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10AL51

Fifth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Management and Entrepreneurship

Time: 3 hrs. Max. Marks:100

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

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. Define Management. Differentiate between Administration and Management. **(10 Marks)**
b. Briefly explain, whether management is a Science or Art. **(10 Marks)**

2 a. Explain the importance of planning. **(10 Marks)**
b. Explain the hierarchy of plans. **(10 Marks)**

3 a. Briefly explain the techniques of selection. **(10 Marks)**
b. Briefly explain the principles of organization. **(10 Marks)**

4 a. Briefly explain the Maslow's hierarchy of needs. **(10 Marks)**
b. Differentiate between Autocratic, Participative and Free – Rein leadership styles. **(10 Marks)**

PART – B

5 a. Define the term "Entrepreneur". Explain the functions of an entrepreneur. **(10 Marks)**
b. Explain the various barriers of entrepreneurship. **(10 Marks)**

6 a. Define "Small Scale Industry" and State the characteristics of a SSI. **(10 Marks)**
b. Explain the functions of WTO. **(10 Marks)**

7 a. Explain the objectives of KSFC. **(10 Marks)**
b. Explain the objectives of TECSOK. **(10 Marks)**

8 a. Define Project. State and explain the classifications of projects. **(10 Marks)**
b. Explain the criteria's for selecting a project. **(10 Marks)**

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10CV/CT52

Fifth Semester B.E. Degree Examination, Dec.2016/Jan.2017
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 is permitted.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. What are the different loads to be considered in the design of an reinforced concrete element? **(06 Marks)**

b. Explain the philosophy and principles of limit state method of design. **(10 Marks)**

c. Explain the necessity of adopting partial safety factors for loads and material strength. **(04 Marks)**

2 a. A single reinforced concrete beam 250×450 mm deep upto the centre of reinforcement is reinforced with 3-16 mm dia at an effective cover 50 mm, effective span 6 m, M20 concrete and Fe415 steel. Determine the central point load that can be supported in addition to the self weight. **(10 Marks)**

b. Determine the moment of resistance of a T-beam for the following data:
Breadth of the flange = 740 mm; Effective depth = 400 mm; Breadth of the web = 240 mm; Area of steel = 5 – 20; Depth of flange = 110 mm; Adopt M20 grade concrete and Fe415 grade steel. **(10 Marks)**

3 a. What are the factors affecting the short term and long term deflections? **(06 Marks)**

b. A singly reinforced rectangular beam $360\text{mm} \times 580\text{mm}$ in section is simply supported on a effective span of 5.25 m. The steel reinforcement consists of $6\#20\phi$. The beam supports a udl of 25 kN/m (Dead load) and 28 kN/m (live load). Assume M_{20} concrete and Fe415 steel. Check the design for short and long term deflection. Take ultimate strain in concrete due to shrinkage as 0.0003 and co-efficient of creep as unity. Effective cover may be taken as 40 mm. **(14 Marks)**

4 A Tee beam slab floor of an office comprises a slab 150 mm thick spanning between ribs of 250 mm wide spaced at 3.2 m centre to centre. Clear span of beam = 7.70 m. The beam is 600 mm deep including slab and simply supported over walls of 300 mm wide. Live load on floor = 4 kN/m^2, Floor and ceiling finish = 0.75 kN/m^2. The beam also support a partition wall which transmits a load of 12 kN/m. Design one of the intermediate beam for flexure and shear. Also check for beam for deflection control. Assume effective cover = 50 mm. M20 grade and Fe415 steel. **(20 Marks)**

PART – B

5 a. Distinguish between one way and two way slab. **(04 Marks)**

b. Design a two way slab for a room of internal dimensions $4\text{m} \times 5\text{m}$, supported on walls of 300 mm thickness with one corner held down. Two adjacent edges of the slab are discontinuous. Thickness of slab = 150 mm. The slab is to support a live load of 3 kN/m^2 and floor finish of 1 kN/m^2. Sketch the reinforcement details M20, Fe415 grade. **(16 Marks)**

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6 a. Design a column 4 m long restrained in position and direction at both ends to carry an axial load of 1600 kN. Use M-20 grade concrete and Fe-415 grade steel. Sketch the reinforcement details. **(10 Marks)**

b. Design a R.C. column, 400 mm square, to carry an ultimate load of 1000 kN and ultimate moment of 160 kN-m. Use M20 concrete and Fe415 steel. Provide a cover of 40 mm. **(10 Marks)**

