(DCE 311)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Third Semester)

CIVIL ENGINEERING

Paper – I : Structural Analysis-I

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) a) Define potential energy and strain energy.

b) State the theorem of minimum potential energy.

c) State Castigliano's second theorem.

d) State Betti's generalised reciprocal theorem.

e) Construct influence lines for reaction at left support A, shear and BM at section X of a simple beam.

f) Define Beggs deformation.

g) How is the propreaction determined.

h) What is an encastre beam.

i) Define a continuous beam.

j) Define Clapeyron's theorem of three moments.

k) When settlements of supports occurs?

l) Why do we perform approximate analysis.

m) What is a redundant frame.

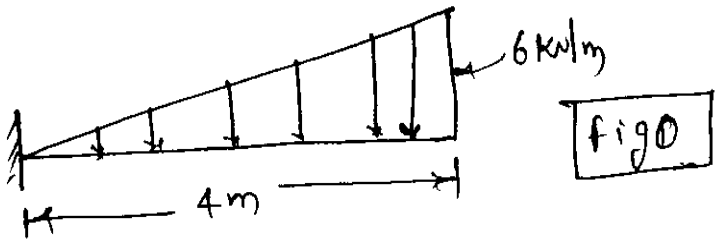
n) What is kinematic indeterminacy.

o) How to determine the internal degree of redundancy?

UNIT - I

2) a) State and explain Castigliano's first theorem.

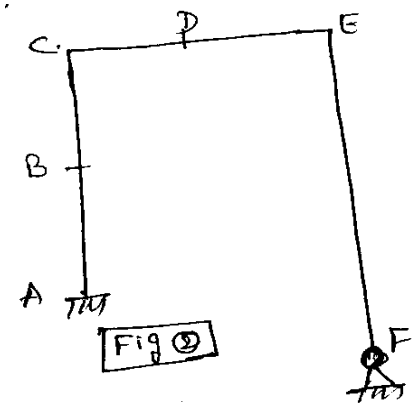
b) Determine the deflection at the free end of a cantilever beam shown in fig1.



Fig①

OR

3) A vertical downward load of 30 KN acting at D in the portal frame shown in fig2 displaces the frame horizontally by 1.5 mm at B towards left and rotates support 'F' by 0.009 rad. Calculate the deflection of D in the vertical direction due to a horizontal load of 20KN applied at B towards right and a counter clockwise moment of 5KNm acting at F.



Fig②

UNIT - II

4) Two concentrated loads of 75KN and 160KN separated by a distance of 4.5m between them rolls across a beam of 12m from left to right with 75 KN load leading the train. Calculate the maximum negative SF and maximum BM at mid- span of the beam.

OR

5) Determine the reaction R_B at support B, and shear V_x and moment M_x at section X in a propped beam shown in fig3 using influence diagram when a UDL of 28KN/m is applied on the beam on its full span (or) on a part of it.

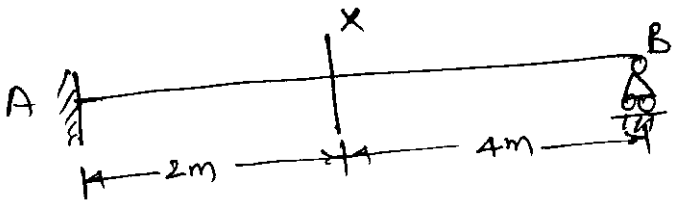


Fig ③

UNIT - III

6) Find the deflection at 'C' in the beam shown in fig4. Take EI=9000 KNm^2. Use strain energy method.

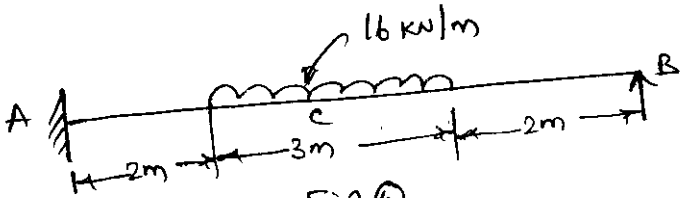


Fig ④

OR

7) Derive expressions for fixed-end moments in a fixed beam of span 'L' carrying UDL of w KN/m by consistent deformation method.

UNIT - IV

8) Determine the forces in all the members of the truss shown in fig5. The area of all the members is 450mm^2 and E=200000 N/mm^2, remains same for all members.

