Register Number :

Name of the Candidate :

0298

B.E. DEGREE EXAMINATION, 2017

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

CLEC-601 / PCLEC-304. HYDROLOGY

(Common with Part-Time)

April] [Time : 3 Hours

Maximum : 75 Marks

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

UNIT – I

1. With a neat sketch, explain the vertical structure of atmosphere. (15)

2. Write about : (15)

   (a) Cyclonic precipitation. (b) Convective precipitation.

   (c) Orographic precipitation.

UNIT - II

3. (a) Explain double mass curve with a neat sketch. (7)

   (b) The average annual rainfalls in cms at 4 existing raingauge stations in a basin are 105, 79, 70, and 66. If the average depth of rainfall over the basin is to be estiamted within 10 % error, determine the additional number of gauges needed. (8)

4. A storm commenced at 7.00 hours. The ordinates of the rainfall mass curve of this storm in mm as recorded by a recording raingauge at 15 minute intervals are

   0, 9·5, 17, 27, 40·5, 49, 63, 84, 95, 102, 110, 112 and 112..

   Construct the keytograph of this storm for a uniform interval of 15 mintues. Construct the keytograph of the storm for a uniform interval of 15 minutes. (15)

UNIT - III

5. Draw the sketch of a ISI Standard pan. Explain the measurement of evaporation using the above ISI Standard pan. (15)

6. (a) Explain the methods of reducing evaporation from water surface. (8)

   (b) During a daily routine observation, 10·8 litres of water was added to bring the water surface in the evaporation pan to the stipulated level and the nearby raingauge measured 3·6 mm of rainfall. What was the evaporation recorded for the day if the diameter of the pan is 122 cm^2 ? (7)

UNIT - IV

7. What are the components of run-off ? Explain with a flow diagram. (15)

8. Define unit hydrograph. Write the assumptions made in the derivation fo unit hydrograph. Also, narrate the limitations of unit hydrograph. (15)

UNIT - V

9. (a) A bridge has an expected life of 25 years and is designed for a flood magnitude of return period 100 years.

   (i) What is the risk of this hydrologic design ?

   (ii) If a 10 % risk is acceptable, what return period will have to be adopted ? (9)

   (b) Define the following : (6)

   (i) Flood. (ii) Flood routing. (iii) Run-off co-efficient.

10. (a) Analysis of flood series of a river yielded a sample mean of 1000 m^3/s and standard deviation 500 m^3/s. Estimate the design flood of a structure on this river to provide 90 % assurance that the structure will not fall in the next 50 years. Use Gumbel's method and assume the sample size to be very large. (9)

    (b) Write short notes on : (6)

    (i) Design flood. (ii) Standard project flood. (iii) Probable maximum flood.

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B.E. DEGREE EXAMINATION, 2017

(CIVIL ENGINEERING)

(SIXTH SEMESTER).

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

(Common with Part-Time)

April] [Time : 3 Hours

Maximum : 75 Marks

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

UNIT – I

1. Find the most economical cross section of a rectangular channel which is to be dug in the rocky portion of a soil. The channel is to convey 8 m^3/s of water with an average velocity of 2 m/s. Take Chezy's constant C = 65.
2. What are undistorted and distorted hydraulic models ? Why undistorted models are adopted for the construction of rivers ?

UNIT - II

3. Derive an expression for the force exerted by a jet of water on moving inclined plate in the direction of the jet.
4. Derive the expression for the efficiency of jet propulsion, when the inlet orifice and the direction of the motion of the ship is perpendicular and parallel.

UNIT - III

5. Draw a schematic diagram of a Francis turbine and explain briefly its construction and working.
6. Find the efficiency of the Kaplan turbine for the following given data :

   Shaft power = 13230 kW. Speed = 75 rpm. Head = 8 m.

   Diameter of boss runner = 0·35 times the external diameter.

   Speed ratio = 2. Flow ratio = 0·6.

