

4

- (b) What is a stage discharge curve? (4)

UNIT - V

9. Explain the design flood estimation by unit hydrograph method. (12)

(OR)

10. Describe Muskingum flood routing method. (12)

2

2. Write a brief note on :

- (i) Global water budget. (6)
(ii) Constituents of atmosphere. (6)

UNIT - II

3. (a) Explain the forms of Precipitation. (6)
(b) Explain the construction and functioning of the non - recording type of rain gauge being used in India. (6)

(OR)

4. (a) What is meant by probable maximum precipitation? (4)
(b) In a certain river basin, there are four rain gauge stations with their normal annual precipitations amounting to 800, 520, 440 and 400 mm. respectively. Determine the optimum number of rain gauges in the catchment, if it is desired to Limit the error in the mean value of rainfall in the catchment to 12%. (8)

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B.E. DEGREE EXAMINATION, 2012

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

CLEC-601. HYDROLOGY

November]

[Time : 3 Hours

Maximum : 60 Marks

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

UNIT - I

1. Define air mass and air front. Discuss the characteristics of cold air mass and warm air mass. (12)

(OR)

3

UNIT - III

5. (a) Explain the factors affecting evaporation losses. (6)
(b) Explain evapotranspiration. (6)

(OR)

6. (a) A six hour storm produced rainfall intensities of 7, 8, 25, 12, 10 and 3 mm per hour in successive one hour interval over a basin of 800 sq.km. The resulting run-off is observed to be 2640 hectare - metres. Determine ϕ index for the basin. (12)

UNIT - IV

7. (a) Describe the factors affecting run-off. (8)
(b) Enumerate the applications of unit hydrograph. (4)

(OR)

8. (a) Explain the measurement of the flow velocity in a stream by using surface and sub surface floats. (8)

Turn Over

10. A single acting reciprocating pump, running at 30 r.p.m. delivers $0.01 \text{ m}^3/\text{s}$ of water. The diameter of the piston is 200 mm and stroke length 400 mm. Determine:

- (a) The theoretical discharge of the pump.
 (b) Co-efficient of discharge.
 and (c) Slip and the percentage slip of the pump. (12)

Consider that the river is prismatic. Take the value of N in Manning's formula as 0.025. (12)

(OR)

2. Using the method of dimensional analysis, obtain an expression for the discharge Q over a rectangular weir. The discharge depends on the head H over the weir, acceleration due to gravity g , length of weir crest L , height of the weir crest over the channel bottom Z and the kinematics viscosity ν of the liquid. (12)

UNIT - II

3. (a) Water is flowing through a pipe at the end of which a nozzle is fitted. The diameter of the nozzle is 100 mm and the head of water at the centre nozzle is 100 m. Find the force exerted by the jet of water on a fixed vertical plate. The co-efficient of velocity is given as 0.95. (6)

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B.E. DEGREE EXAMINATION, 2012

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

**CLEC-602. HYDRAULICS AND
HYDRAULIC MACHINERY**

November]

[Time : 3 Hours

Maximum : 60 Marks

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

UNIT - I

1. A river 45 m wide has a normal depth of flow of 3 m and an average bed slope of 1 in 10,000. A weir is built across the river raising the water surface level at the weir site to 5 m above the bottom of the river. Assuming that the back water curve is an arc of circle. Calculate the approximate length of the backwater curve.

Turn Over

- (b) A jet of water of diameter 75mm moving with a velocity at 25 m/s strikes a fixed plate in such a way that the angle between the jet and plate is 60° . Find the force exerted by the jet on the plate

(i) in the direction normal to the plate.

and (ii) in the direction of the jet. (6)

(OR)

4. A jet of water having a velocity of 35 m/s impinges on a series of vanes moving with a velocity of 20 m/s. The jet makes an angle of 30° to the direction of motion of vanes when entering and leaves at an angle of 120° . Draw the triangles of velocities at inlet and outlet and find:

(a) The angles of vane tips so that water enters and leaves without shock.

(b) The workdone per unit weight of water entering the vanes.

and (c) The efficiency. (12)

UNIT - III

5. A Kaplan turbine develops 24647.6 kW power at an average head of 39 metres. Assuming a speed ratio of 2, flow ratio of 0.6, diameter of the boss equal to 0.35 times the diameter of the runner and an overall efficiency of 90%, calculate the diameter, speed and specific speed of the turbine. (12)

(OR)

6. A reaction turbine works at 450 r.p.m. under a head of 120 metres. Its diameter at inlet is 120 cm. and the flow area is 0.4 m^2 . The angles made by absolute and relative velocities at inlet are 20° and 60° respectively with the tangential velocity. Determine:

- The volume flow rate.
- The power developed.
- Hydraulic efficiency.