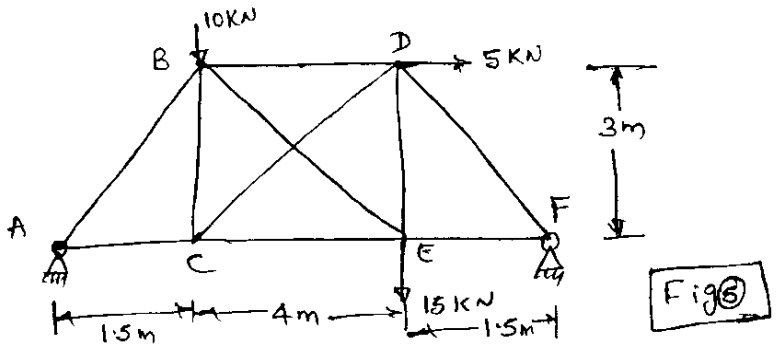


Fig ⑤

OR

9) Find the deflection at the free end of a cantilever arc beam of radius 5m when a concentrated load of 30KN acts at the free end E=15000 KN/m^2 .

(DCE 312)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Third semester)

CIVIL ENGINEERING

Paper – II : Environmental Engineering-I

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) Explain the following

a) Whole some water

b) Reservoir intake

c) Standards for drinking water pH & Turbidity

d) Coagulation

e) Rapid sand Filter

f) Non-return Valve

g) Removal of colour

h) Traps

UNIT - I

2) a) What is meant by design period . Explain briefly methods of population forecasting?

b). Explain the necessity of water supply scheme?

OR

3) a) What is the function of intake and describe lake intake with a neat sketch.

b) The population of city obtained from cengus report is as given below.

Year	1941	1951	1961	1971	1981	1991	2001
Population	25400	27800	34700	41500	47350	54600	61700

Estimate the population of the city for the year 2021 and 2031 by Arithmetical increase and Geometrical increase methodes

UNIT - II

4) Explain the following

a) Types of conduits

b) Water Analysis.

OR

5) a) Compare slow sand and rapid sand filters.

b) Write the procedure for determination of optimum coagulant dose.

UNIT - III

6) Write short notes on.

a) Taste and odour control

b) Iron and manganese removal

OR

7) a) Explain in brief different methods of disinfection of water?

b) What is meant by deflouridation and explain Nalgonda technique?

UNIT - IV

8) Describe various layouts of distribution system with neat sketches and also explain advantages and disadvantages?

OR

9) Explain the following

a) Hydrants

b) Sluice valve & Air valve

c) Sanitary fittings

(DCE 313)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Third Semester)

CIVIL ENGINEERING

Paper – III :Water Resources Engineering-I

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) List out the different types of precipitation.

b) Write any one application of the unit hydrograph.

c) What are Aquicludes?

d) Define irrigation.

e) Give the classification of water resources development projects.

f) What do you understand by permanent witting point?

g) How do you measure consumptive use directly?

h) State the formula for calculating water application efficiency.

i) What are inundation canals?

j) Mention any two ill effects of water logging.

k) Write any two types of weirs.

l) What is the main purpose of canal lining?

m) State any one method of silt control at head works.

n) Give the necessity and location of falls.

o) What is meant by canal escape?

UNIT - I

2) a) Briefly explain the classification of different types of raingauges. Explain the working of any one raingauge.

b) The rate of rainfall for the successive 30min period of a 3hr storm are 1.6, 3.6, 5.0, 2.8, 2.2, 1.0 cm/hr. The corresponding surface runoff is estimated to be 3.6cm. Estimate the ϕ index and ω index.

OR

3) a) Explain in detail about Recuperation test.

b) A 4hr hydrograph for a project site in a river basin is given below. Calculate 2h UH by s-hydrograph approach.

Time(h)	0	2	4	6	8	10	12	14	16	18	20	22	24	26
UH ordinates (m^3/sec)	0	30	110	170	210	120	110	80	40	35	20	15	5	0

UNIT - II

4) a) State the benefits and ill effects of irrigation.

b) A stream of 160 lit/sec was delivered from a canal and 120 lit/sec were delivered to the field. An area of 2.4 hectares was irrigated in eight hours. The effective depth of root zone was 1.5 m. The runoff loss in the field was 450 m^3. The depth of water penetration varied linearly from 1.5 m at the head end of the field to 1.2 m at the tail end. Available moisture holding capacity of the soil is 220 mm/m depth of soil. Determine water conveyance efficiency, water application efficiency and the water irrigation was started at a moisture extraction level of 60%.

OR

5) a) Explain the different steps involved in the planning of a water resources project.

b) State the advantages of drip irrigation over sprinkler irrigation system.

UNIT - III

6) a) Write a detailed notes on comparison of Kennedy's and Lacey's silt theory.

b) A canal is to be designed to carry a discharge of 700cumecs. The bed slope is kept at 1 in 1500. The soil is coarse alluvium having a grain size of 5cm. Assuming the canal to be unlined with unprotected banks and of a trapezoidal section, determine a suitable section for the canal, ϕ for the soil may be taken as 35º.

