

Register Number

Name of the Candidate

VI  
3920

**B.E. DEGREE EXAMINATION, 2018**

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

**CLEC-601 / PCLEC-304 HYDROLOGY**

November ]

[ Time : 3 Hours

Maximum : 75 Marks

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

**UNIT - I**

1. Explain the meteorological data and explain climatic factors of hydrology.  
(OR)
2. Explain the following :  
(a) Evaporation and transpiration (b) Precipitation (c) Run-off

**UNIT - II**

3. Describe the methods of calculating average depth of rain-fall from catchment.  
(OR)
4. Describe the various methods of computing average rain-fall over a basin.

**UNIT - III**

5. Explain  $\theta$ -index and w-index with the procedure to determine the same.  
(OR)
6. Explain the analytical methods of evaporation estimation.

**UNIT - IV**

7. Define the following :  
(a) Direct run-off hydrograph (b) Unit hydrograph (c) S-hydrograph  
(OR)

8. Explain the different methods of stream flow measurement.

**UNIT - V**

9. Explain the different methods available for the estimation of the flood.  
(OR).
10. Draw the classification tree of reservoirs and explain them, bringing out their advantages and disadvantages.

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**B.E. DEGREE EXAMINATION, 2018**

( CIVIL ENGINEERING )

( SIXTH SEMESTER )

**CLEC-602 / PCLEC-202. HYDRAULICS AND HYDRAULIC MACHINERY**

November ]

[ Time : 3 Hours

Maximum : 75 Marks

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

**UNIT - I**

- 1 A trapezoidal channel of bed width 10 m and side slopes 1V : 1.5 H is carrying a flow of  $80 \text{ m}^3/\text{s}$ . The channel bottom slope is 0.002 and Manning's 'n' is 0.015. A dam is planned in such a way that the depth of flow increases to 10m. Evaluate the depth of flow in the channel 250m, 500m and 750m upstream of the dam. Use the standard step method.

(OR)

2. The efficiency  $\eta$  of a fan depends on the density  $\rho$ , the dynamic viscosity  $\mu$  of the fluid, the angular velocity  $\omega$ , diameter D of the rotor and the discharge Q. Using Rayleigh's method, express  $\eta$  in terms of dimensionless parameters.

**UNIT - II**

- 3 A jet of water of diameter 100 mm strikes a curved plate at its centre with a velocity of 15 m/s. The curved plate is moving with a velocity of 7 m/s, in the direction of the jet. The jet is deflected through an angle of  $150^\circ$ . Assuming the plate smooth, find :

- (a) Force exerted on the plate in the direction of jet  
(b) Power of the jet (c) Efficiency

(OR)

4. Prove that the force exerted by a jet of water on a fixed semicircular plate in the direction of the jet when the jet strikes at the centre of the semicircular plate is two times the force exerted by the jet on the fixed vertical plane.

**UNIT - III**

- 5 What are the uses of a draft tube ? Describe with neat sketches the different types of draft tubes.

(OR)

6. Design a Pelton wheel which is required to develop 1500kW, when working under a head of 150 m at a speed of 420 rpm. The overall efficiency may be taken as 85 % and assume other data required.

#### UNIT - IV

7. The diameter of an impeller of a centrifugal pump at inlet and outlet are 20cm and 40cm respectively. Determine the minimum speed for starting the pump, if it works against a head of 25m.

(OR)

8. What is the difference between single stage and multistage pumps ? Describe multistage pump with :
- (a) Impellers in parallel. (b) Impellers in series.

#### UNIT - V

9. A single acting reciprocating pump has a plunger of diameter 250 mm and stroke of 350 mm. If the speed of the pump is 60 rpm and it delivers 16.5 litres per second of water against a suction lead of 5 m and a delivery head of 20 m, find the theoretical discharge, co-efficient of discharge, the slip, the percentage slip of the pump and the power required to drive the pump.

(OR)

10. Draw an indicator diagram, considering the effect of acceleration and friction in suction and delivery pipes. Find the expression for the work done per second in case of single acting reciprocating pump.

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**B.E. DEGREE EXAMINATION, 2018**

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

CLEC-603 / CSEC-602 / PCLEC-303 / PCSEC-504. STRUCTURAL MECHANICS - II

November ]

[ Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.

Assume any reasonable missing data.

