Register Number :

Name of the Candidate :

3 3 0 4

B.E. DEGREE EXAMINATION, 2011

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

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

(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. Derive the expression of length of backwater curve in open channel.   (12)

(OR)

2

2. A trapezoidal channel has side slopes 1 : 2 and a bed slope 1in 1,500. The area of the section is 40m². Find the dimension of the most economical section. Also, determine the discharge of the most economical section if $c = 50$.   (12)

UNIT - II

3. Determine the angle that the plate will make with the vertical under equilibrium condition if a plate of size 0·4m × 0·6m weighing 10 N is hinged at its top edge and allowed to rotate the horizontal axis. A jet of water 20 mm diameter strikes the plate normally at its centre with a velocity of 4 m/s.   (12)

(OR)

4. Derive an expression for component of force exerted on a single moving curved vane when a jet of water strikes and leaves the vane tangentially.   (12)

3

UNIT - III

5. Explain the working principle of Pelton wheel turbine with neat sketches.   (12)

(OR)

6. The propeller reaction turbine of runner diameter 4·5m is running at 48 *rpm*. The guide blade angle at inlet is 145° and the runner blade angle at outlet is 25° to the direction of the vane. The axial flow area of water through the runner is 30m². If the runner blade angle at inlet is radial, determine

  (a) Hydraulic efficiency of the turbine.

  (b) Discharge through the turbine.   (12)

UNIT - IV

7. Explain the working principle of a centrifugal pump with neat sketch.   (12)

(OR)

8. The impeller of a centrifugal pump has an external diameter of 450 mm and internal diameter of 200 mm and it runs at 1,440 *rpm*. Assuming a constant radial flow through the impeller at 2·5 m/s and that the vanes at exit are set back at angle of 25°,

determine

    (a) Inlet vane angle.

    (b) The angle, absolute velocity of water at exit makes with the tangent.

    (c) The work done per N of water. (12)

UNIT - V

9. A single acting reciprocating pump running at 50 rpm delivers 0·00736 m³/s of water. The diameter of the piston is 200mm and stroke length 300mm. The suction and delivery heads are 3·5m and 11·5m respectively. Determine theoritical discharge, co-efficient of discharge, power required to run the pump. (12)

(OR)

10. The diameter and stroke length of a single acting reciprocating pump are 75mm and 50mm respectively. It takes its supply of water from a sump 3m below the pump through a pipe 5m long and 40mm in diameter. It delivers water to a tank 12m above the pump through a pipe 30mm in diameter and 15 m long. If separation occurs 75 KN/m² below the atmospheric pressure, find the maximum speed at which pump may be operated without seperation. Assume that the piston has a simple harmonic motion. (12)

UNIT – 5

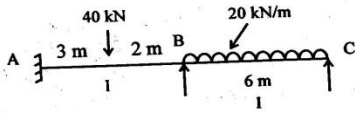9. Analyse the continuous beam shown in figure – 9 by stiffness method. (12)

Figure – 9

(OR)

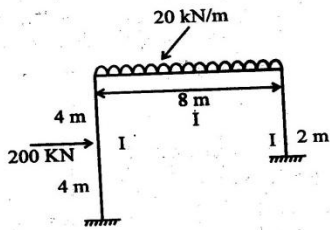10. Analyse the frame shown in figure – 10 by stiffness method. (12)

Figure – 10

Turn Over

UNIT – 1

1. Analyse the continuous beam shown in figure – 1 by slope deflection method. (12)
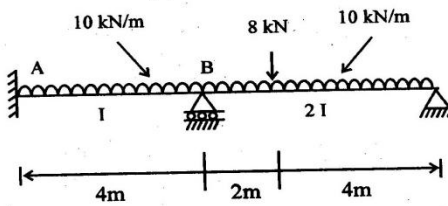
Figure-1

(OR)

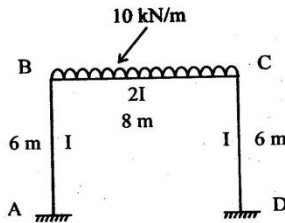2. Analyse the frame shown in figure – 2 by slope deflection method. (12)

Figure-2

UNIT - 2

3. Analyse the continuous beam shown in figure - 3 by strain energy method. (12)
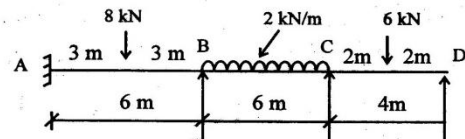
EI constant

Figure - 3

(OR)

4. Analyse the portal frame shown in figure – 4 by strain energy method. (12)
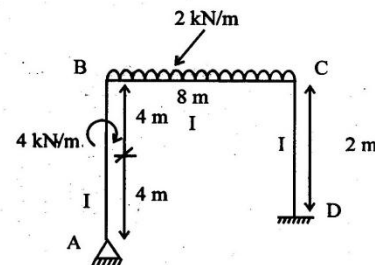

Figure - 4   **Turn Over**

UNIT – 3

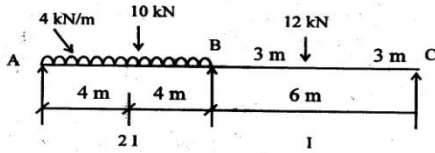5. Analyse the continuous beam shown in figure – 5 by flexibility method. (12)

Figure-5

(OR)

