USN | | | | | | | | | | **10AL51**

Fifth Semester B.E. Degree Examination, June / July 2014
Management and Entrepreneurship

Time: 3 hrs.

Max. Marks:100

Note: *Answer any FIVE full questions, selecting atleast TWO questions from each part.*

PART – A

1 a. What are the characteristics of management? Explain. **(10 Marks)**
   b. Distinguish between management and administration. **(05 Marks)**
   c. List the contribution of F.B. Gilberth. **(05 Marks)**

2 a. What are the characteristics of planning? Briefly explain each component. **(10 Marks)**
   b. What are the advantages of objectives? **(05 Marks)**
   c. What are the important characteristics of decision making? **(05 Marks)**

3 a. What are the principles of organization? Explain each in brief. **(10 Marks)**
   b. What are the sources of recruitment? **(05 Marks)**
   c. What are the main features of staffing? **(05 Marks)**

4 a. Define leadership. What are the basic styles of leadership? Explain each in brief. **(10 Marks)**
   b. What are the features of motivation? **(05 Marks)**
   c. Explain McGregor's theory X and theory Y. **(05 Marks)**

PART – B

5 a. What are the major characteristics of an entrepreneur? Explain each in brief. **(07 Marks)**
   b. How does an entrepreneur differ from a manager? Explain. **(06 Marks)**
   c. In the Indian context, explain the specific role that an entrepreneur has fulfilled in the economic development of the country. **(07 Marks)**

6 a. What are the salient features of new small enterprise policy 1991? **(07 Marks)**
   b. What are the characteristics of SSI? **(06 Marks)**
   c. What are the major effects of WTO/GATT on Indian SSI? **(07 Marks)**

7 a. Explain DIC single window agency. **(07 Marks)**
   b. What are the objectives and functions of SIDBI? **(06 Marks)**
   c. What are the functions of KSFC and TECSOK? **(07 Marks)**

8 a. Explain the various guidelines provided by the planning commission for preparation of project report. **(07 Marks)**
   b. What are the major errors generally made by entrepreneurs during formulating project report? **(06 Marks)**
   c. What are the differences between PERT and CPM? **(07 Marks)**

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Fifth Semester B.E. Degree Examination, June/July 2014
Design of RCC Structural Elements

Time: 3 hrs.   Max. Marks:100

Note: *1. Answer FIVE full questions, selecting
at least TWO questions from each part.
2. Use of IS456-2000 and SP16 permitted.
3. Assume any missing data suitably.*

PART – A

1   a. Explain balanced section, under reinforced section and over reinforced section with the help
of sketches in limit state RCC design.   **(04 Marks)**

b. Derive the expression for stress block parameters, compressive force $C_u = 0.36$ fck χ_u
and its depth $\bar{y} = 0.42 \chi_u$ from top.   **(08 Marks)**

c. Obtain the expression for Max depth of neutral axis, limiting percentages of steel and
limiting moment for rectangular RC section for M20 concrete and Fe415 steel.   **(08 Marks)**

2   a. A single reinforced conc. Beam 250×450 mm deep up to the centre of reinforcement is
reinforced with 3 – 16 mm dia at an effective cover 50 mm, Effective span 6 m. M20 conc.
and Fe415 steel. Determine the central point load that can be supported in addition to the
self weight.   **(08 Marks)**

b. A doubly reinforced concrete rectangular beam 250mm × 500 mm is required to support a
load of 40 kN/m including self wt. Effective span 5 m, effective cover 50 mm. M20 conc.
Fe415 steel. Find the steel required for flexure and shear.   **(12 Marks)**

3   a. A T-beam reinforced concrete beam having flange width 1200 mm flange thickness 100mm
E.depth 600 mm web 300 mm. Find steel to resist an ultimate moment of 550 kNm. Adopt
M15 conc and Fe415 steel.   **(10 Marks)**

b. A doubly reinforced concrete beam having rectangular section 250mm × 500mm is
reinforced with 2 – 12 mm dia in compression 4 – 20 mm dia in tension. Effective cover
40 mm. E.span 5 m. Find ultimate moment capacity. Adopt M20 conc. and Fe415 steel.
                                                                                    (10 Marks)

