4

8. (a) What is slope-stage-discharge curve? How is it constructed?

(b) What are the factors to be considered in locating a stream gauging station?

UNIT – V

9. Describe any two methods of reservoir routing in detail.

(OR)

10. Explain the methods of design flood estimation using the unit hydrograph method. How is it modified when the area is large?

UNIT – I

1. Define air mass and air front. Discuss the characteristics of cold air mass and warm air mass.

(OR)

Turn Over

2. Define hydrometeorology. Mention some of the hydrological problems in which meteorology plays an important role.

UNIT – II

3. (a) Describe with neat sketch the principle of working of Symons non-recording rain gauge.

   (b) Describe the principle of working of a float type recording rain gauge with a neat sketch.

(OR)

4 (a) What is meant by probable maximum precipitation?

   (b) The average annual rainfalls in cm at four existing rain gauge stations in a basin are 105, 79, 70 and 66. If the average depth of rainfall over the basin is to be estimated within 10% error, determine the additional number of gauges needed.

UNIT – III

5. (a) Bring out the differencs among evaporation, transpiration, evapo transpiration and consumptive use.

   (b) Discuss the various factors affecting evapo transpiration.

(OR)

6. (a) A six hour storm produced rainfall intensities of 7, 18, 25, 12, 10 and 3 mm per hour in successive one hour intervals over a basin of 800 square kilometers. The resulting run-off is observed to be 2640 hectare-meters. Determine ϕ index for the basin.

UNIT – IV

7. (a) Sketch a typical hyetograph resulting from an isolated storm and identify the features of the same.

   (b) Why is base flow separated from total run-off? Describe any one method of separating the base flow from total run-off.

(OR) **Turn Over**

-4-

UNIT-V

9. Solve the L.P.P by graphical method. (12)
   Maximize $\quad Z=2x+3y$
   Subjected to : $\quad -x+2y \le 16$
   $\qquad x+y \le 24$
   $\qquad x+3y \ge 45$
   $\qquad -4x+10y \ge 20$
   $\qquad x, y \ge 2$

10. Using Simplex method solve
    Maximize $\quad Z=4x_1+10x_2$
    Subjected to: $\quad 2x_1+x_2 \le 50$
    $\qquad 2x_1+5x_2 \le 100$
    $\qquad 2x_1+3x_2 \le 90$ (12)
    $\qquad x_1, x_2 \ge 0$

UNIT-I

) Compute the mean, median, mode for the distribution. (6)

Class:	0-10	10-20	20-30	30-40	40-50	50-60
	6	5	8	15	7	6

) The contents of urns I, II and III are as follows:
1 white 2 black and 3 red balls
2 white 1 black and 1red balls and
4 white 5 black and 3 red balls
One urn is chosen at random and two balls drawn from it. They happen to be white and red. What is the probability that they come from urns I, II or III? (6)

2. a) Calculate the co-efficient of variation for the data: (6)

Class:	5-10	10-15	15-20	20-25	25-30	30-35
f:	6	8	17	21	15	11

b) Calculate the co-efficient of correlation for the data:

X:	65	66	67	67	68	69	70	72
Y:	67	68	65	68	72	72	69	71

(6)

UNIT-II

3. a) Let X be a random variable following Poisson distribution, such that $P(X=2)=9P(X=4)+90P(X=6)$, find the mean and standard deviation. (6)

b) Fit a straight line to the data; using method of least squares: (6)

X:	0	1	2	3	4
Y:	1	1.8	3.3	4.5	6.3

4. a) Using method of least squares, fit the parabola to the data: (6)

X:	1	2	3	4	5
Y:	5	12	26	60	97

b) X is a normal variate with mean 30 and S.D 5. Find (i) $P(26 \leq X \leq 40)$ (ii) $P(X \geq 45)$ (iii) $P(|X-30|>5)$ (6)

UNIT-III

5. a) Using Simpson's (1/3) rule compute $\int_0^\pi \sqrt{\sin x}\, dx$ choosing 10 strips. (6)

b) A simply supported beam of 8m supports a uniformly distributed load of intensity 3kN/m over the whole span. Estimate the area of the bending moment diagram considering 1m interval using Traphezoidal rule. (6)

a) Using Trapezoidal rule compute $\int_0^2 \frac{x^3}{1+x^4}\, dx$, choosing 10 strips. (6)

b) A solid of revolution is formed by rotating about the x axis, the area between x axis, x=0, x=1 and the curve through the points (0,1), (0.25, 0.98961), (0.75, 0.9089) and (1.0, 0.8415). Find the volume of the solid. (6)

