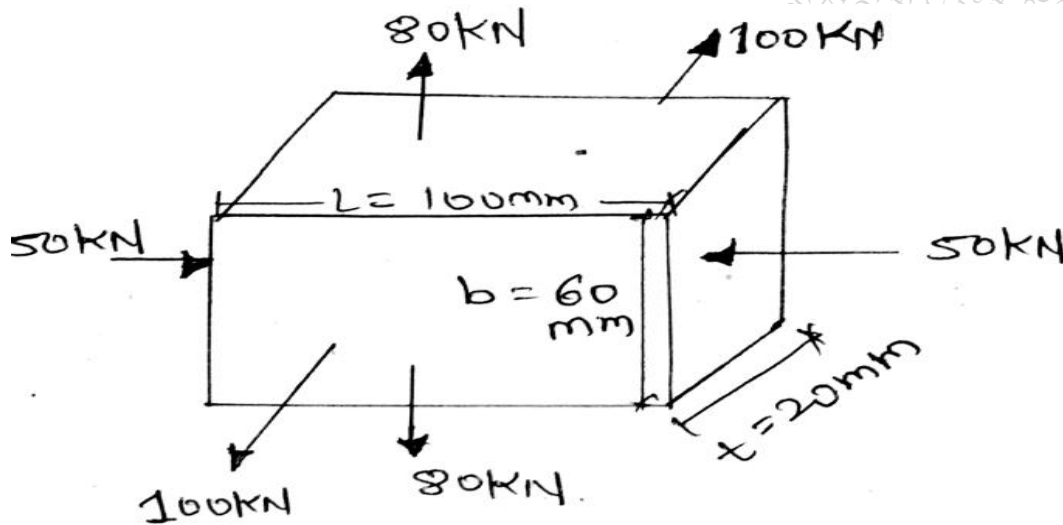
- b) Draw shear force and bending moment diagram for beam shown in figure. 12



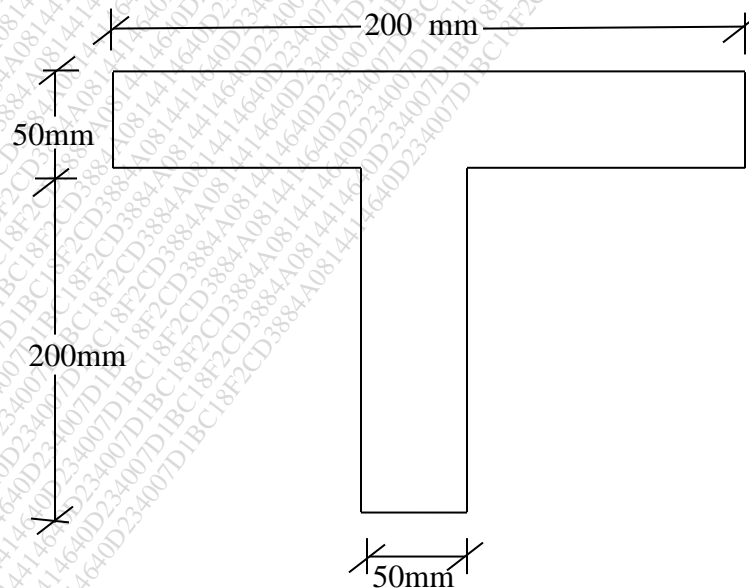
- Q.4 A 'T' section with flange $200 \text{ mm} \times 50 \text{ mm}$ and web $50 \text{ mm} \times 125 \text{ mm}$, is used as a cantilever beam of 2.5 m span subjected to U.d.L. of intensity 20 kN/m over its full span. Determine the maximum stresses in beam. 15



- Q.5 a) Determine change in each dimension and change in volume of block as shown in fig. 08
 Take $E = 2 \times 10^5 \text{ N/mm}^2$
 $\mu = 0.3$



- b) The T-shaped cross – section of a beam shown in fig. is subjected to vertical shear force of 100 kN. Calculate shear stress at the neutral axis and at the junction of the web and flange. 07



Section B

Q.6 Attempt any five

10

- What are the assumptions in theory of torsion.
- Define hoop stress.
- Write torsional formula.
- What are the assumptions in Euler's theory.
- Explain core or Kernel of section.
- Define strain energy.
- Define Principle stresses & principle planes.
- Define polar modulus.

