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

Fifth Semester B.E. Degree Examination, Dec.2013/Jan.2014
Management and Entrepreneurship

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1 a. Define management. Write various characteristics of management. (05 Marks)
   b. Briefly explain the various levels and skills required at different management levels. (05 Marks)
   c. Explain the various functions of management. (10 Marks)

2 a. Define planning and discuss its importance. (05 Marks)
   b. Write differences between strategic planning and tactical planning. (05 Marks)
   c. Explain various steps of planning. (10 Marks)

3 a. What is an organization? Explain the purpose and nature of an organization. (05 Marks)
   b. What are principles of organization? (05 Marks)
   c. Briefly explain the steps in the selection procedure. (10 Marks)

4 a. Explain Maslow's theory of motivation. (05 Marks)
   b. What are the qualities of a good leader? (05 Marks)
   c. Briefly explain the essentials of sound controlling. (10 Marks)

PART – B

5 a. What are the qualities of an entrepreneur? (05 Marks)
   b. Explain the types of entrepreneur. (05 Marks)
   c. Explain the various stages in entrepreneurial process. (10 Marks)

6 a. Enumerate the characteristics of small scale industries. (05 Marks)
   b. Describe the objectives of small scale industries in India. (05 Marks)
   c. Explain the steps involved in setting up a small scale industry. (10 Marks)

7 a. Mention important central and Karnataka state government institutions providing support to SSIs. (05 Marks)
   b. What are the objectives and functions of KIADB? (05 Marks)
   c. Write short notes on any two:
      i)   Karnataka State Finance Corporation (KSFC).
      ii) Karnataka State Small Industries Development Corporation (KSSIDC).
      iii) District Industries Centre (DIC). (10 Marks)

8 a. Write various points to be considered for project identification. (05 Marks)
   b. Write differences between PERT and CPM. (05 Marks)
   c. Explain in detail the contents of "Project Report". (10 Marks)

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Fifth Semester B.E. Degree Examination, Dec.2013/Jan.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 its design Aid (SP-16) permitted.
3. Assume the missing data suitably.

PART – A

1   a. Explain in detail the necessity of considering partial safety factor in the limit state method of design.   **(04 Marks)**
   b. Explain the terms singly reinforced beam and doubly reinforced beam with neat sketch.   **(04 Marks)**
   c. Obtain the expression for the limiting depth of neutral axis, Mr limit and limiting percentage of steel for M25 grade concrete and Fe415 steel.   **(12 Marks)**

2   a. Derive the expression for developmental length in tension. Calculate development length for 24mm dia HYSD bars and Fe500 subjected to compression for M25.   **(06 Marks)**
   b. Design a doubly reinforced beam of limited depth 440mm. The beam is subjected to a factored moment of 600 kNm. The stess in compression steel is 353 N/mm². Take effective depth of 50mm both at compression and tension. Draw the sketch showing reinforcement details. M2D and Fe415 graders.   **(14 Marks)**

3   a. Explain short term deflection and long term deflection.   **(04 Marks)**
   b. A reinforced concrete beam of cross-section (300×600)mm overall is reinforced with 3 bars of 20mm HYSD bars of Fe415 grade on tension side with an effective cover of 50mm. Compute short term deflection of the beam at mid span, consisting of service load of 20kN/m and concentrated load of 25kN at the centre of span. The beam is simply supported over a span of 5m. Use M20 grade concrete and Fe415 steel.   **(10 Marks)**
   c. Calculate the crackwidth directly under the bar on tension face at the location of max bending moment in the beam of b = 300mm, D = 600mm, off cover on comp. side (d′) = 37.5mm, Ast – 3 bars of 20mm dia bars. M = 200 kNm, Ast = 1885 mm².   **(06 Marks)**

4   A T beam whose flange width is 1500mm, depth of flange is 100mm, rib width is 300mm is reinforced with 4 bars of 25mm dia at an effective depth of 560mm. Find moment of resistance of T-beam for M20 grade concrete and Fe415 steel. Also find moment of resistance if it is 5 bars of 25 dia. Ast and for M15 grade.   **(20 Marks)**

PART – B

5   Design a slab over a room measuring (6.15×4.65)m effective. The slab is supported on masonry walls with adequate restraint and corners are held down. The live load on the slab is 3kN/m². M20 and Fe415 grade materials are used. Sketch the plan of reinforcement.   **(20 Marks)**