4   a. A hall 16m × 6m is provided with T-beam and slab, T beams are spaced 4m c/c slab
thickness is 120 mm, L Load 5 kN/m^2 including self wt. Design intermediate T beam. M20
conc. and Fe415 steel. Assume bearing of 500 mm. Check the beam for deflection and
development length at support.   **(12 Marks)**

b. Design a beam 300mm × 600mm to support $M_u = 115$ kNm; $V_u = 95$ kNm ; $T_u = 45$ kNm.
Use M15 conc and Fe415 steel. Assume effective cover 37.5 mm.   **(08 Marks)**

PART – B

5. Design a two way slab 5m × 6m live load 3 kn/m². M20 concrete Fe415 steel. Also check for bond length and shear. Assume corners are held down, bearing 300 mm. **(20 Marks)**

6. a. Design RCC column to support ultimate load of 1800 kN. Effective length 1.85 m, M20 conc and Fe415 steel. **(10 Marks)**

   b. Design a column 450 × 450 mm to support a load of P_u = 2500 kN; M_u = 180 kNm. Adopt M25 conc Fe415 steel. Assume bars on all the four sides. Effective cover 67.5 mm. **(10 Marks)**

7. Design a rectangular isolated footing of uniform thickness for a column 400 × 600 mm to support a load of 600 kN SBC of soil 120 kN/m². Adopt M20 conc Fe415 steel. Take the size of the footing 2.5 m × 2.3 m. Also check the requirements of one way shear, two way shear bond and transfer of load at column base. **(20 Marks)**

8. Design a stair for an office building for the plan shown in Fig.Q8. Rise 150 mm tread 250 mm bearing 400 mm M20 conc and Fe415

Fig.Q8
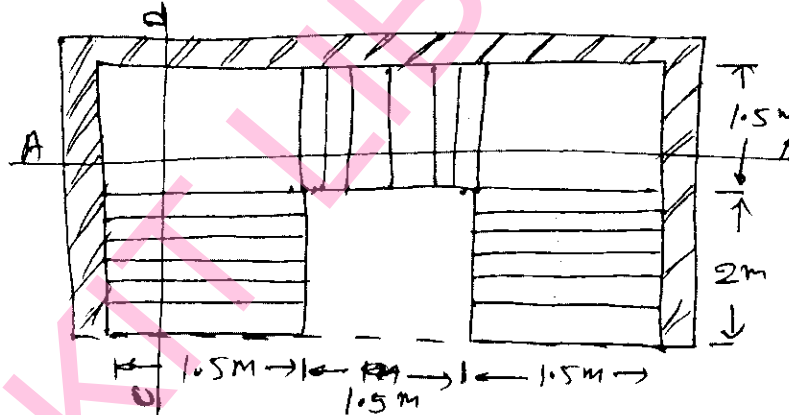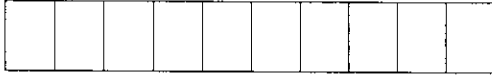
Sketch the details of reinforcement for span AB and CD. **(20 Marks)**

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Fifth Semester B.E. Degree Examination, June / July 2014
Structural Analysis - II

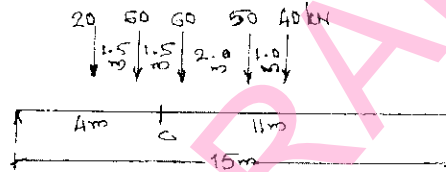Time: 3 hrs.   Max. Marks:100

Note: 1. *Answer any FIVE full questions, selecting atleast TWO questions from each part.*
2. *Missing data may be suitably assumed.*

