

Register Number:

0482

Name of the Candidate:

B.E. DEGREE EXAMINATION, 2019

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

CLEC-601/PCLEC-304: HYDROLOGY

April/May]

[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit (5 × 15 = 75)

UNIT - I

1. Explain the hydrological cycle and the man's interference with it with a neat sketch.
2. Explain the global water budget and its application.

UNIT - II

3. What is a Hydrograph? Draw a single peaked hydrograph and explain its components.
4. Explain any one type of automatic rain gauge.

UNIT - III

5. What do you understand by infiltration index? How do you determine it? Explain it.
6. For a river, the estimated flood peaks for two return periods by the use of Gumbel's method are given below.

Return period(years)	Peak flood m ³ /s
100	485
50	445

What flood discharge in this river will have a return period of 1000 years?

UNIT - IV

7. Derive an expression for the steady state discharge from a well in an unconfined aquifer. Draw a neat sketches and state clearly all the assumptions.
8. Explain the various factors influencing rainfall and define run off.

UNIT - V

9. Explain the various methods of determining the flood discharge in a stream?
10. Explain the following:
 - a) Prism storage and wedge storage
 - b) Flood control and
 - c) Attenuation

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0423

B.E. DEGREE EXAMINATION, 2019

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

01PC-602: ESTIMATION AND VALUATION

April /May]

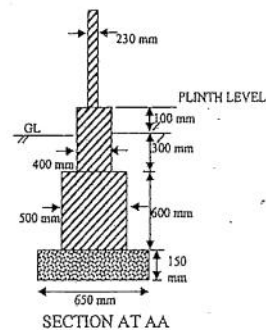
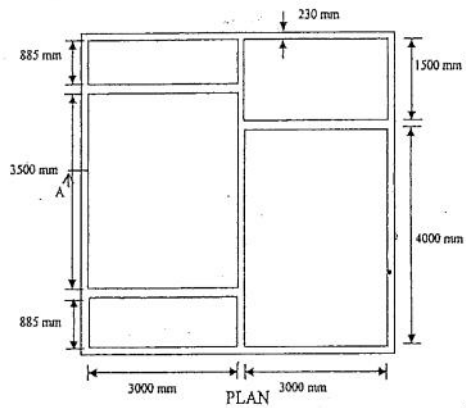
[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit (5 × 15 = 75)

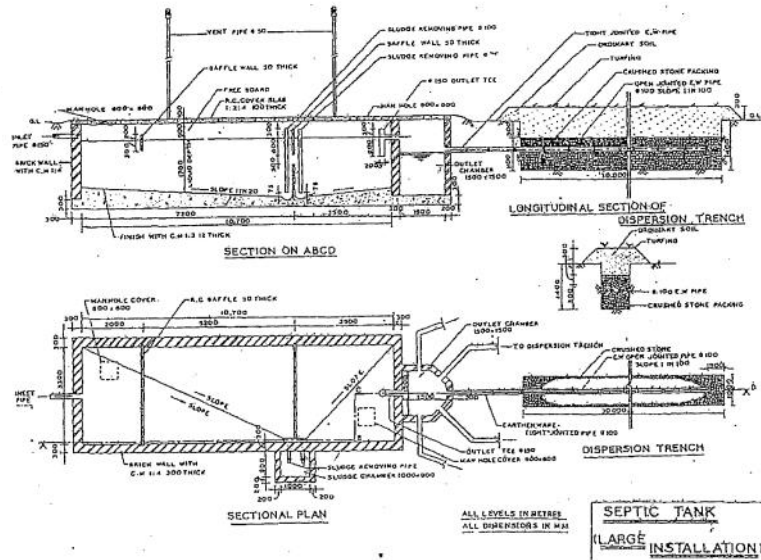
UNIT - I

1. Write the steps in sequence for the preparation of the following estimates for a large industrial building.
 - a) Approximate estimate
 - b) Detailed estimate
 - i) Quantity estimate
 - ii) Cost estimate
 - c) Expected completion estimate while work in progress
2. Estimate the quantity of brick work in foundation and quantity of concrete for roof slab for the building shown in figure.



UNIT - II

3. Take out the quantities for the various items of work involved in the construction of the septic tank shown in figure.