Q.7 a) A steel shaft of solid circular section has to transmit 375 kW at 210 RPM. The maximum shear stress is not to exceed 50 MPa and the angle of twist is 1° in length of 3m. Design the suitable diameter of shaft. Take $C = 80$ GPa. 08

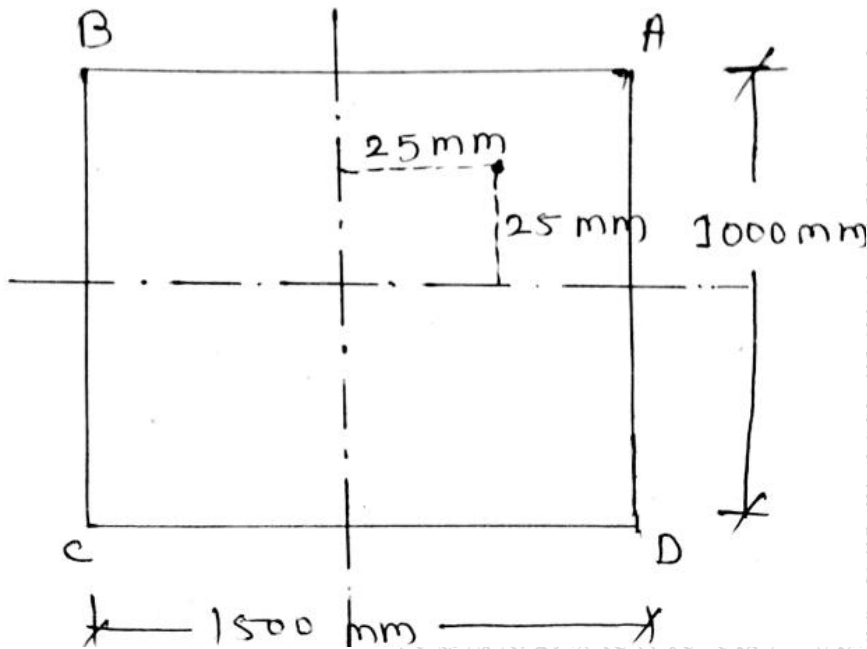
- b) A load of 100 N falls through a height of 2 cm onto a collar rigidly attached to the lower end of a vertical bar 1.5m long and 1.5 cm^2 cross-sectional area, the upper end of the vertical bar is fixed. Determine: 07
- Maximum instantaneous stress induced in the vertical bar.
 - Maximum instantaneous elongation
 - Strain energy stored in the vertical rod.
- Take $E = 2 \times 10^5 \text{ N/mm}^2$

Q.8 a) A cylindrical thin drum 800mm in diameter and 3m long has a shell thickness of 10mm. If the drum is subjected to an internal pressure of 2.5 N/mm^2 . Determine 08

- The change in diameter.
- Change in length, and
- Change in volume.

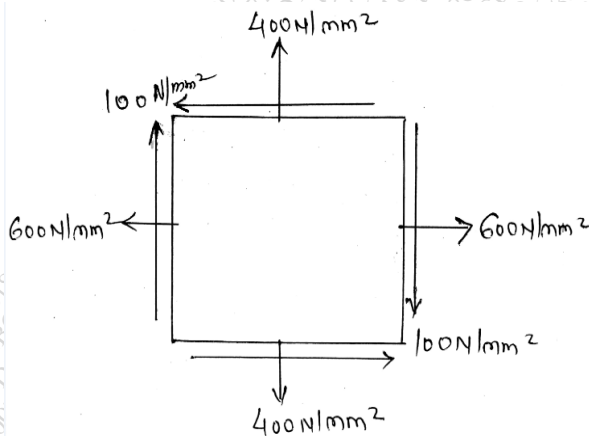
Take $E = 2 \times 10^5 \text{ N/mm}^2$ Poisson's ratio = 0.25

- b) A rectangular pier is subjected to a compressive load of 450 kN as shown in fig. Find the stress intensities on all the four corners of pier. 07



Q.9 At a point in a strain material there are two mutually \perp^{er} stresses of 600 N/mm^2 and 400 N/mm^2 both tensile. They are accompanied by shear stress of 100 N/mm^2 find 15

- 1) Principle stresses
- 2) Position of principle plane
- 3) Maximum shear stresses



Q.10 A hollow column whose outside diameter is 200 mm has a thickness of 20mm. It is 4.5 m long and 15 is fixed at both ends. Compare Euler's critical load with Rankine's critical load taking $\sigma_c = 550 \text{ N/mm}^2$ and $\alpha = \frac{1}{1600}$, $E = 8 \times 10^4 \text{ N/mm}^2$.