OR

7) a) Explain the use of Garret's diagram for designing irrigation canals.

b) Briefly explain the pressure release arrangements behind canal lining.

UNIT - IV

8) a) Explain the various steps involved in Bligh's creep theory in the design of weirs.

b) Explain in detail the various types of outlets.

OR

9) a) Explain the various effects of construction of a weir on the regime of river.

b) Explain the differences between Lane's weighted creep theory and Khosla's theory.

(DCE 314)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Third Semester)

CIVIL ENGINEERING

Paper - IV : Design of Concrete Structures - I

Time : 3 Hours **Maximum Marks: 75**

Answer ONE question from each unit

All questions carry equal marks

UNIT - I

1) A flange of an Isolated T-beam is 100mm thick and 1600 mm wide. Its web is 250mm wide and the effective depth of the beam upto the centre of tensile reinforcement is 600mm. The tensile reinforcement consists of 4ms 20mmϕ bars. The beam is simply supported over a span of 7mts. If the beam section is subjected to a bending moment of 160kNm, calculate the stresses developed in concrete and steel reinforcement. Take M = 19 (WSM).

OR

2) A rectangular R.C. beam 200 mm × 400mm is section is reinforced with 4bars 16mm diameter with a clear core of 25mm. If the permissible stress is concrete is 2.5N/mm^2 in tension, 5N/mm^2 in compression and 140N/mm^2 in steel in tension, find out if the beam is capable of supporting any load is addition to its own weight without developing cracks, m = 19 and weight of concrete is 25000N/m^3. (WSM)

UNIT - II

3) Explain the terms:

a) Characteristic strength and characteristic loads.

b) Partial safety factor.

OR

4) Desing a doubly reinforced section for a rectangular beam at mid span having a simply supported effective span of 7mts. The super imposed load is 100 kN/m and the size of the beam is limited to 300mm × 700mm overall. Use M_{20} mix and Fe_{415} grade steel (LSM).

UNIT - III

5) a) Sketch the various types of shear reinforcement normally provided in practice.

b) Briefly explain how the torsional moment is taken care in the design of beams.

OR

6) A simply supported beam of 320mm × 460mm section has 3ms – 20mmϕ HYSD bars going into the support. If shear force at the centre of support is 170kN at working loads, determine the anchorage length. Sketch the anchorage details. (LSM).

UNIT - IV

7) A room 3m × 7m is size is to be provided with a reinforced brick floor slab. The floor may be assumed to be subjected to a super-imposed load of 2500N/sq.m. Flooring is to be finished with 20mm thick terrazzo finish - following data may be assumed in the design.

σ_{st} = 140N/mm^2, σ_{cbc} = 2.5N/mm^2, m = 40.

Draw a dimensionsed sketch of the designed slab. (WSM).

OR

8) Design second flight of dog legged stair, given the following data

Floor to floor height = 3.6m

Steps of size = 150mm rise and 280mm tread

Imposed load = 3.2 kN/m^2

Dimension of stair case = 2.4m × 5.5m

Assume stair are to be supported on landing beams of width 250mm parallel to stairs. Use σ_{cbc} = 5N/mm^2, σ_{st} = 140N/mm^2, m = 19. Sketch details of reinforcement (WSM).

UNIT - V

9) The portico of a guest house building consists of cantilever beams of effective span 3m, spaced at 2.5m centre to centre. The beams support 120 mm thick slab. Live load on slab is 1.8kN/m^2. Using concrete mix of M_{20} and steel Fe_{415}, design an intermediate beam if slab is flush with (LSM).

a) Top of beams

b) Bottom of beams

OR

10) At a particular cross section of R.C. beam 300mm × 600mm in size, a factored bending moment of 140kN-m, a factored shear force of 120kN and a factored torsion moment of 65kN-n are acting. Design the necessary reinforcements using M_{25} concrete and Fe_{415} HYSD bars (LSM).

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(DCE 315)

B. Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Third Semester)

CIVIL ENGINEERING

Paper – V : Design of Steel Structures-I

Time : 3 Hours **Maximum Marks: 75**

Answer any FIVE questions.

All questions carry equal marks.

UNIT - I

1) a) What are the advantages of welded connections over fillet welded connections.

b) Write neat sketches and explain about different types of welds.

OR

2) Design a single angle section for a tension member of a roof truss to carry a pull 150 kN. The member is subjected to possible reversal of stress due to action of wind. The length of the member from centre to centre of intersection is 4.00 mts.