ALL questions carry EQUAL marks.

**UNIT - I**

- 1 Analyse the continuous beam shown in figure - 1 by slope deflection method. and sketch the bending moment and shear force diagram.

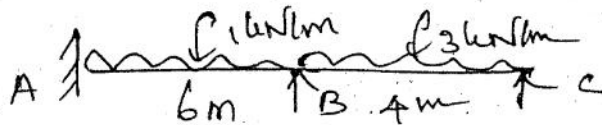


Figure - 1.

(OR)

2. Analyse the portal frame shown in figure - 2 by slope deflection method.

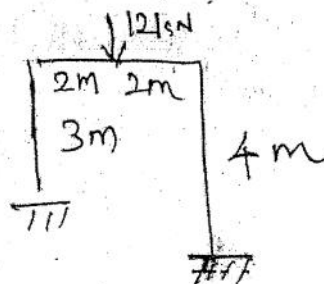


Figure - 2.

## UNIT - II

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

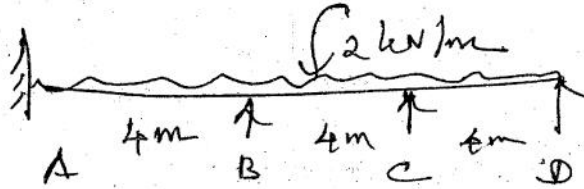


Figure - 3

(OR)

4. Analyse the portal frame shown in figure -4 by strain energy method. EI is constant.

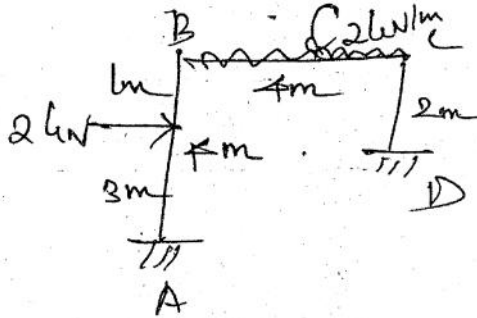


Figure - 4.

## UNIT - III

5. Analyse the continuous beam shown in figure - 5 by flexibility method. EI is constant.

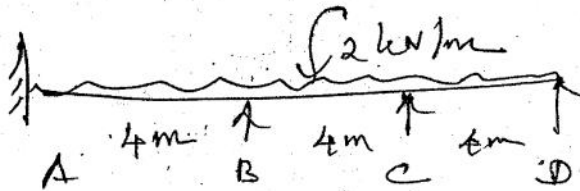


Figure - 5

(OR)

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

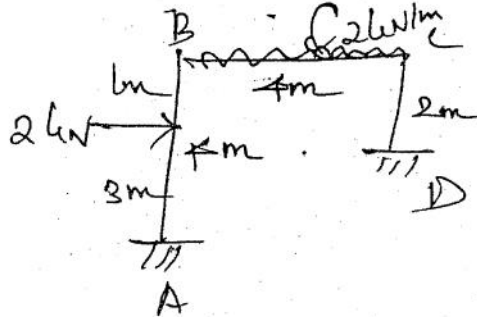


Figure - 6

UNIT - IV

7. Analyse the continuous beam shown in figure - 7 by stiffness method.

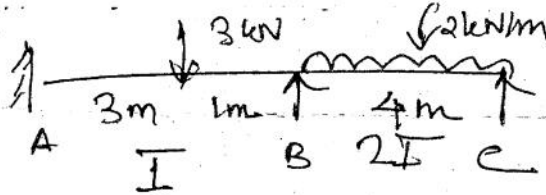


Figure - 7

(OR)

8. Analyse the portal frame shown in figure - 8 by displacement method.

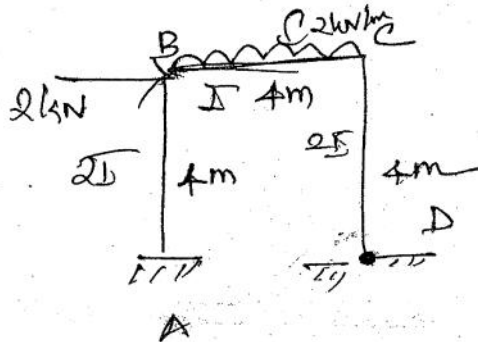


Figure - 8.