6 a. Write the specifications for longitudinal and transverse reinforcement of column as per IS456-2000. **(04 Marks)**

  b. Explain eccentricity of loading on columns. Differentiate uniaxial and biaxial bending with sketch. **(04 Marks)**

  c. Design the reinforcement for a column of size (400×600)mm subjected to dead load and live load. The column has an unsupported length of 4.0m and effectively held in position and restrained against rotation at both ends. Use M25 grade concrete and Fe415 steel. Sketch the details of reinforcement. **(12 Marks)**

7 a. Explain 'punching shear' in the design of footing, and depth determination from punching shear considerations. **(06 Marks)**

  b. A square footing has to transfer a load of 600kN from a square column of (500×500)mm. Design the footing taking SBC of soil as 120 kN/m^2. Use M20 grade concrete and Fe415 steel. **(14 Marks)**

8 A straight stair in a residential building is supported on wall on one side and stringer beam on the other side. The risers are 150mm and treads are 250mm and the horizontal span of the stairs may be taken as 1.2m. Design the steps. Use M20 grade concrete and Fe415 steel. Draw the sketch showing reinforcement details. **(20 Marks)**

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Fifth Semester B.E. Degree Examination, Dec.2013/Jan.2014
Structural Analysis – II

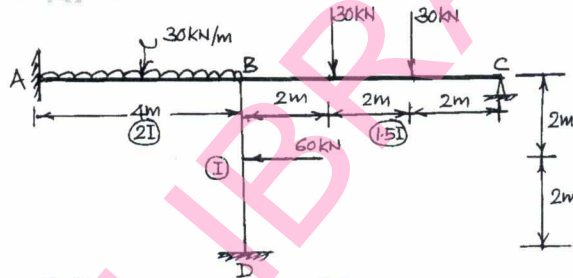Time: 3 hrs.   Max. Marks:100

Note: *1. Answer FIVE full questions, selecting*
at least TWO questions from each part.
*2. Assume any missing data suitably.*

PART – A

1 a. Two wheel loads of 16kN and 8kN, at a fixed distance apart of 2m cross a beam of 10m span. Draw the influence line for bending moment and shear force for a point 4m from the left abutment and find the maximum bending moment and shear force at that point.
(06 Marks)

   b. A uniformly distributed load of 1kN per meter run 6m long crosses a girder of 16m span. Construct the maximum S.F and B.M diagram and calculate the values at sections 3m, 5m and 8m from the left hand support.
(14 Marks)

2 Analyze the frame shown in Fig.Q.2 by using slope deflection method. Draw BMD, SFD and also sketch the elastic curve.
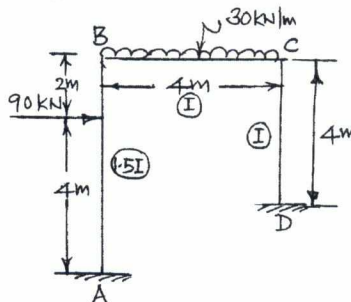**(20 Marks)**

Fig.Q.2

3 Analyze the frame shown in Fig.Q.3 by the method of moment distribution. Draw BMD, SFD and also sketch the elastic curve.
(20 Marks)

Fig.Q.3
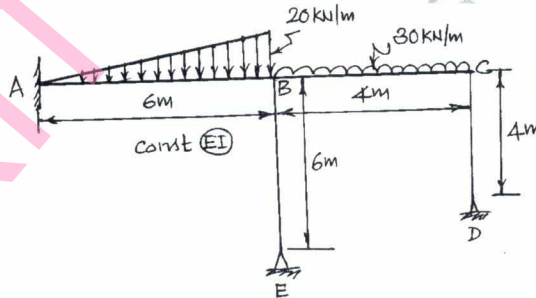
4 Analyze the frame shown in Fig.Q.4 by the method of moment distribution. Draw BMD, SFD and also sketch the elastic curve.
(20 Marks)

Fig.Q.4

Fifth Semester B.E. Degree Examination, Dec.2013/Jan.2014
Geotechnical Engineering – I

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1. a. With the help of soil three-phase diagram explain: (i) Water content   (ii) Air content (iii) Degree of saturation   (iv) Relative density   **(08 Marks)**
   b. With usual notations, derive the relationship
   $$\gamma_d = \frac{(1 - n_a)G\gamma_\omega}{1 + \omega G}$$
        (06 Marks)
   c. A fully saturated soil sample has a water content of 35% and specific gravity of 2.65. Determine its porosity, saturated unit weight and dry unit weight.   **(06 Marks)**

