Register Number :

Name of the Candidate :

3 1 8 6

B.E. DEGREE EXAMINATION, 2013

(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. Describe the hydrological cycle. Explain the global water budget. (12)

(OR)

2. Describe the vertical structure of atmosphere with respect to temperature, with the help of a neat sketch. (12)

UNIT – II

3. What do you understand by cloud seeding? How does it help in the artificial rain making? (12)

(OR)

4. (a) A Catchment area has 5 rainguage stations. These gauges recorded the annual rainfall as

Station	A	B	C	D	E
Rainfall (mm)	1300	1420	1180	1080	1650

For 5% error in estimation of average rainfall, determine the minimum number of additional rainguage stations required to be established in the catchment. (8)

(b) What is a moving – average curve? What are its uses? (4)

UNIT – III

5. With the help of conceptual sketch, differentiate between infiltration and percolation state. How infiltration is measured in field? (12)

(OR)

6. State any four factors affecting evaporation. Also, state any four measures to control the evaporation. (12)

UNIT – IV

7. List the various climate factors affecting run-off. Specifically discuss the effect of the direction of storm movement and the antecedent precipitation on the peak discharge. (12)

(OR)

8. The direct run-off hydrograph, resulting from a 5 cm of effective rainfall of 6th duration is given below. Determine the area of the catchment and the ordinates of the 6th unit hydrograph. (12)

Time hours	0	6	12	18	24	30	36
Direct Run-off m/s	0	25	175	320	360	310	230

42	48	54	60	66	72
165	105	60	30	10	0

UNIT –V

9. Explain briefly

(i) Maximum probable flood.

(ii) Design flood.

(iii) Causes of flood.

(iv) Factors affecting Flood. (12)

(OR)

10. Describe the Muskingum method of routing an inflow hydrograph through a channel reach. Assume the values of the coefficients K and X for the reach are known. (12)

Register Number :

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B.E. DEGREE EXAMINATION, 2013

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

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

November] [Time : 3 Hours

Maximum : 60 Marks

(Maximum 75 marks
for the part-time candidate)

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

Turn Over

UNIT – I

1. A concrete lined trapezoidal channel has to discharge 500 cum/sec. The side slopes are 1 to 1 and the bed slope is 1 in 4000. The permissible velocity is 2·5 m/sec. Determine the bottom width and the depth of the section of the channel. Take Manning's coefficient N = 0·014. (12)

(OR)

2. The efficiency η of a fan depends on the density ρ, the dynamic viscosity μ of the fluid, the angular velocity ω, diameter D of the rotor and the discharge Q. Express η in terms of dimensionless parameters. (12)

UNIT – II

3. A jet of water of diameter 50 mm moving with a velocity of 25 m/s impinges on a fixed curve plate tangentially at an angle of 30^{o} to the horizontal. Calculate the resultant force of the jet on the plate if the jet is deflected through an angle of 50^{o}. Take g as 10 m/s^2.

(OR)

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

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

   (b) The work done 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 m. 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 overall efficiency as 90%, calculate the diameter, speed and specific speed of the turbine. (12)

(OR)

6. (a) Define specific speed and unit quantities. (4)

   (b) Derive an expression for specific speed of turbine. (8)

UNIT – IV

7. Explain in detail about the characteristic curves of a centrifugal pump. (12)

(OR)

8. A centrifugal pump is to discharge 0·118 m^3/sec at a speed of 1450 rpm against a head of 25 m. The impeller diameter is 250mm, its width at outlet is 50mm and manmetric efficiency is 75%. Determine the vane angle at the outer periphery of the impeller. (12)

UNIT – V

9. (a) Explain the working of an air vessel with neat sketch. (6)

   (b) Explain the construction procedure of an ideal indicator diagram. (6)

(OR)

10. A single acting reciprocating pump has a piston diameter 12·5 cm and stroke length 30cm. The centre of the pump is 4m above the water level in the sump. The diameter and length of the suction pipe are 7·5 cm and 7m 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 on which the pump can run without separation. Take atmospheric pressure head as 10·3 m of water. (12)

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Name of the Candidate :

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B.E. DEGREE EXAMINATION, 2013

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

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

November] [Time : 3 Hour

Maximum : 60 Marks

Answer any ONE FULL question from e
ALL questions carry EQUAL m

UNIT – I

1. Analyse the portal frame loaded as shown in figure – 1 by slope deflection method and draw the bending moment diagram.

