Register Number :

Name of the Candidate :

0 1 2 7

B.E. DEGREE EXAMINATION, 2013

(CIVIL ENGINEERING)

(THIRD SEMESTER)

CLEC-302 / CSEC-302 / PCSEC-102. MECHANICS OF SOLIDS - I

May] [Time : 3 Hours

Maximum : 75 Marks

(Maximum 60 Marks for the students who joined before 2011-12)

Answer any ONE FULL question from each unit. ALL questions carry EQUAL marks.

UNIT – I

1. (a) A load of 4,000 N is to be raised at the end of steel wire. If the stress in the wire is not to exceed 80 N/mm^2, what is the minimum diameter required? What will be the extension of 3·5 m length of wire? $E = 2 \times 10^5$ N/mm^2. (8)

Turn Over

(b) A steel bar 50 mm wide, 12 mm thick and 300 mm long is subjected to an axial pull of 84 kN. Find the change in length, width, thickness and the volume of the bar. $E = 2 \times 10^5$ N/mm^2. Poission's ratio = 0·32. (7)

2. (a) At a point in an elastic material under strain, there are normal stresses of 60 N/mm^2 and 40 N/mm^2 (both tensile)respectively at right angles to each other, with positive shearing stress of 20 N/mm^2. Find :

(i) Principal stresses and the position of principal planes.

(ii) The maximum shear stress and its plane. (7)

(b) A bar 3 m long and 50 mm in diameter hangs vertically and has a collar attached to it at its lower end. Find the maximum instananeous stress induced in the bar when

(i) A mass of 200 kg falls by 100 mm on the collar.

(ii) A mass of 2,000 kg falls by 10 mm on the collar.

$E = 2\times 10^5$ N/mm^2. (8)

UNIT - II

3. Determine the position of the centroid of the staded plane figure shown in figure-1. (15)

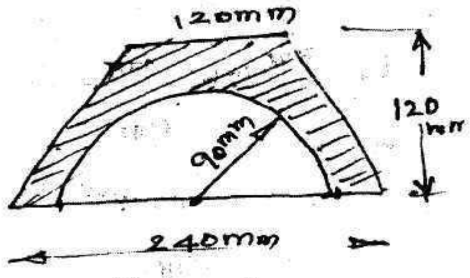

Figure - 1

(OR)

4. Find I_{xx} and I_{yy} for an unequal angle section shown in figure - 2. (15)

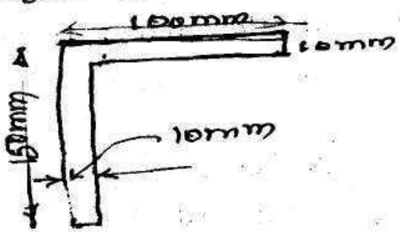

Figure - 2

UNIT - III

5. Draw shear force diagram and bending moment diagram for the beam shown in the figure-3. Locate the point where the bending moment is maximum. (15)

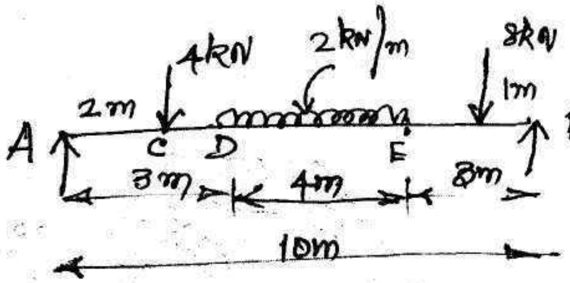

Figure -3

(OR)

6. A timber beam of rectangular section is to support a uniform distributed load of 5 kN/m over a span of 4 m. If the depth of the section is to be twice the breadth and the stress in the timber is not to exceed 60 N/mm^2, find the dimensions of the cross section of the beam. How would you modify the cross-section of the beam if it were a concentrated load of 20 kN placed at the centre with the same ratio of breadth to depth? (15)

UNIT - IV

7. A beam simply supported at ends A and B is loaded with two point loads of 30 kN each at a distance of 2 m and 3 m respectively from end A as shown in figure -4. Determine the position and magnitude of the maximum deflection.

   Take $E = 2 \times 10^5$ N/mm^2.

   $I = 7{,}200 \times 10^4$ mm^4.

Use Macaulay's method. (15)

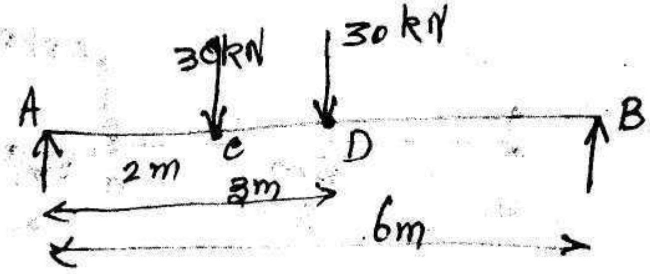

Figure -4

(OR)

8. A beam AB, simply supported at the ends is subjected to a point load at C as shown in figure-5. Using area moment method compute:

(a) Deflection at C.

