7E 7061

Roll No. _____ [Total No. of Pages : 3

7E 7061

B.Tech. VII Semester (Main/Back) Examination, Dec. - 2015

Civil Engg.

7CE1A Water Resources Engineering - I

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting one question from **each unit**. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)*

Unit - I

1. a) Describe the advantages of Irrigation. **(8)**

   b) A water course has culturable commanded area of 2600 hectares out of which the intensities of irrigation for perennial sugar cane & rice crops are 20% & 40% respectively. The duty for these crops are 750 hectares/Cumecs & 1800 hectares/cumecs. Find the discharge required at the head of water cause if the peak demand is 120% of average demand. **(8)**

OR

1. a) Describe various systems of irrigation. **(8)**

   b) The following data pertains to the health, growth of a crop

   i) Field capacity of soil = 30%

   ii) Permanent Wilting percentage =11%

   iii) Density of soil = 1300 Kg/m^3

   iv) Effective depth of root zone = 700mm

   v) Daily consumptive use of water for given crop = 12mm

   For healthy growth moisture content must not fall below 25% of water holding capacity between F.C & PWP. Determine the watering interval in days. **(8)**

Unit - II

2. a) Describe Kennedey's theory in detail. **(8)**

   b) Design an irrigation channel to carry a discharge of 14 cumecs N= 0.0225, m=1,B/D=5.7. **(8)**

OR

2. a) Compare Kennedey's & Decay's theory. **(8)**

   b) A channel section has to be designed for following data

   Discharge Q = 30 cumecs

   Silt factor f = 1.00

   Side slope = ½:1 **(8)**

Unit - III

3. a) What are various types of River training works **(8)**

   b) Describe the working & Details of Groynes **(8)**

OR

3. a) Describe the necessity of fall & types of fall **(8)**

   b) Describe various stages of river. **(8)**

Unit - IV

4. a) What are the various types of tube well **(8)**

   b) Explain causes & prevention measures of water logging. **(8)**

OR

4. a) Explain various types of channel linings. **(8)**

   b) What do you mean by duty of tube well water. **(8)**

Unit - V

5. a) The rainfall rates for successive 30min interval upto 4 hrs are given below. If surface run off is 3.6 cm determine ϕ & W index

Time(min)	0	30	60	90	120	150	180	210	240
Rainfall Intensity(cm/h)	0	1.3	2.8	4.1	3.9	2.8	2	1.8	0.9

(8)

   b) Draw hydrological cycle & explain it. **(8)**

OR

5. a) Describe a Unit hydrograph **(8)**

b) The following are the ordinates for a flood hydrograph resulting from an isolated storm of 6h duration. **(8)**

Time(hr) :	0	12	24	36	48	60	72	84	96
Ordinates of flood hydrograph(cumecs) :	5	15	40	80	60	50	25	15	5

Determine the ordinates of 1cm-6hr Unit hydrograph if catchment area is 450 sq.Km **(8)**

7E7062

Roll No. _____ [Total No. of Pages : 4

7E7062

B.Tech. VII Semester (Main) Examination Dec. - 2015

Civil Engg.

7CE2A Design of Steel Structures - I

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting one question from **each unit**. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. I.S.800-2007 2. Steel tables (Struct. Engg. Hand Book P&I)

Unit - I

1. a) Enumerate types of steel. Which steel is used in structures and why? **(4)**

b) State statical and kinematical theorems for plastic analysis **(4)**

c) Using mechanism method or otherwise. Calculate the collapse load for a fixed beam shown in fig 1. **(8)**

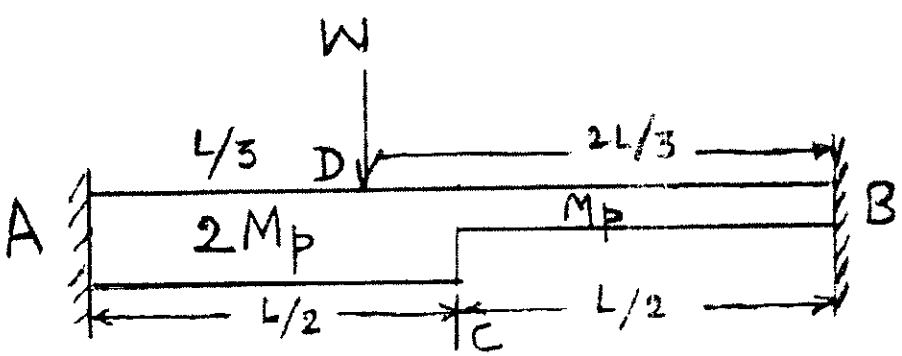

Fig. 1

OR

1. a) Determine the shape factor for a diamond section **(4)**

b) Compute the true value of collapse load for the portal frame loaded as shown in Fig 2. Comment on the type of failure. **(12)**