UNIT - IV

7. Explain the various types of characteristic curves of centrifugal pumps.
8. A centrifugal pump is delivering 0·04 m^3 of water per second to a height of 20 m through a 150 mm diameter pipeline of 100 long. If the inlet losses in suction pipe are equal to 0·33 m and friction factor is 0·06 for the pipeline, find the power required to drive the pump. Assume overall efficiency of the pump as 70 percent.

UNIT - V

9. The diameter and stroke length of single acting reciprocating pump are 100 mm and 200 mm respectively. It takes its supply of water from a sump 4 m below the pump through a pipe 6 m long and 40 mm in diameter. It delivers water to a tank 14 m above the pump through a pipe 30 mm in diameter and 18 m long. If the separation occurs at 78·48 kN/m^2 below the atmosphere, find the maximum speed at which pump may be operated without separation. Assume plunger has a simple harmonic motion.

10. A single acting reciprocating pump, running at 60 *rpm*, delivers 0·53 m^3 of water per minute. The diameter of the piston is 200 mm and stroke length 300 mm. The suction and delivery heads are 4 m and 12 m respectively. Determine :

    (a) Theoretical discharge. (b) Co-efficient of discharge.

    (c) Percentage of slip of the pump. and (d) Power required to run the pump.

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B.E. DEGREE EXAMINATION, 2017

(CIVIL / CIVIL AND STRUCTURAL ENGINEERING)

(SIXTH SEMESTER)

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

(Common with Part- Time)

April] [Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

UNIT – I

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

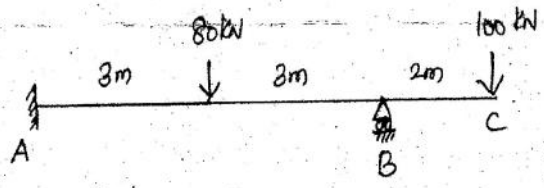

Figure -1

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

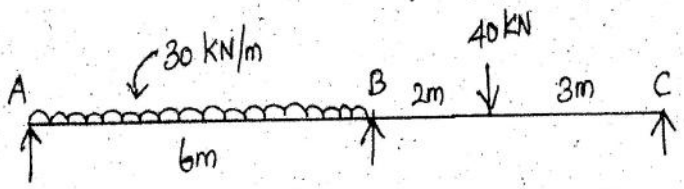

Figure - 2.

UNIT - II

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

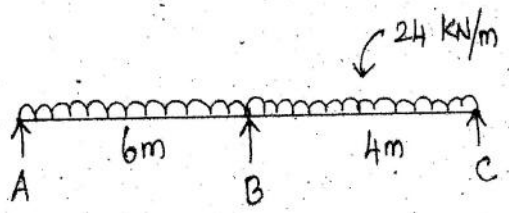

Figure - 3

4. A curved beam in the form of a quadrant of a cirle of radius R and having a uniform cross section is in a horizontal plane. It is fixed at A and free at B as shown in figure - 4. It carries a vertical concentrated load W at the free end B. Compute the shear force, bending moment and twisting moment values. Also, determine the vertical deflection of the free end B. (15)

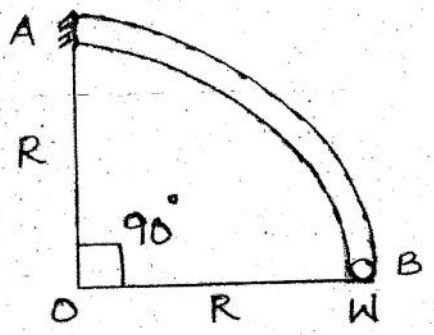

Figure - 4.

UNIT - III

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

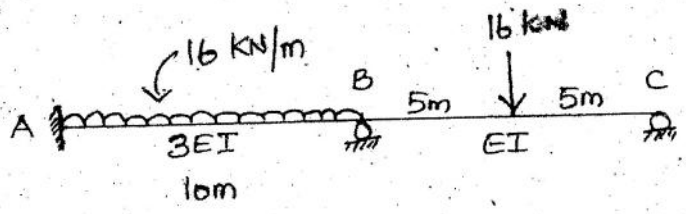

Figure - 5.