(b) Slope at A.

(c) Slope at B.

(d) Slope at C.

Take $I = 6 \times 10^8$ mm^4.

$E = 2 \times 10^5$ N/mm^2. (15)

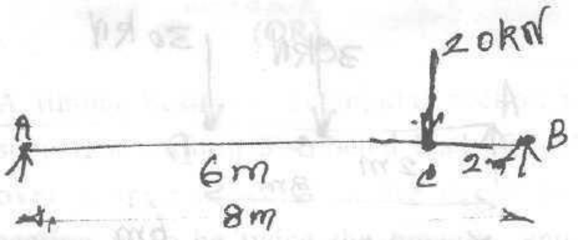

Figure - 5

UNIT - V

9. (a) A solid shaft of 80 mm diameter is transmitting 100 kW power at 200 rpm. Calculate the maximum shear stress induced in the shaft and the angle of twist in degrees for the length of 6m.

Take $N = C = G = 8 \times 10^4$ N/mm^2. (7)

(b) Find the torque that can be safely applied to a shaft of 200 mm diameter if the permissible angle of twist is 1° in a length of 5 m and the permissible shear stress is 45 N/ mm^2.

Take $N = 8 \times 10^4$ N/mm^2. (8)

(OR)

10. (a) A closely coiled helical spring to made out of 10 mm diameter steel rod, the coil consisting of 10 complete turns with a mean diameter of 120 mm. The spring carries an axial pull of 200 N. Find the maximum shear stress induced in the section of the rod. If $N = C = 8 \times 10^4$ N/mm^2, find the deflection of the spring, the stiffness and the strain energy stored by the spring. (8)

(b) A close coiled helical spring is to carry a load of 500 N. Its mean coil diameter is to be 10 times that of the wire. Calculate these diameters if the maximum shear stress in the material of the spring is 80 N/mm^2. (7)

Register Number :

Name of the Candidate :

0128

B.E. DEGREE EXAMINATION, 2013

(CIVIL ENGINEERING)

(THIRD SEMESTER)

CLEC-303 / CSEC - 303.
CONSTRUCTION ENGINEERING

May] [Time : 3 Hours

Maximum : 75 Marks

(Maximum 60 Marks for the students who joined before 2011-12)

Answer any ONE FULL question from each unit.
ALL questions carry EQUAL marks.

Turn Over

UNIT – I

1. Discuss the characteristics and classification of

   (a) Common burnt clay bricks.

   (b) Engineering bricks.

   (c) Burnt clay perforated building bricks. (15)

(OR)

2. Discuss the characteristics, suitability and uses of principle building stones found in India. (15)

UNIT - II

3. Explain the methods used for testing the bearing capacity of soil. (15)

(OR)

4. Explain the shallow foundation with neat sketches. (15)

UNIT - III

5. Explain the types of roofing with neat sketches. (15)

(OR)

6. Explain the following with neat sketches :

   (a) Shuttering.

   (b) Bending and placing of bars. (15)

UNIT - IV

7. Explain the terms :

   (a) Plastering.

   (b) Pointing.

   (c) Shoring. (15)

(OR)

8. Explain the types of formwork and scaffolding in detail. (15)

UNIT - V

9. Explain the demolition techniques used in Civil Engineering. (15)

(OR)

10. Explain the causes and prevention of concrete distress. (15)

Register Number :.

Name of the Candidate :

0 1 2 9

B.E. DEGREE EXAMINATION, 2013

(CIVIL ENGINEERING)

(THIRD SEMESTER)

CLEC-304 / PCLEC -104. ENGINEERING GEOLOGY

May] [Time : 3 Hours

Maximum : 75 Marks

(Maximum 60 Marks for the students who joined before 2011-12)

Answer any ONE FULL question from each unit. ALL questions carry EQUAL marks.

UNIT – I

1. Briefly explain the various physical properties of minerals. (15)

(OR)

2. Explain the properties of rock forming minerals. (15)

Turn Over

UNIT - II

3. How rocks are classified and explain the modes of formation of igneous rocks. (15)

(OR)

4. Explain the importance of sedimentary rocks in detail. (15)

UNIT - III

5. Explain the terms dip and strike. Also, explain types of dip. (15)

(OR)

6. Define fold. Explain the causes of folds and folding. (15)

UNIT - IV

7. Explain the classification of earthquake and detail the various causes of earthquake.(15)

(OR)

8. Explain the types of landslides in detail.(15)

UNIT - V

9. Explain the terms :

   (a) Porosity.

   (b) Permiability.

   (c) Aquifer.