Total No. of Printed Pages:2

SUBJECT CODE NO: E-262
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(CIVIL) Examination Nov/Dec 2017
Fluid Mechanics-I
(OLD)

[Time: 3 Hours]

[Max.Marks:80]

- N.B
- Please check whether you have got the right question paper.
- Question No. 1 & 6 are compulsory.
 - Attempt any two questions from remaining question in each section.
 - Draw neat sketches wherever necessary.
 - Assume suitable data, if necessary.

SECTION A

- Q.1 Attempt any FIVE from the following. 10
- Define Mass density.
 - State Pascal's Law.
 - Define Metacentric and Metacentric height.
 - Define steady and unsteady flow.
 - Determine the dynamic viscosity of a liquid having kinematic viscosity 8 stokes and specific gravity 1.8.
 - Define Hydrostatic paradox.
 - Define rate of flow and give its unit in SI system.
 - Draw the diagram of simple U-tube manometer for gauge pressure and vacuum pressure.
 - Define surface Tension
 - What is manometer? Give its classification.
- Q.2
- Derive the expression for meta centric height of floating body. Explain it with neat sketch. 08
 - A simple manometer is used to measure the pressure of oil (sp.gr.= 0.8) flowing in a pipe line. 07
Its right limb is open to the atmosphere and the left limb is connected to a pipe. The centre of the pipe is 0.09m below the level of mercury (sp.gr.= 13.6) in the right limb. If the difference of mercury level in two limbs is 0.15m determine the absolute pressure of the oil in the pipe.
- Q.3
- Describe an expression for total pressure on a vertical plane surface and location of centre of pressure on it, when the vertical plane is completely submerged in it. 08
 - A block of wood of specific gravity 0.8 floats in water. Determine the meta centric height of block if its size is $4\text{m} \times 2\text{m} \times 1.6\text{m}$. 07
- Q.4
- Enlist the different types of fluid flow and explain any two in details. 07
 - Explain the different types of fluid with the help of Rheological diagram. 08
- Q.5
- Prove that the maximum velocity in a circular pipe for viscous flow is equal to two times the average velocity of the flow. 08
 - The stream function for a two dimensional flow is given by $\Psi = 8xy$, calculate the velocity at the point P(4,5). Find the velocity potential function ϕ . 07

2017

SECTION B

- Q.6 Attempt any five from the following. 10
- i) State Bernoulli's theorem.
 - ii) Define "Notch" and give its classification.
 - iii) Define the terms major energy losses & minor energy losses in pipe?
 - iv) Which formulae are used to find major energy losses in pipe?
 - v) Define the term 'vena-contracta'.
 - vi) Write the Bernoulli's equation for real fluid.
 - vii) Draw neat sketch of venturimeter.
 - viii) Define "kinetic Energy" connection factor.
- Q.7 a) What is orifice meter? Derive an expression for discharge through orifice meter? 08
 b) An oil of specific gravity 0.8 is flowing through a venturimeter having inlet diameter 0.2m and throat diameter 0.1m. The oil mercury differential manometer shows a reading of 0.25m. Calculate the discharge of oil through the horizontal venturimeter. Take $C_d=0.98$ 07
- Q.8 a) Find an expression for the discharge over a rectangular weir in terms of head of water over the crest of the weir. 07
 b) Water flow over a rectangular weir of 1.2 m wide and depth of water over it is 0.165m. the water coming out from the weir is a right angled triangular notch. Find the depth of water over triangular notch. 08
 Take $C_d=0.62$ for wair and $C_d= 0.6$ for notch.
- Q.9 a) Derive Darcy – weisbach equation for loss of energy (head) due friction in pipes. 08
 b) Define : i) co-efficient of velocity 07
 ii) co-efficient of contradiction
 iii) co-efficient of discharge & give the relation between them
- Q.10 a) What is a compound pipe? What will be loss of head when pipes are connected in series? 08
 Derive its equation.
 b) A horizontal pipe of diameter 400mm is suddenly contracted to a diameter 200mm. The pressure intensities in the larger and smaller pipes is given as 14.715 N/cm^2 and 12.753 N/cm^2 respectively. If $C_c=0.62$, find the lon of head due to contraction. Also determine the rate of flow of water. 07