2. a. Define : (i) Liquid limit (ii) Shrinkage limit (iii) Relative consistency (iv) Shrinkage ratio.   **(08 Marks)**
   b. Draw the grain size distribution curve and determine the uniformity co-efficient and co-efficient of curvature of the soil, for the following data: **(08 Marks)**

Sieve size (mm)	2.4	1.2	0.6	0.3	0.15	0.075	Pan
Mass of soil retained (g)	0	5	25	215	225	25	0.5

   c. A soil has a plastic limit of 25% and a plasticity index of 30%. If the natural water content of the soil is 34%, determine its consistency index and liquidity index.   **(04 Marks)**

3. a. Explain field identification of soils.   **(08 Marks)**
   b. What are the different types of clay minerals commonly found in soils? Explain any one with their structure.   **(06 Marks)**
   c. Classify the following soils with IS system of classification:
   Soil A : Liquid limit = 38% and Plastic limit = 20%
   Soil B : Liquid limit = 18% and Plastic limit = 12%
   Soil C : Passing through 4.75 mm IS sieve = 70%
              Passing through 0.075 mm IS sieve = 08%
              $C_U = 7$, $C_C = 3$ and $I_P = 3$ **(06 Marks)**

4. a. Explain the factors affecting permeability.   **(08 Marks)**
   b. Explain Quick Sand phenomenon.   **(06 Marks)**
   c. In a falling head permeability test, head causing flow was initially 500 mm and it drops 20 mm in 5 minutes. Calculate the time required for the head to fall to 250 mm?   **(06 Marks)**

PART – B

5. a. Discuss the effect of compaction on different properties of soil.   **(08 Marks)**
   b. Differentiate between standard and modified proctor tests.   **(04 Marks)**
   c. The observations of a standard proctor test are given below :

Dry density kN/m³	16.16	17.06	18.61	18.95	18.78	17.13
Water content (%)	5.02	8.81	11.25	13.05	14.40	19.25

   (i) Plot the compaction curve and determine optimum moisture content.
   (ii) Also compute the void-ratio and degree of saturation at optimum condition. Take G = 2.77   **(08 Marks)**

6 a. Differentiate compaction from consolidation. **(06 Marks)**

b. Explain the significance of pre-consolidation pressure. Describe the Casagrande method of determining it. **(08 Marks)**

c. A bed of compressible clay. 4 m thick has pervious sand on the top and impervious rock at the bottom. In a consolidation test on an undisturbed sample of clay from this deposit, 90% settlement was reached in 4 hours. The sample was 20 mm thick. Estimate the time in years for the building founded over this deposit to reach 90% of its final settlement. **(06 Marks)**

7 a. Explain sensitivity and thixotscopy of clay. **(06 Marks)**

b. Explain total, neutral and effective stresses in soil. What is the significance of effective stress? **(06 Marks)**

c. The stresses on a failure plane in a drained test on a cohesionless soil are as under:

Normal stress $(\sigma) = 100$ kN/m^2

Shear stress $(\tau) = 40$ kN/m^2

(i) Determine the angle of shearing resistance and the angle which the failure plane makes with the major principal plane.

Also find the major and minor principal stresses. **(08 Marks)**

8 a. What are the advantages and disadvantages of direct shear test over triaxial test? **(06 Marks)**

b. What are curve fitting methods used in consolidation test? Explain any one, with neat sketches. **(08 Marks)**

c. A shear vane of 75 mm diameter and 110 mm length was used to measure the shear strength of a soft clay. If a torque of 600 N-m was required to shear the soil, calculate the shear strength. The vane was then rotated rapidly to cause remoulding of the soil. The torque required in the remoulded state was 200 N-m. Determine the sensitivity of the soil. **(06 Marks)**

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Fifth Semester B.E. Degree Examination, Dec.2013 / Jan. 2014
Hydrology and Irrigation Engineering

Time: 3 hrs.   Max. Marks:100

Note: 1. *Answer any FIVE full questions, selecting*
atleast TWO question from each part.
2. *Assume any missing data suitably.*