UNIT - II

3) A steel column 12m long and carries an axial load of 1600 kN. The column is hinged at both the ends. Design an economical built up section, with double lacing. Design the lacing also.

OR

4) A column effectively held is position but not in direction at their end is 4 mts long and carries an axial load of 800 kN and end moment of 35000 mm/kN. Design the column if only rolled steel beam sections are available. Adopt the stress as per IS code.

UNIT - III

5) A column section ISHB 250 @ 0.510 kN/m carries an axial load of 800 kN. Design a slab base for the column. The allowable bearing pressure on concrete is 4 N/mm^2. The allowable bending stress is the slab base is 185 N/mm^2(MPa).

OR

6) Design a foundation footing for a column carrying 1600 kN of vertical load along with a moment in the same vertical plane equal to 250 m-kN. The bearing capacity of the soil is 230 kN/m^2. The width of foundation should not exceed 2 metres.

UNIT - IV

7) Design a simply supported beam to carry a uniformly distributes load of 45 kN/m. The effective span of beam is 8 mts. The effective length of compression flange of the beam is also 8 mts. The ends of beam are not free to rotate at the bearings.

OR

8) Design a simply supported plated rolled steel beam section to carry a uniformly distributed load 100 kN/m inclusive of self-weight of beam. The effective span of beam is 10 mts. The depth of beam should not be more than 500 mm. The compression flange of the beam is laterally supported by floor construction.

UNIT - V

9) In a framed connection, an ISLB 325 @ 0.431 kN/m transmits an end reaction 150 kN and a moment 21.0 kN-m to a column ISHB 300 @ 0.530 kN/m. Design a clip angle connection.

OR

10) Design a framed connection to connect an ISLB 350 @ 485.6 N/m transmitting as end reaction of 350 kN to the web of ISMB 550 @ 1017.3 N/m.

a) Design the riveted connection.
b) Design the welded connection.

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(DCE 316)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Third Semester)

CIVIL ENGINEERING

Paper - VI : Geo-Technical Engineering-I

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) Define compaction.

b) Define permeability.

c) What is the relationship between porosity and void ratio?

d) Define air content.

e) What is the use of flow net?

f) Define liquid limit.

g) How to determine plastic limit of the soil sample?

h) Define Relative Density.

i) Define Darcy's law.

j) When LL = 75, PL = 35, what is the soil classification?

k) Define sensitivity.

l) Define compression index.

m) What are the different types of laboratory tests to determine shear strength.

n) Draw a compaction curve and zero air voids line.

o) How to determine moisture content by using oven drying method?

UNIT - I

2) a) Explain soil formation.

b) A borrow area soil has a natural water content of 10% and bulk density of 1.80 mg/m^3. The soil is used for an embankment to be compacted at 18% moisture content to a dry density of 1.85 mg/m^3. Determine the amount of water to be added to 1.0 m^3 of borrow soil. How many cubic meters of excavation is required for $1m^3$ of compacted embankment.

OR

3) a) Explain Relationship between the void ratio and water content.

b) Define:

i) Degree of saturation.

ii) Percentage Air voids.

iii) Water content.

iv) Bulk unit weight.

UNIT - II

4) a) Explain particle size classification.

b) Explain effective stress principle.

OR

5) a) Define Darcy's law and explain validity of Darcy's law.

b) How to determine permeability by using constant head method?

UNIT - III

6) Derive the Laplace Equation for seepage Analysis.

OR

7) a) Briefly explain standard proctor test.

b) Explain effect of compaction on properties of soils.

UNIT - IV

8) How to determine coefficient of consolidation by using:

a) Square-root of time method.

b) Logarithmic time fitting method.

OR

9) a) Explain basic differences between a box shear test and triaxial shear test for soils.

b) Explain vaneshear test.

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(DCE 321)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Fourth Semester)

CIVIL ENGINEERING

Paper - I : Structural Analysis-II

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) Why a slope-deflection method is so called?

b) What are end moments?

c) How Kinematic indeterminacy of a structure is estimated?

d) What is side way?

e) Differentiate between absolute stiffness and relative stiffness.

f) What is modified stiffness factor?

g) What is distribution factor?

h) Write the uses of Kani's method.

i) How rotation factor is calculated in Kani's method?

j) How supports as settled?

k) How an arch differs from a beam?

l) State the eddy's theorem?