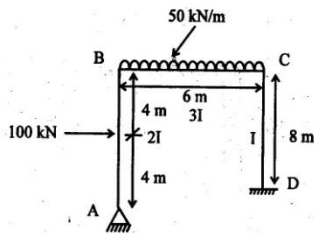6. Analyse the frame shown in figure – 6 by flexibility method. (12)

Figure – 6

UNIT - 4

7. Analyse the continuous beam shown in figure – 7 by stiffness method. (12)
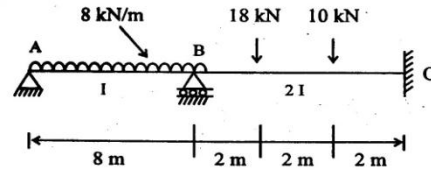
Figure – 7

(OR)

8. Analyse the frame shown in figure – 8 by stiffness method. (12)

Figure – 8

Turn Over

4

centre spacing of 0·9m. The subsoil consists of clay with unconfined compressive strength of 1·5 kg/cm². Determine the efficiency neglecting the bearing action. Take adhesion factor = 0·9. (4)

(OR)

8. (a) State the importance of cyclic pile load test. (4)

(b) Explain in detail about the negative skin friction in pile foundation. (8)

UNIT - V

9. (a) How to overcome the difficulties in sinking of Caisson foundation? (8)

(b) Explain about the design principles of coffer dams. (6)

(OR)

10. (a) Explain the method of construction of under reamed piles. (6)

(b) Explain the design principles of expansive soils. (6)

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B.E. DEGREE EXAMINATION, 2011

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

CLEC-604. SUB-STRUCTURE DESIGN

(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) Explain in detail about the various types of shallow foundations. (8)

(b) What are the general principles in the selection of foundation ? (4)

(OR)

2. (a) What are the various factors influencing the bearing capacity of soil ? (6)

Turn Over

(b) What will be the gross and net safe bearing pressure of sand having $\phi = 36°$ and effective unit weight 18 KN/m^3 under the following cases:

    (i) 1m wide strip footing.

    (ii) 1m × 1m square footing.

Consider the footings are placed at a depth of 1m from ground surface and water table is at a great depth. Assume factor of safety as '3' from Terzagh's chart $N_q = 47$ and $N_\gamma = 43$.   (6)

UNIT - II

3. (a) Distinguish between distributed sample and undistributed samples.   (4)

    (b) Explain in detail about any of the geo-physical methods.   (8)

(OR)

4. (a) What are the limitations of plate load test ?   (4)

    (b) Explain in detail about procedure of static penetration test.   (8)

10. A project has the following schedule. Construct the PERT network and compute the earliest start time for each activity.

Activity	Time in weeks	Predecessors
A	3	None
B	2	A
C	4	A
D	5	B
E	3	C
F	6	D

    (12)

UNIT - III

5. (a) Explain in detail about Couloumb's wedge theory.   (8)

    (b) A soil mass is retained by a smooth backed vertical wall of 6m height. The soil has a bulk unit weight of 20 KN/m^3 and $\phi = 16°$. The top of the soil is level with the top of the wall and is horizontal. If the soil surface carries a uniformly distributed load of 4·5KN/m^2, determine the total active thrust on the wall per linear meter of the wall and its point of application.   (4)

(OR)

6. (a) Explain the stability conditions of retaining walls.   (6)

    (b) Illustrate with diagram, the different states of plastic equilbrium.   (6)

UNIT - IV

7. (a) Briefly expalin about the construction of under reamed pile foundation.   (8)

    (b) A group of 9 piles, 10m long is used as foundation for a bridge pier. The piles used are 30cm. diameter and with centre to

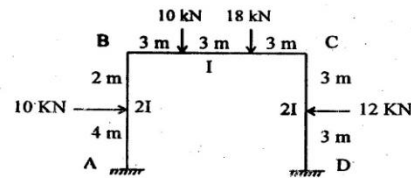**Turn Over**

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B.E. DEGREE EXAMINATION, 2011

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

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

(New Regulations)

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

November]   [Time : 3 Hours

Maximum : 60 Marks

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

UNIT – I

1. Explain in detail about the various types of connections in pre-fabricated units for a residential building construction.   (12)

Turn Over

2. Explain in detail about prefabrication techniques and types. (12)

UNIT – II

3. Explain the types of modern construction techniques adopted in industrial building. (12)

4. Write short notes on :

    (a) Crane.

    (b) Bulldozers.

    (c) Graders. (3 × 4)

UNIT – III

5. Explain the types of organization in detail. (12)

6. (a) Discuss the merits and demerits of lumpsum contract. (6)

    (b) What is the departmental procedure for execution of a civil engineering project? (6)

UNIT – IV

7. Explain with an example how PERT is used to estimate the uncertain duration of a project network. (12)

8. Explain the need for project planning, scheduling and controlling in detail. (12)

UNIT – V

9. The network for a certain project is shown in figure – 1. Find the crital path and the slack for each event. (12)
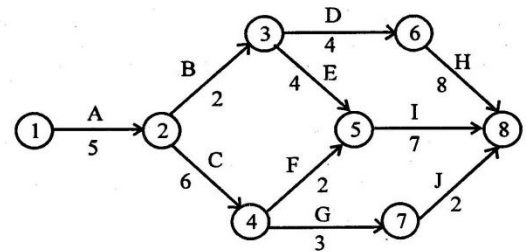
Figure - 1

Turn Over