Assume whirl at outlet to be zero. (12)

UNIT - IV

7. The diameter of a centrifugal pump which is discharging $0.03 \text{ m}^3/\text{s}$ of water against a total head of 20 m is 0.4 m. The pump is running at 1500 r.p.m. Find the head, discharge and ratio of powers of a geometrically similar pump of diameter 0.25 m when it is running at 3000 r.p.m. (12)

(OR)

- Differentiate between the volute casing and vortex casing for the centrifugal pump. (6)
- Obtain an expression for the work done by impeller of a centrifugal pump on water per second per unit weight of water.

UNIT - V

- Explain the comparison between centrifugal pumps and reciprocating pumps. (6)
- Describe the principle and working of a reciprocating pump with a neat sketch. (6)

(OR)

Turn Over

10. The member BE was the last to be fitted in the truss as shown in figure - 10. While fitting, it was observed that the member was 1 mm longer than the required length. Find the forces developed in all the members of the truss due to forcing the member BE into position. The following particulars are given. Cross sectional area of all members is 4000 mm^2 and Young's modulus of the material used is 200 kN/mm^2 .

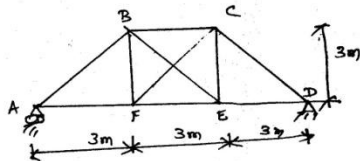


Figure - 10

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B.E. DEGREE EXAMINATION, 2012

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

CLEC-603 / CSEC-602 / PCSEC-504.

STRUCTURAL MECHANICS - II

November]

[Time : 3 Hours

Maximum : 60 Marks

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

Turn Over

UNIT - I

1. Analyse the frame shown in figure - 1 by the slope deflection method and draw the bending moment diagram.

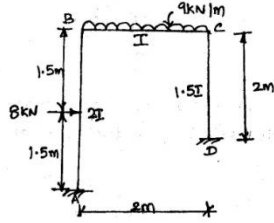


Figure - 1

(OR)

4. The simple portal frame shown in figure - 4 is asymmetrically loaded. EI is constant. Analyse the frame by the strain energy method. Sketch the BMD.

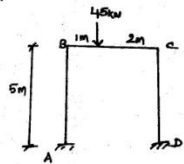


Figure - 4

UNIT - III

5. Analyse the pin jointed structure shown in figure - 5, using matrix flexibility method. The cross-sectional area of each member is 2000 mm². Assume $E = 2 \times 10^5 \text{ N/mm}^2$.

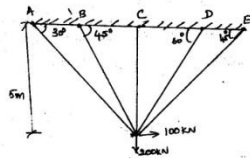


Figure - 5

(OR)

2. Using consistent deformation method, analyse the continuous beam and draw bending moment diagram for the beam shown in figure - 2. EI is constant.

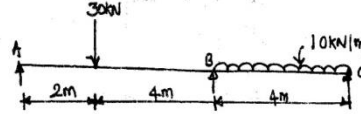


Figure - 2

UNIT - II

3. Analyse the continuous beam loaded as shown in figure-3 by the strain energy method. EI is constant.



Figure - 3

(OR)

Turn Over

6. Analyse the rigid jointed portal frame shown in figure - 6 by the matrix flexibility method.

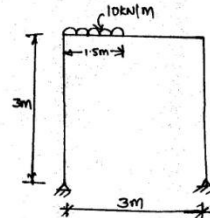


Figure - 7

Turn Over

6

UNIT - IV

7. Find the end moments of the beam shown in figure - 7 by stiffness matrix method and sketch the BMD.

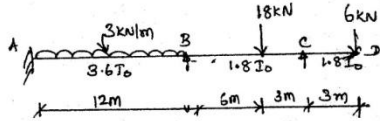


Figure - 7

(OR)

8. Analyse the frame shown in figure - 8 by matrix stiffness method.

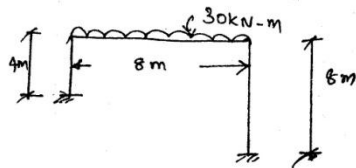


Figure - 8

7

UNIT - V

9. Determine the forces in members of the steel truss shown in figure - 9. The member BE is subjected to an increase in temperature of 70°C . Take the coefficient of linear expansion as $0.00012/^\circ\text{C}$ and $E = 2 \times 10^5 \text{ N/mm}^2$. The cross sectional area of each member is 1250 mm^2 .