7 Design an isolated footing of uniform thickness for an RC square column, of size 500mm × 500mm bearing a vertical load of 600 kN. The safe bearing capacity of the soil may be taken as 120 kN/m^2. Use M-20 grade concrete and Fe-415 grade steel. Sketch the reinforcement details. **(20 Marks)**

8 Design a dog legged stair for an office building in a room measuring 2.8m × 5.8m. Clear vertical distance between the floor is 3.6 m. The width of flight is to be 1.25 m. Assume imposed load of 3 kN/m^2. Use M20 concrete and Fe415 grade steel. Assume that the stairs are supported on 230 mm at the outer edges of landing slabs. Sketch the reinforcement details. **(20 Marks)**

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10CV53

Fifth Semester B.E. Degree Examination, Dec.2016/Jan.2017

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 missing data suitably.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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PART – A

1 a. From the first principle, construct influence line diagrams for bending moment and shear force at section 'C' of a simply supported girder shown in Fig.Q1(a). **(06 Marks)**

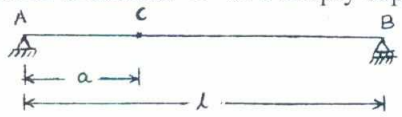

Fig.Q1(a)

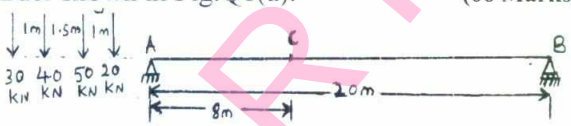

Fig.Q1(c)

b. Explain the procedures to determine absolute maximum bending moment and absolute maximum shear force anywhere in a simply supported girder due to;
i) Series of moving concentrated loads and
ii) Moving uniformly distributed load, shorter than the span of the girder. **(06 Marks)**

c. Obtain maximum bending moment and maximum shear force at section 'C' when a group of concentrated loads passes over the girder, shown in Fig.Q1(c). Use influence line diagram method. **(08 Marks)**

2 Analyze the continuous beam shown in Fig.Q2 by slope-deflection method. Draw bending moment and shear force diagrams and sketch elastic curve.

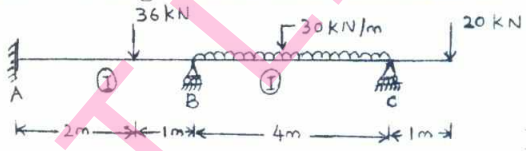

Fig.Q2 **(20 Marks)**

3 Analyze the continuous beam shown in Fig.Q3 by moment distribution method. Draw bending moment and shear force diagrams.

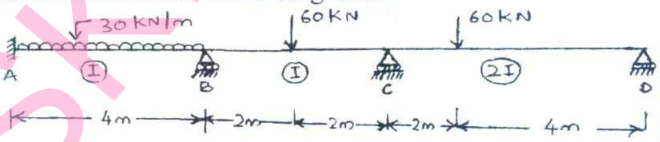

Fig.Q3 **(20 Marks)**

4 Analyze the portal frame shown in Fig.Q4 by slope-deflection method. Draw bending moment diagram.

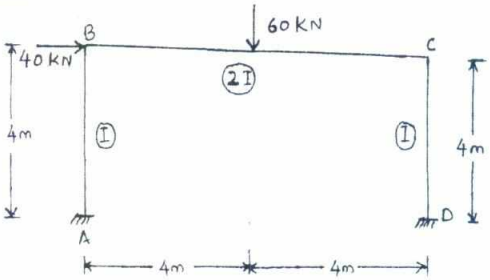

Fig.Q4 **(20 Marks)**

PART – B

5 Using Kani's method of rotation contribution, analyze the symmetric frame shown in Fig.Q5 and sketch bending moment diagram.

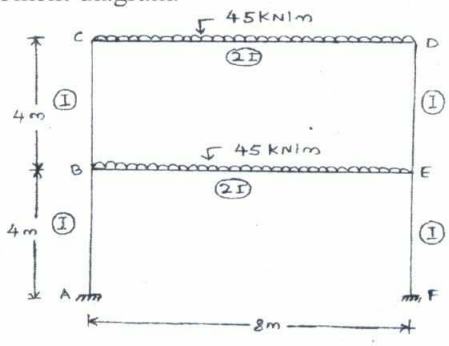

Fig.Q5 **(20 Marks)**

6 Analyze the continuous beam shown in Fig.Q6 by flexibility matrix method and sketch the bending moment diagram. Assume flexural rigidity to be constant throughout the beam.