4. A road is to be constructed in as side long partly in cutting and partly in banking. The formation width of road is 10m, cross slope of ground is 6:1, sides slopes in banking 2:1 and in cutting 1.5:1 depth of cutting at the centre is 45cm although. Calculate the quantity of earthwork in banking and in cutting for a length of 200m. Estimate the cost of a making the formation of the road if the rate of earthworks is Rs. 1,50,000 per cubic meter

UNIT - III

5. a) Define Standard Data and explain how they are prepared.
- b) Define Schedule of Rates and explain the method of preparation.
6. a) What do you understand by Rate Analysis?
- b) Show by an example how the rates are arrived at for making 10SQ m of RCC slab including Fabrication of Steel and Shuttering for Laying of Slabs.

UNIT - IV

7. Explain in detail about the preparation of tender notice and document.
8. Explain arbitration with a case study.

UNIT - V

9. An owner occupied property is required to be values for the wealth tax purpose on land and building. The following particulars are available. Find the present value of property.

Value of hand = Rs. 4,00,000.00

Cost of the building to put up such a building at present = Rs. 10,00,000

Age of building = 40 years

Estimate Cost of Repairs =Rs. 50,000

Depreciation to be allowed for the building =0.75% per annum.

10. a) Write a valuation report for the above assuming suitable data.
- b) A building is likely to generate an income of Rs. 10 lacs per year up to 2040 , if renovation is under taken for Rs. 25 laths by the year 2015. What will be the buyer's assessment of the property at 5% interest rate during 2019?

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B.E. DEGREE EXAMINATION, 2019

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

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

May]

[Time : 3 Hours

Maximum : 75 Marks

Answer ONE FULL question from each unit

ALL questions carry EQUAL marks.

UNIT - I

- 1 (a) Briefly explain about the classification of water surface profiles with diagrams. (10)
- (b) Describe various types of flow in an open channel. (5)

2. The variables controlling the motion of a floating vessel through water the drag force F , speed V , length L , density ρ and dynamic viscosity μ of water and acceleration due to gravity g . Construct an expression for F by dimensional analysis. Using Rayleigh's method. (15)

UNIT - II

- 3 A impulse wheel has a mean bucket speed of 10 m/s with a jet of water flowing at the rate of $1.0 \text{ m}^3/\text{s}$ under a head of 50 m. The bucket deflects the jet through an angle of 165 degree. Calculate the power given by water to the runner and the hydraulic efficiency of the turbine. Assume co-efficient of velocity as 0.99. (15)
4. A jet of water 40 mm diameter strikes a hinged square plate at its centre with a velocity of 25 m/s. The plate is deflected through an angle of 30° . Find the weight of the plate. If the plate is not allowed to swing, what will be the force required at the lower edge of the plate to keep the plate in vertical position ? (15)

UNIT - III

5. A Pelton wheel is required to develop 9000 kW when working under the head of 300 m. The speed of the Pelton wheel is 600 rpm, the co-efficient of velocity is 0.99 and the speed ratio is 0.47. Assuming jet ratio as 15 overall as 90 %, determine:
- (a) Number of jets . (b) Diameter of the wheel.
(c) Quantity of water required. (15)
6. (a) Distinguish between impulse and reaction turbines. (10)
(b) Classify hydraulic turbines. (5)

UNIT - IV

- 7 The centrifugal pump has the following characteristics.
- Outer diameter of impeller is 800 mm .
Width of the impeller vane at outlet = 100 mm.
Angle of the impeller vanes at outlet is 40 degrees.
The impeller runs at 550 rpm and delivers 0.98 m³/sec under an effective head of 35 m. A 500 kW motor is used to drive the pump. Determine the manometric, mechanical and overall efficiencies of the pump. Assume water enters the impeller vanes radially at inlet. (15)
8. The diameters of a impeller of a centrifugal pump at inlet and outlet are 300 mm and 600 mm respectively. Determine the minimum starting speed of the pump of it work against head of 28 m. (15)

UNIT - V

- 9 Explain the working principle of single acting reciprocating pump with neat sketch. (15)
10. A single acting reciprocating pump running at 50 rpm delivers 0.01 m³/ sec of water. The diameter of the plunger is 200 mm and the stroke length is 400 mm. The delivery and suction head are 10 m and 5 m respectively. Determine the theoretical discharge, slip, percentage slip, co-efficient of discharge and the power required to drive the pump. (15)