SUBJECT CODE NO:- E-263
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(CIVIL) (CGPA) Examination Nov/Dec 2017
Fluid Mechanics-I
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B i) Q.No.1 and Q.no.6 are compulsory.
 ii) solve any two questions from the remaining questions in each section
- Section A
- Q.1 Solve any five 10
- i) State Newton's law of viscosity and give example of its application
 - ii) Define Newtonian and Non Newtonian fluid
 - iii) What is fluid? How are fluids classified?
 - iv) One litre of oil weighs 13.2 N. Calculate its specific weight and specific gravity
 - v) Differentiate between absolute and gauge pressure
 - vi) Explain the term metacenter and metacentric height
 - vii) What are the different types of fluid flow
 - viii) What is path line and streak line
 - ix) Define forced vortex flow
 - x) Enlist different pressures
- Q.2 a) Derive an expression for the force exerted on sub-merged vertical plane surface by the static liquid and locate the position of centre of pressure 07
- b) A U - tube differential manometer connects to pressure pipes A and B, pipe A contains carbon tetrachloride having a specific gravity 1.594 under a pressure of 11.772N/cm² and pipe B contains an oil of sp. gr. 08 under a pressure of 11.772N/cm². The pipe A lies 2.5 m above pipe B. find the difference of pressure measured by mercury as fluid filling U-tube 08
- Q.3 a) Explain the conditions of equilibrium of a floating body and sub-merged body with neat sketch 07
- b) A wooden log of 0.8m diameter and 6m length is floating in river water. Find the depth of wooden log in water when the sp.gr. of the wooden log is 0.7 08
- Q.4 a) Define stream function . obtain an expression for stream function 07
- b) The velocity potential function (Φ) is given by expression 08
- $$\Phi = -\frac{xy^3}{3} - x^2 + \frac{x^3y}{3} + y^2$$
- i) Find the velocity components in x and y direction
 - ii) Show that Φ represents a possible case of flow
- Q.5 a) Derive an expression for the metacentric height by an experimental method 05
- b) Describe the use and limitation of the flow nets 05
- c) Define surface tension and capillarity 05

Section –B

- Q.6 Solve any five 10
- What is Euler's equation of motion
 - State the different forces present in fluid flow
 - What is convergent divergent mouthpiece?
 - Classify weir and notches
 - What factor decides the type of flow in pipes?
 - Define Hydraulic gradient line
 - What is pitot- static tube ?
 - What do you mean by equivalent pipe?
 - Define momentum correction factor
 - Give the formula for discharges over an ogee weir
- Q.7 07
- Derive an expression for discharge through venturimeter 07
 - A pipeline carrying oil of specific gravity 0.8 changes in diameter from 300 mm at a position to 500mm diameter to a position B which is 5m at a higher level . If the pressure at A and B are 19.62 N/cm^2 and 14.19 N/cm^2 respectively and discharge is 150 litres/s determine the loss of head and direction of flow 08
- Q.8 07
- Explain experimental determination of hydraulic coefficients 07
 - The tank has two identical orifices on one of its vertical sides the upper orifice is 3 m below the water surface and lower one is 5 m below the water surface if the value of C_v for each orifice is 0.96 find the point of intersection of the two jets 08
- Q.9 07
- Derive an expression for discharge over a trapezoidal notch or weir 07
 - Determine the rate of flow of water through a pipe of diameter 20cm and length 50m when one end of the pipe is connected to a tank and other end of the pipe is open to the atmosphere. The pipe is horizontal and the height of water in the tank is 4 m above the centre of pipe. Consider all minor losses and take $f = 0.009$ 08
- Q.10 Write short note on 05
- Prandtl's mixing length theory 05
 - Flow through branched pipes 05
 - Minor energy losses 05

[Time: Three Hours]

Surveying-I (OLD)

[Max.Marks:80]

N.B

- i) Q.No.1 from section A and Q.No.6 from section B are compulsory.
- ii) Attempt any two questions from the remaining questions from each section
- iii) Figures to right indicate the maximum marks.
- iv) Assume suitable data if necessary.

