

6E 6031

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6E 6031

B.Tech. VI Semester (Main & Back) Examination, April - 2019
Civil Engineering
6CE1A Theory of Structures - II

Time : 3 Hours**Maximum Marks : 80****Min. Passing Marks : 26****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. Four wheel loads of 6kN, 4kN, 8kN and 5kN cross a girder of 20 m span, from left to right followed by UDL of 4 kN/m and 4 m long with the 6 kN load leading. The spacing between loads in the same order are 3m, 2m and 2m. The head of the UDL is at 2m from the last 5 kN load. Using influence lines, Calculate the S.F. and B.M. at a section 8m from the left support when the 4kN load is at centre of the span. (16)

(OR)

1. a) What is influence line? Write the uses of influence line.
b) Explain Muller Breslau Principle.
c) A point of 50 kNm rolls over a girder of 20 m span. Draw ILD and find maximum positive and negative shear force and bending moment at a point 8m from the left hand end. (16)

Unit - II

2. A parabolic three hinged arch has a span of 20 m the centre of rise of the arch is 4m. It is loaded with UDL with intensity of 2 kN/m on left 8 m. Calculate: (16)
a) Direction and Magnitude of the reaction at hinge,
b) Bending moment, Normal thrust and Radial shear at 4 m.

(OR)

2. Show that the horizontal thrust developed in a parabolic arch of span L and rise h subjected to concentrated load W at a distance a from springing is given by

$$H = [5Wa(L-a)(L^2 + La - a^2)] / (8hL^3) \quad (16)$$

Unit - III

3. A suspension cable 160 m span and 16 m central dip carries a load of 0.5 kN per lineal horizontal metre. Calculate the maximum and minimum tension in the cable. Find horizontal and vertical force in each pier under the following alternative conditions:

- If the cable passes over frictionless rollers on the top of the piers.
- If the cable is firmly clamped to saddles carried on frictionless rollers on the top of the piers.

In each case the back stay is inclined at 30° to the horizontal. (16)

(OR)

3. A light cable, 18m long is supported at two ends at the same level. The supports are 16m apart. The cable supports three loads of 8, 10 and 12 N dividing the 16 m distance in four equal parts. Find the shape of the string and the tension in various portions. (16)

Unit - IV

4. Determine the principal moment of inertia for an unequal angle section $180 \text{ mm} \times 120 \text{ mm} \times 9 \text{ mm}$. Use analytical expression or Mohr's Circle Method. (16)

(OR)

4. The load on a bolt consists of an axial pull of $15 \times 10^3 \text{ N}$ together with a transverse shear of $7.5 \times 10^3 \text{ N}$. Calculate the diameter of the bolt according to (16)
- Maximum principal stress theory,
 - Maximum shear stress theory,
 - Maximum strain theory,
 - Strain energy theory,
 - Shear strain energy theory.

Unit - V

- What do you understand by Matrix method. (8)
- Explain Force displacement relationship. (8)

(OR)

- Explain Force transformation matrix. (8)
- Explain Displacement transformation matrix. (8)

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B.Tech. VI - Semester (Main&Back) Examination, April-2019
Civil Engineering
6CE2A Geotechnical Engineering-II

Time : 3 Hours**Maximum Marks : 80****Min. Passing Marks : 26****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) Derive an expression for the vertical stress at a point load, using Boussinesq's theory. (8)
- b) Discuss the basis of the construction of Newmark's influence chart. How is it used? (8)

(OR)

1. a) 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 at a horizontal distance of 5m from the axis of the load. (8)
- b) A long strip footing of width 2m carries a load of 400kN/m. Calculate maximum stress at a depth of 5m below the centre line of the footing. Compare the results with 2:1 distribution method. (8)

Unit - II

2. a) Discuss Terzaghi's theory of consolidation stating the various assumptions and their validity. (8)
- b) A clay stratum 5m thick has the initial void ratio of 1:50 and the effective over burden pressure of 120 kN/m² when the sample is subjected to an increase of pressure of 120 kN/m², the void ratio reduces to 1.44. Determine the coefficient of the volume compressibility and the final settlement of the stratum. (8)