## UNIT - V

9. Analyse the continuous beam shown in figure - 9 by stiffness matrix method.

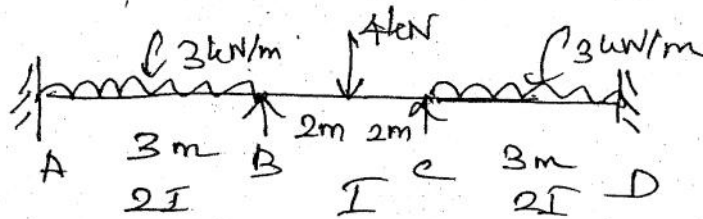


Figure - 9.

(OR)

10. Analyse the frame shown in figure - 10 by stiffness matrix method.

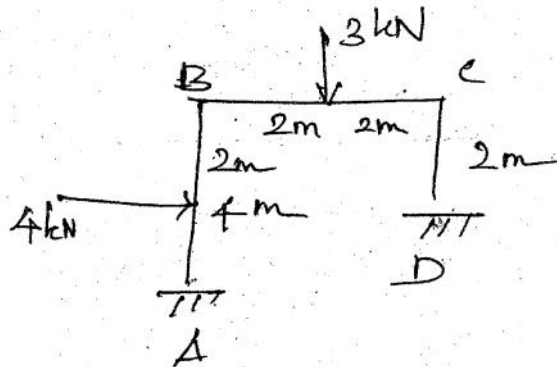


Figure - 10

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Name of the Candidate:

**B.E. DEGREE EXAMINATION, 2018**

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

**CLEC-604/PCLEC-503: FOUNDATION ENGINEERING**

(Common with Part-Time)

November]

[Time: 3 Hours

Maximum: 75 Marks

**Answer One Full Question from each Unit. (5 × 15 = 75)**

**UNIT - I**

1. Discuss the determination of bearing capacity from plate load test. (15)
2. What are different types of raft foundations? Discuss the conventional method of design of raft foundation. (15)

**UNIT - II**

3. What is meant by sample and samplers and explain with neat sketches of any three types of samples. (15)
4. Explain the remedial measure against harmful settlement. (15)

**UNIT - III**

5. Explain Coulomb's wedge theory. (8)
6. Explain Rankine's Active earth pressure theory for Cohesion less soil and Cohesive soil. (15)

**UNIT - IV**

7. Explain the Dynamic formulae for estimating the load carrying capacity of a single driven pile. (15)
8. A concrete pile 30 cm diameter is driven into a medium dense sand ( $\phi = 35^\circ$ ,  $r = 21 \text{ KN/m}^3$ ),  $K = 1.0 \tan S = 0.7$ ,  $N_q = 60$ . For a depth of 8 m. Estimate the safe load, taking a factor of safety of 2.5, if the water table rises to 2m below the ground surface take  $r_w = 10 \text{ KN/m}^2$

**UNIT - V**

9. Explain the design procedure for foundations for bridges.
10. Discuss in details about the various problems to be considered in the design of a under reamed piles. (7)



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**3925**

Name of the Candidate:

**B.E. DEGREE EXAMINATION, 2018**

**(CIVIL ENGINEERING)**

**(SIXTH SEMESTER)**

**CLEC-605/PCLEC-502 ENVIRONMENTAL ENGINEERING -I**

(Common with Part-Time)

November]

[Time: 3 Hours

**Maximum: 75 Marks**

**Answer One Full Question from each Unit. (5 × 15 = 75)**

**UNIT - I**

1. a) Discuss the need for protected water supply. (8)  
b) Briefly explain the drinking water quality standards. (7)
2. Explain the various type of water demand and discuss the factors affecting per capita demand. (15)

**UNIT - II**

3. a) Describe the various underground sources of water. (8)  
b) Enumerate the points to be considered while selecting the intake point. (7)
4. How can the yield of an open well be determined? Illustrate the recuperation test for finding the yield of open well. (15)

**UNIT - III**

5. a) Name the different types of pipes used in water supply schemes. Briefly describe their characteristics. (8)  
b) Explain the different types of pumps used in water supplier with a neat sketch. (7)
6. What are the basic requirements of a pipe joint? Describe the various pipe joints with neat sketches. (15)

