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10AL51

Fifth Semester B.E. Degree Examination, June/July 2018
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. Explain the term management and discuss the functions of management. (08 Marks)
b. Explain modern management approaches. (12 Marks)
- 2 a. Explain the steps involved in planning process with an example. (08 Marks)
b. Explain the hierarchy of plans of a organization. (12 Marks)
- 3 a. Explain with a block diagram line and matrix type of organization. (08 Marks)
b. Explain the principles of organization. (12 Marks)
- 4 a. Explain the requirements of effective direction. (06 Marks)
b. Explain Maslaw's hierarchy of needs theory. (08 Marks)
c. Differentiate between co-ordination and cooperation. (06 Marks)

PART – B

- 5 a. Explain the concept of entrepreneurship and its evolution. (08 Marks)
b. Explain the types of entrepreneur. (12 Marks)
- 6 a. Explain the characteristics of small enterprises. (08 Marks)
b. Explain the advantages of small enterprises. (12 Marks)
- 7 a. Explain the activities of Karnataka Industrial Area Development Board (KIADB). (10 Marks)
b. Explain the activities of Karnataka State Small Industries Development Corporation (KSSIDC). (10 Marks)
- 8 Explain various details which should be included in a project work. (20 Marks)

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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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10CV/CT52

Fifth Semester B.E. Degree Examination, June/July 2018
Design of RCC Structural Elements

Time: 3 hrs.

Max. Marks: 100

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

PART – A

- 1 a. Enlist the reasons for adopting partial safety factors for loads and material strength. (05 Marks)
b. Briefly explain singly and doubly reinforced RCC beam. Enlist the situations where doubly reinforced RCC beam adaptation required. (05 Marks)
c. A singly RCC beam of dimensions 230×500 mm overall, simply supported over a span of 5 m (effective). The beam consists of 4 # 16mm diameter bars in tension zone use M₂₀ and Fe-415 grade. Calculate the UDL the beam can carry. Take clear cover 25 mm. (10 Marks)
- 2 a. Explain different limit states to be considered in the design of RCC beam and derive the expression for stress block parameter. (10 Marks)
b. Determine the moment of resistance of the T-beam having following section properties:
Effective width of flange = 1100 mm Thickness of flange = 110 mm
Width of rib = 250 mm Effective depth = 450 mm
Area of steel = 5 # 20 mm diameter.
Use M-25 grade concrete and Fe-415 grade steel. (10 Marks)
- 3 a. Explain short term and long term deflections. (06 Marks)
b. A simply supported RCC beam of size 300 × 600 mm carries a udl live load of 250 kN/m and superimposed dead load 12 kN/m over an effective span of 5 m. It is reinforced with 4#16 mm diameter bars. The effective cover is 50 mm. calculate the short term and long term deflection of beam $t_{cs} = 0.003$ and creep coefficient = 1.6. (14 Marks)
- 4 Design a RCC beam of section 230 × 600mm effective span of the beam is 6m, effective cover is 50mm. Imposed load is 30 kN/m. Use M-20 grade concrete and Fe-415 grade steel. Sketch the details of reinforcement.

Strain	Stress (N/mm ²)
0.00276	351.8
0.00280	360.9

(20 Marks)

PART – B

- 5 a. Explain briefly one way and two way slab. (04 Marks)
b. Design a corner rectangular slab panel of size 4m × 5.5m. Assume that slab supports an imposed load of 3 kN/m² and floor finish 1 kN/m². The slab is subjected to moderate exposure condition and is made of M-25 grade concrete, Fe-415 grade steel. Wall support is 230 mm. (16 Marks)

- 6 a. Enlist the functions of longitudinal and lateral reinforcement in columns. (05 Marks)
b. Design the reinforcement in a column of size 400mm × 500mm subjected to an axial load of 2000 kN. The column has unsupported length of 3.3m and is held in position at both the ends, restrained against rotation at one end. Use M-25 grade concrete and Fe-415 grade steel. (15 Marks)
- 7 Design a footing for a column of size 300mm × 300mm, carrying a load of 1200 kN. Take SBC of soil as 180 kN/m². Use M₂₀ grade concrete and Fe-415 grade steel. Sketch the reinforcement details. (20 Marks)
- 8 Design a waist slab type dog legged staircase for an office building given the following data:
Clear dimensions of room = 2.6 m × 4.75 m
Height of floor = 3.2 m
Rise = 160 mm, Tread = 250 mm
Width of flight = 1.25 m
Use M-20 grade concrete and Fe-415 grade steel. Landing slab spans in the same direction of the staircase. Assume wall thickness 230 mm. Take live load = 3 kN/m² and floor finish = 1 kN/m². (20 Marks)

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10CV53

Fifth Semester B.E. Degree Examination, June/July 2018
Structural Analysis – II

Time: 3 hrs.