(OR)

2. a) Explain in detail any one method for determining the coefficient of consolidation of soil. (8)
- b) A Stratum of clay is 2m thick and has an initial over burden pressure of 50kN/m^2 at its middle. Determine the final settlement due to an increase in pressure of 40kN/m^2 at the middle of the clay layer. The clay is over-consolidated with a preconsolidation pressure of 75kN/m^2 . The values of the coefficients of recompression and compression index are 0.05 and 0.25 respectively. Take initial void ratio as 1:40. (8)

Unit - III

3. a) Derive an expression for the factor of safety of an infinite slope in a cohesionless soil. What is the effect of steady seepage parallel to the slope on the stability? (8)
- b) A long natural slope is an over consolidated clay ($C' = 10\text{kN/m}^2$, $\phi' = 25^\circ$, $\gamma_{sat} = 20\text{kN/m}^3$) is inclined at 10° to the horizontal. The water table is at the surface and the seepage is parallel to the slope. If a plane slip had developed at a depth of 5m below the surface, determine the factor of safety. Take $\gamma_w = 10\text{kN/m}^3$. (8)

(OR)

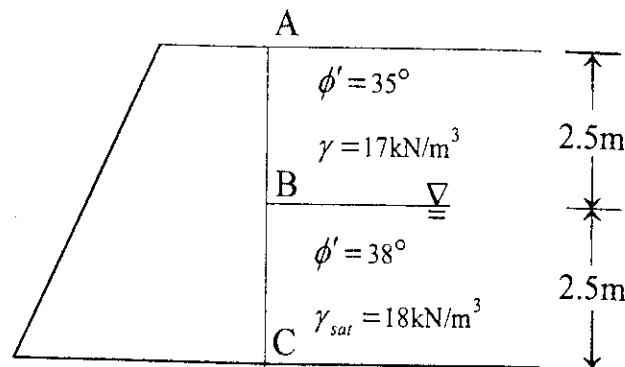
3. a) Discuss the friction circle method for the stability analysis of slopes. Can this method be used for purely cohesive soil? (8)
- b) Determine the factor of safety with respect to cohesion if an embankment 25m high and having a slope of 40° is subjected to sudden drawdown. ($C = 40\text{kN/m}^2$, $\phi = 10^\circ$, $\gamma_{sat} = 18\text{kN/m}^3$). (8)

Unit - IV

4. a) What are the assumptions of Rankine's theory? Derive the expressions for active pressure and passive pressure (8)
- b) Derive an expression for active pressure when the ground surface is inclined. (8)

(OR)

4. a) What are the assumptions in Coulomb's theory? Compare Rankine's theory and Coulomb's theory (8)
- b) Determine the active pressure on the retaining wall shown in Figure. Take $\gamma_w = 10 \text{ kN/m}^3$. (8)



Unit - V

5. a) Differentiate between the general shear failure and the local shear failure. How the ultimate bearing capacity in local shear is determined. (8)
- b) A footing 2m square is laid at a depth of 1.3m below the ground surface. Determine the net ultimate bearing capacity using IS code method. Take $\gamma = 20 \text{ kN/m}^3$, $\phi' = 30^\circ$ and $c' = 0$, $N_c = 30.14$, $N_q = 18.4$, $N_r = 22.4$, $S_c = 1.3$, $S_q = 1.2$ and $S_r = 0.80$. (8)

(OR)

5. a) Describe the split - spoon sampler. What is its use? (4)
- b) How would you conduct an in-situ vane shear test? What is its use? (6)
- c) What are the factors that affect the sample disturbance? How are these effects minimized? (6)

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B.Tech. VI-Semester (Main & Back) Examination, April-2019
Civil Engineering
6CE3A Environmental Engineering - II