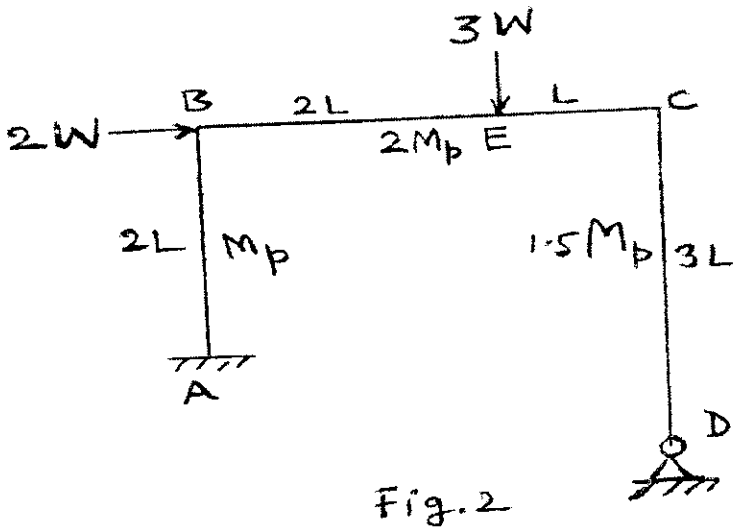

Fig. 2

Unit - II

2. a) Design the welded joint for a single angle section ISA 100×100×8 mm with a gusset plate 10 mm thick, using shop welds of size 6mm, along the end and both sides. The member carries an axial factored load of 200 kN. **(4)**

b) A plate bracket connection is shown in fig 3. A factored load of 75 kN acts at 140 mm from the centroidal axis of column There are 6 bolts of grade 4.6 of diameter 18mm. Make calculations to show. whether the design is safe. **(12)**

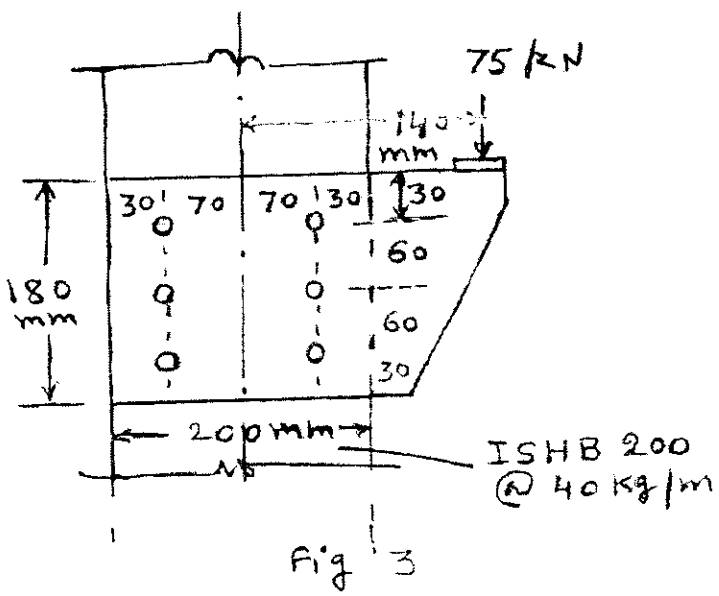

Fig 3

OR

2. a) What is prying action? How it is accounted for? **(4)**

   b) Design a single angle section for a tension member to carry a factored axial load of 225 kN. Use 20 mm dia. Shop bolts with fub = 400 N/mm^2. Draw the neat sketch of the joint. **(12)**

Unit - III

3. a) What are buckling classes and how do they affect compression carrying capacity of the column section. **(4)**

   b) An ISHB 250 @ 51.0 kg/m is strenghened by welding a plate 300mm × 10mm to each flange symmetrically. Find the design factored maximum axial compressive load which the section can take safely, if it is 3.0 m long. Its both ends are restrained against position but not against direction. **(12)**

OR

3. A Built up column is to be designed for an axial factored load of 1400 kN. Taking two ISLB or ISMB sections, placed side by side, design the column if it is 4.0 m in length. The column is hinged at top and fixed at bottom. Also design a system of battens for the column. **(16)**

Unit - IV

4. a) What do you understand by terms 'web buckling' and 'web crippling'. **(4)**

   b) Design a laterally supported beam having effective span 6.0.m. The beam is simply supported at the two ends and carries a uniform by distributed factored load of 30 kN/m, including its self weight. **(12)**

OR

4. a) Write a short note on lateral torsional buckling. **(4)**

   b) A beam of effective span 7.0 m is simply supported at the ends and is loaded by 20 kN/m throughout the span. The beam is laterally supported only at mid span. Design the beam. **(12)**