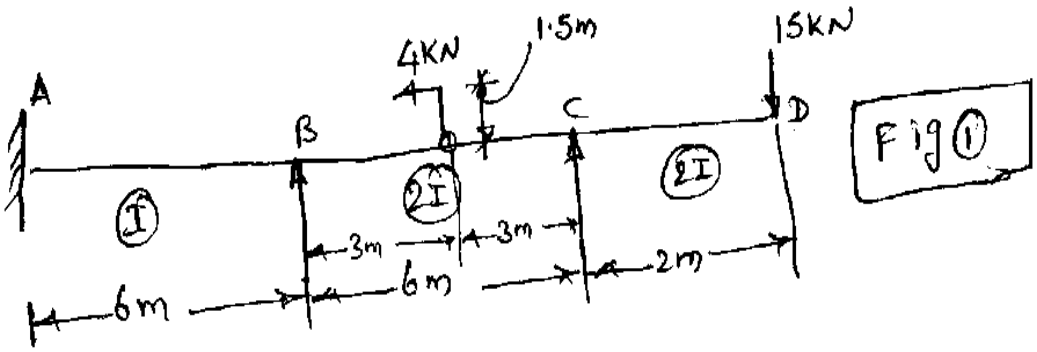
m) List out different types of archs.

n) What are the basic characteristics of cable?

o) Define geometry of a cable.

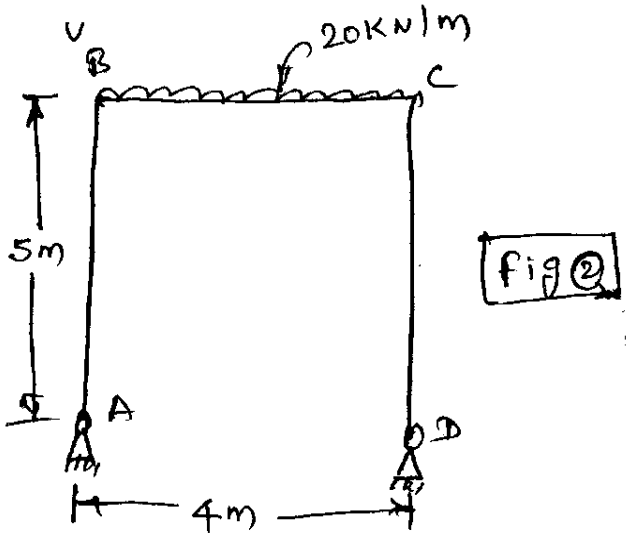
UNIT - I

2) A continuous beam with left end fixed with an overhang on the right is shown in Fig. 1. Determine the end moments by slope-deflection method. Also draw the SFD and the BMD for the beam.



OR

3) Analyse the frame shown in Fig. 2 by slope-deflection method. Use simplification for hinged end.



UNIT - II

4) Analyse the frame of Fig. 3 by moment distribution method.

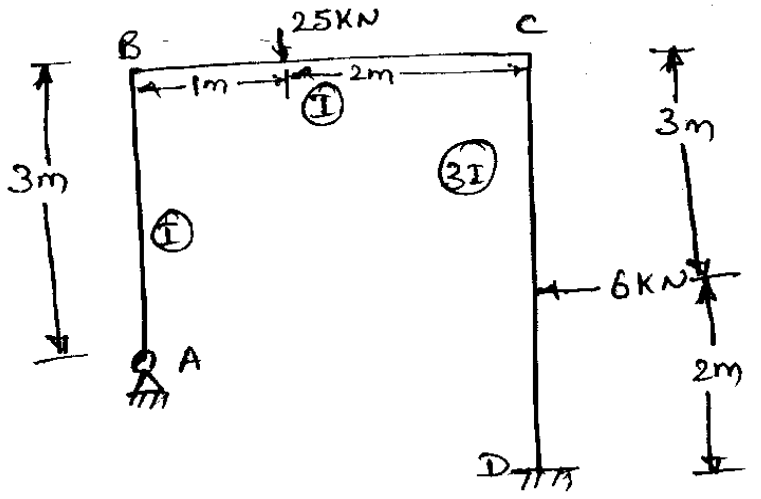


Fig (3)

OR

5) Analyse the continuous beam shown in Figure 4 by moment distribution method and draw bending moment diagram.

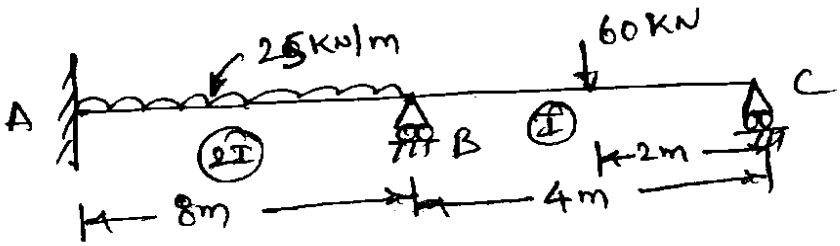


Fig (4)

UNIT - III

6) Analyse the following frame 5 by portal method of analysis. Draw the axial force diagram.

