B.E. DEGREE EXAMINATION, 2012

(CIVIL ENGINEERING)
(THIRD SEMESTER)
PCLEC-301.STATISTICS AND NUMERICAL METHODS

Nov.)   (Time: 3 Hours

Maximum: 75 Marks
Answer any ONE FULL question from each unit
All questions carry equal marks

UNIT-I

1. a) Calculate the mean, median, mode and co-efficient of variation of

Class interval	0-8	8-16	16-24	24-32	32-40	40-48
Frequency	4	12	20	28	36	44

(7½)

b) A problem of statistics is given to the 3 students A,B and C whose chances of solving it are ½, ¾ and ¼ respectively. What is the probability that the problem will be solved if all of them try independently? (7½)

(OR)

2. a) A r.v x has the following probility functional values of X,

x	-2	-1	0	1	2	3
P(x)	0.1	K	0.2	2K	0.3	K

Find the value of K and calculate the mean and variance (7½)

b) The contents of urns I,II and III are as follows
    1 white, 2 black and 3 red balls
    2 white, 1 black and 1 red ball and
    4 white, 5 black and 3 red balls. One urn is chosen at random and 2 balls drawn. They happen to be white and red. What is the probability that they come from urns I,II or III. (7½)

UNIT-II

3. a) The mean and variance of binomial distribution are 4 and 4/3 respectively. Find $P(x \geq 1)$.
(7½)

b) Obtain the mean and variance of Poisson distribution. (7½)

4. a) Using method of least squares , fit a straight line to the following data.

x	1	2	3	4	5	6	7	8	9	10
Y	1	2	4	4	5	8	9	10	10	20

(7½)

b) The mean yield for one-acre plot is 662 kilos with a s.d of 32 kilos. Assuming normal distribution. How many one acre plots in a battle of 1000 plots would you expect to have yield.

i) Over 700 kilos   ii) Below 650 kilos   (7½)

UNIT-III

5. a) Explain the application of numerical integration in Civil Engineering.

(7½)

b) Evaluate $\int_0^1 \dfrac{dx}{(1+x)}$, correct to 3 decimal places by Trapezoidal Rule.   (7½)

6. The velocities of a car (running on straight road) at intervals of 2 minutes are given below.

Time in minutes	0	2	4	6	8	10	12
Velocity in km/hr	0	22	30	27	18	7	0

Apply Simpson's rule to find the distance covered by the car.

(15)

UNIT-IV

7. Explain the application of finite difference method on statistically indeterminate beam problem and buckling of columns.   (15)

8. Explain in detail the finite difference methods and expression of derivatives by finite differences with an example.   (15)

UNIT-V

9. Solve graphically the LPP.
   Maximize $Z = 3x_1 + 2x_2$
   s.t.c $x_1 - x_2 \leq 1$
   $x_1 + x_2 \geq 3$; $x_1, x_2 \geq 0$ (15)

10. Solve by simplex method
    Maximize $Z = 107x_1 + x_2 + 2x_3$
    s.t.c $14x_1 + x_2 - 6x_3 + 3x_4 = 7$
    $16x_1 + 1/2x_2 - 6x_3 \leq 5$
    $3x_1 - x_2 - x_3 \leq 0$ and $x_1, x_2, x_3 \geq 0$ (15)

******

B.E. DEGREE EXAMINATION, 2012

(CIVIL ENGINEERING)

(THIRD SEMESTER)

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

November]   [Time : 3 Hours

Maximum : 75 Marks

(Maximum 60 marks those who joined before 2011-12)

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

UNIT – I

1. (a) A wooden block is 75 mm wide, 150 mm deep and 1·5 m long is subjected to an axial pull of 45000 N. The stretch of the member is found to be 0·6380 mm. Find the Youngs modulus for the material.   (7)

Turn Over

(b) A steel rod 20 mm diameter and 6 m long is connected to two grips one at each end at a temperature of 120°C. Find the pull exerted when the temperature falls to 40°C. (8)

    (i) If the ends do not yield.

    (ii) If the ends yield by $1 \cdot 10$ mm.

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

$\alpha = 1 \cdot 2 \times 10^{-5}$ per $^\circ$C.

(OR)

2. (a) A rectangular block of material is subjected to a tensile stress of 100 N/mm^2 on one plane and tensile stress of 50 N/mm^2 on a plane of right angles together with shear stresses of 60 N/mm^2 on the same plane. Find

    (i) The direction of the principal planes.

    (ii) The magnitude of the principal stresses.