Unit - V

5. a) Differentiate between 'slab base' and 'gusseted base' as column bases **(4)**

   b) A column in a steel building is 4.5 m in height. A beam transfers its reaction of 400 kN at an eccentricity of 80 mm from the major axis of the section. Check whether the section ISHB 300 @ 58 kg/m is satisfactory. **(12)**

OR

5. A column consists of the section ISHB 400 @ 82.16 kg/m. It carries an axial compressive factored load of 1800 kN. The column rests symmetrically on a square base plate of size 750 mm ×750 mm. Design a two tier grillage foundation for the column. The bearing capacity of the soil may be taken as 140 kN/m^2. **(16)**

7E7063

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7E7063

B.Tech. VII Semester (Main) Examination, Dec. - 2015

Civil Engg.

7CE3A Design of Concrete Structures - II

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting one question from **each unit**. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Use of following supporting material is permitted during examination (Mentioned in form No. 205)

1) IS : 456 (2000) ;

2) IRC : 6 and IRC : 21

Unit - I

1. a) Name any four losses of prestress in "Pre-tensioning" and describe any one of these in detail. **(2+4)**

b) A prestressed concrete beam (400 mm × 600 mm) has a simply supported span of 6m. The beam is subjected to a u.d.l. of 16 KN/m (inclusive of self weight). The effective prestressing force of 960 kN is provided through prestressing straight tendons located at 200 mm. from soffit. Determine the extreme fibre stresses in concrete at the mid span section. Give the neat sketch of the problem. **(10)**

OR

1. a) Write short notes on the following

i) Load balancing concept.

ii) Friction and wobble concept. **(2×4=8)**

b) A prestressed concrete beam is provided with a parabolic tendon as shown in Fig. 1 which is tensioned from both the ends. If the stress in the tendons at the ends is 1050 N/mm^2. Calculate the loss of prestress from end to centre. Take, coefficient of friction in curve, $\mu = 0.35$ and friction coefficient for wave effect $K_f = .0015$/m **(8)**

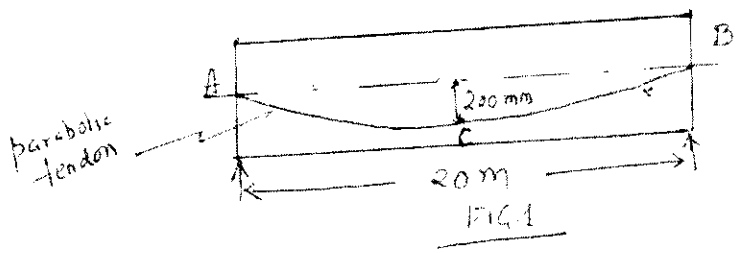

FIG 1

Unit - II

2. a) Describe the concept of redistribution of moment with a suitable example. **(6)**

b) A singly reinforced R.C.C. beam (300 mm × 600 mm) is subjected to factored moment of 115 KN.m, factored torsion of 45 kN.m and factored shear of 95 kN. Effective cover to tension and side face reinforcement is 35 mm. Determine and provide longitudinal tension reinforcement and transverse reinforcement for this beam as per codal provisions. Give a neat dimensional sketch of cross section use M20 and Fe-415. **(10)**

OR

2. a) Describe the terms 'primary torsion' and "secondary torsion" **(6)**

b) Determine and provide +ve and -ve flexural reinforcement for the RCC continuous beam shown in Fig.2, using coefficients, as per I.S. : 456. All the spans are subjected to 15 kN/m dead load (inclusive of self weight) and 12 kN/m live load. Use M20 and Fe-415. Beam section is 300 mm× 600 mm and effective cover to tension reinforcement = 50 mm. **(10)**

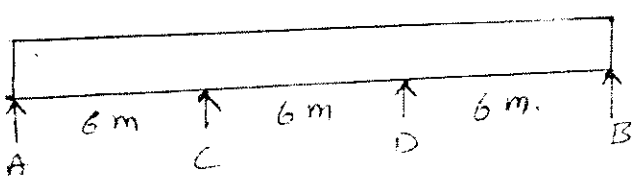

fig. 2

Unit - III

3. a) Differentiate between "membrane theory" and 'beam theory' of analysis of shell structures **(6)**

   b) Design the vertical wells of a circular tank resting on firm ground. Use following data:

   Inside diameter = 3.5 m ; Depth of water = 3 m (with free board = 360 mm)

   Specific weight of water = 9810 N/m^3.