UNIT-IV

Estimate the buckling load of a pin-ended column of length L and flexural rigidity EI, considering four sub-intervals. Compare the approximate value with the exact Euler critical load. (12)

Find the buckling load of the prismatic column shown in figure, by dividing the beam into 7 equal parts. The governing equation is $EI\frac{d^2v}{dx^2}+pv=0$, p is positive if it is tensile. (12)

(Buckling of a prismatic Column)

8 8 0 5
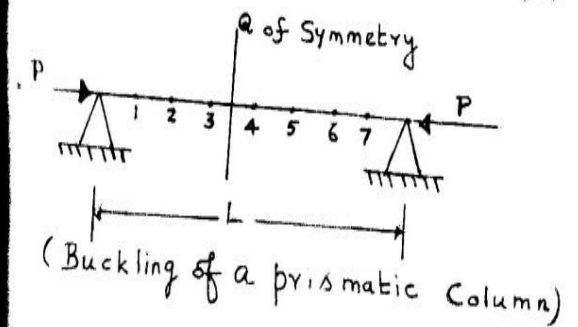
B.E. DEGREE EXAMINATION, 2011

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

CLEC-603 / CSEC-602 / PCLEC-205 /
PCSEC-504. STRUCTURAL
MECHANICS - II

(Old & New Regulations)

[Time : 3 Hours

Maximum : 60 Marks

Answer ONE FULL questions from each unit.

All questions carry equal marks.

2

UNIT – I

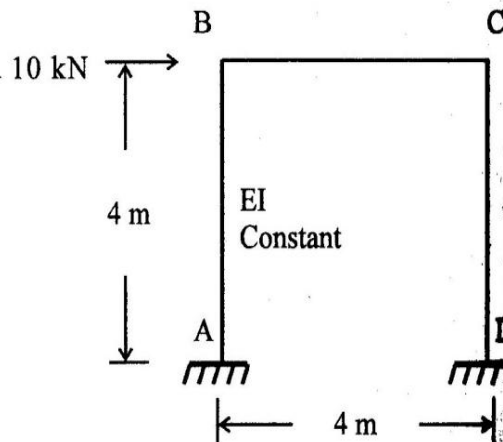1. Analyse the frame shown in figure -1 deflection method and draw BMD.

Figure - 1

(OR)

3

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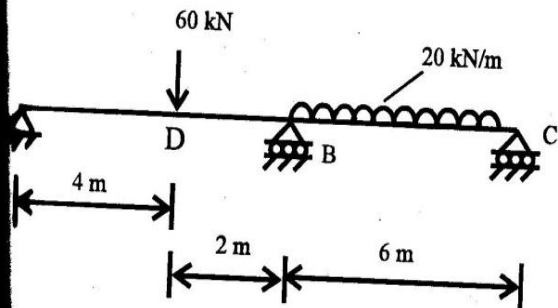
Figure - 2.

UNIT - II

Find the deflection at the free end of a quarter of circular cantilever beam, it it is loaded by vertical load P at its free end, and radius of the circle is R.

(OR)

4. Using the method of strain energy, analyse portal frame shown in figure-3. Also, plo bending moment diagram.
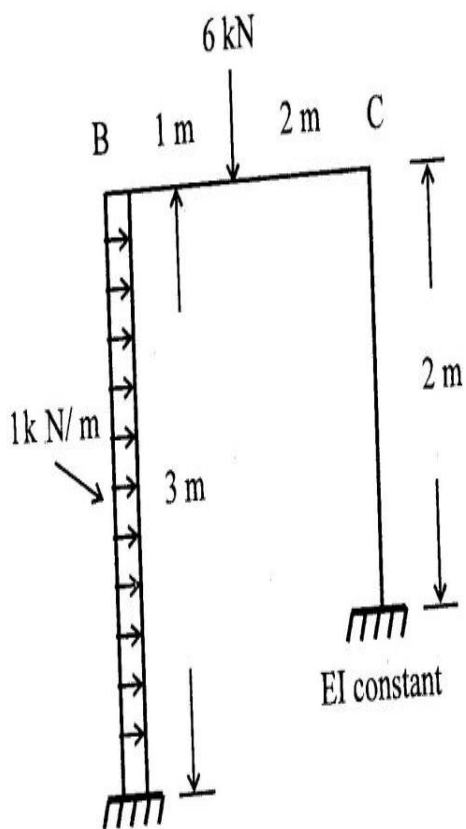
6 kN

B 1 m   2 m   C

1k N/ m

3 m

2 m

EI constant

Figure - 3.