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 26

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 importance of determination of solids in sewage. How do you determine the suspended solids in a given sample of waste water? **(8)**
- b) Data from an unseeded domestic waste water BOD test are: 5 ml of waste water in 300 ml bottle, initial DO of 7.8 mg/l and 5 days DO equal to 4.3mg/l. Find out BOD and the ultimate BOD. Assume a k-rate of 0.10 per day. **(8)**

(OR)

1. a) Write notes on following:
 - i) Population Equivalent
 - ii) TOC
 - iii) COD/TOC Ratio
 - iv) Sullage and sludge **(4×2=8)**
- b) The BOD_5 of a waste water is 150mg/l at 20°C. The k value is known to be 0.23 per day. What would be BOD_8 if the test was run at 15°C? **(8)**

Unit - II

2. a) What are different components of pumping stations? (8)
- b) A 350 mm dia sewer is to flow at 0.35 depth on a grade ensuring a degree of self-cleansing equivalent to that obtained at full depth at a velocity of 0.8 m/sec. Find : (8)

i) The required grade

ii) Associated velocity

Given that :

Manning's rugosity coefficient = 0.014

Proportionate area = 0.315

Proportionate wetted perimeter = 0.472

Proportionate HMD (γ/R) = 0.7705

(OR)

2. a) What are properties of sewer materials? Explain different types of sewer materials. (8)
- b) A rectangular sewer with width 2 times its depth is hydraulically equivalent to a circular one. Find the relation between the width of the rectangular sewer and the diameter of the circular sewer. (8)

Unit - III

3. a) Draw a sketch of sewerage treatment plant and explain each unit briefly. (8)
- b) A rectangular grit chamber is designed to remove particles with a diameter 0.2mm specific gravity 2.65. The settling velocity have been found to be 0.020 m/sec. A flow through velocity of 0.3 m/sec will be maintained by proportioning weir. Determine the channel dimensions for a maximum waste water flow of 20,000 cu m/day. (8)

(OR)

3. a) Explain the various operation and units of an activated sludge plant. (08)
- b) A sewage contains 550 ppm of suspended solids. 2.25 million litres per day is treated in a sedimentation tank. The tank removes 50% of suspended solids. Calculate the quantity of sludge produced per day in bulk and weight of it, if the moisture content of sludge is 94%. (8)

Unit - IV

4. a) Critically discuss one and two pipes systems of plumbing. (8)
b) Write a detailed explanatory note on the self-purification of streams with neat sketch. (8)

(OR)

4. Write notes on following:
a) P, Q and S traps in sanitary plumbing systems.
b) Dilution standards for waste water have different degree of BOD.
c) Importance of sewage disposal by irrigation sewage farming.
d) Sewage plans of buildings and their testing. (4×4=16)

Unit - V

5. Write notes on following:
a) Acid rains and their harmful effects on environment.
b) Emission standards for various pollutional gases.
c) Ozone depletion and effects.
d) Global warming and greenhouse gases. (4×4=16)

(OR)

5. Explain the following: (8)
a) Octave Band analysis.
b) Effect of air pollution on human health. (8)

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6E3033**B.Tech. VI - Semester (Back) Examination, April - 2019****Civil Engineering****6CE2(O) Concrete Structures - II****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 26****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 prestressed concrete beam of rectangular section 300mm wide and 600mm deep has a span of 10m. The effective prestressing force is 980kN at an eccentricity of 120mm. The dead load of the beam is 4.5kN/m and the beam has to carry a live load of 7.5kN/m.

Determine the extreme stresses :

- At the end section.
- At the mid section without action of live load.
- At the mid section with the action of live load. (16)

(OR)

1. a) A prestressed concrete pile is 300mm × 300mm in section and is provided with 40 wires of 3mm diameter distributed uniformly over the section. Initially the wires are tensioned in the prestressing beds with a total pull of 450kN. Determine the final stress in concrete and the percentage loss of stress in the wires.