PART - A

1. a. A series of wheel loads crosses over a girder of span 15m from left to right with 40kN load leading as shown in fig.Q1(a). Determine i) Maximum B.M and ii) Maximum S.F at a section 4m from left support. **(10 Marks)**

Fig.Q1(a)

b. Draw ILD for S.F and B.M at a section 3m from left support for a simply supported beam 12m long. Use the diagram to calculate maximum S.F and B.M at this section due to rolling load 5m long and 2kN/m intensity. **(10 Marks)**

2. Analyse the frame shown in fig. Q2, by slope deflection method and draw B.M.D. **(20 Marks)**

Fig.Q2
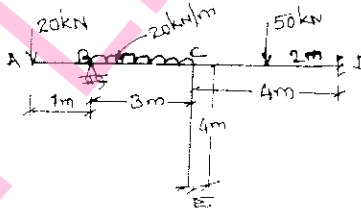
3. A horizontal beam ABCD is carried on hinged supports and is continuous over three equal spans each of 3m. All the supports are initially at the same level. The beam is loaded as shown. Plot B.M.D for the beam if the support 'A' settlers by 10mm, 'B' settlers by 30mm and 'C' settlers by 20mm. Use M.D method. Take $E = 2.0 \times 10^5 N/mm^2$, $1 = 2.4 \times 10^6 mm^4$. **(20 Marks)**

Fig.Q3
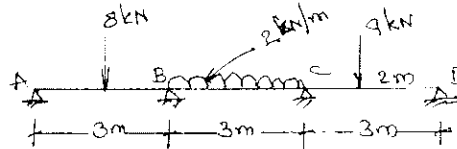
4. Analyse the portal frame loaded as shown in fig. Q4 and draw B.M.D. Use Moment distribution method. **(20 Marks)**

Fig.Q4
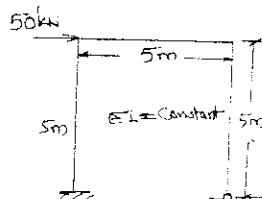
PART - B

5   Analyse the continuous beam shown in fig. Q5 by Kani's method. Draw S.F.D and B.M.D.
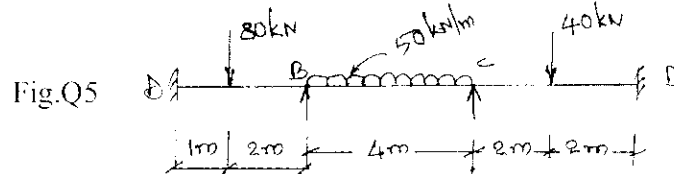**(20 Marks)**

Fig.Q5

6   Analyse the frame shown in fig. Q6 by Flexibility method and draw B.M.D. Use system approach.
(20 Marks)
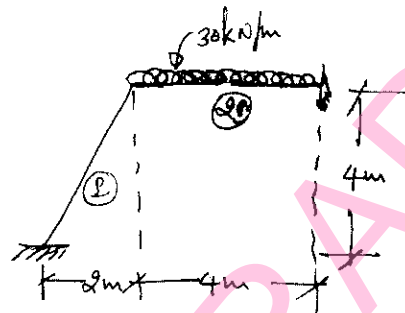
Fig.Q6

7   Analyse the bent shown in fig. Q7 by stiffness method and draw B.M.D. Use system approach.
(20 Marks)

Fig.Q7

8   a. Explain : i) Free Vibration i) Forced Vibration   iii) Natural frequency   iv) Degree of freedom   v) Damping   vi) Periodic motion. **(12 Marks)**
     b. Find the natural frequency of the system. The mass of the beam is negligible in comparison to the suspended mass $E = 2.1 \times 10^5$ N/mm^2 and $I = 28.125 \times 10^6$ mm^4 for beam. **(08 Marks)**

Fig.Q8(b)

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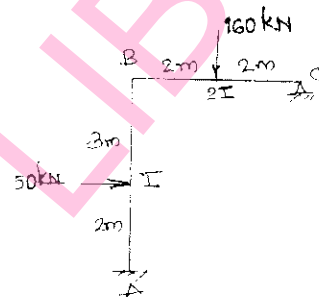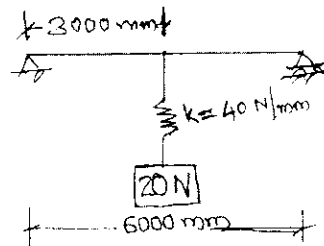## Fifth Semester B.E. Degree Examination, June/July 2014
Geotechnical Engineering – I

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions, selecting*
atleast TWO questions from each part.