UNIT – III

5. Analyse the pin jointed truss by flexibility matrix method. Areas of members AB, BC, CD are 6,000 mm^2 respectively and the members AF, BF, CF, BE, EF, CE, DE are 3,000 mm^2.

B   C

6 m

A   F   E   D

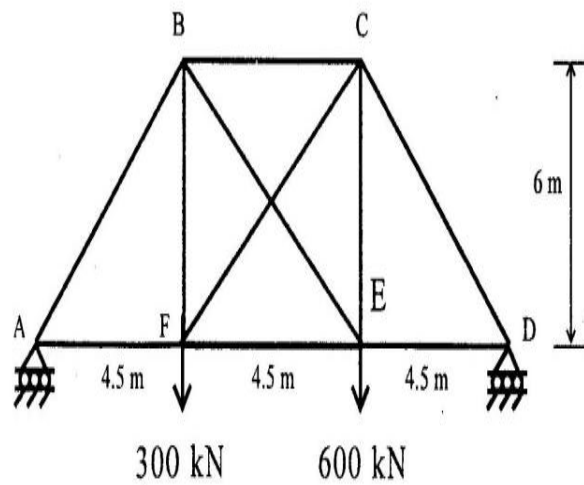4.5 m   4.5 m   4.5 m

300 kN   600 kN

Figure - 4

(OR)

6. Analyse the frame as shown in figure 5 by flexibility matrix method.
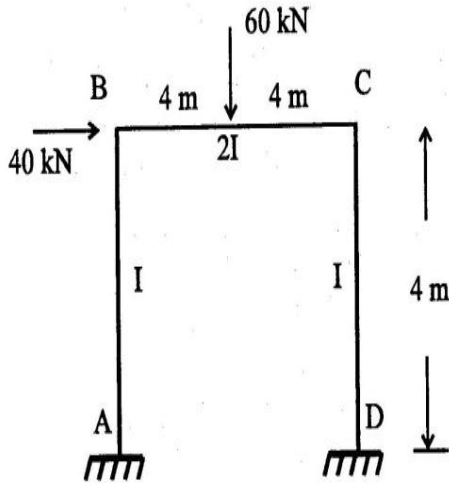

Figure - 5

UNIT – IV

7. Analyse the continuous beam shown in figure-6 by stiffness matrix method.
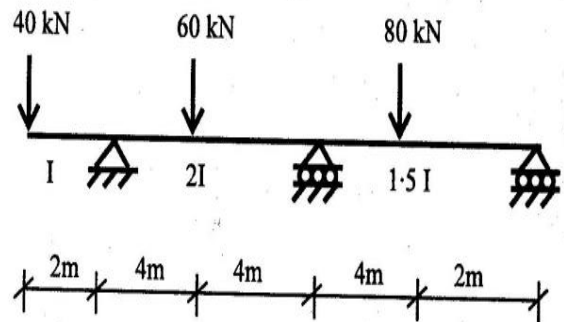

Figure -6

(OR)

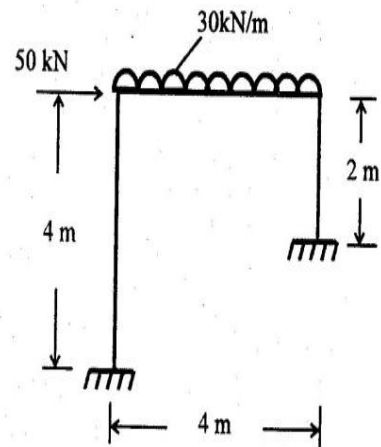8. Using stiffness matrix method, analyse the frame shown in figure-7. Take EI constant throughout.

