

8. (a) Find an analytic function

$$f(z) = u + iv \text{ whose imaginary part is } -\sin x \sin hy. \quad (6)$$

- (b) Find the bilinear transformation which maps 1, i, -1 of z-plane onto 0, 1, ∞ of w-plane. (6)

UNIT - V

9. (a) Using Cauchy's integral formula,

$$\text{evaluate } \int_c \frac{3z^2 + 7z + 1}{z - 1 + i}$$

$$\text{where } c \text{ is } x^2 + y^2 = 4. \quad (6)$$

- (b) Find the Laurent's series expansion of

$$\frac{1}{z^2 - 3z + 2} \text{ in } 1 < |z| < 2. \quad (6)$$

(OR)

$$10. (a) \text{ Evaluate: } \int_{-\infty}^{\infty} \frac{x^2}{(x^2 + a^2)(x^2 + b^2)} dx$$

by using Contour integration.

Register Number :

Name of the Candidate :

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B.E. DEGREE EXAMINATION, 2011

(CIVIL ENGINEERING)

(THIRD SEMESTER)

CLEC-301. MATHEMATICS - II

(Old Regulations)

(For the students joined during 2006-07
and before)

November]

[Time : 3 Hours

Maximum : 60 Marks

Answer any ONE FULL question from each unit.

ALL questions carry equal marks.

UNIT - I

1. Find Fourier expansion of

$$f(x) = x \sin x, \text{ if } 0 < x < 2\pi.$$

(OR)

Turn Over

2. Find Fourier series for $f(x) = x^2$,
when $-\pi < x < \pi$. Hence deduce that

$$\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \dots = \frac{\pi^2}{12} \quad (6)$$

- (b) Find Half range Cosine series for

$$f(x) = (x - 1)^2 \text{ in } 0 < x < 1 \quad (6)$$

UNIT - II

3. (a) Form the PDE by eliminating f from

$$f(x + y + z) = x^2 + y^2 + z^2. \quad (6)$$

(b) Solve : $x^2 p^2 + y^2 q^2 = z^2$. (6)

(OR)

4. (a) Find the general solution of

$$\begin{aligned} x(y^2 - z^2)p + y(z^2 - x^2)q \\ = z(x^2 - y^2). \end{aligned} \quad (6)$$

(b) Solve : $(D^2 + 3DD^1 + 2D^1)^2 z = x + y$. (6)

UNIT - III

5. (a) Find $L [t^2 e^{-t} \cos t]$ (6)

(b) Find $L^{-1} \left[\frac{2}{S} + \frac{S+8}{S^2+4S+13} \right]$ (6)

(OR)

6. Solve the system of equations

$$Dx + x + Dy - y = 2$$

$$\text{and } D^2x + Dx - Dy = \cos t,$$

for which $x = 0$, $Dx = 2$ and $y = 1$,

when $t = 0$.

UNIT - IV

7. (a) Show that

$$U(x, y) = 3x^2 y + 2x^2 - y^3 - 2y^2$$

is harmonic and find its conjugate harmonic function V . (6)

- (b) Find the image of $|z - 2i| = 2$ under the

$$\text{map } w = \frac{1}{z}. \quad (6)$$

(OR)

Turn Over

Register Number :

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3 0 2 6

B.E.DEGREE EXAMINATION, 2011

(CIVIL & STRUCTURAL ENGINEERING)

(THIRD SEMESTER)

CLEC - 302 / CSEC - 302 / PCSEC - 102.

MECHANICS OF SOLIDS I

(Old & New Regulations)

November]

[Time : 3 Hours

Maximum : 60 Marks

Answer any ONE FULL question from each Unit.

ALL questions carry equal marks.

UNIT - I

1. (a) What is a composite section ? (3)
- (b) A bar of 25 mm diameter is subjected to a pull of 40 KN. The measured extension on a gauge length of 200 mm is 0.085 mm and the change in diameter is 0.003 mm. Calculate the Poisson's ratio and the value of three modullii. (9)

Turn Over

2. (a) Define the principal planes and principal stresses. (3)
- (b) A steel rod 40 mm in diameter and 5 m in length is suddenly loaded to an axial pull of 50 KN. Determine the work done and maximum instantaneous elongation. (9)