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B.E. DEGREE EXAMINATION, 2019

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

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

April/May]

[Time : 3 Hours

Maximum : 75 Marks

*Answer any ONE FULL question from each unit
Assume any reasonable missing data*

UNIT-I

1. A beam ABC, 10m long, fixed at ends A and B is continuous over joint B and is loaded as shown in figure.1. Using the slope deflection method, compute the end moments and plot the bending moment diagram. Also, sketch the deflection shape of the beam. The beam has constant EI for both the spans.

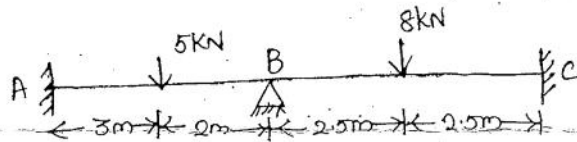
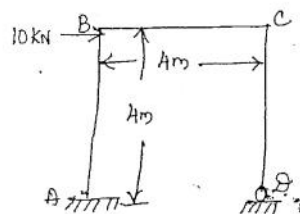


Figure -1

2. Analyse the portal frame shown in figure-2. Also sketch the deflected shape of the frame. The end A is fixed and end D is hinged.



EI constant

Figure -2

UNIT-II

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

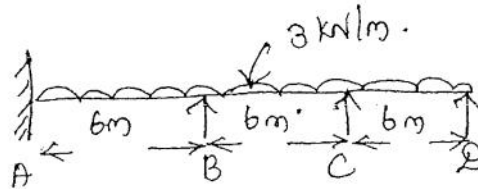


Figure - 3.

4. Analyse the portal frame in figure-4 by strain energy method. EI is constant.

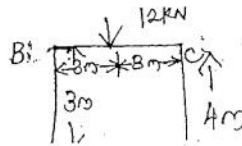


Figure-4

UNIT-III

5. Analyse the continuous beam ABC shown in figure-5, by the flexibility method and draw the bending moment diagram.

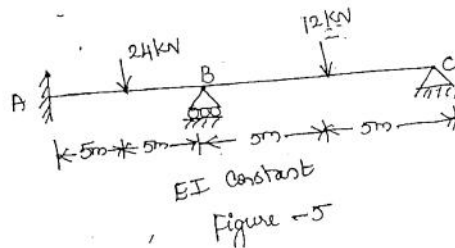


Figure - 5

6. Analyse the frame shown in figure-6 by the flexibility of matrix method. Take EI as constant.

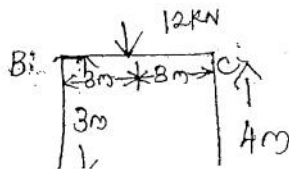


Figure-6

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UNIT-IV

7. Find the bar forces in the truss shown in fig-7 stiffness method. AE and L for all members are tabulated below.

Member	AE (MN)	L (cm)
AD, CD	300	300
BD	259.8	259.8

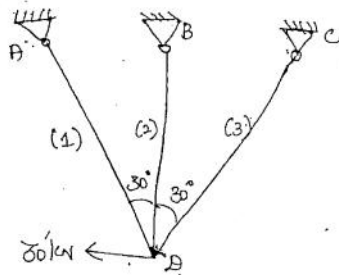


Figure-7

8. Explain the steps involved in the analysis of pin jointed plane frames using stiffness matrix method.

UNIT-V

9. A two span continuous beam ABC is fixed at A and simply supported over the support B and C, AB=6m and BC=6m. The moments of inertia is constant throughout. A single concentrated central load of 10 Tens act on AB and a udl of 8 ton/m acts over BC. Analyze the beam by matrix stiffness method.
10. Analyse the continuous beam shown in figure-8 by stiffness method. Assume uniform flexural rigidity of beam AB and BC= $EI=12 \times 10^{11}$ N-mm².