Q.1 Attempt any five

- a) Define bench mark.
- b) What is surveying? What is the object of surveying?
- c) Define:- True bearing and local attraction.
- d) Give the advantages of plane table surveying.
- e) Compare “collimation method” with rise and fall method.
- f) Draw the contour lines showing the following characteristics
1) Ridge lines 2) Valley lines.
- g) Explain “GTS” bench mark.
- h) Define sensitivity of level tube.
- i) What is magnetic declination?
- j) What does the term ‘chain angle’ mean?

07

- 08

(b) What is Meridian? What are the different types of meridian? Explain.

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- Q.3 (a) The following are the bearings taken for closed traverse. Find the included angles and Correct the bearing of lines. Draw the sketch of the plot, if AB = 90m, BC=90m and CD= 60m and show in it all included angles. 08

Line	FB	BB
AB	140° 45'	318° 15'
BC	216° 30'	38° 00'
CD	209° 15'	30° 15'
DE	319° 15'	139° 45'
EA	60° 15'	240° 15'

- (b) What are the sources of errors in chaining a line? How to compensate these errors. 07
- Q.4 (a) What is orientation? What are the methods of orientation? Describe the method with a sketch. 08
- (b) Explain the procedure for measurement of horizontal angle by repetition method using a Theodolite. 07
- Q.5 (a) In fly levelling from a B. M. of RL. 140.0m following readings were observed 08
back sight : 1.545, 2.695, 1.415, 2.925 **fore sight** : 0.575, 1.235, 0.595. From the last position of the instrument six pegs at 20m intervals are to be set out on a Uniformly rising gradient of 1 in 50, the first peg is to have R. L. 144.000m. Find the staff readings and reduced levels of the pegs.
- (b) Describe with the help of sketches characteristics of contours. 07

SECTION- B

- Q.6 Attempt any five 10
- (a) What is planimeter
- (b) What is zero circle
- (c) Explain principle of tacheometer.
- (d) What are direct angles and deflection angles?
- (e) Explain mass diagram.
- (f) What is an Azimuth?
- (g) Explain Transit and Non Transit Theodolite

(h) Define contour line and contour interval.

(i) What is substance bar?

(j) Why are they both the Venires of theodolite recorded?

Q.7 (a) What are the circumstances under which reciprocal levelling is recommended? How? 07

(b) The following offsets were taken from a chain line to an irregular boundary line at an interval of 10m 0, 2.50, 3.50, 5.00, 4.60, 3.20, 0 m Compute the area between the chain line, the irregular boundary line and end offsets by 08

- (a) The mid-ordinate rule
- (b) The average ordinate rule
- (c) The trapezoidal rule
- (d) Simpson's rule

Q.8 (a) What are sources of errors in theodolite traverse? 05

(b) The following observations were taken using a tacheometer fitted with an analytic lens, the Staff being held vertically. 10

Instrument Station	Height of axis	Staff station	Vertical angle	Hair readings	Remarks
P	1.45	BM	$-6^{\circ} 12'$	098, 1.54, 2.100	RL of BM = 384.25
P	1.45	Q	$+7^{\circ} 5'$	0.83, 1.36, 1.89	
Q	1.57	R	$+12^{\circ} 21'$	1.89, 2.48, 3.07	

Q.9 (a) Explain the various methods of tacheometry surveying, 07

(b) Explain i) Theory of anallatic lens 08
ii) Errors in tacheometry.

Q.10(a) Explain "Double sighting" method of extension of line in the field. 08

(b) Explain in details the computations in "Gale's traverse Table" 07

Total No. of Printed Pages:3

SUBJECT CODE NO: E-304
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(CIVIL) (CGPA) Examination Nov/Dec 2017

Surveying-I
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

- N.B
- Please check whether you have got the right question paper.
- i) Q.No.1 from section A and Q.No.6 from section B are compulsory.
 - ii) Attempt any two questions from the remaining questions in each section.
 - iii) Assume suitable data if necessary.
 - iv) Figures to the right indicate full marks.