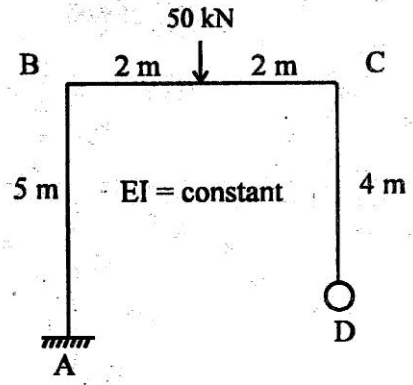

Figure - 1

(OR)

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

Figure - 2

UNIT – II

3. A curved beam in the form of a quadrant of circle of radius R and having uniform cross section is in a horizontal plane. It is fixed at A and free at B as shown in figure 3. It carries a vertical concentrated load W at the free end B. Determine the vertical deflection at the free end B . Draw the bending moment diagram also.

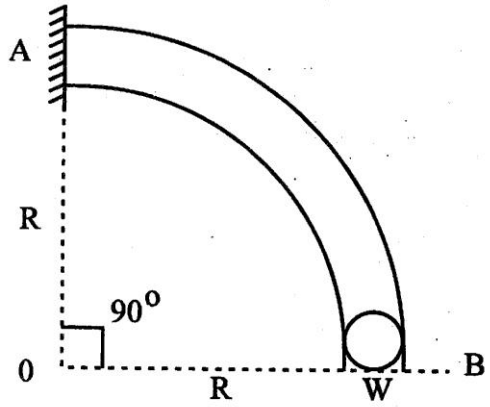

Figure - 3

(OR)

4. Analyse the continuous beam shown in figure-4 by strain energy method. Sketch the bending moment diagram.

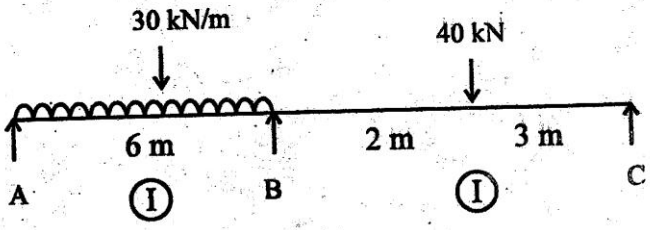

Figure - 4

UNIT – III

5. Analyse the continuous beam shown in figure-5 by the flexibility matrix method and draw the bending moment diagram. EI constant.

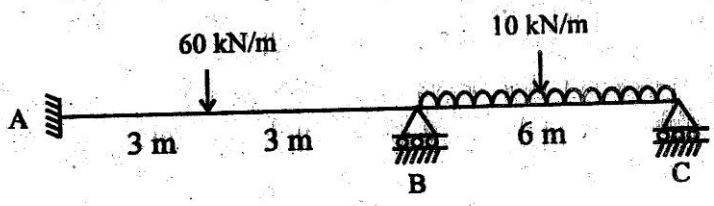

Figure - 5

(OR)

6. Analyse the portal frame shown in figure-6 by the flexibility matrix method and draw the bending moment diagram.

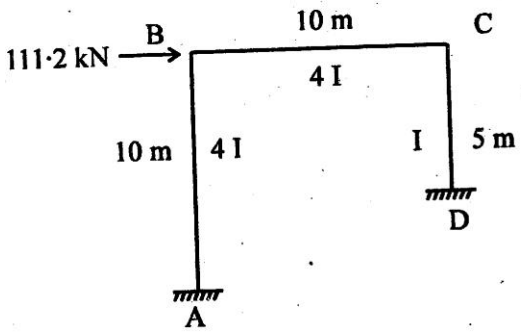

Figure - 6

UNIT – IV

7. Analyse the continuous beam shown in figure-7 by the stiffness matrix method. Draw the bending moment diagram. EI is constant.