    (iii) The magnitude of the greatest shear stress. (7)

(b) Two planes AB and BC which are at right angles carry shear stresses of intensity $17 \cdot 5$ N/mm^2. While these planes also carry a tensile stress of 70 N/mm^2 and compressive stress of 35 N/mm^2 respectively. Determine the principal planes and the principal stresses. Also, determine the maximum shear and the planes on which it acts. (8)

UNIT – II

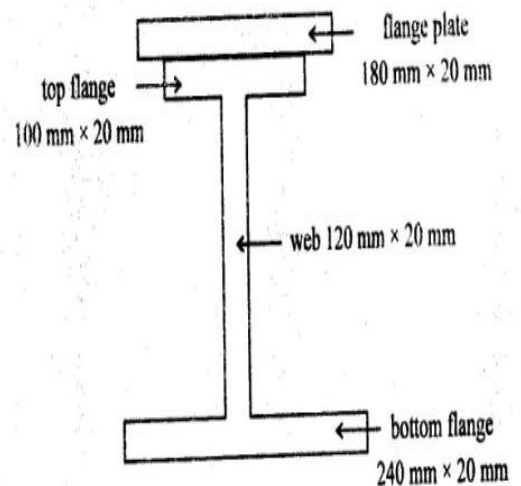3. Determine the centroid of the section shown in figure – 1.

Figure - 1

(OR)

4. Find the moment of inertia of the area shaded in figure – 2 about the axis AB. (15)
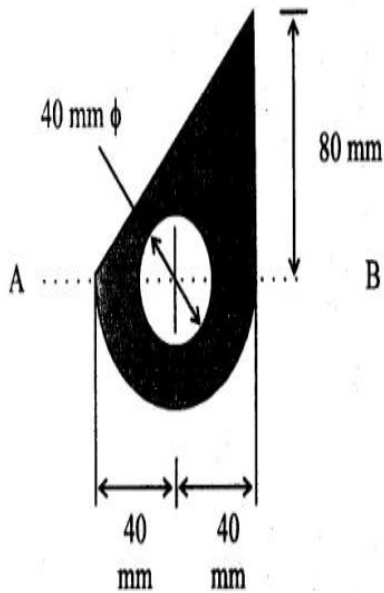

Figure – 2

UNIT – III

5. Draw shear force and bending moment for the loaded beam shown in figure – 3. Locate the point of contraflexure. (15)
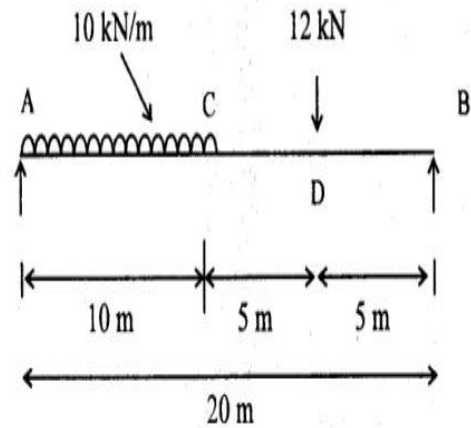

Figure - 3

(OR)

6. A beam of 500 mm deep of a symmetrical section has $I = 1 \times 10^8$ mm^4 and is simply supported on a span of 10 metres. Calculate ;

(i) A uniformly distributed load it may carry if the maximum bending stress is not to exceed 150 N/mm^2.

(ii) The maximum bending stress if the beam carries a central point load of 25 kN.

UNIT – IV

7. Calculate the deflection under each load and the maximum deflection as shown in figure – 4.

$I = 18 \times 10^8 \text{ mm}^4$

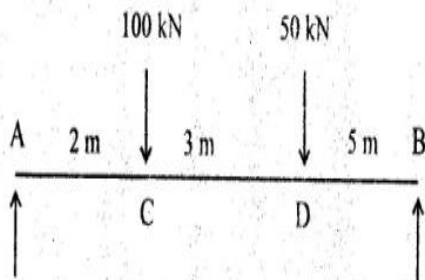$E = 200 \text{ kN/mm}^2$.

Figure – 4

8. A beam AB of 6 m span is simply supported at the ends and is loaded as shown in the figure – 5. Determine :

(i) Deflection at C.

(ii) Maximum deflection

and (iii) Slope at end A.

$E = 2 \times 10^5 \text{ N/mm}^2$.
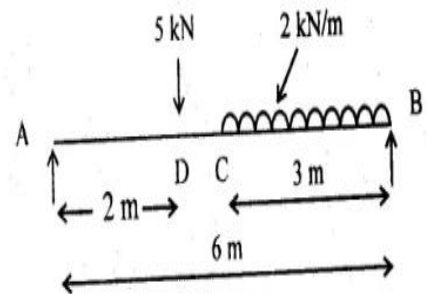
$I = 2000 \times 10^4 \text{ mm}^4$.   (15)

Figure - 5

B.E. DEGREE EXAMINATION, 2012

(CIVIL ENGINEERING)

(THIRD SEMESTER)

CLEC-303/CSEC-303.
CONSTRUCTION ENGINEERING

November]   [Time : 3 Hours

Maximum : 75 Marks

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

Answer any ONE FULL question from each unit.
EACH FULL question carries FIFTEEN marks.