Max. Marks:100

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

PART – A

- 1 a. What is an Influence line? Explain its importance in structural analysis. (05 Marks)
 b. Draw influence line for shear force and bending moment. Find maximum shear force and bending moment at D, 6m from the left hand support as shown in Fig.Q1(b). Also find the absolute maximum bending moment due to the given load system. (15 Marks)

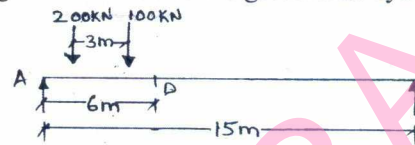


Fig.Q1(b)

- 2 Analyse the continuous beam shown in Fig.Q2 by Slope Deflection Method. Draw Bending moment diagram, shear force diagram and elastic curve. (20 Marks)

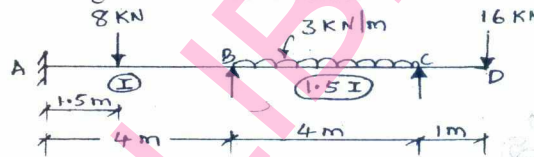


Fig.Q2

- 3 Draw the bending moment diagram for the beam loaded as shown in Fig.Q3 when support B sinks by 10 mm below the levels of A, C and D. Assume $E = 200 \text{ GPa}$, $I = 132 \times 10^6 \text{ mm}^4$ for all the members. Use the moment distribution method. (20 Marks)

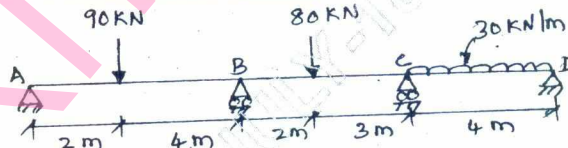


Fig.Q3

- 4 Analyse the frame shown in Fig.Q4 and draw bending moment diagram. Adopt Slope Deflection method. (20 Marks)

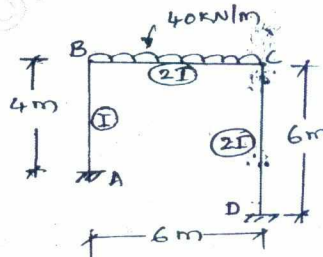


Fig.Q4

PART – B

- 5 Analyse the continuous beam shown in Fig.Q5 by Kani's method. Draw Bending Moment Diagram, Shear Force Diagram and Elastic Curve. (20 Marks)

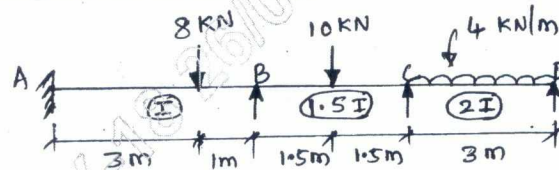


Fig.Q5

- 6 Analyse the continuous beam shown in Fig.Q6 by flexibility matrix method. Draw Bending Moment Diagram and elastic curve. (20 Marks)

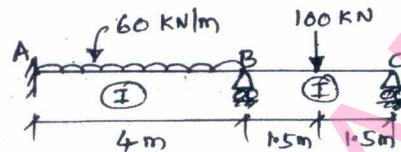


Fig.Q6

- 7 Using stiffness matrix method, analyse the frame shown in Fig.Q7. Draw bending moment diagram. Take EI constant throughout. (20 Marks)

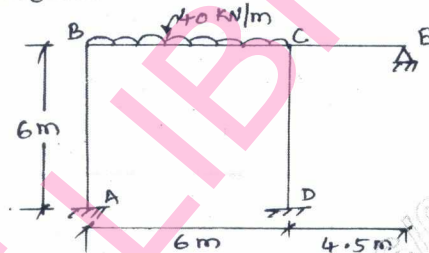


Fig.Q7

- 8 a. Explain :
 (i) Degree of freedom (ii) Free vibration (iii) Natural frequency
 (iii) Forced vibration (v) Damping. (10 Marks)
- b. Determine the natural frequency, cyclic frequency and period of oscillation for the spring mass system with mass 10 kg and stiffness 1000 N/m. If the system is given an initial displacement of 0.1m and an initial velocity of 0.2 m/s. Obtain the equation of motion. Also find displacement, velocity and acceleration after 0.2 sec. (10 Marks)

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10CV54

Fifth Semester B.E. Degree Examination, June/July 2018
Geotechnical Engineering – I

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer FIVE full questions, selecting at least TWO full questions from each part.