**UNIT - IV**

7. Elaborate, with neat sketch, the construction, working and cleaning of a rapid sand filter. (15)
8. a) Explain the different forms of chlorination. (8)  
b) Describe the method of removal of iron and manganese from water. (7)

**UNIT - V**

9. a) Elucidate the methods of water distribution system with a neat sketch. (7)  
b) What is the function of fire-hydrant? Describe the fire hydrant with a neat sketch. (8)
- 10 List the different method of analyzing a given distribution system. Explain Hardy Cross method of pipe network analysis. (15)

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Register Number:

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**B.E. DEGREE EXAMINATION, 2018**

(CIVIL AND STRUCTURAL ENGINEERING)

(SIXTH SEMESTER)

**CSEC-605/PCSEC-503: EXPERIMENTAL TECHNIQUES**

(Common with Part- Time)

November]

[Time: 3 Hours

**Maximum: 75 Marks**

**Answer One Full Question from each Unit. (5 × 15 = 75)**

**UNIT - I**

1. (a) Explain briefly working principle of optical strain gauge. (15)
2. a) Write on strain gauge classification principle and its application. (15)

**UNIT - II**

3. a) Rosette yield the following strain indications  $e_a = -845 \mu m/m$ ,  $e_b = 1220 \mu m/m$ ,  $e_c = 710 \mu m/m$  calculate the maximum value of principal stresses, strain and shear stress. (10)
- b) Describe the expression for principal strain, principal stresses and maximum shear stress for a rosette. (5)

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4. The following reading of strain were obtained on a rectangular strain rosette mounted on aluminum for which  $E = 70 \text{GPa}$ ,  $\nu = 0.32$ ,  $\Sigma a = 285 \times 10^{-6}$ ,  $\Sigma b = 65 \times 10^{-6}$  Determine the principle strain, principal strain direction, principal stress and maximum shear stress. (15)

**UNIT - III**

5. Explain the laboratory setup of circular polariscope. (15)
6. Describe any one method used for the calibration of material used for photo-elasticity investigation. (15)

**UNIT - IV**

7. What are the different types of cracks? How to measure the cracks? (15)
8. Classify the different types of fringe measuring devices and explain briefly with neat sketch. (15)

**UNIT - V**

9. Discuss about velocity and acceleration transducer. (15)
  - 10 Explain the associated instrumentation for measuring static and dynamic strains. (15)
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**B.E. DEGREE EXAMINATION, 2018**

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

**CLEC-606/ PCLEC-601: CONSTRUCTION TECHNIQUES  
AND MANAGEMENT**

(Common with Part Time)

November]

[Time: 3 Hours

Maximum: 75 Marks

**Answer One Full Question from each Unit. (5 × 15 = 75)**

**UNIT - I**

1. (a) Explain the principle of prefabrication techniques. (8)
- (b) Discuss the concept of production techniques. (7)
2. Elucidate the important aspect considered during hoisting, transportation and erection of precast element. (15)

**UNIT - II**

3. a) Elaborate the various construction techniques for modern buildings. (8)
- b) Briefly explain the equipment used for erection of structures. (7)
4. a) Write in detail about material handling equipment. (7)
- b) Describe the various factors involved in selection of equipment of earthwork. (8)

**UNIT - III**

5. Discuss the principal, characteristics and types of organization. (15)
6. a) What is contract agreement? Explain interpretation of contract agreements. (8)
- b) Briefly explain essentials of a contract. (7)

**UNIT - IV**

7. Enumerate the techniques used for scheduling a project with uncertain duration. Explain any one of them in detail. (15)
8. a) Highlights the procedure of network analysis. (7)
- b) Give a detail account on three time estimates for PERT with example. (8)

## UNIT - V

9. A project has the following characteristics: (15)
- Draw CPM network for this project
  - Find the various paths and the critical path as well as the project completion time
  - Prepare an activity schedule showing the ES, EF, LS, LF times and float for each activity. (15)

Activity	Preceding activity	Duration (in weeks)
A	-	5
B	A	2
C	A	6
D	B	12
E	D	10
F	D	9
G	D	5
H	B	9
I	C,E	1
J	G	2
K	F,I,J	3
L	K	9
M	H,G	7
N	M	8

10. a) Discuss various steps in cost optimization. (7)
- b) Write a note on resources smoothing and resources leveling. (8)

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