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10AL51

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.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. Define Management. List and explain the functions of Management. **(10 Marks)**
b. Explain the scope of management. Explain the characteristics and levels of management. **(10 Marks)**

2 a. Explain Hierarchy of plans. **(05 Marks)**
b. Briefly explain types of planning. **(05 Marks)**
c. State the different types of decisions and explain the steps in decision - making. **(10 Marks)**

3 a. Explain with sketch the line and staff organisation. **(05 Marks)**
b. What are the advantages of Management By Objectives (MBO) and Advantages of Management by Exception (MBE)? **(10 Marks)**
c. What are the advantages of Matrix Organisation? **(05 Marks)**

4 a. Write about Maslow's theory of Motivation. **(05 Marks)**
b. Explain Mc Gregor's theory X and theory Y. **(05 Marks)**
c. Differentiate between Co-ordination and Co-operation. **(05 Marks)**
d. What are barriers of successful communication? **(05 Marks)**

PART – B

5 a. Briefly compare Intrapreneurs, Entrepreneurs and managers. **(06 Marks)**
b. Explain in detail the stages in Entrepreneurial process. **(10 Marks)**
c. Explain the characteristics of Entrepreneurship. **(04 Marks)**

6 a. Define briefly about Ancillary Industry and Tiny Industry. **(06 Marks)**
b. Write a short note on GATT and also mention the challenges faced since its inception. **(10 Marks)**
c. List four prominent functions of WTO. **(04 Marks)**

7 a. Name any five state or Central Government Institutions and state their objectives and functions. **(10 Marks)**
b. Explain the roles of IDBI. **(05 Marks)**
c. Write a note on Single window DIC agency. **(05 Marks)**

8 a. Write short notes on : i) Quantifiable and non – quantifiable projects ii) Sectoral projects. **(05 Marks)**
b. Classify Techno – Economic projects and briefly describe the same. **(06 Marks)**
c. Write short notes on :
i) Project Identification ii) Project Selection iii) Project Report. **(09 Marks)**

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10CV52

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
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. *IS: 456 -2000 and SP – 16 is permitted.*

PART – A

1 Explain the following :

a. Partial safety factors for loads and materials. **(04 Marks)**

b. Explain the principles of limit state design. **(06 Marks)**

c. Show that x_u limt = 0.53d, for Fe250 grade of steel. **(04 Marks)**

d. Explain under reinforces section, over-reinforced section, balance section with a neat sketches. **(06 Marks)**

2 A R.C.C beam of rectangular section 300×600mm is reinforced with 4 bars of 20mm dia with an effective cover 50mm, effective span of the beam is 6m. Assuming M20 concrete and Fe250 steel. Determine the central concentrated P, that can be carried by the beam in addition to its self weight. **(20 Marks)**

3 a. Distinguish between short term and long term deflection in case of R.C structures. Mention the main factors affecting these deflections. **(06 Marks)**

b. A rectangular simply supported beam of span 5m is 300mm×650mm in cross section and is reinforced with 3 bars of 20mm on tension side at an effective cover of 50mm. Determine the shaft term defection due to an imposed working load of 20kN/m (excluding self wt). Assume grade of concrete M20 and grade of steel Fe415. **(14 Marks)**

4 A T-Beam slab floor has 125mm thick slab forming part of T – beam which are of 8m clear span. The end bearing are 450mm thick. Spacing of T-beams is 3.5m. The live load on the floor is 3kN/m^2. Design one of the intermediate beams. Use M20 concrete and Fe415 steel. **(20 Marks)**

PART – B

5 Design a slab for a room of clear dimensions 3m×5m supported on wall of 300mm thickness with corners held down. Two adjacent sides of the slab are continuous and other discontinuous. LL on slab is 3kN/m^2. Assume floor finish of 1kN/m^2. Use M20 concrete and Fe415 steel. Sketch the details of reinforcement. **(20 Marks)**

6 a. Design the reinforcement for a axially loaded square column of size 450mm × 450mm to support a load of 1500 kN. Use M20 concrete and Fe415 steel. **(10 Marks)**

b. A column size of 300×400mm has effective length of 3.6m and is subjected to P_u = 1100kN, and M_u = 150 kN-m, about the major axies. Assume the bars on two side, design the column using M25 concrete and Fe415 steel. **(10 Marks)**