   use M 25 and Fe-415. **(10)**

OR

3. a) Draw a neat labelled sketch (elevation) of a intz type water tank. Show the various types of forces acting on conical dome. **(8)**

   b) Develope the expression for meridional thrust in a circular dome. **(8)**

Unit - IV

4. Check the stability at the cantilever retaining wall shown in Fig. 3. If soil weighs. 18000 N/m^3 and has angle of repose of 30^0. The safe bearing capacity of the soil is 200 KN/m^3. Use M20 and Fe-415. Also design and provide the reinforcement in stem portion. **(8+8)**

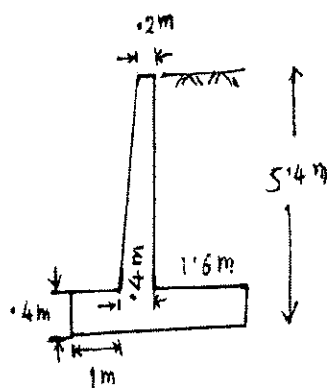

Fig.3

OR

4. a) Draw the typical deflected shape of stem heel slab and toe slab of a cantilever retaining wall. **(4)**

   b) Describe the assumptions in yield line theory. **(4)**

   c) Using the virtual work method, develope an expression for collapse load for an isotropically reinforced square slab fixed on all edges and subjected to uniformly distributed load. **(8)**

Unit - V

5. Write the short notes on following.

a) Importance of hydraulic factors in bridge design

b) Impact effect while considering the vehicle load.

c) Disposition of tracked vehicle (class AA) for maximum bending moment.

d) Design loads for 'Kerb' **(4×4=16)**

OR

5. Design a deck slab for the following data clear span = 5.5 m, Bearing width = 400 mm

Thickness of deck slab = 440 mm

Width of deck slab = 9.5 m

Width of foot path on either side = 1m

Wearing coat = 100 mm thick

Loading = IRC class (AA) tracked.

Use M-25 and Fe-415. **(16)**

7E 7064

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7E7064

B.Tech. VII Semester (Main/Back) Examination, Dec. - 2015

Civil Engineering

7CE4A Transportation Engineering - II

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting one question from **each unit**. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)*

Unit - I

1. a) Mention the requirements of an ideal permanent way. **(6)**

   b) Define Creep. What are the possible causes and effects of Creep? **(3+7=10)**

OR

1. a) What do you meant by 'Coning of wheels'? What are the advantages due to uniformity of gauges? **(4×2=8)**

   b) Draw a neat sketch of CST - 9 Sleeper. Mention the salient features. **(8)**

Unit - II

2. a) Distinguish between surface & under ground railway systems. Enumerate the factors that favour the selection of one over the other. **(8)**

   b) What is a turnout & how does it function? Explain with the help of suitable neat diagram. **(8)**

OR

2. a) Explain with neat sketches the following: 4:

   i) Switch angle.

   ii) Theoretical nose of crossing.

   iii) Heel divergence.

   iv) Throw of switch. **(2×4=8)**

   b) What are the salient features of the kolkata metro railway? Enumerate the technologies used in its construction. **(8)**

Unit - III

3. a) Write short notes on: **(2×4=8)** 5.

   i) Grade compensation on curves.

   ii) Negative cant.

   b) In a layout of a B.G. Yard, 98^0 curve diverges from 5^0 main curve. If the maximum permissible speed on the main curve is 68 kmph, determine the restricted speed on diverging curve. **(8)** 5.

OR

3. a) What are the objects of providing transition curves? Explain briefly the essential requirements of an Ideal transition curves. **(8)**

   b) Determine the equilibrium cant on a 2^0 degree curve on a broad gauge, if 16 trains, 10 trains, 8 trains, 4 trains and 2 trains are running at a speed of 50 kmph, 60 kmph, 70 kmph, 80 kmph and 100 kmph respectively. (8)

Unit - IV

4. a) Write a brief note on "Airport classifications. **(6)**

   b) What is Wind Rose diagram? Explain briefly with a neat sketch any one method of orientation of runway. **(10)**

OR

4. a) Explain the factors which influence the airport site selection. **(6)**

b) Calculate the actual length of runway from the following data:

Airport Elevation	RL:-100m
Airport reference temperature	28^0 C
Basic length of runway	900m
Highest point along the length	RL:-97.00
Lowest point along the length	RL:- 92.50

(10)

Unit - V

5. Write detail note on the various methods for designing flexible airport pavements. **(16)**

OR

5. Describe the effect of jet aircraft characteristics on Airport pavement design. **(16)**

7E7065

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7E7065

B.Tech. VII Semester (Main) Examination, Dec. - 2015

Civil Engg.

7CE5A Application of Numerical Methods in Civil Engg.