Section - A

Q.1 Solve any five 10

- 1) Define surveying
- 2) What are the basic units of angular Measurements?
- 3) Define Representative fraction
- 4) What are the conventional symbols
 - (a) Main Stations
 - (b) River
 - (c) North line
 - (d) Temple
- 5) Define chain surveying
- 6) Define (a) Bearing (b) Meridian.
- 7) Differentiate between W.C.B & Q.B.
- 8) What are the Fundamental axis of a transit theodolite.
- 9) Define consecutive Co – ordinates
- 10) Define orientation

Q.2 (A) What are the classification of Surveying? Explain in detail. 07

(B) A line was measured by a 20M chain which was accurate before starting the day's work After chaining 900M the chain was found to be 6CM too long After chaining a total distance of 1575M. the chain was found to be 14CM too long find the true distance of the line. 08

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Q.3 (A) What are the sources of Errors in Compass Surveying? Explain. 07

(B) AB, AC, AD, AE are $35^\circ 30'$, $125^\circ 15'$, $225^\circ 30'$, $330^\circ 45'$ respectively find the included Angles with the neat sketch. 08

Q.4 (A) Explain field Procedure for Measurement of Repetition Method with the help neat sketch. 07

(B) Calculate latitude departure & closing Error for the given traverse & adjust by using Bowditch's Rule. 08

Line	Length (M)	W. C. B.
PQ	89.31	$45^\circ 10'$
QR	219.76	$72^\circ 05'$
RS	151.18	$161^\circ 52'$
ST	159.10	$228^\circ 43'$
TP	232.26	$300^\circ 42'$

Q.5 (A) What are the temporary adjustments of plane table Surveying? Explain Briefly. 07

(B) Explain field Procedure of Plotting Few Points by radiation Method with neat sketch. 08

Section – B

Q.6 Solve any Five. 10

- 1) Define Levelling
- 2) Define G. T. 5 bench Mark.
- 3) What is back Sight reading
- 4) Define Simple levelling
- 5) Define Contour interval
- 6) Define horizontal equivalent.
- 7) Give the formula for Refraction of Correction
- 8) Define (I) B.M (II) MSL
- 9) Give the Area of formula by Mid ordinate rule
- 10) Define Tachometer.

Q.7 (A) Explain a DUMPY level with neat sketch.

07

(B) The following staff readings observe successively with a level the instrument having been Moved after third sixth & eighth 2.228, 1.606, 0.988, 2.090, 2.864, 1.262, 0.602, 1.982, 2.044, 2.684 metres. Enter the above readings in a Page of Level book & Calculate R.L of points in the first was taken with staff held on a B.M of R.L 432.384M Calculate R.L's using H.I.methods & also usual checks.

08

Q.8 (A) What are the characteristics of contour lines?

07

(B) Two Point A & B are 1530 M apart across a wide river the following reciprocal levels are taken with one level.

08

Level at	Readings on	
	A	B
A	2.165	3.810
B	0.910	2.355

The error in the collimation adjustments of the level is -0.004M in 100M. Calculate the True difference of level between A&B & the refraction.

Q.9 (A) Define Planimeter? Explain with neat Sketch of Planimeter?

07

(B) A railway Embankment is 400M, long is 12M wide at the Formation Level & has the side slope 2:1 the ground levels at every 100mt along the Centre line are as under.

08

Distance	0	100	200	300	400
R.L	204.800	206.200	207.500	207.200	208.300

The formation level at 'O' chainage is 207.000 & Embankment has a rising gradient 1:100 the ground is level across the centre line. Calculate the Volume of Earth work.

Q.10(A) Explain the Procedure of Field measurement of Determination of tacheometric Constants with a neat Sketch.

07

(B) Instrument was set-up at station 'O' Following observation where Make angle of Elevation $Q_1 = 10^\circ 20' 20''$ $S_1 = 1.005$ $S_2 = 1.350$ $S_3 = 1.705$ angle of depression $Q_2 = 6^\circ 50' 20''$ $S_1 = 0.560$ $S_2 = 0.750$ $S_3 = 0.940$ R.L of B.M. = 100.000 Find distance between AB & R.L Of 'B' take $K=100$ $C=0.4$.