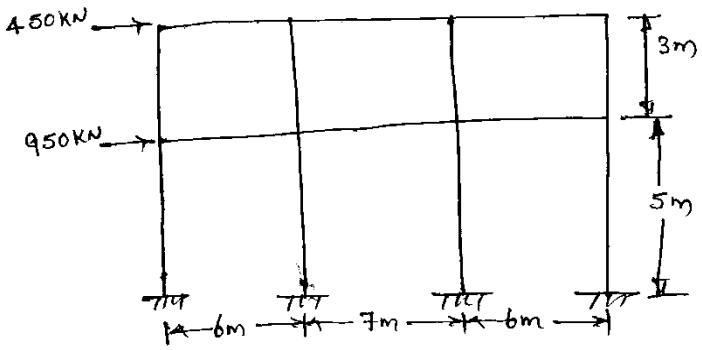


Fig (5)

OR

7) Analyse the frame loaded as shown in Fig. 6. by Kani's method and sketch the bending moment diagram.

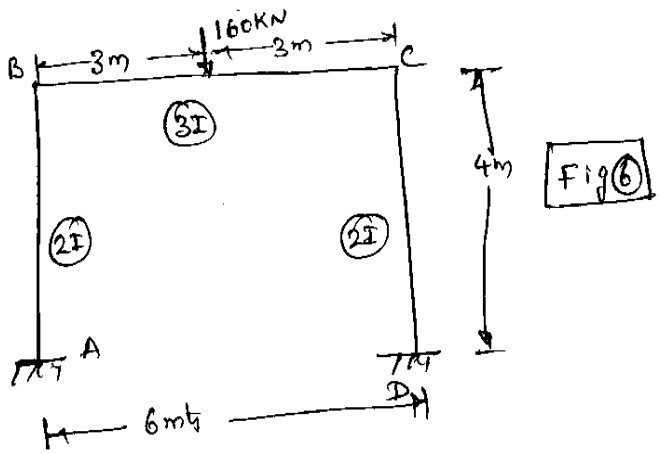


Fig 6

UNIT - IV

8) Determine the horizontal thrust developed in a two hinged semicircular arch subjected to a uniformly distributed load of w/unit length over the left half of the arch. Assume EI to be constant throughout.

OR

9) A cable is supported at the same level between two points spanning a distance of 380 mts. It carries UDL of 160 kN/m horizontally. If the central dip is 30 mts, compute the maximum tension in the cable.

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(DCE 322)

B. Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Fourth Semester)

CIVIL ENGINEERING

Paper - II: Transportation Engg.-I

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is Compulsory *(15)*

Answer ONE Question from each unit *(4×15=60)*

1) a) What is the Role of transportation in Rural Development.

b) Define super elevation.

c) Draw a Road pattern for Radial (or) Star and circular pattern.

d) Define surface drainage.

e) Write three sight distance situations are considered in the design.

f) Write any four factors affecting friction.

g) Define preliminary survey.

h) What is the importance of a Project Report.

i) What is Geometric Design.

j) Define Rigidity Factor.

k) Define Traffic volume study.

l) Classify the different gradients for vertical alignment.

m) What are the classification of urban roads.

n) What are the different types of Roads.

o) What is the Role of Transportation in "CIVIL ENGG".

UNIT-I

2) a) Explain necessity of highway planning.

b) Explain Nagpur Road plan (or) I-20 year Road plan.

OR

3) a) Explain Drawings in a Highway project.

b) What are the engineering surveys for highway location and explain any two surveys.

UNIT-II

4) Briefly explain overtaking sight distance with neat sketch and analysis of overtaking sight Distance.

OR

5) a) The Radius of a Horizontal circular curve is 100m. The Design speed is 50 kmph and the Design coefficient of Lateral friction is 0.15.

i) Calculate the super elevation Required in full lateral friction is assumed to develop.

ii) Calculate the coefficient of Friction needed if no super elevation is provided.

iii) Calculate the Equilibrium super elevation if the pressure on inner and outer wheels should be equal.

b) Explain I.S. soil classification system.

UNIT-III

6) What is mean by Design of Flexible pavements and list out various flexible pavement design methods and explain any two.

OR

7) a) Write construction procedure for WBM Roads.

b) Explain Transverse Joints.

UNIT-IV

8) a) Explain pavement evaluation.

b) List out typical Flexible pavement Failures and explain any two.

OR

9) a) What is the importance of Highway drainage .

b) Explain Road construction in water-Logged areas.