2. Assume missing data suitably, if any.

PART – A

- 1 a. Derive the following with usual notation.

$$\gamma_{\text{sat}} = \frac{\gamma_w (G + e)}{1 + e}$$

(06 Marks)

- b. Define: i) Void ratio ii) Porosity iii) Water content iv) Specific gravity. (04 Marks)
- c. A moist soil sample has a weight of 6.33 N and volume of $3 \times 10^{-5} \text{ m}^3$ at a water content of 11%. Taking specific gravity as 2.68, Find void ratio, air content (n_a) degree of saturation. Also determine water content at which soil gets saturated. What will be the unit weight at saturation? (10 Marks)

- 2 a. What is consistency of soil? List and define various consistency limits. (06 Marks)
- b. List the different methods to determine water content of soil and explain any one method. (06 Marks)
- c. The results obtained from a liquid limit test on a day sample is as follows. The plastic limit is 13% and natural water content of the soil is 45%.

Number of blows	38	34	20	12
Water content, percent	16	17	20	22

Plot the flow curve and determine:

- i) Liquid limit
 ii) Flow index plasticity index
 iii) Toughness index
 iv) Liquidity index.

(08 Marks)

- 3 a. Mention three different clay minerals commonly present in soils. Explain their structure with neat sketches. (06 Marks)
- b. Explain BIS classification of soil system. (06 Marks)
- c. An oven dried sample of 50g passing through 75 micron sieve is taken for hydrometer analysis. The corrected hydrometer reading in 1000ml soil suspension at 2 mins elapse time interval is 25. The effective depth corresponding to $R_h = 25$ is $H_e = 121 \text{ mm}$. Taking $G = 2.7$ and viscosity as 0.01 poise calculate the diameter and percent finer. (08 Marks)
- 4 a. Briefly explain variable head permeameter test and derive the expression to determine coefficient of permeability. (06 Marks)
- b. List and explain the factors effecting the permeability. (06 Marks)
- c. On a falling head permeameter the soil sample is having a length of 180mm and $22 \times 10^{-4} \text{ m}^2$. Calculate the time required for a head drop of 250 to 100mm if the cross sectional area of the stand pipe is $2 \times 10^{-4} \text{ m}^2$. The soil sample is heterogeneous having coefficient of permeabilities $30 \times 10^{-7} \text{ m/s}$ for first 60mm, $4 \times 10^{-6} \text{ m/s}$ in second 60mm and $6 \times 10^{-6} \text{ m/s}$ for last 60mm thickness. Assume flow taking place perpendicular to the bedding plane. (08 Marks)

PART – B

- 5 a. Explain Mohr-Coulomb's failure theory of soils. (06 Marks)
 b. List and explain various shear tests based on drainage conditions. (06 Marks)
 c. A direct shear test conducted on a soil sample and following results are obtained. The size of the shear box is 60mm × 60mm.

	1	2	3
Normal load, (N)	360	720	1080
Shear load, (N)	268	432	576

Determine shear parameters of soil. Mark failure plane for any one of failure point on a Mohr's circle and obtain principal stress and planes. (08 Marks)

- 6 a. List and explain the factors affecting the compaction of soils. (06 Marks)
 b. Differentiate between light and heavy compaction tests. (06 Marks)
 c. A standar proctor test is carried out and results are as follows:

Bulk unit weight, kN/m ³	18	19	19.9	20.8	21	20.5	20.1
Water content, percent	9	11	13	15	16	17	18