PART – A

1 a. Define: i) Void ratio; ii) Porosity; iii) Degree of saturation; iv) Water content; v) Dry unit weight; vi) Unit weight of soil solids; vii) Air content with the help of a three phase diagram; viii) %ge of air voids. **(05 Marks)**

b. With usual notations derive the relationship: $Se = W.G$. **(05 Marks)**

c. The volume of an undisturbed clay sample having a natural water content of 40% is 25.6×10^{-6} m^3 and its weight is 0.435N. Calculate the void ratio and degree of saturation of the sample, if specific gravity is 2.75. Solve by first principles. **(10 Marks)**

2 a. Define: i) Liquid limit; ii) Plastic limit; iii) Shrinkage limit; iv) Relative consistency; v) Toughness index; vi) Slenderness ratio. **(06 Marks)**

b. A 100×10^{-6} m^3 clay sample has a natural water content of 30%. Its shrinkage limit is 18%. If the sp.gr. of solids is 2.72, what will be the volume of sample at a water content of 15%? **(04 Marks)**

c. In a liquid limit test specimens of certain sample of clay following readings are obtained:

Water content (%)	31.93	27.62	25.51	23.30
No. of blows	5	16	23	42

The plastic limit of clay is 13% natural water content is 18%. Determine liquid limit, plasticity index, liquidity index, relative consistency, flow index and toughness index of soil. **(10 Marks)**

3 a. Explain the classification of fine grained soils as per Indian soil classification system. **(06 Marks)**

b. Define soil structure. Explain with neat sketches single grained and honey combed structures in soils. **(06 Marks)**

c. The following data refers to a sample of soil: **(08 Marks)**

Percentage passing 4.75mm I.S sieve   = 64
Percentage passing 75 micron I.S sieve   = 6
Coefficient of uniformity   = 7.5
Coefficient of curvatures   = 2.7
Plasticity index   = 2.5
Classify the soil

4 a. List and explain the factors affecting the permeability of soils. **(06 Marks)**

b. A permeameter of 82mm diameter contains a sample of soil of length 350mm. It can be used for either constant head or falling head tests. The stand pipe used for the latter has a diameter of 25mm. In the constant head test the loss of head was 1160mm measured on a length of 250mm. When the rate of flow was 2.73 ml/sec. Find the coefficient of permeability of the soil. If a falling head test was then conducted, how much time would be taken for the head to drop from 1.5m to 1.0m? **(08 Marks)**

c. The effective sizes of two sands are 0.09mm and 0.54mm. The capillary rise of water in the first sand is 480mm. What is the capillary rise in second sand, if void ratio is same for both sands? **(06 Marks)**

PART – B

5 a. Explain Mohr-Coulomb theory as applied to soils. **(05 Marks)**

b. Explain the factors affecting the shear strength of soils. **(05 Marks)**

c. A deep clay stratum underlies a sand strata of 5m thick. The ground water table is found at 3m depth form GL. For sand $G = 2.65$ and $c = 0.6$. The sand above water table is 40% saturated. For clay if natural water content is 45% and $G = 2.70$ draw total, effective and neutral pr. Variation diagrams upto a depth of 8m from GL. **(10 Marks)**

6 a. Explain the factors affecting compaction of soils. **(08 Marks)**

b. Following are the result of standard proctor test:

Trial No.	1	2	3	4	5
Moisture content (%)	8.30	10.50	11.30	13.40	13.80
Bulk unit wt (kN/m^3)	19.8	21.3	21.6	21.2	20.8

The sp.gr. of soil particles is 2.65.
Plot the following and determine OMC and MDD:
i) Moisture density curve.
ii) Zero airvoids curve.
iii) Ten percent air content curve. **(12 Marks)**

7 a. Distinguish between normally consolidated soils and over consolidated soils. **(06 Marks)**

b. What are the assumptions made in Terzaghi's one dimensional consolidation theory? **(08 Marks)**

c. Explain the determination of preconsolidation pressure by casagrande method. **(06 Marks)**

8 a. With a neat sketch, explain the square root of time fitting method of determining coefficient of consolidation. **(06 Marks)**

b. Explain how the shear tests are classified based on sample drainage conditions. **(06 Marks)**

c. A bed of compressible clay of 4m thickness has pervious sand on top and impervious rock at the bottom. In a consolidation test on an undisturbed specimen of clay from this deposit, 90% settlement was reached in 4 hrs. The specimen was 20mm thick. Estimate the time in years for a building founded over this deposit to reach 90% of its final settlement. **(08 Marks)**

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Fifth Semester B.E. Degree Examination, June / July 2014
Hydrology and Irrigation Engineering

Time: 3 hrs.　　　　　　　　　　　　　　　　　　　　　　　　Max. Marks:100

Note: *Answer any FIVE full questions, selecting atleast TWO questions from each part.*

PART – A

1　a. Define Hydrology. List the practical applications of hydrology. **(06 Marks)**
　b. With a neat sketch, explain the construction and working of Float type raingauge (Siphon type). **(06 Marks)**
　c. The analysis of a storm yielded the following information regarding isohyets. Calculate the average depth of rainfall. **(08 Marks)**

Isohyet interval in mm	70 – 80	80 – 90	90 – 100	100 - 110	110 – 120	120 – 130
Area in km^2	10	85	113	98	136	67

2　a. Define the term infiltration capacity of a soil. Explain briefly the factors affecting the infiltration capacity of a soil. **(06 Marks)**
　b. List the factors affecting evaporation. Explain with a neat sketch, the measurement of evaporation using class – A pan. **(06 Marks)**
　c. A 6 hour storm produced rainfall intensities of 7, 18, 25, 12, 10 and 3mm/hr in successive one hour intervals over a basin of 800km^2. The resulting run off is observed as 2640 hect – meter. Determine the ϕ - index of the basin. **(08 Marks)**

3　a. Define unit hydrograph. What are the assumptions underlying the unit hydrograph theory and what are the limitations of unit hydrograph theory. **(08 Marks)**
　b. The ordinates of the 3 hour unit hydrograph are given below :

Time in hour	0	3	6	9	12	15	18	21	24	27	30
Ordinates m^3/sec	0	10	25	20	16	12	9	7	5	3	0

Find the ordinates of a 6 hour unit hydrograph for the same basin, analytically. Also sketch this unit hydrograph. What is the peak value of discharge in this unit hydrograph? **(12 Marks)**

4　a. Explain the following terms :
　　i) Design flood　　ii) Maximum probable flood　　iii) Standard project flood. **(06 Marks)**
　b. What are the different types of flood control reservoirs? **(06 Marks)**
　c. Write a short note on channel improvement as flood control measure. **(08 Marks)**

PART – B

5　a. Define Irrigation. List the advantages and disadvantages of irrigation. **(08 Marks)**
　b. What are the environmental impacts of irrigation? **(06 Marks)**
　c. Write a short note on sewage irrigation. **(06 Marks)**

6 a. Describe briefly the various soil groups of India. **(06 Marks)**
   b. Explain the following terms : i) Saturation capacity ii) Field capacity iii) Moisture equivalent iv) Wilting point v) Available moisture. **(10 Marks)**
   c. Distinguish between crop period and base period. **(04 Marks)**