08

Total No. of Printed Pages:3

SUBJECT CODE NO:- E-347
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(Civil) Examination Nov/Dec 2017
Concrete Technology
(OLD)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- Solve any two questions from question no. 2 to 5 and any two from question no. 7 to 10.
 - Question no. 1 and question no. 6 are compulsory.
 - Figures to right indicate the maximum marks.
 - Assume suitable data, If any.

SECTION- A

- Q.1 Answer the following questions.(Any five) 10
- What is the effect of moisture content in aggregates?
 - Enlist five types of cement?
 - Enlist the different types of Non-destructive testing?
 - What are different types of manufacturing of concrete how they are different from each other?
 - What are super plasticizers?
 - What are the raw materials used manufacturing of cement?
 - What is workability of concrete? Explain.
 - What are the factors promoting alkali aggregate reactions?
 - Enlist types of vibrators?
 - What is micro cracking? How does they occurs?
- Q.2
- Enlist the physical properties of fresh concrete? Explain any two? 08
 - Explain compressive & tensile strength of concrete? 07
- Q.3
- Enlist the types of cement? Explain any two? 08
 - What is sieve analysis? For which material it is carried out & enlist different IS services used. 07
- Q.4
- What is non-destructive testing? Explain Ultrasonic Pulse Velocity? 08
 - What is meant by workability of concrete? What are the factors affecting workability? 07
- Q.5 Write short notes on. (any Three) 15
- Differences in between Destructive & non-destructive testing.
 - Initial & final setting time importance & why they are necessary.
 - Compaction of concrete.
 - Types of formworks.
 - Swelling of concrete.

SECTION –B

- Q.6 Answer the following questions.(Any five) 10
- What are different methods of mix design?
 - What quality control should be adopted while mix design of concrete?
 - What are the different grades of concrete as per IS 456:2000? Specify proportion of materials used?
 - Write down the factors affecting on cracks in concrete?
 - What is batching of concrete?
 - What is high density concrete?
 - What are joints in concrete?
 - Enlist the special concretes?
 - What are the factors affecting on high strength concrete?
 - What is fiber reinforced concrete?
- Q.7 Design a concrete mix of grade M40 to suit following data as per IS 10262 15
- Type of cement OPC 53 grade.
 - Specific gravity of cement- 3.15.
 - Max nominal size of aggregate-20mm.
 - Types of Aggregates- Crushed Angular Aggregates.
 - Zone of Sand- III.
 - Min. Cement content- 320 Kg/m³.
 - Water cement ratio- 0.45.
 - Workability: 100 mm slump.
 - Method of Concrete placing – Pumping.
 - Max. Cement content -450 kg/m³.
 - Chemical Admixture Type- Plasticizers.
 - Sp. Gravity of C.A. 2.8.
 - Sp. Gravity of F.A. 2.6.
 - Water absorption: Coarse agg. - 0.5%.
Fine agg. – 1.0 %
- Q.8 08
- What is fiber reinforced concrete? Explain in detail different types of fibers?
- 07
- What is high density concrete? Explain the Applications of high density concrete?
- Q.9 08
- What does it mean by strength, mean strength, variance, standard deviation & coefficient of variance in Mix Design?
- 07
- What is durability and factors affecting durability of concrete?
- Q.10 Write a short notes on. (any Three) 15
- Ready mix concrete.
 - Evolution of cracks.
 - Self compacting concrete.
 - Core test of concrete.
 - Hauling of concrete.

Table 1: Maximum Water Content per Cubic Meter Concrete for Nominal Max. Size of Aggregates

(25 to 50 mm Slump)

Sr. No.	Nominal Max. Size of Aggregates (mm)	Max. Water Content (Kg)
i.	10	208
ii.	20	186
iii.	40	165

Table 2: Volume of Coarse Aggregates per Unit Vol. of Total Aggregates for Different Zones of Fine Aggregates.

Sr. No.	Nominal Max. Size of Aggregates (mm)	Vol. Of Coarse Aggregates per Unit Volume of Total Aggregates for Different Zones of Fine Aggregates.			
		Zone IV	Zone III	Zone II	Zone I
i.	10	0.50	0.48	0.46	0.44
ii.	20	0.66	0.64	0.62	0.60
iii.	40	0.75	0.73	0.71	0.69

Total No. of Printed Pages:3

SUBJECT CODE NO:- E-348
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(CIVIL) (CGPA) Examination Nov/Dec 2017
Concrete Technology
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

N.B

Please check whether you have got the right question paper.