7 Design on Isolated rectangular Footing of uniform depth for the column size of 230mm×300mm supporting an axial service load of 850kN. The safe bearing capacity of soil is 150kN/m^2. Adopt M20 grade concrete and Fe415 grade steel. Sketch the reinforcement details. **(20 Marks)**

8 Design a dog-legged stairs for an building in a room measuring 3.6×5.2m clear. The vertical distance between the Floors is 3.2m. Consider LL 3kN/m^2. Use M20 concrete and Fe415 grade of steel. Assume stairs are supported on 300mm wall at the outer edges of landing slabs. Consider Rise = 160mm, and Tread = 300mm. **(20 Marks)**

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10CV53

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Structural Analysis – II

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 assumed suitably.***

PART – A

1 a. What is an influence line? Explain its importance in structural analysis. **(04 Marks)**

b. The load system shown in Fig. Q1 (b) move from left to right on a girder of span 10 m. Find the absolute maximum B.M. for the girder. Also find the maximum +ve and –ve S.F. anywhere on the beam. **(16 Marks)**

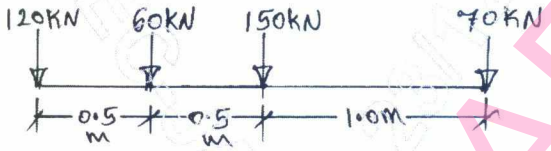

Fig. Q1 (b)

2 Analyse the continuous beam shown in Fig. Q2 by slope deflection method and draw B.M. diagram. Support B sinks by 1.0 mm and C rises up by 0.5 mm relative to support A. Take EI = 30000 kN-m^2. **(20 Marks)**

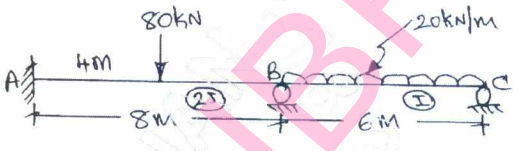

Fig. Q2

3 Analyse the given frame shown in Fig. Q3 by moment distribution method and draw BMD and SFD. **(20 Marks)**

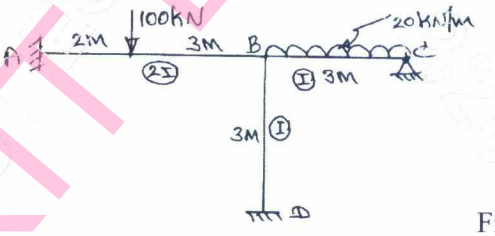

Fig. Q3

4 Find the total force P to be applied at C to prevent sway shown in Fig. Q4. Use slope deflection method. **(20 Marks)**

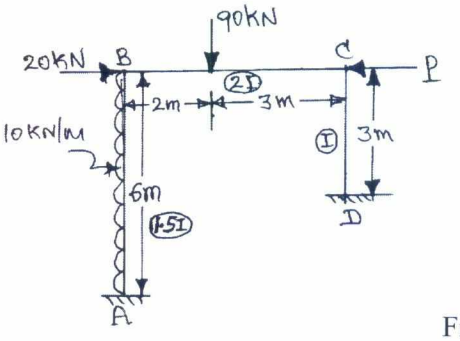

Fig. Q4

PART – B

5 Analyse the multistorey building frame shown in Fig. Q5 by Kani's method and draw BMD. Use principle of symmetry only. **(20 Marks)**