7 a. Write a brief note on crop seasons and crops of India. **(06 Marks)**
   b. What are the factors affecting duty of water? How can duty be improved? **(07 Marks)**
   c. What is consumptive use of water? List the various factors affecting consumptive use of water. **(07 Marks)**

8 a. How irrigation canals are classified? **(08 Marks)**
   b. Describe briefly the various considerations made in the alignment of an irrigation canal. **(08 Marks)**
   c. Distinguish between productive canal and a protective canal. **(04 Marks)**

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Fifth Semester B.E. Degree Examination, June/July 2014
Transportation Engineering - I

Time: 3 hrs.   Max. Marks:100

Note: *1. Answer FIVE full questions, selecting
atleast TWO questions from each part.*
2. Assume IRC standards as applicable.
3. Missing data, if any, may be suitably assumed.

PART – A

1   a. Explain briefly, the various characteristics of road transport.   **(06 Marks)**
       b. Compare the characteristic features of different modes of transportation.   **(06 Marks)**
       c. Explain :
          i) Jayakar committee recommendations
          ii) Central road fund
          iii) Central road research institute.   **(08 Marks)**

2   a. Explain the classification of roads as per Third 20 year road development plan.   **(06 Marks)**
       b. Explain saturation system for phasing the road development programme.   **(06 Marks)**
       c. What are the important policies mentioned in vision : 2021 document.   **(08 Marks)**

3   a. What are the conditions which necessitate taking up a realignment project of a highway?
                                                                  (06 Marks)
       b. Define comber. Discuss the factors on which the amount of camber to be provided depends. Specify the recommended ranges of camber for different types of pavement surfaces.
                                                                    (06 Marks)
       c. The speeds of overtaking and over taken vehicles are 80 kmph and 60 kmph respectively. If the acceleration of the over taking vehicles is 2.5 kmph/s, calculate the safe passing sight distance for two –way traffic. What should be the length of overtaking zone? Show the position of signs by means of sketch.   **(08 Marks)**

4   a. Define super elevation. Explain maximum and minimum super-elevation. Enumerate the steps for practical design of super-elevation.   **(06 Marks)**
       b. On a highway there is a horizontal curve of radius 400 m and length 200 m. Compute the set back distance required so as to provide stopping sight distance, for the design speed of 65 kmph. The distance between the centre line of the road and the centre line of inner lane is 1.9 m.   **(06 Marks)**
       c. Explain :
          i) Ruling gradient
          ii) Limiting gradient
          iii) Minimum gradient
          iv) Grade compensation on curve.   **(08 Marks)**

PART – B

5   a.   The properties of subgrade soil are given below :
        Passing 75 micron IS sieve   = 80%
        Liquid limit   = 58%
        Plasticity index   = 25%
        Classify the soil by HRB system with group index value.   **(06 Marks)**
    b.   Compare tar and Bitumen.   **(06 Marks)**
    c.   Define modulus of subgrade reaction. With the sketch explain the principle test for determining the K – value. How correction for K-value is made for different plate sizes.
                                                                         (08 Marks)

6   a.   Explain ESWL. How is it determined for dual wheel assembly?   **(06 Marks)**
    b.   Explain the steps involved in the design of flexible pavement as per IRC : 37 – 2001.
                                                                         (06 Marks)
    c.   Explain the steps involved in design of slab thickness of rigid pavement as per IRC : 58 – 2002.   **(08 Marks)**

7   a.   Write down the construction steps for wet mix macadam base course.   **(06 Marks)**
    b.   Explain the construction steps for dry lean concrete subbase.   **(06 Marks)**
    c.   Explain the significance of highway drainage.   **(08 Marks)**

8   a.   What are the quantifiable and non – quantifiable road user benefits due to the construction of a new highway or improvement of existing highway?   **(06 Marks)**
    b.   Briefly explain any three methods of economic evaluation of highway projects.   **(06 Marks)**
    c.   Explain briefly various factors affecting the vehicle operation cost.   **(08 Marks)**

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