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

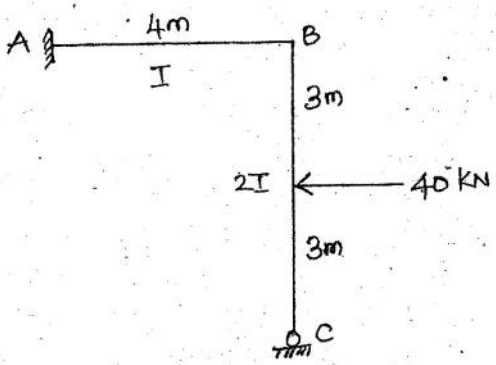

Figure - 6.

UNIT - IV

7. Analyse the continuous beam shown in figure - 7 by stiffeness method and draw the SFD and BMD. Take EI as constant. (15)

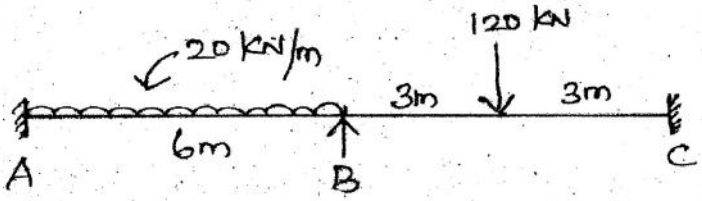

Figure - 7.

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

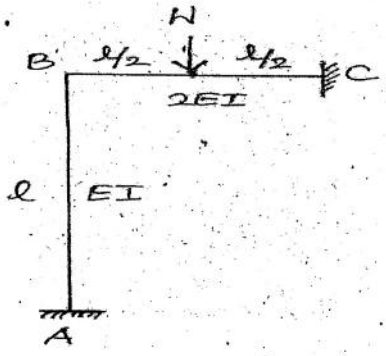

Figure - 8.

UNIT - V

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

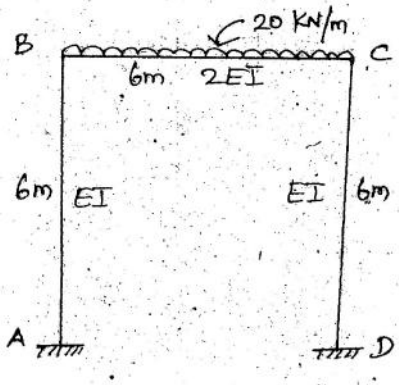

Figure - 9.

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)

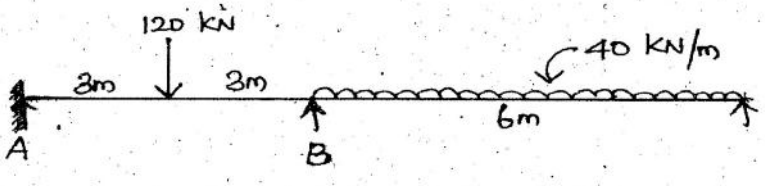

Figure - 10.

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B.E. DEGREE EXAMINATION, 2017

(CIVIL ~~AND STRUCTURAL~~ ENGINEERING)

(SIXTH SEMESTER)

CLEC-604 / PCLEC-503. FOUNDATION ENGINEERING

(New Regulations)

(Common with Part-Time)

April] [Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.

UNIT – I

1. Explain the general principles of design and selection of foundations.
2. A strip footing is 20 m wide and its base rests on 1 m below ground surface. If the soil below the ground level is dense with C = 100 kN/m^3 and $\phi = 38°$, determine the ultimate bearing capacity of the soil, assuming γ = 20 kN/m^3.

UNIT - II

3. Explain the field tests for determining the bearing capacity of soil.
4. (a) What are the causes of settlement ? (8)
   (b) Explain the methods of minimizing settlement using codal provision. (7)

UNIT - III

5. A retaining wall with a vertical smooth back is 10 m high. It supports cohensionless soil (γ = 19 kN/m^3, ϕ = 30°). The surface of the soil is horizontal. Determine the thrust on the wall.
6. Explain Rankine's theory of active earth pressure for a submerged backfill.