Take $E_s = 2.08 \times 10^5 \text{ N/mm}^2$, $E_c = 3.20 \times 10^4 \text{ N/mm}^2$

Creep shortening = $32 \times 10^{-6} \text{ mm/mm per N/mm}^2$ of stress

Total Shrinkage strain = 200×10^{-6}

Relaxation loss of stress in steel = 4.50% of the initial stress. (10)

b) Explain the following terms : (any Two)

(6)

- i) Load Balancing concept.
- ii) Losses in prestress.
- iii) Friction and wobble concept.

Unit - II

2. A rectangular beam section of size 230mm wide $\times$ 600mm overall depth subjected to a factored sagging bending moment of 48 kN m; factored shear force 48kN and factored torsional moment of 18kN m. Design the reinforcement at the section. The materials are M20 grade concrete and HYSD reinforcement of grade Fe415. (16)

(OR)

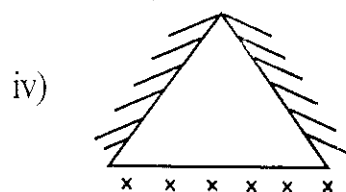
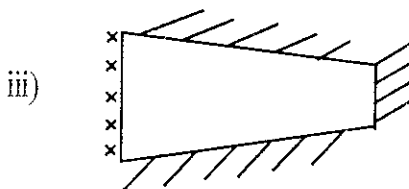
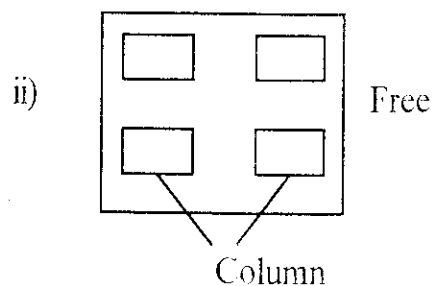
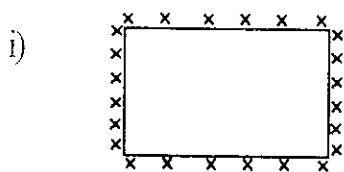
2. a) A beam circular in plan is loaded with uniform load of 140 kN/m inclusive of selfweight. The radius of the beam is 4m. The beam is supported by six symmetrically placed columns. Draw SF, BM and torque diagram for one of the spans. (10)
- b) Describe the concept of redistribution of moment with a suitable example. (6)

Unit - III

3. Derive the formula for Meridional thrust and hoop stress for spherical dome, for uniformly distributed load and concentrated load at the Crown. (16)

(OR)

3. a) Draw yield line diagrams. (10)



- b) Derive an expression for collapse load for simply supported square slab. Using the virtual work method. (6)

Unit - IV

4. Design a circular water tank with flexible base and open at top for a capacity of 6,00,000 litres resting on ground. The materials are M30 Grade concrete and HYSD reinforcement of Grade Fe415. (16)

(OR)

4. Design top dome, top ring beam, cylindrical wall and bottom ring beam for a Intze tank with the capacity of 10,00,000 liters. Assume diameter of cylindrical portion $D = 16\text{m}$, height of conical dome $h_0 = 2\text{m}$, diameter of ring beam B_2 , $D_0 = 10$. Bearing capacity of soil is 150 kN/m^2 . Also assume the intensity of wind pressure as 1500 N/m^2 . Use M20 concrete and HYSD bars. (16)

Unit - V

5. Design the stem and heel slab of R.C. cantilever retaining wall supporting an earth embankment 3.0m high, the top surface of which is horizontal, unit wt. of earth $= 18 \text{ kN/m}^3$, angle of internal friction $= 40^\circ$. The safe bearing capacity of soil is 180 kN/m^2 . Use M20 grade of concrete and Fe415 grade of steel. Show the reinforcement details with a proper sketch. (16)

(OR)