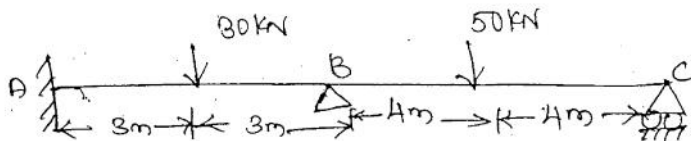


Figure - 8

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Name of the Candidate:

0424

B.E. DEGREE EXAMINATION, 2019

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

01PE-603: WATER SUPPLY ENGINEERING

April /May]

[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit (5 × 15 = 75)

UNIT - I

1. A town requires a water supply of 60 lakhs liter per day. Estimate the storage capacity of service reservoir required for the demand shown in the table for 16 hours continuous pumping from 4.00 am. Also express the capacity as percentage of daily demand.

Time in hours	0-4	4-5	5-9	7-9	9-12	12-14
Demand/hour	0.25a	1.25a	2.25a	1.50a	1.25a	1.00a

14-16	16-20	20-24
1.75a	1.00a	0.25a

Where 'a' is the average demand of water per hour.

2. Explain in brief the different methods used for prediction of future population of a city, with reference to the design of a water supply system.

UNIT - II

3. a) What are 'infiltration galleries' and 'infiltration wells'? Explain both with neat sketches.
b) Discuss the different types of tube wells.
4. Design a gravity transmission pipeline of MS pipe to carry a discharge of 65,000 Lpm. Length of pipeline is 4,200m. Available head difference between source and discharge level is 12m. Assume residual pressure required at discharge end as 2m. Assume Hazen-Williams coefficient (C) for the pipe material as 130.

UNIT - III

5. a) List and explain the factors to be considered in selecting pipe materials for water supply.
b) Water is to be supplied to a town with 1.5 lakhs population at the rate of 200 litres per capita per day from a river 2Km away. The difference in elevation between the lowest water level in the sump and service reservoir is 40m. Determine the size of the main and power of the pump required. Assume suitable data where required.
6. a) Design a pumping station to raise water from an intake well to sedimentation tank with the following data. Water to be raised per day-18000 m³, length of suction pipe-40m, length of rising main-150m, Hazen-Williams roughness coefficient -120. Diameter of suction and delivery pipe-0.5m. Shifts of working of pumps-2. Duration of each shift-8-hours. Combined efficiency of motor and pump 80%. Static head through which water is to be raised-21m.

- b) Draw a centrifugal pump characteristics curve and indicate the operating point and operating range of the pump.

UNIT - IV

7. A new township is to have a population of 2,00,000 and 90 Lpcd of water supply. Design a rapid sand filter unit with details of under drainage and water washing including gutter arrangement. Limit the maximum spent backwash water as 3.5%.
8. a) A sample of water contains 210mg/L alkalinity, 55mg/L hardness as CaCl_2 and 75mg/L hardness as CaCl_2 and 75mg/L hardness as MgSO_4 . Compute the quantities of lime and soda ash required to treat 1 million liters of water. If in place of pure lime. Slaked lime with 85% purity is available, find the required quantity of slaked lime.
- b) Describe various methods of removing iron and manganese from ground water.

UNIT - V

9. Illustrate with sketches, the different types of layouts of pipe system in distributing water and compare their merits and demerits.
10. Determine the balanced flows and head losses in water supply (15) distribution network shown in fig-1 using hardy cross method (Stop with two iterations) C_H value for all the pipes=110.

Pipe	Diameter	Length(m)
AB	300	1000
BC	200	2500
BD	300	3000
AD	400	3500
DC	200	600

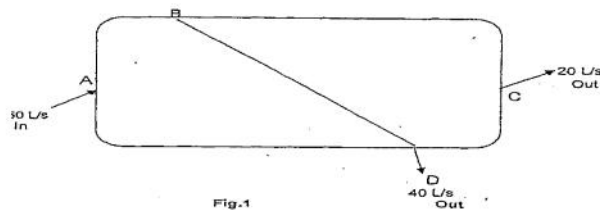


Fig.1

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Name of the Candidate:

B.E. DEGREE EXAMINATION, 2019

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

01PE-604: GROUND WATER ENGINEERING

April/May]

[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit (5 × 15 = 75)

UNIT - I

1. Explain how rock properties affect ground water.
2. a) Write the limitations of Darcy's law. (8)
b) Write the factors affecting permeability. (7)

UNIT - II

3. Explain the laboratory method of measuring permeability.
4. Derive the discharge equation of a well in an unconfined aquifer.