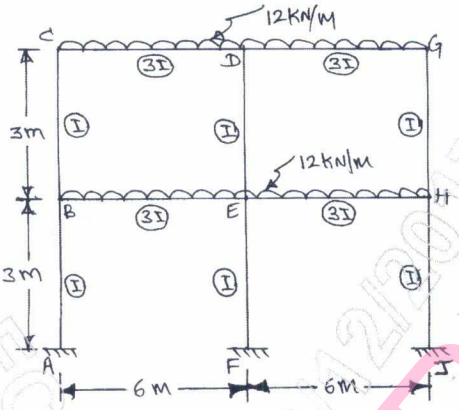

Fig. Q5

6 Analyse the frame shown in Fig. Q6 by flexibility matrix method. Draw BMD. **(20 Marks)**

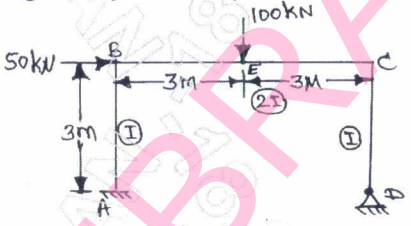

Fig. Q6

7 Analyse the portal frame shown in Fig. Q7 by stiffness matrix method. Draw BMD EI constant. **(20 Marks)**

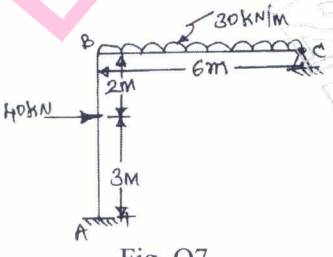

Fig. Q7

8 a. Define natural frequency and period of vibration. **(04 Marks)**

b. Determine the natural frequency of the systems shown in Fig. Q8 (b). **(10 Marks)**

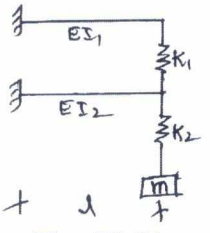

Fig. Q8 (b)

c. Set up the differential equation of motions for the free vibration of a spring mass system. **(06 Marks)**

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10CV54

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
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. Explain three phase system of soil, with a sketch. Differentiate between void ratio and percentage voids. **(06 Marks)**

b. With usual notation show that

$$e = \frac{Gw}{Sr}.$$ **(06 Marks)**

c. Soil sample in its natural state is fully saturated with a water content of 30%. Determine the void ratio, dry unit weight and wet unit weight. Also calculate total weight of water required to fully saturate a soil mass of volume $50m^3$. Take G = 2.60. **(08 Marks)**

2 a. Determine the moisture content of soil sample by Pycnometer method. At what situation this method is preferred? **(07 Marks)**

b. Discuss advantages and limitations of sedimentation analysis. Explain the corrections to be applied to Hydrometer readings. **(07 Marks)**

c. A dry sample of weight 50gms is mixed with distilled water to prepare a suspension of 1000 mℓ for hydrometer analysis. The reading of the hydrometer taken after 5 minutes is 25 and the depth of the centre of the bulb below the water surface when the hydrometer was in the jar was 150mm. The volume of the hydrometer 62mℓ and cross section area of Jar 55 cm^2. Assuming G = 2.68 and $\eta = 1.0 \times 10^{-5}$ g-sec/cm^2. Determine the co-ordinates of the point corresponding to above observation. **(06 Marks)**

3 a. With a neat sketch, explain plasticity chart and describe its use in classifying fine grained soil. **(06 Marks)**

b. Explain with neat sketches, the structure of the following minerals :
i) Kaolinite ii) Montmorillonite. **(06 Marks)**

c. Following are the results obtained from the tests conducted on two soils A and B. Classify them as per IS classification system. Show the salient steps involved. **(08 Marks)**

Soil	LL	PL	% Retained on IS 75 μm Sieve	% Retained on IS 4.75 mm Sieve	Cu	Cc
A	110	50	40	Zero	-	-
B	-	-	97	05	7	2

4 a. State Darcy's Law. With a neat sketch, derive an expression for the co-efficient of permeability of a soil in a falling head permeability test. **(08 Marks)**

b. Explain the factors affecting the permeability of soil. **(06 Marks)**

c. A sample of soil for constant head permeability test yielded the following data :
i) Diameter of sample = 7.6cm.
ii) Length of sample = 20cm.
iii) Head causing the flow = 15cm.
iv) Quantity of water collected in 10min = 150 CC.