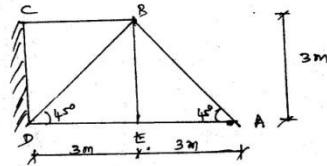


Figure - 9

Turn Over

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B.E. DEGREE EXAMINATION, 2012

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

CLEC-604 / PCLEC-503.

SUBSTRUCTURE DESIGN

November]

[Time : 3 Hours

Maximum : 60 Marks

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

UNIT - I

1. Explain briefly about the combined footing and strap footing. (12)

(OR)

2. Explain briefly about the Terzaghi's analysis with assumptions. (12)

Turn Over

UNIT – II

3. Explain the methods of site exploration with neat sketch and also, explain about the depth of exploration. (12)

(OR)

4. (a) Explain about settlement of footing. (6)
(b) Explain the field tests for determination of bearing capacity. (6)

UNIT – III

5. Discuss in detail the states of plastic Equilibrium. (12)

(OR)

6. Explain Rankine's theory. (12)

UNIT – IV

7. Explain in detail the pile load and penetration tests. (12)

(OR)

UNIT – V

9. Describe continuous and intermittent systems of water supply with its functions. (12)

(OR)

10. Illustrate the Hardy-cross method of pipe network analysis. (12)

8. What are the considerations to be taken during the selection of piles and explain the estimation of individual and group capacity. (12)

UNIT – V

9. Explain in detail the construction and use of under-reamed pile foundations. (12)

(OR)

10. Explain the principles of design and construction for Caissons well foundation and coffer dams. (12)

Register Number :

Name of the Candidate :

3 2 0 3**B.E. DEGREE EXAMINATION, 2012****(CIVIL ENGINEERING)****(SIXTH SEMESTER)****CLEC-605. ENVIRONMENTAL
ENGINEERING**

November]

[Time : 3 Hours

Maximum : 60 Marks

*Answer any ONE FULL question from each unit.
ALL questions carry EQUAL marks.***UNIT – I**

1. Explain the effects of variations in the rate of demand on the design of various units of a water supply scheme. (12)

(OR)

Turn Over

2. The population of a locality, as obtained from a census report is given below.

Census Year	1880	1890	1900	1910	1920
Population	8,000	12,000	17,000	22,500	29,000

1930	1940	1950	1960
38,000	45,000	57,000	66,500

Estimate the population of the locality in 1980 by the incremental method. (12)

UNIT - II

3. (a) Explain mass curve analysis. (8)
 (b) What are the common sources of water? (4)
- (OR)
4. Briefly explain infiltration galleries with neat sketch. (12)

UNIT - III

5. Write short notes of following :
- (a) Corrosion of metal pipes. (6)
 (b) Pipe appurtenances. (6)
- (OR)
6. Discuss briefly the procedure followed in laying, jointing and testing of C.I and R.C.C.pipes. (12)

UNIT - IV

7. Describe the construction and working of a rapid sand filter with a neat sketch. (12)
- (OR)
8. Discuss the construction procedure of the following:
- (a) Flocculation tank. (6)
 (b) Sedimentation tank. (6)

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B.E. DEGREE EXAMINATION, 2012

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

CLEC-606 / PCLEC-601. CONSTRUCTION TECHNIQUES AND MANAGEMENT

November]

[Time : 3 Hours

Maximum : 60 Marks

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

UNIT - I

1. Explain in detail the benefits of on site construction.
2. Explore the prefabrication techniques.

UNIT - II

3. Discuss the modern construction techniques used for industrial buildings.
4. List the construction Machinery and explain them in detail.

UNIT- III

5. Describe the various stages at which the planning of construction job is done.
6. Summarize the contract agreements.

UNIT - IV

7. Describe the different forms of scheduling.
8. Outline the probability distribution.

UNIT - V

9. Differentiate between CPM and PERT.

10. For a small project shown in figure-1, determine the expected time of each activity and hence find the probability of completing the project in 18 days. Numbers on the arrows indicate optimistic, likely and pessimistic times respectively in days.

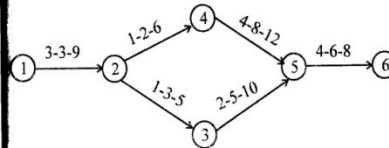


Figure - 1