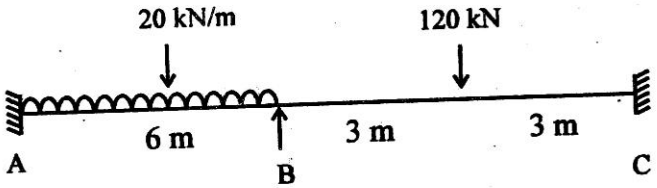

Figure - 7

(OR)

8. Analyse the portal frame shown in figure-8 by the stiffness matrix method. EI is constant.

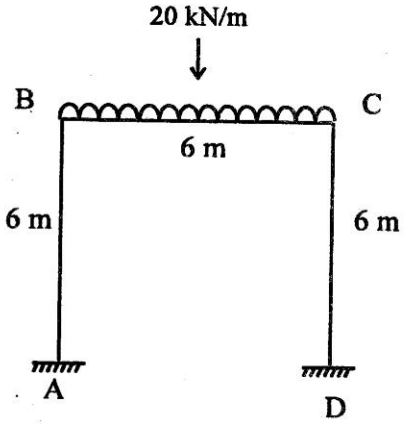

Figure - 8

UNIT – V

9. In the truss shown in figure-9, the member BE was the last member to be fixed and it was found that BE was too long by 1·2 mm. Find the force in BE. Area = 1000 mm^2 and E = 2 × 10^5 N/mm^2 for all the members.

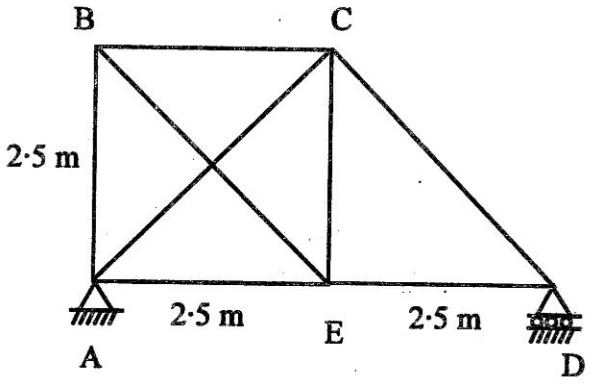

Figure - 9

(OR)

10. In the frame shown in figure-10, the member BD is subjected to a fall in temperature of $30^{\circ}C$,

Area = $1000\ mm^2$

and $E = 2{\cdot}047 \times 105\ N/mm^2$ for all the members. $\alpha = 12 \times 10^{-6}/^{\circ}C$.

Find the force in the member BD.

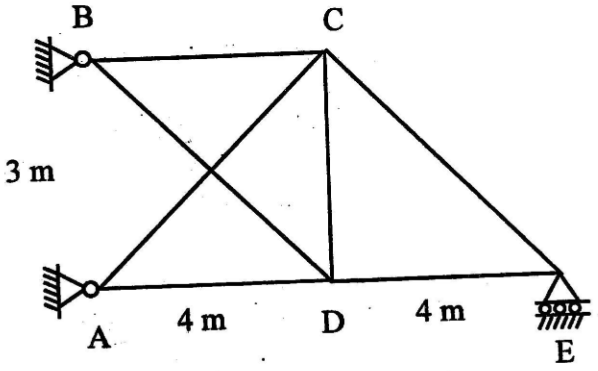

Figure - 10

Register Number :

Name of the Candidate :

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B.E. DEGREE EXAMINATION, 2013

(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. Describe the procedures to be followed to conduct a Plate Load Test, with sketch.

2. A Strip footing is laid to a depth of 1m. The soil consists of clay having Cu = 55 KN/m^2 and γ = 17·6 kN/ m^3, Using Terzagi's analysis, calculate q_{nf} and q_f

Turn Over

UNIT – II

3. Describe the conditions to be followed at the time of foundation exploration.

4. Describe the geophysical methods of site explorations.

UNIT – III

5. Describe the active and passive earth pressures with sketches.

6. Explain Coulomb's wedge theory.

UNIT – IV

7. Explain different types of uncased cast – in – situ concrete piles with sketches.

8. A single pile with free head is subjected to lateral load at the ground surface. The deflection under a load of 20 kN is 2 cm. Compute the deflection if the pile were fixed at the head.