UNIT - III

- ~~5. Explain the method of drilling deep well.~~
6. Write short notes on the following: (i) Conjunctive use (ii) Collector wells (iii) Ground water management.

UNIT - IV

7. Explain geophysical method of ground water exploration.
8. a) Outline briefly on subsurface investigation of groundwater.
b) Write short notes on 'test drilling' and 'resistivity' methods.

UNIT - V

9. Explain Glyben-Horzberg relation between fresh-water and saline water.
 10. Explain any three methods or artificially recharging ground water.
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Register Number:

0486

Name of the Candidate:

B.E. DEGREE EXAMINATION, 2019

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

CLEC-604/PCLEC-503: FOUNDATION ENGINEERING

April/May]

[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit (5 × 15 = 75)

UNIT - I

1. What are the different types of shallow foundation? Explain with the neat of sketches.
2. A rectangular footing has a size of 1.8m×3m has to transmit the load of a column at a depth of 1.5m. Calculate the safe load which the footing can carry at a factor of safety of 3 against shear failure use IS code method. The soil has the following properties: porosity, $\eta=40\%$; specific gravity, $G=2.67$; water content, $w=15\%$ cohesion, $C=8\text{kN/m}^2$; angle of shearing resistance $\theta=32^\circ$; for $\theta=32^\circ$; $N_c=36$; $N_q=23$ and $N_\gamma=30$.

UNIT - II

3. Discuss the various factors influencing the bearing capacity of a footing on (i) a cohesionless soil and (ii) a purely cohesive soil.
4. A square footing of size 4×4m is founded at a depth of 2m below the ground surface in loose to medium dense sand. The corrected standard penetration test value $N=11$. Compute the net safe bearing pressure for a settlement of 40mm.

UNIT - III

5. What is earth pressure at rest? Derive an expression for determining the magnitude of earth pressure for at rest condition.
6. A wall with smooth vertical back, 10m high supports a purely cohesive soil cohesion as 10kN/m^2 and unit weight as 18kN/m^3 . Determine (a) total Rankine's active pressure against the wall; (b) position of zero pressure; (c) distance of the centre of pressure above the base.

UNIT - IV

7. Discuss the method of obtaining ultimate load and also allowable load on a single pile from pile load test.
8. What is 'negative skin friction' on pile and why does it cause concern? How do you estimate its value in clay and sandy soil? Suggest means of controlling it.

UNIT - V

9. Explain (a) Well foundation (b) Cofferdams (c) Foundations for machinery
 10. What do you understand by IS code provisions for under reamed piles? Explain it.
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B.E. DEGREE EXAMINATION, 2019

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

01PE-604: GROUND WATER ENGINEERING

April/May]

[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit (5 × 15 = 75)

UNIT - I

1. Explain how rock properties affect ground water.
2. a) Write the limitations of Darcy's law. (8)
b) Write the factors affecting permeability. (7)

UNIT - II

3. Explain the laboratory method of measuring permeability.
4. Derive the discharge equation of a well in an unconfined aquifer.

UNIT - III

- ~~5. Explain the method of drilling deep well.~~
6. Write short notes on the following: (i) Conjunctive use (ii) Collector wells (iii) Ground water management.

UNIT - IV

7. Explain geophysical method of ground water exploration.
8. a) Outline briefly on subsurface investigation of groundwater.
b) Write short notes on 'test drilling' and 'resistivity' methods.

UNIT - V

9. Explain Glyben-Horzberg relation between fresh-water and saline water.
 10. Explain any three methods or artificially recharging ground water.
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0487

Register Number:

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B.E. DEGREE EXAMINATION, 2019

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

CLEC-605/PCLEC-502 ENVIRONMENTAL ENGINEERING -I

(Common with Part-Time)

April/May]

[Time: 3 Hours

Maximum: 75 Marks

Answer any ONE FULL Question from each Unit (5 × 15 = 75)

UNIT - I

1. a) Briefly explain the objectives of the public water supply system. (7)
- b) Enumerate the salient features of water supply scheme. (8)
2. Describe the methods of forecasting the population of town with example. (15)

UNIT - II

3. Illustrate the different types of intake with neat sketch. (15)
4. a) Explain the various sources of water. (8)
- b) Describe the methods of development of well. (7)