Figure - 7   **Turn Over**

9. The member BE was the last to be fitted in the truss as shown in figure-8. While fitting, it was observed that the member was 1 mm longer than the required length. Find the forces developed in all the members of the truss due to forcing the member BE into position. The following particulars are given : Cross sectional area of all the members is 4,000 mm^2 and Young's modulus of the material used in 200 kN/mm^2.
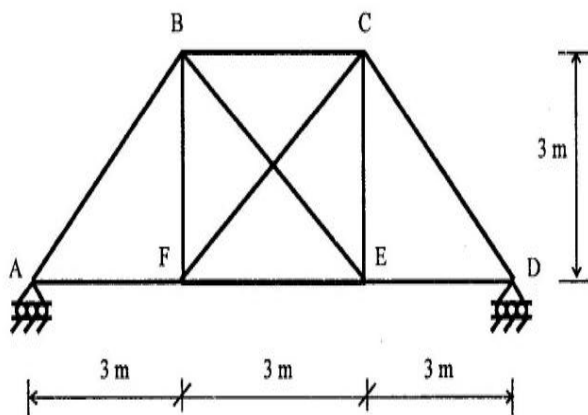
Find the forces developed in all the members of the truss shown in figure-9, if the temperature of member AC goes up by 20°C. Take the co-efficient of thermal expansion $\alpha = 12 \times 10^{-6}/°C$. Cross sectional area of all the members is 2,500 mm^2 and Young's modulus is 200 kN/mm^2.

Figure - 8

(OR)
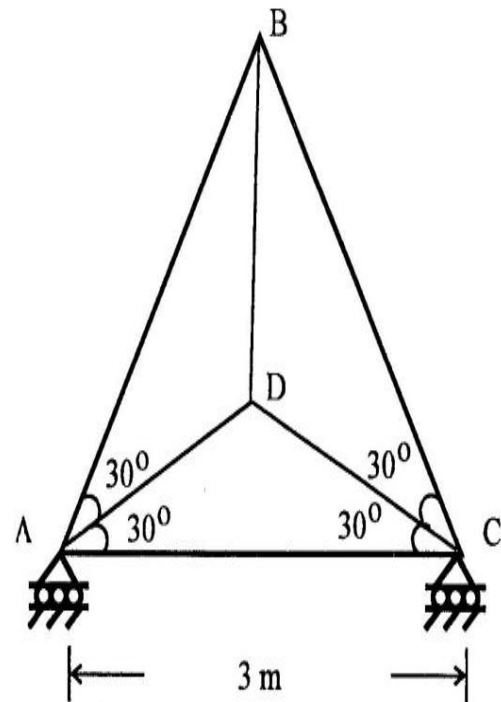
Figure - 9.

Name of the Candidate:

B.E. DEGREE EXAMINATION, 2011

(CIVIL AND STRUCTURAL ENGINEERING)

(SIXTH SEMESTER)

CLEC-606/PCLEC-603.MANAGEMENT SCIENCES

May)   (Time: 3 Hours

Maximum: 60 Marks

Answer PART-A B and C in separate answer books

PART-A   (2×12=24)
Answer any TWO questions

1.   a) Explain the various factors of Demand and supply.
                                                    (6)

     b) Distinguish between economic decisions and technical decisions.   (6)

2.   a) Explain the various sources of finance.   (6)

     b) What is Pricing? State its various methods.   (6)

3.   a) State the differences between group behaviour and individual behaviour.   (6)

     b) State the qualities of a good leader.   (6)

4. a) What is Training? State the various methods of training. (6)

b) How will you prevent industrial accidents? (6)

PART-B (2×12=24)
Answer any TWO questions

5. a) Explain the Taylor's principles of scientific management. (7)

b) What is depreciation? What are the various methods of calculating depreciation? (5)

6. a) What is job evaluation? (6)

b) Explain the various methods of wage payments. (6)

7. a) What is time study? State its principles. (6)

b) Write down the theories of motivation. (6)

8. Explain the various approaches to human behaviour in organization. (12)

PART-C (1×12=12)
Answer any ONE question

9. State the differences between public sector and private sector organization.

10. Explain the selection process in an organization.

11. What are the differences between economic efficiency and technical efficiency?

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Register Number :

Name of the Candidate :

8 8 0 4

B.E. DEGREE EXAMINATION, 2011

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

CLEC-602. HYDRAULICS AND HYDRAULIC MACHINERY

(Old & New Regulations)

May]   [Time : 3 Hours

Maximum : 60 Marks

Answer ONE question from each unit.
All questions carry equal marks.