UNIT - II

3. (a) State and prove parallel axis theorem in the determination of moment of inertia of an area. (6)
- (b) An isosceles triangular section ABC has base width 80 mm and height 60 mm. Determine the moment of inertia of the section about the CG of the section and the base BC. (6)
4. (a) What is meant by mass moment of inertia? (3)
- (b) Calculate the moments of inertia of an I-section having equal flanges 30×10 mm and web also 30×10 mm about an axis passing through its CG and parallel to XX and YY axes. (9)

UNIT - III

5. (a) What do you understand by the term contraflexure? (3)
- (b) A beam 6 m long rests on two supports 5 m apart. The right end is overhanging by 1 m. The beam carries an UDL of 1.5 KN/m over the entire length of the beam. Draw the SFD and BMD. Also, find the magnitude and position of the maximum bending moment. (9)
6. (a) State the assumptions made in the theory of simple bending. (3)
- (b) A rectangular beam 60 mm wide and 150 mm deep is simply supported over a span of 4 m. If the beam is subjected to a UDL of 4.5 KN/m, find the maximum bending stress induced in the beam. (9)

UNIT - IV

7. A beam with a span of 4.5 m carries a point load of 30 KN at 3 m from the left support. If for the section $I_{xx} = 55 \times 10^{-6} \text{m}^4$ and $E = 200 \text{ GN/m}^2$, find the deflection under the

Turn Over

load and position and amount of maximum deflection. (12)

8. A beam 4 m long is freely supported at the ends. It carries concentrated loads of 20KN each at points 1 m from the ends. Calculate the maximum slope and deflection of the beam and slope and deflection under each load.

$$EI = 13,000 \text{ KNm}^2. \quad (12)$$

UNIT - IV

9. (a) State the assumptions made for finding the shear stress in a circular shaft subjected to torsion. (3)
- (b) A solid shaft transmits 75 KW power at 200 rpm. Calculate the shaft diameter if the twist of shaft is not to exceed 1° in 2 m length of the shaft the shear stress is limited to 30 MN/m². Take modulus of rigidity $C = 100 \text{ GN/m}^2$. (9)
10. (a) What is laminated spring ? Where is it used? (3)

- (b) A laminated spring 1 m long is made up of plates each 50 mm wide and 10 mm thick. If the bending stress in the plates is limited to 100MPa, how many plates are required to enable the spring to carry a central point load of 2 KN.

$$E = 200 \text{ GN/m}^2.$$

What is the deflection under the load ?

(9)

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3028

Name of the Candidate:

B.E. DEGREE EXAMINATION, 2011
(CIVIL ENGINEERING)
(THIRD SEMESTER)
CLEC-304. ENGINEERING GEOLOGY
(Old Regulation)
(For the students joined during 2006-07 and before)

Nov.)

(Time: 3 Hours)

Maximum: 60 Marks

Answer any ONE FULL question from each unit

All questions carry equal marks

UNIT-I

1. Elaborately discuss the salient features, uses and the important properties of feldspar group of minerals. (12)
2. Write a note on the following minerals:
i) Amphiboles (12)
ii) Epidote paryle (12)

UNIT-II

3. Explain the important characteristics and classifications of Metamorphic rocks. (12)
4. Distinguish between igneous and sedimentary rocks with suitable examples. (12)

UNIT-III

5. Describe with the help of sketches, various type of fold and its engineering considerations. (12)
6. Write a short note on the following:
i) Dip and strike (12)
ii) Chief forms of igneous bodies (12)

UNIT-IV

7. Briefly discuss the following:
i) Seismographs (12)
ii) Seismic zones of India (12)
8. Write a critical essay on landslide its causes and preventive measures in the geological aspect. (12)

UNIT-V

9. Write briefly types of tunnels and its geological conditions. (12)
10. Describe the various factors to be considered for the site selection of dam in geological aspect. (12)

UNIT - V

9. What rocks are suitable for foundation of dams and reservoirs? How foundation rocks can be improved? (12)

(OR)

10. Describe geological considerations in tunneling. (12)

Register Number :

Name of the Candidate :

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B.E. DEGREE EXAMINATION, 2011

(CIVIL ENGINEERING)

(THIRD SEMESTER)

CLEC-304 / PCLEC-104. ENGINEERING

GEOLOGY

(New Regulations)

(For the Students joined during 2007-08 and after)

November]

[Time : 3 Hours

Maximum : 60 Marks

*Answer any ONE FULL question
from each unit.*

ALL questions carry equal marks.