5. Design a deck slab for a reinforced concrete Culvert on a state highway with following data : (16)
- i) Width of the bridge = 12m
 - ii) Clear span = 5m
 - iii) Width of footpath = 1.5m on either side
 - iv) Thickness of wearing course = 80mm as asphaltic concrete
 - v) Material M25 and Fe415.
 - vi) IRC class AA tracked loading.
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6E 6034

B.Tech. VI Semester (Main & Back) Examination, April-2019
Civil Engineering
6CE4A Design of Concrete Structures-I

Time : 3 Hours**Maximum Marks : 80****Min. Passing Marks : 26****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

Unit - I

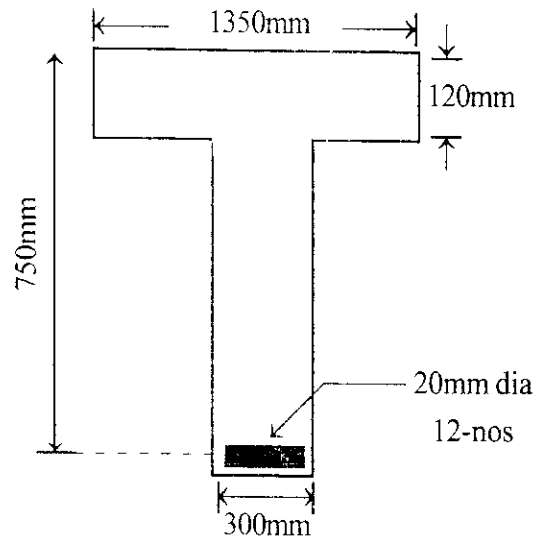
1. a) Using working stress method, find the moment of resistance of a R.C.C. beam 300mm wide and 500mm effective depth is reinforced with 3bars of 16mm. M-20 concrete grade and Fe-415 steel is used. **(08)**
- b) Using limit state design method, design a beam section for clear span = 5.1m. Length of bearing at each end is 150mm. Superimposed load = 18 kN/m, live load = 12 kN/m concrete grade: M15 and steel grade: Fe-415. Keep $\frac{b}{d} = 0.5$. **(08)**

(OR)

1. Describe the following:
 - a) Assumptions of limit state of collapse (flexure). **(05)**
 - b) Balanced, under-reinforced section and over-reinforced sections **(05)**
 - c) Stress block parameters used in limit state method along with stress diagram. **(06)**

Unit - II

2. a) Write down the conditions in which we design doubly reinforced beam. (06)
- b) The cross-section of a T-beam is shown in Fig.1. Calculate the bending strength of the beam in the limit state of collapse. Concrete grade: M15 and steel grade: Fe 415 (10)



(OR)

2. A simple beam rests over a clear span of 5.1m. Bearing end is 150mm. Dead load is 18kN/m & live load is 12kN/m. The overall dimensions of beam restricted to 275mm × 550mm. Use M-15 & Fe-415. Check for deflection also. (12+4)

Unit - III

3. a) Design the shear reinforcement for a beam width $b = 400\text{mm}$, $d = 550\text{mm}$, $V_u = 125\text{ kN}$, $F_{ck} = 25\text{ N/mm}^2$, $F_y = 415\text{ N/mm}^2$ and percentage of steel is 1.64%. (10)
- b) Elaborate the codal provision for curtailment of reinforcement. (06)

(OR)

3. a) A rectangular beam with width of section $b = 300\text{mm}$ and effective depth $= 500\text{ mm}$ has a factored load (shear) of 450 kN at the critical section near support. The beam reinforced with 6-32 ϕ (Fe-415). Use M-25 grade concrete. Design share reinforcement at support using 2-legged vertical stirrups of 10mm diameter. (10)
- b) Describe the following: (06)
- i) Bond stress
 - ii) Anchorage length
 - iii) Development length

Unit - IV

4. Design the RC slab, for a room with effective span $4\text{m} \times 5.5\text{m}$, to resist factored live load 2.5kN/m^2 and 20mm thick lime concrete having unit weight as 20kN/m^3 . Use following data: Thickness of slab = 155mm, effective cover = 25mm, M-20 & Fe-415. Also check slab for deflection.