- i) Q.No-01 and Q.No-06 are compulsory. Attempt any two Questions from each section from remaining.
- ii) Draw neat sketch wherever necessary.
- iii) Figure to the right indicate full marks.

Section – A

Q.1 Answer the following questions (Any five)

10

- a) Why homogeneity and cohesiveness required in good concrete.
- b) Which factor is responsible for unsoundness of cement?
- c) Is it possible to determine unsoundness of Aggregate? Justify Answer.
- d) Is strength of PPC cement at 7 days is greater than opc cement. Give reason.
- e) Concrete needs to Travel longer distance from site of manufacturing to site of placing. Time required forty minutes suggest whether Admixture is necessary, which and why.
- f) What will happen if C₃A proportion increases and Quantity of gypsum added reduced to 2%.
- g) Differentiate between Destructive and Non-destructive Testing of concrete.
- h) Why workability of concrete is necessary. Enlist Test conducted to measure workability.
- i) Why pozzollanic materials used in High performance concrete.
- j) What is gel space ratio? Write the equation for gel space ratio [strength of get space ratio] for full Hydration.

Q.2 a) What is Finness modulus? Determine fineness modulus of coarse aggregate sample weigh 2250gm weight retained on each sieves are as follows. 08

Is sieve Numbers	40mm	20mm	16mm	10mm	Residue
Weight retained in gm	450	500	230	1050	20

Assume sieves not mentioned with zero weight.

b) Explain the properties of Aggregate which affect on strength of concrete. (Any four) 07

Q.3 a) What is the necessity of compaction of concrete? Explain compaction of concrete with Neat Sketch. 07

b) Explain relation between Tensile and compressive strength of concrete. 08

2017

- Q.4 a) Why formwork is required for concreting. Explain different types of formwork with Neat Sketch. 07
- b) Workability of concrete needs to be maintained during pumping of concrete. Give reason. Also explain slump cone test to determine workability. 08
- Q.5 a) Find gel space ratio and theoretical strength of sample of concrete with 1050gm of cement with 0.43 w/c ratio, on full Hydration and at 73% Hydration. 07
- b) What is curing and why it is required. Explain any three methods of curing with Neat sketch. 08

Section – B

- Q.6 **Answer the following questions. (Any five)** 10
- What is permeability of concrete? Suggest some preventive measure.
 - What is sulphate attack?
 - Enlist factor affecting cracks in concrete.
 - What is target mean strength of concrete in mix design?
 - Suggest some safety measures to avoid formwork failure.
 - Enlist different types of repair used in concrete.
 - Enlist material used for light weight concrete.
 - Write down advantages of ready mix concrete.
 - Is it possible to use wastes in concrete. Enlist different waste.
 - What is high density concrete where it is to be used?
- Q.7 a) Prepared a mix design for a concrete having grade m-40 and w/c ratio 0.43. The material is tested to obtained its properties before the Actual mix design and properties obtained is listed below. Cement – opc 53 with specific gravity 3.14. Fine Aggregate – belongs to Zone – I with Fineness modulus 2.78 having specific gravity 2.81 with moisture content 2% & water absorption Nil. Coarse Aggregate to be used having NMSA 20mm with water absorption 1.3% & moisture content Nil. Specify gravity 2.9. [Further suggested to assume data if required and mention at right location] 12
- b) Write a short note on underwater concreting. 03
- Q.8 a) Differentiate between High strength and High performance concrete. 05
- b) Explain the phenomena of carbonation & its significance. 05
- c) Write a short note on Hot weather concreting. 05
- Q.9 a) Explain sulphate attack and corrosion of reinforcement. 07
- b) Explain the material properties to be considered in mix design and its role in mix design. 05
- c) Explain briefly underwater concreting. 03

- Q.10
- a) Differentiate between light weight concrete and High density concrete. Which material generally used for manufacturing of light weight and High density concrete. Also suggest its suitability to use. 06
 - b) What is durability? How it can be achieved. Discuss briefly. 04
 - c) Write a short note on common types of repairs. 05