UNIT - I

1. What is a mineral? What are their physical properties? How do these physical properties help in identifying different minerals? (12)

(OR)

2. What is meant by 'Hardness of a mineral'? How can it be determined? What is Mohr's scale of hardness? (12)

UNIT - II

3. What are the agents of weathering and transportation of rocks? How do these agents affect the resultant soils and their characteristics? (12)

(OR)

4. What is the difference between a rock and soil? How are soils formed, and what are their types? (12)

UNIT - III

5. What is meant by folding of rocks, and how is it produced? Classify and describe the various types of folds encountered in the crust of the earth. (12)

(OR)

6. Classify and describe the different types of joints in rock. (12)

UNIT - IV

7. What do you understand by landslides? Discuss the conditions that favour them and the means that are helpful in combating these hazards. (12)

(OR)

8. What is meant by 'intensity' and 'magnitude' of an earthquake? What considerations and safety measures are required while designing engineering structures particularly buildings and dams in a seismic region? (12)

measured on standard cylinders. Standard deviation can be taken as 4MPa. The specific gravity of FA and CA are 2.6 and 2.7 respectively. The dry rodded bulk density of CA is 1,500 kg/m³ and finess modulus of FA is 2.70. OPC type- I will be used. A slump of 50 mm is necessary. CA is found to be absorptive to the extent of 1% and free surface moisture in sand is found to be 2%. Assume any other essential data. (12)

(OR)

10. Design a concrete mix by IS method for the above data. (12)

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B.E. DEGREE EXAMINATION, 2011

(CIVIL & STRUCTURAL ENGINEERING)

(THIRD SEMESTER)

CLEC - 305 / CSEC-306.

CONCRETE TECHNOLOGY

(*New Regulations*)

(*For the students joined during 2007-08 and after*)

November]

[Time : 3 Hours

Maximum : 60 Marks

Answer any ONE FULL question from each Unit.

ALL questions carry equal marks.

UNIT - I

1. (a) Explain in detail about the manufacture of portland cement. (6)
- (b) Write short notes on chemical composition of cement. (6)

(OR)

Turn Over

2. (a) Discuss about the water requirements for hydration. (6)
- (b) Write short notes on :
- (i) Air entraining cement.
- (ii) Expansive cement. (6)

UNIT - II

3. (a) Discuss about the characteristics of aggregate and their significance. (6)
- (b) How specific gravity of cement can be determined? (6)

(OR)

4. (a) What are the qualities required for water which is to be used in mixing concrete? (6)
- (b) How the crushing value of aggregate can be determined? (6)

UNIT - III

5. Explain in detail about the various stages of manufacture of concrete. (12)
- (OR)

6. (a) How the workability can be measured from slump cone test? (6)
- (b) Discuss about the setting time of concrete. (6)

UNIT - IV

7. (a) What is hardend concrete? What are their significance? (6)
- (b) Write short notes on :
- (i) Drying shrinkage.
- (ii) Creep. (6)

(OR)

8. (a) What are the various causes of concrete deterioration? (6)
- (b) Why admixtures are used in concrete? Explain about mineral admixture. (6)

UNIT - V

9. Design a concrete mix by ACI method for the construction of an elevated water tank. The specific design strength of concrete (characteristic strength) is 40MPa at 28 days

Turn Over

Register Number:

3030

Name of the Candidate :

B.E. DEGREE EXAMINATION, 2011

(THIRD SEMESTER)

CLEC-306. CIVIL ENGINEERING DRAWING
(Old Regulation)

(For students joined during 2006-07 and before)

November)

Maximum: 60 Marks

(Time: 3 Hours

Answer any ONE full question from each Section

SECTION – A

1. a) Draw two course of one brick thick wall in English bond (15)
b) Draw the elevation of 6 courses of coursed rubble stone masonry (15)
 2. a) Draw the sectional plan and elevation of a double lead partly paneled and partly glazed door of size $2.50 \times 3.10\text{m}$. (20)
b) Draw circular stone arch for a span of 3.50m . (10)
-

SECTION – B

3. Draw the elevation and joint details of a north light roof truss for a span of 20.00m . Use appropriate cross section for various members in the truss. (30)
 4. Draw the plan, elevation and sectional view of the given framed structure for the following specifications. (30)
 - a) Size of beams in longitudinal direction $450 \times 450\text{ mm}$.
 - b) Size of beams in longitudinal direction $300 \times 450\text{ mm}$.
 - c) Size of beams in lateral direction $450 \times 450\text{ mm}$.
 - d) Thickness of wall 230mm .
 - e) Floor height – 4500mm
 - f) (GF + 2) RCC framed structure
-