UNIT - IV

7. Explain the different types of piles with neat sketches.
8. A pre-cast concrete pile is driven with a 60 kN hammer, having a free fall of 1 m. If the penetration in the last blow is 0·5 cm, determine the load carrying capacity of the pile using Engineer's new record formula. (FOS = 5·0).

UNIT - V

9. Explain :
   (a) Well foundation. (b) Coffer dams. (c) Foundations for machinery.
10. What do you understand by under reamed piles and what situations dictate their uses ?

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B.E. DEGREE EXAMINATION, 2017

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

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

(Common with Part-Time)

April] [Time : 3 Hours

Maximum : 75 Marks

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

UNIT – I

1. Describe the necessity of having a planned water supply scheme for a town. How are such schemes financed, planned and executed in India ? (15)

2. What is meant by the variations in the rate of demand ? What are the effects of these variations on the design of various units of a water supply scheme ? (15)

UNIT - II

3. Explain with the help of a sketch, the utility of a mass curve. (15)

4. Enumerate the methods which are used for determining the yeild of dug wells. Discuss in detail any one of these methods. (15)

UNIT - III

5. What is meant by 'water hammer' and how is it produced in pipes conveying water under pressure ? What provisions are normally made in the design of pipelines on this account ? (15)

6. Mention the method to calculate the most economical size of a rising main. List the appurtenances necessary to be installed on a rising main between pumps and over head tank. Indicate their relative positions on a line diagram. (15)

UNIT - IV

7. Define 'flowing through period' and 'detention period' in a sedimentation basin and describe in detail the various constituents of a coagulation - sedimentation plant. (15)

8. Write short notes on the following : (3 + 3 + 3 + 3 + 3)

   (a) Chlorination. (b) Fluorination. (c) Desalination.

   (d) Chemical coagulation. (e) Clarflocculator.

UNIT - V

9. Illustrate with sketches, the different types of layouts of pipe systems in distributing water and compare their merits and demerits. (15)

10. Write short notes on the following : (5 + 5 + 5)

    (a) Metering in distribution systems. (b) Stand pipes. (c) Distribution reservoirs.

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B.E. DEGREE EXAMINATION, 2017

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

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

(Common with Part-Time)

April] [Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

UNIT – I

1. Discuss in detail the types of pre-fabricated concrete construction. (15)

2. Explain with neat sketches, the types of joints in different structural connections. (15)

UNIT - II

3. Discuss briefly the modern construction techniques adopted for urban housing systems. (15)

4. State and explain the various factors affecting the selection of construction equipment. (15)

UNIT - III

5. Define "planning". What are the principles involved ? Discuss its advantages. (15)

6. With the help of a neat sketch, discuss the importance of construction co-ordination in governmenet organisations. (15)

UNIT - IV

7. What is PERT and when is it used ? Explain PERT network scheduling. (15)

8. Draw a PERT network for the following project : (15)

   (a) 'A' is first event 'K' is end event.
   (b) 'J' is successor event to 'F'.
   (c) 'C' and 'D' are successor event to 'B'.
   (d) 'D' is a preceeding event to 'G'.
   (e) 'E' and 'F' occur after event 'C'.
   (f) 'E' preceeds 'F'.
   (g) 'C' restraints the occurence of 'G' and 'G' preceeds 'H'.
   (h) 'H' preceeds 'J'.
   (i) 'F' restraints the occurrence of 'H'.
   (j) 'K' is successor to event 'J'.

UNIT - V

9. Explain how CPM can be adopted for determining extension of time of a project. (15)

10. From the following data, prepare the network diagram,. decide the completion period and complete the critical path method schedule : (15)

Activity Item	Duration in days	Activities immediately	
		preceeding	following
A	3	None	B,C
B	4	A	D
C	6	A	D,E
D	3	B,C	F
E	6	C	G
F	4	D	I
G	5	E	H,J
H	3	G	I
I	6	F,H	L
J	4	G	K
K	4	J	L
L	4	I,K	None