- i) Plot the compaction and determine maximum dry density and optimum moisture content.
 ii) Also plot zero air void line and 10% air void line if the specific gravity of soil solids is 2.60. (08 Marks)
- 7 a. Explain theory of consolidation with spring analogy concept. (06 Marks)
 b. Explain different types of deposits based on consolidation theory. (06 Marks)
 c. Define the following terms:
 i) Coefficient of compressibility.
 ii) Coefficient of volume change.
 iii) Coefficient of compression index. (08 Marks)
- 8 a. Explain tri axial shear test with a neat sketch. (06 Marks)
 b. List and explain the advantages and limitations of direct shear tests. (06 Marks)
 c. A footing 3.6m × 3.6m for a watch tower carries a load of 90kN and rests on dense sand of 9.0 m thickness overlaying a clay layer of 3.0 m depth. The depth of foundation is 1.5m. The clay layer overlies hard rock. The liquid limit of clay is 54percent, void ratio as 1-08. The saturated unit weights of sand and clay are 18.5 kN/m³ and 17.5 kN/m³ respectively. Assume the load distribution as 2V to 1H. Also the site is flooded. Determine the ultimate settlement of clay layer due consolidation. (08 Marks)

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10CV55

Fifth Semester B.E. Degree Examination, June/July 2018
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

- Explain the different methods of determining the average rainfall over a catchment due to storm. Discuss with merits and demerits of the methods. (10 Marks)
 - The normal annual rainfall at rain gauge stations A, B, C and D in a basin are 80.97, 67.59, 76.28 and 92.01 cm respectively. In the year 1985 the station D was in operative and the stations A, B and C recorded annual precipitation of 91.11, 72.23, 79.89cm respectively. Estimate the rainfall at station 'D' in that year. (05 Marks)
 - List out the applications of Hydrology in Engineering. (05 Marks)
- Discuss the factors that affect the evaporation from a water body. (06 Marks)
 - Describe ISI standard evaporation pan, with a neat sketch. (08 Marks)
 - The total observed runoff volume during a 6 hour storm with a uniform intensity of 1.5cm/hour is $21.6 \times 10^6 \text{ m}^3$. If the area of the basin is 300 km^2 . Find the average infiltration rate of the basin. (06 Marks)
- Define Hydrograph and Unit Hydrograph and describe the step by step procedure of the derivation of a unit hydrograph from an isolated storm. (10 Marks)
 - Given the ordinates of a 4-h unit hydrograph as below derive the ordinates of a 12-h unit Hydrograph for the catchment. (10 Marks)

Time (h)	0	4	8	12	16	20	24	28	32	36	40	44
UHG -4h	0	20	80	130	150	130	90	52	27	15	5	0

- What are the methods of estimating design flood? What are their limitations? (08 Marks)
 - Define Flood Routing. What are the uses of flood routing? (06 Marks)
 - A culvert is proposed across a stream drainage an area of 185 hectares. The catchment as a slope of 0.004 and the length of travel for water is 1150m, estimate the 25 year flood of the rainfall is given by

$$I = \frac{1000T_r^{0.2}}{(t+20)^{0.7}}$$

Where I is in mm/hour, T_r is in years and 't' is in minutes. Assume runoff co-efficient of 0.35. (06 Marks)

PART - B

- What is the necessity of Irrigation? Discuss in brief the merits and demerits of Irrigation. (10 Marks)
 - Compare Surface and Subsurface irrigation. (05 Marks)
 - Write a note on Border strip method of irrigation, with neat sketch. (05 Marks)
- Write a note on the following : i) Saturation capacity ii) Field capacity iii) Wilting point iv) Ready available moisture v) Frequency of irrigation. (10 Marks)

- b. A loam soil as field capacity of 22% and wilting co-efficient of 10%. The dry unit weight of soil is 1.5gm/cc. If the root zone depth is 70cm, determine the storage capacity of the soil. Irrigation water is applied when moisture content falls to 14%. If the water application efficiency is 75%, determine the water depth required to be applied in the field. (10 Marks)
- 7 a. Explain the terms 'Duty', 'Delta' and Base period of a crop and derive an relationship between them. (06 Marks)
b. What are the methods of assessment of irrigation water and why it is essential? (06 Marks)
c. A water course as C.C.A of 2600 hectares out of which the intensities of irrigation for perennial sugarcane and rice crops are 20% and 40% respectively. The duty for these crops at the head of water course are 750 hectares/cumec and 1800 hectares/cumec. Find the discharge required at the head of water course if the peak demand is 20% of the average requirement. (08 Marks)
- 8 a. Define Canal and explain various types of canals classified. (10 Marks)
b. Explain how would you design the channel using Kennedy's theory for a channel of given discharge (Q), Rugosity(N), CVR (m) and bed width – depth ratio (B/D). (10 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.

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 80,000km², 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)

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 – 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%
600 μ - 65%
75 μ - 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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