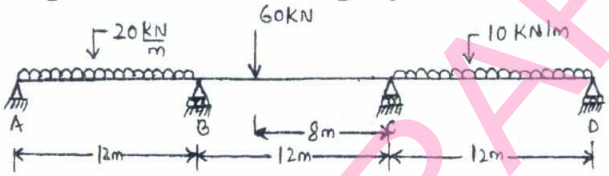

Fig.Q6 **(20 Marks)**

7 Using stiffness matrix method, analyze the frame shown in Fig.Q7. Draw bending moment diagram.

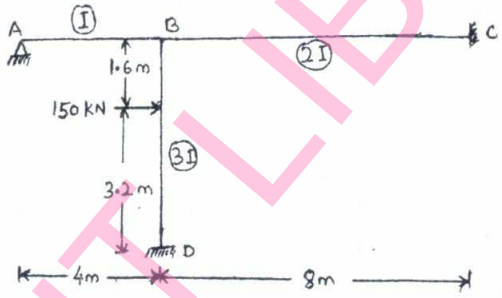

Fig.Q7 **(20 Marks)**

8 a. Explain the importance of inertial force, damping force, restoring force and exciting force in structural dynamics. **(04 Marks)**

b. Explain the following in brief:
i) Degree of freedom ii) Natural frequency
iii) Period iv) Free undamped and damped vibrations. **(06 Marks)**

c. Obtain natural frequencies for the structural systems shown in Fig.Q8(c)(i) and Fig.Q8(c)(ii). The cross-section of both the beams is rectangular of size 100 mm wide and 150 mm deep. Take Young's modulus $E = 2.1 \times 10^5$ MPa for the materials of the beam.

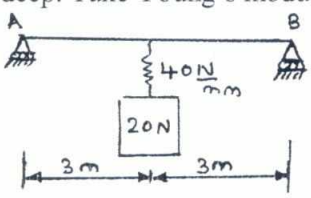

Fig.Q8(c)(i)

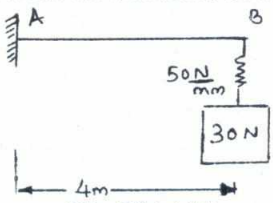

Fig.Q8(c)(ii)

(10 Marks)

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10CV54

Fifth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Geotechnical Engineering – I

Time: 3 hrs. Max. Marks:100

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

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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PART – A

1 a. Define the following with the help of three phase diagram. Indicate the units:
   i) degree of saturation
   ii) water content
   iii) specific gravity
   iv) air content. **(08 Marks)**

b. Prove that $S \times e = w \times G$. **(06 Marks)**

c. How many cubic meters of soil can be formed with a void ratio of 0.5 from 100 cubic meters of soil shaving void ratio of 0.7. **(06 Marks)**

2 a. With the help of particle size distribution curve explain :
   i) Well graded soil
   ii) Uniformly graded soil
   iii) Gap graded soil. **(06 Marks)**

b. A soil sample, consisting of particles size ranging from 0.5 mm to 0.01 mm, is put on the surface of still water tank 5 meters deep. Calculate the time of settlement of the coarsest and finest particles of the sample to the bottom of the tank. Assume average sp. gravity of soil particles as 2.66 and viscosity of water as 0.01 poise. **(06 Marks)**

c. The results of a liquid limit test are given below :

No. of blows	48	38	29	20	14
Water content (%)	32.1	35.9	40.9	46.1	52.8

The plastic limit of the soil is 23%. Plot the flow curve and determine :
   i) Liquid limit
   ii) Plasticity index
   iii) Flow index and
   iv) Toughness index. **(08 Marks)**

3 a. Explain plasticity chart with a neat sketch and its use in classification of fine grained soil. **(08 Marks)**

b. Explain any two clay minerals with the help of neat sketches. **(08 Marks)**

c. Explain how to distinguish silt and clay in the field. **(04 Marks)**

4 a. Derive an expression to obtain coefficient of permeability under falling head condition. **(06 Marks)**

b. Define permeability. List and explain factors affecting permeability of soil. **(06 Marks)**

c. Calculate the co-efficient of permeability of a soil sample, 6 cm in height and 50 cm^2 in cross-sectional area, if a quantity of water equal to 430 ml passed down in 10 minutes, under an effective constant head of 40 cm. On oven drying the test specimen has mass of 498 gms. Taking the specific gravity of soil solids as 2.65, calculate the seepage velocity of water during the test. **(08 Marks)**