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(DCE 323)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Fourth Semester)

CIVIL ENGINEERING

Paper - III : Water Resources Engineering - II

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) What is the significance of Pitot tube?

b) List out various methods of discharge measurement.

c) Define Meandering?

d) Define Groynes.

e) Define Double-float.

f) What is the use of stilling basins?

g) What is meant by Flood Routing?

h) What is meant by Reservoir sedimentation?

i) List out types of galleries.

j) Give the expression for factor of safety on overturning.

k) What is meant by load curve?

l) Define soil erosion.

m) Define turbine.

n) List out types of spillways.

o) What is stream guage?

UNIT - I

2) a) Explain any three velocity measuring devices in a stream.

b) Explain the significance of guaging site? How the guaging sites are selected? Justify with the example.

OR

3) a) Explain different types of cross drainage works.

b) Explain the selection of site for an Aqueduct with an neat sketch and example.

UNIT - II

4) a) Explain the method of construction of Mass inflow curve and Demand Curve with neat sketches.

b) Explain various factors affecting the site proposed for a reservoir.

OR

5) a) What are the types of Dams? Explain the possible failures of Earthen dams with neat sketches.

b) Define:

i) firm yield.
ii) design yield.
iii) secondary yield.
iv) zones of storages in a reservoir based on purpose with neat sketch.

UNIT - III

6) Explain various forces Acting on a gravity dam with expressions and neat sketches.

OR

7) Explain elementary profile and practical profile of a gravity dam with neat sketches.

UNIT - IV

8) Describe with neat sketches, the various seepage control measures in foundation and body of earthen dam.

OR

9) Define:

a) Power-Duration curve.

b) Load curve.

c) Load factor.

d) Capacity factor.

e) Utilization factor.

f) Pen-stock.

g) Diversity factor.

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(DCE 324)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Fourth Semester)

CIVIL ENGINEERING

Paper - IV : Design of Concrete Structures - II

Time : 3 Hours **Maximum Marks: 75**

Answer ONE question from each unit

All questions carry equal marks

UNIT - I

1) A 450mm × 450mm column 12000mm long is restrained at both ends and is required to carry an axial load of 980kN. Design the column using M_{20} grade of concrete and mild steel reinforcement. (WSM).

OR

2) Design a continuous R.C. slab for a class room 7m wide and 14mts long. The roof is to be suppoted on R.C.C. beams spaced at 3.5mts intervals.The width of beam should be kept 250mm. The super imposed load is 3.5kN/m^2 and finishing load expected is 1kN/m^2. Use M_{20} concrete and Fe_{415} steel. (LSM)

UNIT - II

3) Design a reinforced slab for a room of clear internal dimensions 3m × 5m supported on walls of 300mm thickness, with corners held down. Two adjacent edges of the slab are continuous and other two discontinuous. Live load on the slab is 3.2kN/m^2. Assume floor finish of 1KN/m^2. Use M_{20} concrete and Fe_{415} steel. Sketch the details of reinforcements. (LSM).

OR

4) Design an interior panel of a flat slab of size 5m × 5m without providing drop and column head. Size of columns is 500 × 500mm and live load on the panel is 4.5kN/m^2. Take floor finishing load as 1kN/m^2, use M_{20} concrete and Fe_{415} steel. (LSM).

UNIT - III

5) A R.C.C. square column is to be designed to carry a factored load of 2450kN. The reinforcement is to be restricted to 2% of gross area. Adopting M_{25} concrete and Fe_{415} steel, design the column. The column may be considered as short. (LSM).

OR

6) Design a column of size 450mm × 300mm using M_{30} concrete and Fe_{415} steel. Given l_{ex} = 6.0m, l_{ey} = 5.5m, P_u = 1650 kN, M_{ux} = 45kN-m at top and 30kN-m at bottom, M_{uy} = 40kN-m at top and 25KN-m at bottom. (LSM)

UNIT - IV

7) a) Write a brief note on earth pressures in case of Retaining walls.

b) Write a brief note on stability of Retaining wall.

OR

8) Design the stem of a cantilever retaining wall to retain an earth embankment with a horizontal top 3.75m above ground level. Density of earth as 19kN/m^3. Angle of internal friction ϕ=30º. SBC of soil is 200kN/m^2. Co-efficient of internal friction between soil and concrete is 0.5. Adopt M_{20} grade concrete and Fe_{415} grade steel (LSM)

UNIT - V

9) Design a footing of uniform thickness for a column of size 400mm × 400mm carrying a load of 1260 kN. SBC of soil is 250kN/m^2. Use M_{20} concrete and Fe_{415} steel. Sketch the reinforcement details.