   (d) Aquifuge. (15)

(OR)

10. Explain the geological considerations in tunneling. (15)

Register Number :

Name of the Candidate :

0 1 3 0

B.E. DEGREE EXAMINATION, 2013

(CIVIL ENGINEERING)

(THIRD SEMESTER)

CLEC-305 / CSEC -306.

CONCRETE TECHNOLOGY

May] [Time : 3 Hours

Maximum : 75 Marks

(Maximum 60 Marks for the students who joined before 2011-12)

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

UNIT – I

1. Explain the various methods deployed for testing cement. (15)

(OR)

Turn Over

2. List the composition of cement and explain how these ingredients interact in hardening of cement paste. (15)

UNIT - II

3. Explain the various tests conducted in aggregate as per IS code. (15)

(OR)

4. Explain the specifications of aggreate as per IS code. (15)

UNIT - III

5. Explain the methods to measure the workability of concrete. (15)

(OR)

6. Explain the stages of placing concrete. (15)

UNIT - IV

7. Explain in detail the various causes for the deterioration of concrete. (15)

(OR)

8. Explain various procedures adopted to test hardened concrete as per IS code and also, state the factors that affects the compressives strength of concrete. (15)

UNIT - V

9. Explain the steps followed in IS code method of concrete mix design. (15)

(OR)

10. Explain how the quality of concrete is controlled. (15)

Register Number :

Name of the Candidate :

0 1 3 1

B.E. DEGREE EXAMINATION, 2013

(CIVIL ENGINEERING)

(THIRD SEMESTER)

CLEC-306 / PCLEC -103.

FLUID MECHANICS

May] [Time : 3 Hours

Maximum : 75 Marks

(Maximum 60 Marks for the students who joined before 2011-12)

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

UNIT – I

1. (a) Define the following properties of fluids:

   (i) Viscosity.

   (ii) Compressibility.

   (iii) Surface tension. (7)

Turn Over

(b) A shaft of diameter 120 mm is rotating inside a journal bearing of diameter 122 mm at a speed of 360 *rpm*. The space between the shaft and the bearing is filled with a lubricating oil of viscosity 5 Poise. The length of the bearing is 200 mm. Find the power absorbed in the lubricating oil. (8)

(OR)

2. (a) A square plate of size 1 m × 1 m and weighing 350 N slides down an inclined plane with a uniform velocity of 1·5 m/s. The inclinded plane is laid on a slope of 5 vertical to12 horizontal and has an oil film of 1 mm thickness. Calculate the dynamic viscosity of oil. (10)

(b) Derive an expression surface tension on a liquid droplet and hollow bubble. (5)

UNIT - II

3. (a) Differentiate between absolute pressure and gauge pressure. (5)

(b) A U-tube differential manometer connects two pressure pipes A and B. Pipe-A contains carbon tetrachloride having a specific gravity 1·594 under a presssure of 11·772 N/cm^2 and pipe-B contains oil of specific gravity 0·8 under a pressure of 11·772 N/cm^2. The pipe-A lies 2·5 m above pipe-B. Find the difference of pressure measured by mercury as fluid filling U-tube. (10)

(OR)

4. The opening of a dam is 3 m wide and 2 m high. A vertical sluice gate is used to cover the opening. On the upstream of the gate, the liquid of specific gravity 1·5 lies upto a height of 2 m above the top of the gate whereas on the downstream side, the water is available upto a height of the top of the gate. Find the resultant force acting on the

gate and position of centre of pressure. Assume the gate is higher at the bottom (15)

UNIT - III

5. A closed cylindrical vessel of diameter 30 cm and height 100 cm contains water upto a depth of 80 cm. The air above the water surface is at a pressure of $5{\cdot}886\ N/cm^2$. The vessel is rotated at a speed of 250 *rpm* about its vertical axis. Find the pressure head at the bottom of the vessel :

   (a) At the centre.

   and (b) At the edge. (15)

(OR)

6. (a) Define Bernoulli's theorem and state its assumption. (5)

   (b) Define the terms :

   (i) Path line.

   (ii) Stream line.

   (iii) Streak line.

   (iv) Local acceleration. (10)

UNIT - IV

7. (a) Derive an expression for Darcy's Weibasch equation. (10)

   (b) Distinguish between laminar and turbulent flow. (5)

(OR)

8. (a) Derive an expression for loss due to expansion. (10)

   (b) Water is flowing through a horizontal pipe of diameter 200 mm at a velocity of 3 m/s. A circular soild plate of diameter 150 mm is placed in the pipe to obstruct the flow. Find the loss of head due to obstruction in the pipe if $C_c = 0{\cdot}62$. (5)

UNIT - V

9. With a neat sketch, explain the principle of working of pitot tube and current meter. (15)

(OR)

10. Explain the term hydraulic jump. Derive an expression for the depth of hydraulic jump. (15)