PART - A

1 a. Define Rain gauge. Describe with a neat sketch the principle of working of Symon's non – recording gauge and its demerits. **(08 Marks)**
   b. Define Precipitation. Explain the different forms of precipitation. **(06 Marks)**
   c. Calculate the mean areal rainfall using Isohyetal method using the necessary data. **(06 Marks)**
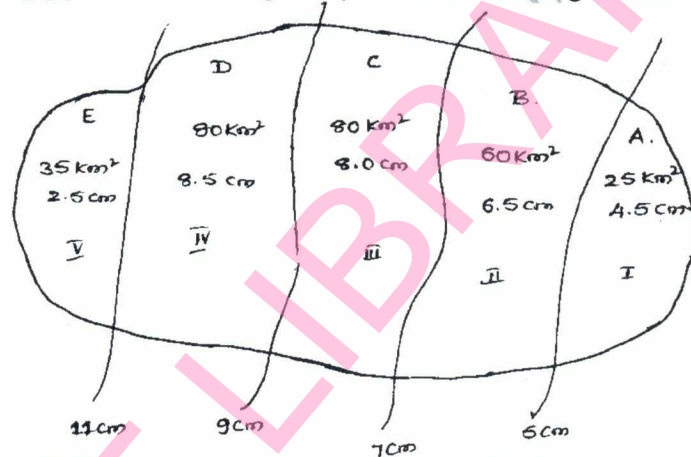
2 a. Define evaporation. With a neat sketch, explain the measurement of evaporation using IS class A pan. **(07 Marks)**
   b. Explain factors affecting infiltration capacity. **(07 Marks)**
   c. A 6h storm producing rain fall intensities of 7, 18, 25, 12, 10 and 3mm/hr in successive one hour interval over a basin of 800sq.km. The resulting runoff is observed to be 2640 ha.m. Determine the ϕ - index for the basin. **(06 Marks)**

3 a. Define unit hydrograph. Derive the unit hydrograph from an isolated storm. **(06 Marks)**
   b. Explain in detail the various methods of base flow separation. **(08 Marks)**
   c. In a typical 4 hr storm producing 5cm of run off from a basin. The flow in the stream area is as follows. **(06 Marks)**

Time in hr	0	2	4	6	8	12	16	20
Flow in cumec	0.0	1.25	4.25	6.75	5.60	3.50	1.35	1.0

4 a. Define flood. Explain factors affecting flood. **(04 Marks)**
   b. Give three empirical formula that are commonly used to estimate the design flood? Also specify the regions in India, where they are applied and range of coefficient values in the equation. **(10 Marks)**
   c. Differentiate between : i) Channel routing and Reservoir routing   ii) Droson storage and Wedge storage. **(06 Marks)**

PART – B

5   a.   Define the term irrigation. Briefly describe the factors which necessitate the irrigation.
(08 Marks)

   b.   Explain any three of the following : i) Well irrigation   ii) Tube irrigation   iii) Infiltration galleries   iv) Sewage irrigation   v) Lift irrigation. **(06 Marks)**

   c.   Write a note on Environmental impacts of irrigation. **(06 Marks)**

6   a.   With a neat sketch, describe soil profile and add a note on physical properties of soils.
(08 Marks)

   b.   Discuss briefly the classification of Indian soils. **(06 Marks)**

   c.   Determine the frequency of irrigation from the following data : i)   Field capacity of soil = 35%   ii)   Permanent writing point = 18%   iii)   Density of soil = 1.5g/cm^3 iv)   Depth of root zone = 30cm   v)   Daily consumption use of water = 17mm. **(06 Marks)**

7   a.   Discuss various methods of assessment of irrigation water. **(06 Marks)**

   b.   Explain in detail irrigation efficiency and add a note on crop seasons of India. **(08 Marks)**

   c.   A channel is to be designed for irrigating 5000 hectares in Kharif crop and 4000 hectares in Rabi crop. The water requirement for Kharif and Rabi are 60cm and 25cm respectively. The Kor period for Kharif is 3 weeks and for Rabi is 4 weeks. Determine the discharge of the channel for which is to be designed. **(06 Marks)**

8   a.   Define canal. Discuss the various types of canals. **(08 Marks)**

   b.   Write a note on alignments of canals. **(06 Marks)**

   c.   What is meant by Design of canals and write a note on comparison between Kenned's and Lacey's theory. **(06 Marks)**

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Fifth Semester B.E. Degree Examination, Dec.2013 / Jan. 2014
Transportation Engineering - I