(12+4)

(OR)

4. Design a two-way slab having thickness 250mm, which is simply supported on all the four walls of a hall with effective span 6m and 4m. Assume live load 10kN/m^2 and dead load 5kN/m^2 . Use M-25, Fe-415 grade. Determine provide and show reinforcement along short & long span.

(10+6)

Unit - V

5. a) Design a circular column to carry axial load of 1500kN. Use M-20 and Fe-415 grade of steel. Also provide helical reinforcement for the above column. (10)
- b) Describe one way shear and two way shear in a square footing. (06)

(OR)

5. A footing supports a square column of size $500 \times 500\text{mm}$ with service load of 850 kN. Find the size of footing, depth and reinforcement required in it. The safe bearing capacity of soil is 200kN/m^2 . Use M-20, Fe-415 steel. Also draw sketch at footing.

(12+4)

6E6035

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6E6035**B.Tech. VI-Semester (Main & Back) Examination, April - 2019****Civil Engineering****6CE5A Transportation Engineering - I****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 26****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 are the Characteristics of Road Transport in comparison with other systems? (08)
- b) What is the importance of Nagpur road plan in highway planning of our country? Explain the plan formulae and the salient features of the plan. (08)

(OR)

1. Calculate the total length of NH, SH, MDR, ODR and VR needed in a district as per second 20 - years road development plan or Bombay road plan. The Data collected from the district are given below:-
 - i) Total Area = 18,400 km²
 - ii) Development and agricultural area = 8000 km²
 - iii) Undeveloped Area = 4800 km²

iv) Population centres are as given below

Population Range	Number of Towns	
< 500	200	
500 - 1000	350	
1000 - 2000	750	
2000 - 5000	360	
5000 - 10,000	150	
10,000 - 20,000	80	
20,000 - 50,000	25	
50,000 - 1,00,000	10	
> 1,00,000	5	(16)

Unit - II

2. a) State the test principal and procedure of CBR test. Draw sketches showing standard details of CBR penetration test and expansion test. (10)
- b) Explain the desirable properties of Aggregate to be used in different types of pavements construction. (06)

(OR)

2. a) What are the requirement of material, plants and equipment for cement concrete road construction? Discuss briefly. (08)
- b) Explain briefly the construction of earth roads. Discuss the advantages and limitations of earth roads. (08)

Unit - III

3. a) What are the objects of highway geometric design? List the various geometric elements to be considered in highway design. (10)
- b) What are the factors on which the stopping sight distance depends? Explain briefly. (06)

(OR)

3. a) Calculate the stopping sight distance for a design speed of 100 kmph. Take the total reaction time 2.5 second and the co-efficient of friction = 0.35 (08)
- b) Explain super elevation. What are the factors on which the design of super elevation depends? (08)

Unit - IV

4. a) Write short notes on :
- i) One street parking.
 - ii) Origin and Destination studies.
 - iii) Trip generation.
 - iv) Spot speed study. (08)
- b) What are the various types of traffics accidents? Discuss the method of analyzing the speed of vehicle involved in the accident. (08)

(OR)

4. a) Explain the various types of traffic signals and their functions. How are the signal timing decide? (08)
- b) Explain the term traffic volume. What are the objects of carrying out traffic volume studies? (08)

Unit - V

5. a) Explain the CBR method of Flexible pavement design. How is this method useful to determine thickness of component layers? (08)
- b) What is the importance of hill road drainage? With the aid of neat sketches show the surface, drainage system for effective drainage and disposal of water. (08)

(OR)

5. a) What are the various method of Rigid pavement design? Explain westergaard method and limitations of this method. (08)
- b) A Subgrade soil sample has following properties :-

Soil passing soil 0.075 mm sieve = 60%

Liquid limit = 55%

Plastic limit = 45%

Design the pavement section by group Index method for heavy traffic with over 400 commercial vehicles per day. (08)

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B.Tech. VI - Semester (Main & Back) Examination, April-2019

Civil Engineering

6CE6.3A Repair And Rehabilitation of Structures

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 26

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 F&T and pitting deterioration in detail. Describe the various effects and preventive measures of F&T abrasion. (8)
- b) Explain the following with mechanism: (8)
 - i) Carbonation
 - ii) Chloride ingress
 - iii) Corrosion
 - iv) Erosion.