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting one question from **each unit**. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) i) Explain the various types of errors with suitable examples. **(4)**

ii) Convert $(0.859375)_{10}$ to the corresponding Binary Fraction **(4)**

b) If $n = 10\ x^3\ y^2\ z^3$ and error in x,y,z are respectively 0.03,0.01 & 0.02 at $x = 3$, $y=1$ & $z=2$, calculate the absolute error & percent relative error in the calculation of it. **(8)**

OR

1. Explain the Taylor's Theorem and derive General formula for errors using the Taylor's theorem. **(16)**

Unit - II

2. Find the root of the equation, $Cosx\text{-}xe^x=0$ using secant method correct to four decimal places. **(16)**

OR

2. Using Newton - Raphson method, find a root of the equation $f(x) = xsinx+cosx=0$ correct to three decimal places, assuming that the root is near to $x=\pi$. **(16)**

Unit - III

3. Solve the equations , by using cramer's Rule (16)

$$x_1 + 2x_2 - x_3 = 2$$
$$3x_1 + 6x_2 + x_3 = 1$$
$$3x_1 + 3x_2 + 2x_3 = 3$$

OR

3. Solve the system of equations. (16)

$$\begin{bmatrix} 1 & 2 & 3 \\ 2 & 8 & 22 \\ 3 & 22 & 82 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 5 \\ 6 \\ -10 \end{bmatrix}$$

Unit - IV

4. Starting with $(x_0, y_0, z_0) = (0,0,0)$ as first iteration, calculate the Next three iteration for the solution of the system of equation as given below. (16)

$$5x - y + z = 10$$
$$2x + 8y - z = 11$$
$$-x + y + 4z = 3$$

OR

4. Solve $54x + y + z = 110$
$2x + 15y + 6z = 72$
$-x + 6y + 27z = 85$

Using Gauss - seidel method. (16)

Unit - V

5. Find the cubic polynomial $f(x)$ which takes on the values $f(0) = -4$, $f(1) = -1$, $f(2) = 2$, $f(3) = 11$, $f(4) = 32$, $f(5) = 71$. Hence, or otherwise obtain the value of f(6) (16)

OR

5. The following values of the Function $F(x) = \sin x + \cos x$ are given as **(16)**

x	10^0	20^0	30^0
$f(x)$	1.15 85	1.2817	1.3660

Construct the quadratic interpolating polynomial that fit the data , find . $f(\pi/12)$ Compare with exact value.

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7E7066

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7E 7066

B.Tech. VII Semester (Main) Examination, Dec. - 2015

Civil Engg.

7CE6.1A Advance Transportation Engineering

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting one question from **each unit**. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)*

Unit - I

1. a) Explain the term traffic volume. What are the objects of carrying out traffic volume **(8)**

   b) What are the various objects and Applications of Spot-Speed studies? **(8)**

OR

1. a) Explain how the speed & delay studies are carried out. Write also the various uses of speed & delay studies. **(8)**

   b) Explain origin & destination study. What are the various uses of O&D studies. **(8)**

Unit - II

2. Write Detail note on :-

   i) Standard Deviation

   ii) Binomial distribution.

   iii) Linear Regression

   iv) Normal Distribution **(4×4=16)**

OR

2. 0.18 is the probabilty that a vehicle will turn left at an intersection. Assuming independence, calculate the probabilities of the following:- 5.

   i) Exactly three out of ten vehicles will turn left.

   ii) The tenth vehicle is not turning left 5.

   iii) Not more than three out of ten vehicles will turn left.

   iv) At least three out of ten vehicles will turn left. **(4×4=16)**

Unit - III

3. Write detail note on :-

   i) Relation between traffic volume, density & Speed.

   ii) Macroscopic and microscopic traffic characteristics. **(8×2=16)**

OR

3. Write detail note on.

   i) Various parameters to be considered in designing a Rotary Intersection.

   ii) Advantages and Disadvantages of traffic signals. **(8×2=16)**

Unit - IV

4. Write detail note on :-

   i) Types of Road marking with suitable Diagram.

   ii) Street Lighting.

   iii) TrafficIslands.

   iv) At grade inter sections. **(4×4=16)**

OR

4. Write detail note on:-

   i) Expression for safe speed at an intersection.

   ii) Traffic laws.

   iii) Kerb parking for traffic control.

   iv) Pedestrian and mixed Traffic **(4×4=16)**

Unit - V

5. Write Detail note on detrimental Effects of traffic on Environment. Viz. Air pollution &Noise pollution. **(16)**

OR

5. a) "Round abouts are safer than four-arm intersection", State reasons for this. **(8)**

   b) What are the possible measures for improving pedestrians safety at Intersections? **(8)**

7E7068

Roll No. _____ [Total No. of Pages : 2

7E7068

B.Tech. VII Semester (Main/Back) Examination, Dec.- 2015

Civil Engineering

7CE6.3A Rural Water Supply & Sanitation

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting one question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) Describe water harvesting and its different techniques. **(8)**

   b) Sketch and describe the working of hand pumps. What are the problems associated in using hand pump water? **(8)**