UNIT – V

9. Describe the types and shapes of wells and component parts for well foundations.

10. Explain the procedure for sinking the pneumatic Caisson with sketch.

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B.E. DEGREE EXAMINATION, 2013

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

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

November] [Time : 3 Hours

Maximum : 60 Marks

(Maximum 75 marks
for the part-time candidate)

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

UNIT – I

1. Explain the standards and planning factors for public water supplies in India. (12)

(OR)

2. How population forecast is done? Explain anyone method in detail. (12)

UNIT – II

3. With a neat sketch, describe briefly the sources of water and explain the construction of deep tube wells. (12)

(OR)

4. Explain impound storage and mass curve analysis. (12)

UNIT – III

5. Explain laying, joining and testing CI pipe.(12)

(OR)

6. Explain pipe appurtenances and pumping stations. (12)

UNIT – IV

7. Explain with a neat sketch the working of flocculators. (12)

(OR)

8. Write note on water disinfection, water softening and aeration. (12)

UNIT – V

9. Write short notes on elevated, ground water reservoirs for distribution. (12)

(OR)

10. Explain Hardy cross method of balancing with example. (12)

Register Number :

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B.E. DEGREE EXAMINATION, 2013

(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 the prefabrication techniques in detail. (12)

(OR)

2. Explain the modern methods of on-site construction. (12)

Turn Over

UNIT – II

3. Explain the construction techniques adopted in industrial buildings. (12)

(OR)

4. Explain with a neat sketch the hoisting and conveying cranes. (12)

UNIT – III

5. Explain the organization of PWD departments. (12)

(OR)

6. Discuss the various methods of executing works in the field. (12)

UNIT – IV

7. Differentiate between frequency distribution and probability distribution. (12)

(OR)

8. Explain the concept of slack and critical path with an example. (12)

UNIT – V

9. Construct a PERT network for the project shown in the table below.

   (a) Find all the early and late event times and the event slack.

   (b) Determine the critical path and its length. (12)

Activity	Immediately Preceding Activity	Expected Completion Time
a	-	2
b	-	3
c	-	2
d	b	4
e	a, b	3
f	b	2
g	f, c	5
h	g	4
i	f	3
j	i, d	2
k	j	1
l	e	6

(OR)

10. The table given below represents the activities of the network of a construction project. The durations for the activities for the network are also given.

    (i) Prepare the network diagram.

    (ii) Find the critical path and time of completion of construction project.

    (iii) Prepare time schedule indicating float and free float. (12)

Activity	Duration of Days
(0 - 1)	5
(1 – 2)	11
(2 – 3)	9
(2 – 4)	35
(2 – 7)	5
(3 – 4)	7
(3 – 7)	9
(4 – 5)	13
(4 – 6)	15
(5 – 6)	0
(6 – 7)	11
(7 – 8)	7

Register Number :

Name of the Candidate :

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B.E. DEGREE EXAMINATION, 2013

(CIVIL ENGINEERING)

(SIXTH AND FOURTH SEMESTER)

CLEC-604 / PCSEC-403.
FOUNDATION ENGINEERING

November] [Time : 3 Hours

Maximum : 60 Marks

(Maximum 75 marks for part-time candidates)

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

UNIT – I

1. (a) List shallow foundation and explain them with neat sketches. (12)

(OR)

Turn Over

(b) A strip footing 1·2 m wide is located at a depth of 1·5 m in a non-cohesive soil deposit for which the corrected N-value of SPT is 20. Water table is located at a depth of 2m below the ground surface. Find the allowable bearing pressure for the soil. (12)

UNIT - II

2. (a) Write down the procedure to conduct standard penetration test. (12)

(OR)

(b) A column carrying a load of 1,250 kN is to be founded at a shallow depth on a soil having E = 50,000 kN/m^2 and Poisson's ratio of soil is 0·5, the allowable soil pressure is 200 kN/m^2. Calculate the immediate settlement. (12)

UNIT - III

3. (a) A retaining wall with a smooth vertical back retains a purely cohesive fill. Height of wall is 12 m. Unit weight of fill is 20 kN/m^3. Cohesion = 1 N/cm^2.

(i) Determine the total active Rankine thrust on the wall.

(ii) At what depth is the intensity of pressure is zero and where does the resultant thrust act? (12)

(OR)

(b) What are the different types of earth pressure? Give examples for

(i) Earth pressure at rest.

(ii) Active earth pressure.

(iii) Passive earth pressure. (12)

UNIT - IV

4. (a) Sketch and detail various types of pile foundations. (12)

(OR)

(b) A pile is driven with a single acting steam hammer of weight of 15 kw with a free fall of 900 mm. The final set, the average of the last 3 blows is 27·5 mm. Find the safe load. (12)

UNIT - V

5. (a) Explain briefly the analysis of well foundation. (12)

(OR)

(b) Discuss Indian standard code of practice for design of foundations for impact type machines. (12)