4201

B.E. DEGREE EXAMINATION, 2017

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

CLEC-601 / PCLEC-304. HYDROLOGY

(Common with Part-Time)

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 global water budget and its applications.
2. Explain the practical applications of hydrologic cycle and general circulation.

UNIT - II

3. Enumerate various types of rain gauge and explain weighing bucket type rain gauge in detail.
4. Describe the methods of calculating average depth of rainfall from catchment.

UNIT - III

5. Explain θ - index and W-index with the procedure to determine the same.
6. Explain how you would use infiltration capacity curve to calculate run-off from a small catchments.

UNIT - IV

7. (a) Define the following :

   (i) Direct run-off hydrograph. (ii) Unit hydrograph. (ii) S-hydrograph.

   (b) Clearly explain the procedure of separating base flow in a hydrograph.

8. The ordinates of 4 hour hydrograph are given in the table. Compute the ordinate of 8 hour unit hydrograph :

Time in hour	1	4	8	12	16	20	24	28	32	36	40	44
Unit hydrograph in cumec	0	20	50	150	120	90	70	50	30	20	10	0

UNIT - V

9. Explain the following :

   (a) Prism storage and wedge storage. (b) Flood control and

   (c) Attenuation.

10. Distinguish between :

   (a) Minimum probable flood and design flood and

   (b) Return period and exceedance probability.

Register Number :

Name of the Candidate :

4 2 0 2

B.E. DEGREE EXAMINATION, 2017

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

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

(Common with Part-Time)

November] [Time : 3 Hours

Maximum : 75 Marks

(for the candidates of 2011-12 batch and later)

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

UNIT - I

1. Prove that for trapezoidal channel of most economical section :

   (a) Half top width = Length of one of sloping sides.

   (b) Hydraulic mean depth = $\frac{1}{2}$ depth of flow.

(OR)

2. The rate of flow of water through a circular channel of diameter 0·8 m is 200 litres/s. Find the slope of bed of channel for maximum velocity. Take C= 50.

UNIT - II

3. 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 semiccircular plate is two times the force exerted by the jet on the fixed vertical plane.

(OR)

4. A jet of water of diameter 150 mm strikes a flat plate normally with a velocity of 12 m/s. The plate is moving with a velocity of 6 m/s in the direction of the jet and away from the jet. Find :

   (a) The force exerted by the jet on the plate.

   (b) The work done by the jet on the plate per second.

   (c) Power of jet. (d) Efficiency of the jet.

UNIT - III

5. Prove that the work done per second per unit weight of water in a reaction turbine is given by

$$\frac{1}{g} = \left(V_{w_1} u_1 \pm V_{w_2} u_2 \right)$$

Where V_{w_1} and V_{w_2} = Velocities of whirl at inlet and outlet.

(OR)

6. A Pelton wheel is having a mean bucket diameter of 0·8 m and is running at 1000 *rpm*. The net head on the Pelton wheel is 400 m. If the side clearance angle is 15° and discharge through nozzle is 150 litres/s, find :

(a) Power available at the nozzle. and (b) Hydraulic efficiency of the turbine.

UNIT - IV

7. How will you obtain an expression for the minimum speed for starting a centrifugal pump ?

(OR)

8. A centrifugal pump is running at 1000 rpm. The outlet vane angle of the impeller is 30° and velocity of flow at outlet is 3 m/s. The pump is working against a total head of 30 m and the discharge through the pump is 0·3 m^3/s. If the manometric efficiency of the pump is 75 % , determine :

(a) The diameter of the impeller and (b) The width of the impeller at outlet.

UNIT - V

9. What is an air vessel ? Describe the function of the air vessel for reciprocating pumps.

(OR)

10. A single acting reciprocating pump has piston diameter 15 cm and stroke length 30 cm. The centre of the pump is 5 m above the water level in the sump. The diameter and length of the suction pipe are 10 cm and 8 m respectively. The separation occurs if the absolute pressure head in the cylinder during suction stroke falls below 2·5 m of water. Calculate the maximum speed at which the pump can run without separation. Take atmospheric pressure head = 10·3 m of water

Register Number :

Name of the Candidate :

4203

B.E. DEGREE EXAMINATION, 2017

(CIVIL / CIVIL AND STRUCTURAL ENGINEERING)

(SIXTH SEMESTER)

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

(Common with Part - Time)

November] [Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL Marks.

UNIT - I

1. Analyse the portal frame loaded shown in figure - 1 by slope deflection method and draw the SFD and BMD. Take EI as constant. (15)

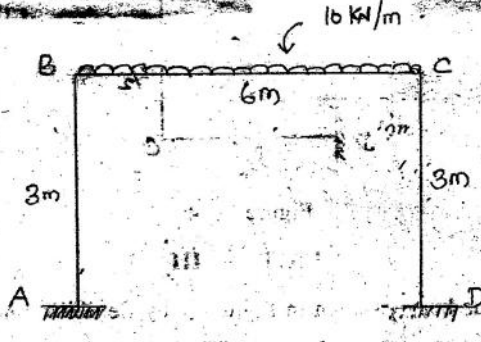

Figure - 1

(OR)

2. Analyses the continuous beam shown in figure -2 by consistent deformation method and draw the SFD and BMD. Take EI as constant. (15)