OR

1. a) Describe various types of wells used in rural areas and the sanitary aspects in well construction. **(8)**

   b) Describe various types of pumps used for village wells. How do we calculate the horse power of a pumping set? **(8)**

Unit - II

2. a) What are the norms of rate of water supply in rural areas as per government of India? How do we calculate the cattle water demand? **(8)**

   b) What are the standards of water quality in rural area. Explain water quality surveillance. **(8)**

OR

2. a) Describe the various sources of communicable diseases and their modes of transfer. **(8)**

   b) Describe the ways to control communicable diseases. Explain the guinea worm eradication. **(8)**

Unit - III

3. Describe the design of different schemes of rural water supply in Rajasthan, as per government norms. **(16)**

OR

3. Write short notes on following
   i) Slow sand filter
   ii) Horizontal roughing filter
   iii) Disinfection of rural water sources
   iv) Fluoride problem and its control. **(4×4=16)**

Unit - IV

4. Write short notes on following:
   i) Cattle shed sanitation
   ii) Pasteurization
   iii) Food poisoning
   iv) Botulism. **(4×4=16)**

OR

4. a) Describe with sketch life cycles of flies and mosquitos. **(8)**
   b) Explain various methods of flies and mosquito control. **(8)**

Unit - V

5. a) Describe various types of village latrines. Suggest the construction of low cost latrine, method and estimate of the same. **(8)**
   b) Sketch and design a septic tank for 100 users. Describe the working of a septic tank and the pollution problem associated with it. **(8)**

OR

5. Write short notes on following:
   i) Composting
   ii) Bio-gas
   iii) Small bore sewer system
   iv) User participation in sanitation projects. **(4×4=16)**

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7E4031

B.Tech. VII Semester (Back) Examination, Dec. - 2015

Civil Engg.

7CE1(O) Geotechnical Engineering - 1

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting one question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly).*

Units of quantities used/calculated must be stated clearly.)

Unit - I

1 a) What do you understand by 3 phase system of soil? Derive the relationship between G, e, w, r_t and r! These respectively represents specific gravity of soil, void ratio, moisture content, bulk unit weight and submerged unit wt. Also write the relationship for completely saturated and dry state. **(8)**

b) A core cutter was used to find the insitu density of soil. The volume of core cutter has 1000 C.C. and its weight has 947.0 g. The weight of core cutter filled with soil has found 2771.0 gm. The laboratory tests indicated the water content 10.5% and specific gravity 2.65. Determine the bulk unit weight, dry unit weight,void ratio and degree of saturation of the sample. **(8)**

OR

a) Explain how would you determine the shrinkage limit of soil. Also explain the shrinkage ratio and importance of shrinkage limit. **(8)**

b) A Soil sample with a liquid limit 72.8% and water content of 81.3%. Its liquidity index in 1.21, What is plastic limit and plasticity index of soil. In what region would the soil be located on plasticity chart. **(4)**

c) What different corrections are applied to hydrometer reading. How do you get corrected reading for determination of particle size and percentage finer?**(4)**

Unit - II

2. a) What are the important clay minerals. Describe the structure of montmorillonite. **(8)**

   b) What do you understand by soil fabric or structure? Describe various soil structures and their impact on properties of soil. **(8)**

OR

2. a) What are the different tests for determining the permeability in the laboratory. Explain the suitability of these tests to different types of soils. Explain falling head test method for determination of permeability.

   b) The following data were recorded in constant head permeability test.

   Internal diameter of mould = 7.5cm

   Head lost over sample length of 18cm = 24.7cm

   Quantity of water collected in 60 seconds = 626ml

   Porosity of soil = 44%

   Caiculate the coefficient of permeability of soil. Also determine the discharge velocity and the seepage velocity during the test. If the test wascarried out at a temperature of 25°c, estimate the permeability of soil for a porosity of 39% and at 20°c. Viscosity of water at 25°c 8.95 millipoise sal 20°C 10.09 millipoise. **(8)**

Unit - III

3. a) A sand deposit is 12m thick and overlies a bed of soft clay. The water table in 4m below the ground surface. If the sand above water table has 50% degree of saturation, calculate the effective stress at middle and bottom of sand layer. What would be change in effective stress as determined above, if the water table rises to ground surface Take e=0.60 and G = 2.65. Comment on the results obtained. **(12)**

   b) What do you understand by seepage pressure. Explain how would you compute seepage pressure. **(4)**

OR

3. a) Explain the principle of electro osmosis. How this is helpful in drainage of water from soil. **(12)**

   b) A coarse - grained soil has a water content of 14% and degree of saturation 48%. Calculate the critical gradient at which quick sand condition will occur. Take specific gravity of soil as 2.67. **(4)**