Time: 3 hrs.   Max. Marks:100

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

PART - A

1. a. Explain the various characteristics of road transport. **(06 Marks)**
   b. Explain briefly the contribution of the following in the road development in India.
      i) Indian Roads Congress   ii) Central Road Research Institute. **(08 Marks)**
   c. Discuss the role of transportation in the development of a country. **(06 Marks)**

2. a. Write a note on road patterns. **(06 Marks)**
   b. Explain briefly the objectives and the functions of : i) PMGSY   ii) K SHIP. **(06 Marks)**
   c. Four new road links A, B, C and D are to be constructed during a 5 year plan period. Suggest the order of priority for phasing the road construction programme based on maximum utility approach. Assume utility units of 0.5, 1.0, 2 and 4 for the four population ranges and 1 per 1000 tonnes, 500 tonnes and 100 tonnes of agricultural, raw material and industrial products respectively. **(08 Marks)**

Road link	Length km	No. of villages served with population range				Productivity served, in tonnes		
		< 500	501-1000	1001 - 2000	> 2000	Agricultural	Raw material	Industrial products
A	70	30	18	8	3	8000	4000	1000
B	45	11	7	6	3	6000	1000	1600
C	65	23	7	5	5	4500	2000	3200
D	60	38	4	3	3	4000	6000	500

3. a. Write a note on engineering surveys to be conducted in a highway alignment. **(05 Marks)**
   b. Explain the various factors governing the geometric design of a highway. **(06 Marks)**
   c. Explain the objectives of providing : i) Camber   ii) Shoulders   iii) Overtaking zone. **(09 Marks)**

4. a. List the objects of providing : i) Super elevation   ii) Extra widening of pavement on horizontal curves. **(06 Marks)**
   b. Why vertical curves are provided? Explain different types of vertical curves. **(05 Marks)**
   c. A NH passing through a flat terrain has a horizontal curve of radius equal to the ruling minimum radius. If the design speed is 100 kmph, calculate the i) Design super elevation ii) Extra widening and iii) Length of transition curve by making suitable assumptions. **(09 Marks)**

PART - B

5. a. Write a note on HRB soil classification. **(06 Marks)**
   b. Differentiate between : i) Bitumen and Tar   ii) Cut back and emulsion. **(06 Marks)**

c. Following test data is collected in a soil subgrade specimen. Plot the data and determine the CBR value. **(08 Marks)**

Penetration (mm)	0	0.5	1.0	1.5	2.0	2.5	3.0	4.0	5.0	7.5	10.00	12.50
Load (kg)	0	5	16.2	28.1	40	49	57	67	75.2	89.0	99.5	106.5

6 a. Draw the typical cross – section of highway flexible pavement and explain the function of each one of these. **(06 Marks)**
   b. What is ESWL? Explain its significance in pavement design. **(06 Marks)**
   c. Calculate the warping stresses at interior, edge and corner region in a 25cm thick concrete pavement with transverse joints at 11m interval and longitudinal joints at 3.6m interval. The modulus of subgrade reaction is $6.9kg/cm^3$. Assume temperature difference for day conditions to be 0.6^0C per cm of slab thickness. Assume radius of loaded area as 15cm. $C_x = 1.03$ and $C_y = 0.55$, $E = 3 \times 10^5 kg/cm^2$, $\mu = 0.15$. **(08 Marks)**

7 a. Write the specifications for materials and step by step construction procedure for Bituminous concrete. **(06 Marks)**
   b. What is WMM? Describe the method of constructing wet mix Macadam roads. **(06 Marks)**
   c. Indicate any two methods of sub surface drainage. Explain with sketches. **(08 Marks)**

8 a. Write a note on NPV method. **(06 Marks)**
   b. Briefly explain the various highway user benefits. **(06 Marks)**
   c. Compare the annual costs of two types of pavements given below :
      i) WBM with thin bituminous surface at a total cost of Rs 3 lakhs per km, Life of 10 years, interest at 10%, salvage value of Rs 1 lakh after 10 years, annual average maintenance cost of Rs 0.5 lakhs per km and
      ii) Bituminous Macadam base and bituminous concrete surface with total cost of Rs 5 lakhs per km, life of 15 years, interest at 8%, salvage value of Rs 2 lakhs at the end of 15 years, annual average maintenance cost of Rs 0.3 lakhs per km. **(08 Marks)**

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