UNIT - I

1. Explain the various stages involved in the
    manufacture of bricks.   (15)

(OR)

2. What are the objective of seasoning of timber and also, explain the types of seasoning with neat sketches, stating its advantages and disadvantages. (15)

UNIT - II

3. What is bearing capacity of soil and briefly discuss the improve bearing capaicty of loose soils. (15)

(OR)

4. Explain the types of deep foundation in detail. (15)

UNIT - III

5. Explain the various methods of damp proofing in detail. (15)

(OR)

6. With neat sketches, explain the different types of stairs. (15)

UNIT - IV

7. With neat sketches, explain any four types of scaffolding. (15)

(OR)

8. Define pointing and explain types of pointing with neat sketches. (15)

UNIT - V

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

(OR)

10. Explain the strengthening methods used in repairing distressed concrete. (15)

3 0 2 5

B.E. DEGREE EXAMINATION, 2012

(CIVIL ENGINEERING)

(THIRD SEMESTER)

CLEC-304/PCLEC-104.

ENGINEERING GEOLOGY

November]   [Time : 3 Hours

Maximum : 75 Marks

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

Answer any ONE FULL question from each unit. EACH FULL question carries FIFTEEN marks.

UNIT - I

1. Write in detail about "pyroxene group." (15)

(OR)

2. Describe feldspathoid family in detail. (15)

Turn over

UNIT - II

3. Describe in detail the forms of igneous rocks.

(15)

(OR)

4. Write the origin of sedimentary rocks and their texture. (15)

UNIT - III

5. Describe the parts of fold and classification of folds. (15)

(OR)

6. (a) Define unconformity and formation of unconformity. (5)

(b) Write about types of unconformity and criteria for recognition of unconformities. (10)

UNIT - IV

7. Write in detail about the causes and effects of earthquakes. Also, write the effects of earthquakes on civil engineering structures. (15)

(OR)

8. Describe the classification of landslides. (15)

UNIT - V

9. (a) Describe the hydrological cycle. (10)

(b) Explain the vertical distribution of ground-water. (5)

(OR)

10. Describe the geological studies connected with dam construction. (15)

B.E. DEGREE EXAMINATION, 2012

(CIVIL ENGINEERING)

(FIRST SEMESTER)

CLEC-304/PCLEC-104.ENGINEERING GEOLOGY

Nov)   (Time: 3 Hours

Maximum: 75 Marks
Answer any ONE FULL question from each unit
All questions carry equal marks   (5×15=75)

UNIT-I

1. Describe the physical properties of minerals.   (15)

2. Write quartz group and varieties of Quartz.   (15)

UNIT-II

3. Describe the classification of igneous rocks.   (15)

4. Explain Granite and their availability in India.   (15)

UNIT-III

5. Describe the parts of faults and their classification.   (15)
                                (OR)
6. Write about joints, causes of joint patterns and classification of joints.   (15)

UNIT-IV

7. a) Write in detail about seismograph and seismogram.   (10)

    b) Name the seismic zones of India.   (5)
                                (OR)
8. Describe landslide and the causes of landslides.   (15)

UNIT-V

9. Write the five hydrogeological properties of rock and explain them.   (15)

10. Write about purpose of tunneling and types of tunnels.   (15)

****

Register Number :

Name of the Candidate :

3 0 2 6

B.E. DEGREE EXAMINATION, 2012

(CIVIL ENGINEERING)

(THIRD SEMESTER)

CLEC-305/CSEC-306.
CONCRETE TECHNOLOGY

November]   [Time : 3 Hours

Maximum : 75 Marks

*(Maximum 60 Marks for those who joined
before 2011-12)*

*Answer any ONE FULL question from each unit.
EACH FULL question carries EQUAL marks.*

UNIT - I

1. Explain the types of Portland Cement in detail.

(15)

(OR)

2. Explain the process of hydration of cement.

(15)

Turn over

UNIT - II

3. What are the characteristics of aggregate and explain how it signifies the strength of concrete? (15)

(OR)

4. List out the qualities to be possessed by the water to be used in concrete. (15)

UNIT - III

5. Explain the various stages of concrete manufacturing. (15)

(OR)

6. Explain the terms segregation, bleeding and shrinkage. (3×5=15)

UNIT - IV

7. Explain the various NDT methods to test the concrete. (15)

(OR)

8. Explain some of the special concrete in detial. (15)

UNIT - V

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

(OR)

10. Design a concrete mix as per IS Code for a minimum strength of 20 N/mm^2 with moderate exposure condition using OPC-43 grade with a compacting factor 0·7. Assume relevant data. (15)