OR

10) Design a combined footing to support two columns of sizes 400 × 400mm speed 4m apart, carrying axial loads of 860kN and 1250kN respectively. The SBC of soil is 140kN/m^2. The property line is 0.8m from the centre of column carrying 860kN load. Adopt M_{20} concrete and Fe_{415} steel.

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(DCE 325)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Fourth Semester)

CIVIL ENGINEERING

Paper - V : Design of Steel Structures - II

Time : 3 Hours **Maximum Marks: 75**

Answer ONE question from each unit

All questions carry equal marks

UNIT - I

1) Design an over head riveted steel rectangular flat bottom tank of capacity 1,50,000 litres. The staging consists of six columns. The bottom of the tank is 12 mts above the ground level.

OR

2) Design an elevated circular steel tank to hold 2,00,000 liters of water. The staging and the circular supporting beam need not be designed.

UNIT - II

3) Design a simply supported gantry girder to be used in an industrial building for the following data.

Crane capacity – 150 kN

Weight of crab – 40 kN

Weight of crane (excluding Crab) – 160 kN

Minimum clearance between crane hook and gantries girder – 1.00 mts.

Wheel base – 3.00mts

Distance between c/c of gantries – 20.0 mts

Distance between c/c gantry columns – 6.0 mts

OR

4) Write a brief note on the following:

a) Design principles of concrete composite construction.

b) Composite beam design.

UNIT - III

5) a) List out different types of trusses for different spas and components of a roof truss.

b) Explain step by step procedure of design of end bearings.

OR

6) The trusses in a factory building are spaced at 4.5mts centre to center and the purlin are spaced at 2.0mts centre to center. Pitch of the roof truss is $\frac{1}{4}^{th}$ and the span of the roof is 10mts. The vertical load from roof sheets are equal to 200N/m^2 and wind load on the roof surface normal to the roof is equal to 1200N/m^2. Design an I section purlin.

UNIT - IV

7) A plate girder is composed of a 1600mm × 12mm webplate, 4ISA 150mm × 150mm × 18mm flange angles and two 300mm × 12mm thick flange plates. The gross moment of inertia of plate girder is 2355120.2×$10^4$$mm^4$. The web of bending moment at a section is 2100kN-m and shear force 1500kN. One flange angle is spliced at this section. Design flange angle splice. Provide a single splice angle.

OR

8) A plate girder, having an effective span 14.0 mts is required to carry a uniformly distributed load of 100KN/m inclusive of its own weight, ends being simply supported. Design the plate grider.

UNIT - V

9) The effective span of a plate girder through type bridge for a single broad gauge track is 30mts. The dead load, live load and impact load reaction is 1250kN. The vertical reaction due to over turning effect of wind at each end of the girder is 90kN. The lateral load due to wind at each bearing is 40kN. Design the rocker bearing.

OR

10) a) Write a brief note on the following:

i) Permissible stresses in steel bridges.

ii) Bridge bearings and their types.

b) Explain step by step procedure of design of roller bearings.

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(DCE 326)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Fourth Semester)

CIVIL ENGINEERING

Paper - VI : Geo-Technical Engineering - II

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) Define Bearing capacity.

b) What are the methods of Exploration?

c) What is the area ratio of the sampler.

d) Write any Three forces acting on the well Foundation.

e) Define stream Function.

f) Write Terzaghi's Bearing capacity Equation.

g) Define Immediate settlement.

h) Define Active Earth pressure.

i) What is net safe bearing capacity?

j) What are the graphical methods to determine Earth pressure?

k) Define Retaining wall.

l) State the use of split spoon sampler.

m) Define negative skin friction.

n) What is the difference between tilts & shifts.

o) What are the Different types of Foundations?

UNIT - I

2) Briefly Explain:

a) Split-spoon samplers.

b) Piston-sampler.

OR

3) a) Derive the Boussinesq's Equation for vertical stress due to a line load condition.

b) A concentrated load of 2000kN is applied at the ground surface. Determine the vertical stress at a point 'P' which is 6m directly below the load. Also calculate the vertical stress at a point 'R' which is at a depth of 6m but a horizontal distance of 5m from the axis of the load.

UNIT - II

4) a) Explain Different types of lateral Earth pressures.

b) Write a procedure for a culmann's graphical method for Active Earth Pressure.

OR

5) Explain analysis of finite slopes by using culman's method.

UNIT - III

6) a) Briefly explain different bearing capacity Equations.

b) Explain plate load test.

OR

7) Briefly explain settlement of foundations.

UNIT - IV

8) a) Explain load-carrying capacity of pills.

b) Explain Dynamic-Formula for load carrying capacity of a driven pile.

OR

9) a) Explain sinking of wells.

b) Explain different shapes of wells.

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