Unit - IV

4. a) Explain Mohr-Coulomb shear strength theory for soils. **(10)**

   b) A unconfined compression test was conducted on a clay sample. The sample had a diameter 38mm and height 76mm. The load in failure measured was 28N and axial determination at failure 12mm. Determine unconfined compressive strength and the undrained shear strength of clay. **(6)**

OR

4. a) Explain how would you determine the shear strength of soil by direct shear test method. Also discuss the limitations of this test. **(8)**

   b) Describe the stress strain volume change behaviour of normally and over consolidated clays. **(8)**

Unit - V

5. a) Draw a compaction curve and explain the difference between various properties of soil at dry of optimum and wet of optimum moisture content. **(10)**

   b) A sand deposit was compacted dry to inplace void ratio 0.45. For this sand $e_{max} = 0.7$ and $e_{min} = 0.3$. Determine relative density and relative compaction of this sand deposit. G =2.65. **(6)**

OR

5. a) What are the different methods of determining the field compaction. Describe the sand replacement method for determining field compaction. **(10)**

   b) 500gm most silt with water content 22.5% is mixed with 600gm sand in dry state and the mixture was compacted to reach 20% air voids. Determine the dry density and degree of saturation if the silt has specific gravity G = 2.7 and sand has G = 2.65. **(6)**

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B.Tech. VII Semester(Back) Examination, Dec. - 2015

Civil Engg.

7CE3(O) Environmental Engg. - I

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **Five questions**. Selecting **one question** from **each unit**. All Questions carry **equal** Marks. (Schematic diagrams must be shown wherever necessary Any data you feel missing suitably be assumed and stated clearly units of quantities used/calculated must be stated clearly.)*

Unit - I

1. a) Describe the various aspects of waste water management **(8)**

   b) Give the main difference between Domestic & Industrial Sewage . Also Suggest methods in brief for Industrial waste treatment **(8)**

OR

1. a) Describe the term BOD. Give the test to determine its Value - Also explain TOC and give typical value of ratio of BOD_5/TOC **(8)**

   b) The BOD of a Sewage incubated for one day at 30°C has been found to be 100mg/l. What will be the 5 day 20°C BOD. Assume K = 0.12 (Base 10) at 20°C **(8)**

Unit - II

2. Describe the Rational Method for storm water discharge determination **(16)**

OR

2. a) Derive the value of hydraulic elements of a Circular Sewer having d/D = 0.7 **(8)**

   b) Write a short note on sewer maintenance system **(8)**

Unit - III

3. a) Describe the Biological action taking place in a trickling Filter. Also discuss the problem associated With Trickling Filter **(8)**

   b) Describe various types of Activated sludge treatment systems **(8)**

OR

3. a) Explain the working of oxidation ditch **(8)**

   b) Explain activated sludge process & Describe MLSS & MLVSS **(8)**

Unit - IV

4. a) Describe the Zones of pollution in the stream **(8)**

   b) A Stream, Saturated with Do, has a flow of 1.2m^3/s BOD of 4ppm And rate Constant of 0.3 per day. It receive an effluent discharge of 0.25m^3/s having BOD 20 mg/l. Do 5mg/l and rate constant 0.13 per day. The average velocity of flow of the stream is 0.18m/s .Calculate the Do deficit at point 20Km downs beam. Assume that the temperature is 20^{0}c and BOD is measured at 5 days Take Saturation Do or 20^{0}C as 9.17mg/l. **(8)**

OR

4. a) Enumerate the characteristics of traps **(8)**

   b) Give classification of traps **(8)**

Unit - V

5. Describe in details the term air pollution and give details of Vehicular pollution **(16)**

OR

5. Describe the following

   a) Green house effect

   b) Noise pollution **(16)**

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B.Tech. VII Semester (Back) Examination Dec. - 2015

Civil Engg.

7CE4 (O) Building Design

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

Instructions to Candidates:

Attempt any ***Five questions****. Selecting* ***one question*** *from* ***each unit****. All Questions carry* ***equal*** *Marks.(Schematic diagrams must be shown wherever necessary Any data you feel missing suitably be assumed and stated clearly units of quantities used/calculated must be stated clearly.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. *Is : 875 Part 1, 2 and 3* 2. *Is 1893. Part - I*

Unit - I

1. a) Explain The Terms "Strength" and 'Stiffness'. Explain the situations, Which cause sudden changes in Stiffness and Strength between different storeyes of a building with figure. **(6)**

   b) Explain 'load flow' to different structural components with figure **(3)**

   c) Explain typical cases of asymmetry in buildings with figures **(3)**

   d) Explain 'Framed tube', 'trussed tube', tube - in - tube, and 'bundled tube' Systems with figures **(4)**