UNIT –I

1. Define the terms: Afflux and backwater curve. Prove that the length of the backwater curve is given by L = (E2 – E1) / (Sb – Se) where L is the length of backwater curve, E2 is specific energy at the end of backwater curve, E1 is

Turn Over

the specific energy at the section where water starts raising, Sb is the slope of the bed and Se is slope of energy gradient.

(OR)

2. (a) Define the following non-dimensional numbers: Reynold's number, Froude number and Mach number. What are their significance for fluid flow problems?

(b) State Buckingham's π – theorem. Why this theorem is considered superior over the Rayleigh's method for dimensional analysis?

UNIT – II

3. Prove that for a curved radial vane the efficiency is given by

$$\eta = 2\{V_{w_1 u_1} + V_{w_2 u_2}\} / (V_1^2)$$

(OR)

4. A jet of water 75 mm diameter having a velocity of 20m/s strikes normally a flat smooth plate. Determine the thrust on the plate

   (i)   If the plate is at rest,

(ii) If the plate is moving in the same direction as the jet with a velocity of 5 m/s.

Also find the work done per second on the plate in each case and the efficiency of the jet when the plate is moving.

UNIT – III

5. (a) What is a draft tube? Why is it used in a reaction turbine? Describe with sketches two types of draft tubes.

(b) What is the basis of selection of turbine at a particular place?

(OR)

6. (a) Draw a schematic diagram of a Francis turbine and explain briefly its construction and working.

(b) Define the terms: specific speed of a turbine, unit speed, unit power and unit rate of flow of a turbine.

UNIT – IV

7. (a) What do you mean by manometric efficiency, mechanical efficiency and overall efficiency of a centrifugal pump?

(b) What is priming? Why is it necessary?

(OR)

8. (a) Define specific speed of a centrifugal pump. Derive an expression for the same.

(b) Two geometrically similar pumps are running at the same speed of 1,000 rpm. One pump has an impeller diameter of 0·3 m and lifts water at the rate of 20 litres per second against a head of 15 m. Determine the head and impeller diameter of the other pump to deliver half the discharge.

UNIT – V

9. (a) What is an air vessel? Describe the function of air vessel for reciprocating pump.

(b) Draw an indicator diagram, considering the effect of acceleration in suction and delivery pipes.

(OR)

10. (a) What is negative slip in a reciprocating pump? Find an expression for the work done per second in case of a single acting reciprocating pump.

(b) Explain how and when separation of flow takes place in a reciprocating pump.

Register Number :

Name of the Candidate :

8 8 0 6

B.E. DEGREE EXAMINATION, 2011

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

CLEC - 604 / PCLEC - 503.
SUB STRUCTURE DESIGN

(Old & New Regulations)

May]   [Time : 3 Hours

Maximum : 60 Marks

Answer any ONE full question from each unit.

All questions carry equal marks.

UNIT - I

1. (a) Explain briefly about

(i)   Combined footing.   (4)

(ii) Raft footing.   (4)

Turn Over

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

(OR)

2. A strip footing 2 m wide carrries a load intensity of 400 KN/m^2 at a depth of 1·2 m in sand. The saturated unit weight of sand is 19·5 KN/m^3 and unit weight above water table is 16·8 KN/m^3. The shear strength parameters are $C = 0$ and $\phi = 35°$. Determine factor of safety with respect to shear failure for following casea of location of water table.

    (a) Water table is 4 m below ground level.

    (b) Water table is 1·2 m below ground level.

    (c) Water table is 0·5 m below ground level. (12)

UNIT - III

3. Explain in detail about the various methods of boring in site exploration. (12)

(OR)

4. (a) Explain in detail about the procedure of dutch cone test. (8)

(b) A 30 cm square bearing plate settles by 8 mm in plate load test on cohesionless soil, when the intensity of loading is 180 KN/m^2. Estimate the settlement of shallow foundation of 1·6 m square under the same intensity of loading. (4)

UNIT - III

5. (a) Compute the intensities of active earth pressure and passive earth pressure at a depth of 8 m in clay cohesionless sand with an angle of internal friction of 30° and unit weight of 18KN/m^3. What will be the intensities of active and passive earth pressure if water level rises to ground level? Take saturated unit weight of sand as 22 KN/m^3. (6)

(b) Explain in detail about Rankine's theory. (6)

(OR)