PART – B

5 a. Explain the types of shear test based on different drainage conditions. **(06 Marks)**

b. What are the advantages and limitations of direct shear test? **(06 Marks)**

c. A consolidated undrained test was conducted on a clay sample and the following results are obtained :

Cell pressure (kN/m^2)	200	400	600
Deviator stress at failure (kN/m^2)	118	240	352
Pore water pressure at failure (kN/m^2)	110	220	320

Determine the shear strength parameters with respect to i) total stresses ii) effective stresses. **(08 Marks)**

6 a. List and explain factors affecting compaction. **(05 Marks)**

b. List the differences between standard and modified proctor compaction test. **(05 Marks)**

c. The following are the results of a compaction test.

Mass of mould + wet soil (gm)	2925	3095	3150	3125	3070
Water content (%)	10.0	12.0	14.3	16.1	18.2

Volume of mould = 1000 ml Sp. gravity of solids = 2.7

Mass of mould = 1000 gms

i) Find the compaction curve showing the optimum moisture content (OMC) and maximum dry density

ii) Plot the zero air void line

iii) Determine the degree of saturation. **(10 Marks)**

7 a. Explain spring analogy theory of consolidation of soil. **(07 Marks)**

b. What is pre consolidation pressure? How it is determined by Casagrande's graphical method? **(07 Marks)**

c. Explain pre consolidated, normally consolidated and under consolidated soil. **(06 Marks)**

8 a. Explain square root of time fitting method for determination of consolidation. **(08 Marks)**

b. Explain vane shear test with neat sketch. **(04 Marks)**

c. An undisturbed sample of clay, 24 mm thick, consolidated 50% in 20 minutes, when tested in laboratory with drainage allowed at top and bottom. The clay layer, from which the sample was obtained, is 4 m thick in the field. How much time will it take to consolidate 50% with double drainage? If the clay stratum has only single drainage, calculate the time to consolidate 50%. Assume uniform distribution of consolidation pressure. **(08 Marks)**

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10CV55

Fifth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Hydrology and Irrigation Engineering

Time: 3 hrs. Max. Marks:100

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

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. Explain Horton's qualitative representation of hydrologic cycle, with a neat sketch. **(08 Marks)**

b. Explain with a neat sketch, Simon's rain gauge. **(06 Marks)**

c. A precipitation station X was inoperative for some time during which a storm occurred. At three stations A, B and C surrounding station X, the total precipitation recorded during this storm are 75mm, 58mm and 47mm respectively. The normal annual precipitation amounts at X, A, B and C are respectively 757mm, 826mm, 618mm and 482mm. Estimate the storm precipitation at X. **(06 Marks)**

2 a. Describe the method of determining infiltration capacity using a double ring infiltrometer. **(06 Marks)**

b. Enlist the factors affecting evapotranspiration. **(06 Marks)**

c. The total observed runoff volume during a 6hr-storm with a uniform intensity of 1.50 cm/hr is $21.6 \times 10^6 m^3$. If the area of the basin is $350 km^2$, find the average infiltration rate for the basin. **(08 Marks)**

3 a. Explain a typical single peaked hydrograph components with a neat sketch. **(06 Marks)**

b. What are the assumptions made in unit hydrograph theory? **(06 Marks)**

c. Find the ordinates of a flood hydrograph resulting from a storm with rainfalls of 2.50, 6.85 and 3.75cm each during successive 3 hours. The ordinates of a 3 hour UHG are given below.

Time (hours)	3	6	9	12	15	18	21	24	3	6	9	12	15	18	21	24
UHG ordinates (cumec)	0	115	370	510	395	315	252	231	172	127	96	64	43	25	12	0

Assume an initial loss of 5mm, infiltration index, ϕ = 2.5mm/hr, Base flow = 12 cumec. **(08 Marks)**

4 a. What is flood? What are the factors that affect flood? **(06 Marks)**

b. List out various methods for estimation of design flood. Explain rational method of flood estimation. **(06 Marks)**

c. Explain Muskingum's routing method for hydrologic channel routing. **(08 Marks)**

PART – B

5 a. What are the advantages and disadvantages of irrigation? **(08 Marks)**

b. Enlist the various factors affecting the choice of method of irrigation. **(04 Marks)**

c. List out the advantages of sprinkler irrigation and drip irrigation. **(08 Marks)**