UNIT - III

5. a) How to selection pipe materials for water supply systems? Explain in detail. (7)
- b) Illustrate the different types of pipe appurtenances used in water supply project. (8)
6. Enumerate the method of laying, jointing and testing of pipeline. (15)

UNIT - IV

7. a) Briefly discuss the theory and purpose of sedimentation. (5)
- b) Describe in detail the zeolite process for the removal of permanent hardness in water. (10)
8. What is distiction? What are the factors affecting disinfection? Explain the methods of disinfection. (15)

UNIT - V

9. a) Distinguish between Continuous and Intermittent water supply system. (5)
- b) Enumerate the types of distribution reservoirs. (10)
10. Explain the hardy cross method used for pipe network analysis in water distribution system. (15)

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B.E. DEGREE EXAMINATION, 2019

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

01PE-605: CONSTRUCTION MANAGEMENT

April /May],

[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit (5×15=75)

UNIT - I

1. Explain the various functions of construction management and give its application.
2. Explain the procedure of the estimating the resource requirements for activities.

UNIT - II

3. Classify organization and explain its types in detail.
4. Explain the procedure of organization labour and construction labour.

UNIT - III

5. Explain in detail the classification of contract planning.
6. Explain the advantages and limitations of planning.

UNIT - IV

7. Explain the difference between CPM and PERT in detail.
8. Explain the various types of float and single time estimates.

UNIT - V

9. Explain the important points to be checked during inspection of Masonry.
10. Explain legal and financial aspects of accidents in construction.

Register Number:

0488

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B.E. DEGREE EXAMINATION, 2019

(CIVIL ENGINEERING)

(SIXTH SEMESTER)

**CLEC-606/ PCLEC-601: CONSTRUCTION TECHNIQUES
AND MANAGEMENT**

(Common with Part Time)

April/May]

Maximum: 75 Marks

[Time: 3 Hours

Answer any ONE FULL Question from each Unit (5 × 15 = 75)

UNIT - I

1. (a) Explain the modern methods of construction of site. (8)
- (b) Discuss the need for prefabrication. (7)
2. Elaborate the process of production, transportation and erection of precast units in prefabrication construction. (15)

UNIT - II

3. a) Illustrate the modern construction method for industrial buildings. (7)
- b) Explain the various operations involved in multipurpose excavators with neat sketch. (8)
4. Write a detail note on types of hoisting and conveying cranes with neat sketch. (15)

UNIT - III

5. Explain the objectives and function of construction management. (15)
6. What is contract? Explain different types of contracts. (15)

UNIT - IV

7. a) Describe about classification of scheduling. (7)
- b) What are the limitations of Bar chart? (8)
8. State the objectives of Network Analysis. Explain the procedure of Network analysis and also state its advantages. (15)

UNIT - V

9. The following table gives the activities in a construction project and other relevant information:

Activity	Duration
1-2	20
1-3	25
2-3	10
2-4	12
3-4	6
4-5	10

- i) Draw the network for the project
- ii) Find the critical path
- iii) Find free, total and independent floats for each activity. (15)
10. Discuss in detail, direct project cost and indirect project cost with example. (15)

Register Number:

0427

Name of the Candidate:

B.E. DEGREE EXAMINATION, 2019
(CIVIL ENGINEERING)
(SIXTH SEMESTER)
01OE-606: URBAN AND RURAL PLANNING

April /May]

[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from Unit I to IV (5 × 15 = 75)

UNIT - I

1. Enumerate the important features to be considered in the selection of site for an ideal town.
2. Write down the detailed note on development of town planning in ancient India.

UNIT - II

3. List out the various classification of residential buildings? Explain any three.
4. Discuss in details the important points to be remembered in the planning of modern town.

UNIT - III

5. What is the necessity of road junctions? Explain the various types of road junctions.
6. Explain the factors to govern while providing the parking facilities and street lighting.

UNIT - IV

7. Discuss the control rules for Metropolitan and District Municipalities.
8. Discuss briefly the objectives and necessity of existing towns.

UNIT - V

9. Define the term Rural Planning. Explain the principles of Rural Planning.
10. Explain briefly the concept of grouping of houses.

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