6. (a) A retaining wall 6 m high retains sand with $\phi = 30°$ unit weight of 24 KN/m³ upto a depth of 3 m from top. From 3 m to 6 m, the material is a cohesive soil with $C = 20$ KN/m³ and $\phi = 20°$. Unit weight of cohesive soil is 18 KN/m³. Determine the total lateral earth pressure acting on the wall and its point of application. (10)

(b) Distinguish between active earth pressure and passive earth pressure. (2)

UNIT - IV

7. (a) Explain in detail about the procedure of pile load tests. (8)

(b) In a 16 pile group, the pile diameter is 45 cm and centre to centre spacing of square group is 1·5 m. If $C = 50$ KN/m², determine whether the failure occur with the pile acting individually, or as a group? Neglect bearing at the top of the pile. All piles are 10 m long. Take $m = 0·7$ for shear mobilisation around each pile. (4)

(OR)

8. (a) A wooden pile is being driven with a drop hammer weighing 20 KN and having a free fall of 1·0 m. The penetration in the last below is 5 mm. Determine the load carrying capacity of the pile according to the Engineering news formula. (2)

(b) Explain in detail about the classification of piles :

   (i) Based on function.

   (ii) Based on materials. (10)

UNIT - V

9. (a) Explain in detail about the forces acting on a well foundation. (8)

(b) Briefly explain about pneumatic Caission's. (4)

(OR)

10. (a) Briefly explain about the uses of under-reamed piles. (6)

(b) Explain in detail about the design of foundation in expansive soils. (6)

B.E. DEGREE EXAMINATION, 2011

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

CLEC-605/PCLEC-203.TRANSPORTATION ENGINEERING-I
(Old Regulation)

ay)   (Time: 3 Hours

Maximum: 60 Marks

Answer any ONE FULL question from each unit
All questions carry equal marks

UNIT-I

1. What are the types of surveys to be carried out in a major road construction project? Explain them.

2. Describe the types of road curves with sketches and their uses.

UNIT-II

3. Explain different types of testing of aggregates with sketches.

4. Describe the main features of construction which affect the quality of Cement concrete roads.

UNIT-III

5. Explain the objectives and uses of traffic volume studies.

6. Describe the classification of regulatory signs with sketches.

UNIT-IV

7. Explain the facilities required and space required for airport terminal building.

8. Describe the factors which govern the selection of location for airport.

UNIT-V

9. Discuss about airport special lighting and draw a neat sketch of general lighting pattern of an airport.

10. Write short notes on:
    a) Landing Aids.
    b) Airport maintenance.
    c) Sub-surface drainage.

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Register Number :

Name of the Candidate :

8 8 1 0

B.E. DEGREE EXAMINATION, 2011

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

CLEC - 605.
ENVIRONMENTAL ENGINEERING

(New Regulations)

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

May]   [Time : 3 Hours

Maximum : 60 Marks

Answer any ONE full question from each unit.

All questions carry equal marks.

UNIT - I

1. What is meant by variations in the rate of demand ? What are the effects of these variations on the design of various units of a water supply scheme ?   (12)

(OR)

2. The population of a locality as obtained from the censes report is as follows :

Year	1950	1960	1970	1980	1990	2000
Population	8,000	12,000	17,000	22,500	29,000	37,500

Estimate the population of the locality in 2020 by

(a) Arithmetic increase method

and (b) Incremental increase method.   (12)

UNIT - II

3. Explain the details regarding the estimation of storage capacity of an impounding reservoir.   (12)

(OR)

4. What is meant by tube wells ? What are their types ? Describe the most widely used type of tube wells with a neat sketch.   (12)

UNIT - III

5. What are the different kinds of pipes available for use in water supply system ? Discuss merits of each.   (12)

(OR)

6. Explain the procedure for the complete testing of a newly laid C.I.pipe for carrying water supply.   (12)

UNIT - IV

7. Briefly explain the construction and working function of a slow sand filter with neat sketch showing all the details.   (12)

(OR)

8. What is meant by 'disinfection' in treating public water supply ? What is its importance? What are the chemicals which are used as disinfectants and what are their comparative merits and demerits ?   (12)

Turn Over

UNIT - V

9. Explain the Hardy-Cross method of pipe network analysis. (12)

(OR)

10. Write short notes on leak detection and corrosion control in distribution system. (12)