6 a. Write a note on soil classification. **(06 Marks)**

b. What are the different techniques to be adopted to maintain soil fertility? **(06 Marks)**

c. Write a note on India soils. **(08 Marks)**

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7 a. What are the different methods adopted to improve duty of water? **(06 Marks)**

b. Write a note on assessment of irrigation water. **(06 Marks)**

c. After how many days will you supply water to soil (clay loam in order to ensure efficient irrigation of the given crop, if

i) Field capacity of soil = 27%

ii) Permanent wilting point = 14%

iii) Density of soil = 15kN/m^3

iv) Effective depth of root zone = 75mm

v) Daily consumptive use of water for a given crop = 11mm. **(08 Marks)**

8 a. Write a note on canal classification. **(06 Marks)**

b. What are the considerations made during alignment of canals? **(06 Marks)**

c. Design a trapezoidal canal by Kennedy's theory with side slope 1:1 in alluvial soil to carry a discharge of 30 m^3/sec in bed slope of 1 in 5000. Rugosity coefficient of Kutter is 0.0225, CVR = 1. **(08 Marks)**

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10CV56

Fifth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Transportation Engineering – I

Time: 3 hrs. Max. Marks:100

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

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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PART – A

1 a. Explain various characteristics of road transport. **(06 Marks)**

b. Determine the length of different categories of road in a state in India by 2001 plan. Total area of the state is 80,000km^2, total number of towns as per 1981 census is 86. Calculate the length of primary, secondary and tertiary road network. **(08 Marks)**

c. Explain briefly the following:
i) Indian Roads Congress (IRC)
ii) Central Road Fund. **(06 Marks)**

2 a. Define saturation system of road planning. **(06 Marks)**

b. List the factors affecting realignment of a project (highway). **(06 Marks)**

c. Three new roads A, B and C are to be completed in a district a five year plan period. Using the data given below in a table, work out the order of priority for phasing the plan programme by the principle of maximum utility per unit length. Assume the data suitably. **(08 Marks)**

Road	length in km	No. of villages served population			Productivity, 1000 ton	
		< 2000	2000-5000	>5000	Agriculture	Industrial
A	15	10	8	3	15	1.2
B	12	16	3	1	11	0.0
C	18	20	10	2	20	0.8

3 a. Explain obligatory points. With a neat sketches discuss how these control the alignment. **(06 Marks)**

b. Explain PIEV theory. **(06 Marks)**

c. Define shoulders and list the important functions of the same. **(08 Marks)**

4 a. What is super elevation? Explain the steps for practical design of super elevation. **(06 Marks)**

b. The speeds of overtaking and overtaken vehicles are 100kmph and 84kmph respectively. If the acceleration of overtaking vehicle is 3.6kmph/sec. Calculate the safe OSD. Draw a neat sketch of overtaking zone, indicating the necessary data. **(08 Marks)**

c. List different types of transition curves and provide the objectives of providing the same. **(06 Marks)**

PART – B

5 a. List the desirable properties of bitumen. What are the various tests carried out on bitumen? **(06 Marks)**

b. Explain step by step procedure to determine modulus of subgrade reaction and to make corrections for variation in plate size. **(08 Marks)**

c. Classify the given soil into HRB soil classification:
Soil % passing
6.3mm – 100%
2.0mm – 70%
600μ - 65%
75μ - 42%
Liquid limit of soil is 45% and plastic limit is 20%. **(06 Marks)**

6 a. Differentiate between flexible and rigid pavement. **(06 Marks)**

b. Determine the ESWL under a dual tandem wheel load assembly using simplified graphical method at a depth of 450mm and 900mm and load on wheel is 70kN and pressure is 0.6MPa. C/C distance between dual wheels is 600mm, C/C distance between tandem axle is 1400mm. **(08 Marks)**

c. Define modulus of subgrade reaction and radius of relative stiffness. **(06 Marks)**

7 a. Write step by step procedure used in construction of a bituminous concrete layer. **(08 Marks)**

b. List the requirements of an highway drainage system. **(06 Marks)**

c. Write step by step procedure involved in preparing subgrade. **(06 Marks)**

8 a. With examples explain tangible and intangible benefits. **(06 Marks)**

b. Write short notes on: i) Annual cost method; ii) Benefit cost ratio method. **(08 Marks)**

c. Explain the concept of BOT and BOOT, in financing highway project. **(06 Marks)**

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