(OR)

1. a) What are the different types of cracks in concrete. Explain with neat sketches. Also write the preventive measures of cracks. (12)
- b) What do you mean by sulphate attack deterioration and what precautions should be kept to prevent the concrete from sulphate attack. (4)

Unit - II

2. a) What is the meaning of NDT? Write down the principle and procedure of Rebound hammer. (10)
- b) What is the purpose of rebar locator? Explain pull out test method. (6)

(OR)

2. a) Explain the method of corrosion measurement. Write the method of assessment of corrosion using half cell potential. (12)
- b) Give the brief introduction about Mapping of data. (4)

Unit - III

3. a) Discuss properties, selection criterion and method of application of epoxy, polyester and acrylic resin.. (10)
b) Define FRP? Discuss the uses and relative properties of GFRP and CFRP. (6)

(OR)

3. a) How bonding aspect of repair material can be evaluated? Discuss and three methods with reference to standard. Explain with figure. (10)
b) What are the Ferro cement techniques? Discuss its utilization and application. (6)

Unit - IV

4. a) Write the material used and procedure in Grouting technique? Explain different types of Grouting process. (8)
b) What is main purpose of jacketing? Explain the different types of jacketing. (8)

(OR)

4. a) How under water repairing is done in civil structures? Also mention their repairing material. (8)
b) What are the applications of Shotcrete? How it is done? Which materials are used in this method. (8)

Unit - V

5. a) What are preliminary investigation? Why it is necessary for structure before rehabilitation? (8)
b) Explain a case study of rehabilitation of Bridge. (8)

(OR)

5. Write short notes on: (16)
a) Types of Distress
b) Preliminary test methods
c) Study about tunnel
d) Ultra sonic pulse velocity method.
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6E 6036

B.Tech. VI - Semester (Main & Back) Examination, April-2019

Civil Engineering

6CE6.1A Remote Sensing and GIS

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 26

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 is Parallax ? How it is helpful in height determination? (2+6=8)
- b) Write short notes on
 - i) Aerial camera.
 - ii) Photo-Theodolite. (2×4=8)

(OR)

1. a) What is Photogrammetry ? (8)
 - b) Define Stereoscopes. Write in brief about the stereoscopic vision. (4)
 - c) What are maps ? Write in brief about the different types of maps. (4)
- (8+4+4=16)

Unit-II

2. a) Write short notes on:
 - i) Electromagnetic radiation (4+4=8)
 - ii) Spectrum.
- b) Define Atmospheric Windows. What is the use of atmospheric windows in Remote sensing? (8)

(OR)

2. What is Remote Sensing ? What are the essential elements and applications of remote sensing ? (2+14 =16)

Unit-III

3. Write short notes on:

- a) Multi concept in Remote sensing (8+8=16)
- b) Orbital Parameters of a satellite.

(OR)

- 3. a) What are sensors ? What are the characteristics of sensors? (4)
- b) Describe briefly about different types of resolution used as a parameters of sensors. (12)

Unit-IV

- 4. a) Write down the principles of interpretation of aerial and satellite images. (8)
- b) What are the equipments and aids required for the interpretation of aerial and satellite images. (8)

(OR)

- 4. a) Define Digital image concept. (4)
- b) Write the advantages of multidata and multiband images in remote sensing. (12)

Unit-V

5. Write short notes on

- a) Applications of GIS in agriculture
- b) GIS application in Land Use. (8+8 = 16)

(OR)

- 5. What is Geographic Information System (GIS) ? Describe the different components of GIS and its applications in Civil Engineering. (16)
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