OR

1. a) Explain the role and behaviour of shear walls with figures **(6)**

   b) Find the design loads for an interior column of

      i) Ground floor

      ii) 3rd Floor

   of a six storey building for the data :

height of each floor =3.5m,Spacing of columns c/c in each direction = 3.8m; live load on roof = 1.5kN/m^2, live loadon each floor = 3.0kN/m^2 Thickness of R.C. slab = 120mm, Dead weight of floor finish = 1kN/m^2, Weight of wall and beam = 10.8kN/m **(10)**

Unit - II

2. A power plant structure having maximum dimension more than 60m is proposed to be built on down hill side near chittargarh. The height of the hill is 250m with a slope of 1 in 4. If the location is 200m from the crest of the hill on downward slope, and its eve board is at a height of 8m, determine the design wind pressure **(16)**

OR

2. Determine the design wind pressure on the purlins of an industrial building near Jaipur, with class of building: General with Life of 50 Years.

Terrain : Category 2

Maximum dimension : 40m

Width of building : 15m

Height at eve level = 9m

Topography : θ less than 3^0, Permeability : Medium span of truss = 20m, Pitch = 1/5, sheeting : Ac Sheets, spacing of purlin = 1.40m, Spacing of truss = 4.50m **(16)**

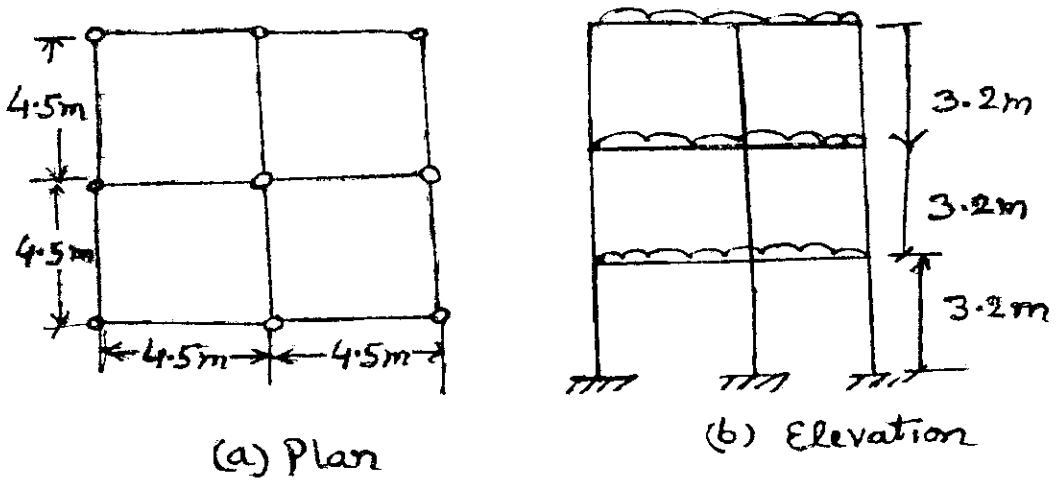
Unit - III

3. Determine the base shear forces in a two storey un - reinforced brick masonry building situated at surat; with building data as:

Plan Size = 25×25m, Total height of building 6.8m (each storey height =3.4m) weight of roof = 2.5kN/m^2, Weight of Walls = 5.0kN/m^2 live load at roof = 1.0 kN/m^2, (25% of imposed load). Importance factor = 1.0, Response reduction factor = 1.5 Spectral Acceleration (Sa/g) = 2.5, Soil : Type II (Medium Soil) **(16)**

OR

3. The plan and elevation of a three - story RCC school building are shown below. The building is located in seismic Zone V. The type of soil encountered is medium stiff and it is proposed to design the building with a special moment resisting frame The intensity of dead load is 10kN/m^2 and the floors are to cater to an imposed load of 3kN/m^2. Determine the design seismic loads on the structure by static analysis. **(16)**



Unit - IV

4. Explain ductile detailing provisions as per IS 13920. For anchorages and splices of longitudinal reinforcement, Spacing and anchorage and splices of lateral reinforcement; with detailed explanation, and figures **(16)**

OR

4. a) Explain behaviour of unreinforced masonry walls, particularly under earthquake with figures **(10)**

   b) Explain behaviour of infull walls with figures **(6)**

Unit - V

5. a) Describe significance of prefabricated construction **(4)**

   b) Describe prefabricated systems for

      i) Foundation

      ii) Frames and Panels

      iii) Volumetric assemblies

      iv) Modularised building services **(12)**

OR

5. a) Describe advantages of northlight shell roots, Selection of Shell parameters for this type of roof and methods of analysis. **(10)**

   b) Describe 'Folded plates' and their advantages over shells. **(6)**