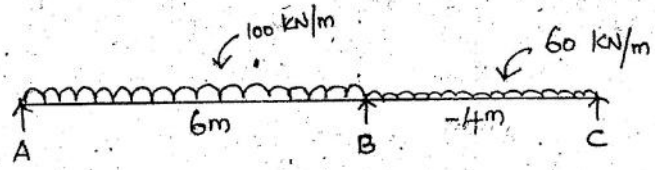

Figure - 2

UNIT - II

3. Analyse the continuous beam shown in figure - 3 by strain energy method and draw the BMD. Take EI as constant. (15)

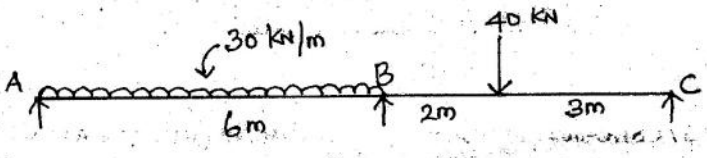

Figure - 3

(OR)

4. A circular section of radius r is bent in the form of rectangle and fixed at A and D as shown in figure - 4. The load on straight portion is W at the midpoint BC. Find the deflection at the midpoint of BC. Take G = 0·4 E. (15)

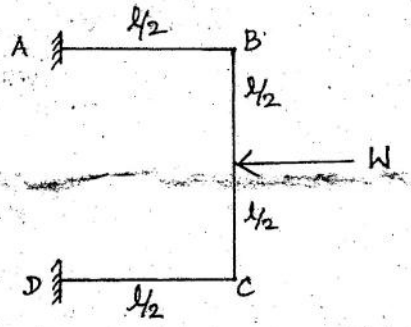

Figure - 4.

UNIT - III

5. Analyse the continuous beam shown in figure - 5 by flexibility method and draw the SFD and BMD. Take EI as constant. (15)

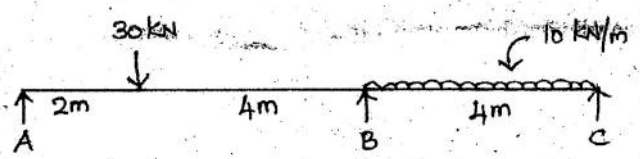

Figure - 5

(OR)

6. Analyse the frame shown in figure - 6 by flexibiliy method and draw the BMD. (15)

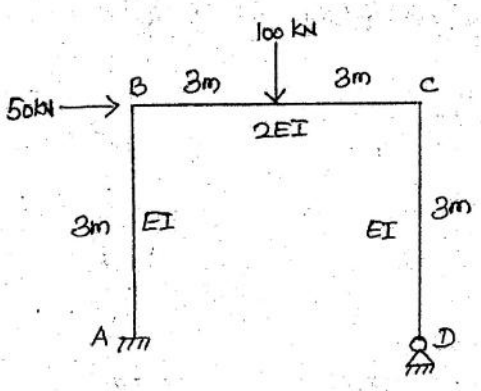

Figure - 6

UNIT - IV

7. Analyse the continuous beam shown in figure - 7 by stiffness energy method and draw the SFD and BMD. (15)

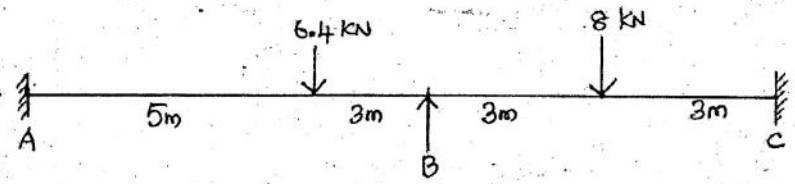

Figure - 7

(OR)

8. Analyse the single frame shown in figure - 8 by stiffness method and draw the BMD. (15)

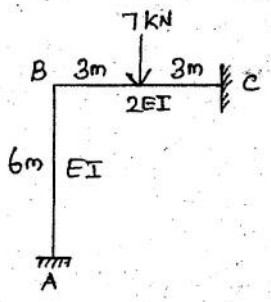

Figure - 8

UNIT – V

9. Analyse the portal frame shown in figure - 9 by stiffness method and draw the BMD. (15)

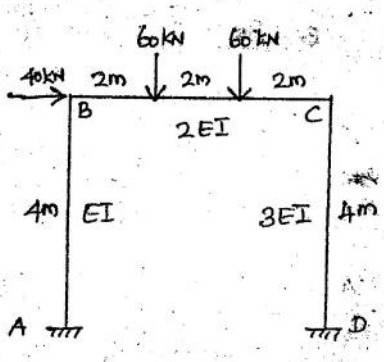

Figure - 9.

(OR)

10. Analyse the continuous beam shown in figure -10, if the downward settlement of support B in kN.m unit is 1000 /EI by stiffness method and draw the SFD and BMD. Take EI as constant. (15)

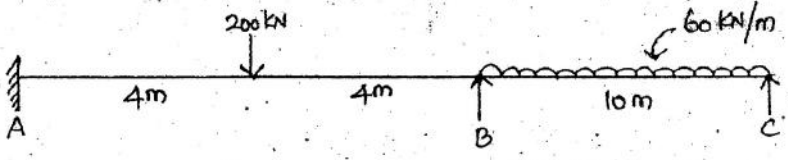

Figure - 10