Assume G = 2.65 , γ_d = 18kN/m^3.
Determine : i) Co-efficient of Permeability ii) Discharge velocity iii) Seepage Velocity. **(06 Marks)**

PART – B

5 a. Explain Mohr – Coulomb failure theory of soils. Sketch Coulomb failure envelope for pure sand and pure clay. **(06 Marks)**

b. Explain the following terms : i) Sensitivity and Thixotropy of clay.
ii) Total, neutral and effective stresses in soils. **(06 Marks)**

c. Two identical specimens 4cm diameter and 8cm height of partly saturated compacted soil are tested in a triaxial cell under undrained conditions. The first specimen failed at deviator load of 720N under a cell pressure of 100kN/m^2. Second specimen failed at deviator load of 915N under a cell pressure of 200kN/m^2. The increase in the volume of first specimen at failure is 1.2mℓ and shortens by 0.6cm. The increase in the volume of second specimen at failure is 1.6mℓ and shortens by 0.8cm. Determine apparent cohesion and angle of shearing resistance by analytical method. **(08 Marks)**

6 a. Obtain the value of compactive energy imported to the soil during Light compaction and Heavy compaction test. **(04 Marks)**

b. What are the objectives of Compaction? Discuss the factors affecting compaction. **(06 Marks)**

c. Following are the results obtained from a standard compaction test :

Water content, W(%)	13.5	20.2	25	35	45
Bulk unit weight , γ_b kN/m^3	16.3	19.4	18.8	18	17.2

Plot compaction curve and obtain maximum dry unit weight and OMC. Also plot 100% saturation line. Show specimen calculation. G = 2.65 **(10 Marks)**

7 a. Define the following terms : i) Compression index ii) Co-efficient of compressibility iii) Co-efficient of volume compressibility. **(06 Marks)**

b. Explain with a neat sketch, Casagrande's method of obtaining Pre – consolidation pressure. **(06 Marks)**

c. A saturated soil stratum 5m thick lies above an impervious stratum. It has a compression index of 0.25 and co-efficient of Permeability 3.2 × 10^{-3}mm/sec. If void ratio is 1.90 at a normal stress of 0.15N/mm^2. Compute i) void ratio due to increase in stress to 0.2N/mm^2 ii) settlement of soil stratum due to above increase in stress. **(08 Marks)**

8 a. List the merits and demerits of Triaxial shear test over Direct shear test. **(06 Marks)**

b. Explain the determination of co-efficient of consolidation by square root of time fitting method. **(06 Marks)**

c. In a direct shear test on a specimen of clean dry sand a normal stress of 200kN/m^2 was applied and failure occurred at a shear stress of 140kN/m^2. Determine i) Angle of shearing resistance ii) Principal stresses during failure iii) Direction of principal planes with respect to plane to shearing.
Draw a neat sketch of Mohr circle showing the directions of Major and Minor principal planes with reference to shearing. **(08 Marks)**

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10CV55

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Hydrology and Irrigation Engineering

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. Explain different types of precipitation. **(08 Marks)**

b. Analysis of a storm yielded the following information regarding isohyets. Calculate average depth of rainfall. **(06 Marks)**

Isohyetal interval (mm)	70 - 80	80 - 90	90 - 100	100 - 110	110 - 120	120 - 130
Area (km^2)	20	96	125	80	100	89

c. The average annual rainfall at five existing rain gauge stations in a watershed are 1000mm, 995mm, 800mm, 825mm and 750mm. If the average depth of rainfall should be estimated within 6% error, determine the optimal number of rain gauges for the water shed. **(06 Marks)**

2 a. Differentiate between : i) Evaporation and Evapotranspiration ii) W – index and ϕ - index iii) AET and PET iv) Infiltrometer and Lysimeter. **(08 Marks)**

b. What are the measures taken to reduce the evaporation? **(06 Marks)**

c. A twelve hour storm rainfall with the following depths in cm occurred over a basin : 2, 2.5, 7.6, 3.8, 10.6, 5, 7, 10, 6.4, 3.8, 1.4 and 1.4.
The surface runoff resulting from the above storm is equivalent to 25.5cm of depth over the basin. Estimate the average infiltration index. **(06 Marks)**

3 a. Define Flood hydrograph and explain the different components of flood hydrograph. **(06 Marks)**

b. What is a Master depletion curve? What is its use? **(04 Marks)**

c. The ordinates of a storm hydrograph due to 6h isolated storm is given. Obtain the ordinates of 6h unit hydrograph for the catchment, if its area is $423km^2$. **(10 Marks)**

Time (hr)	0	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
Discharge (m^3/s)	10	32	88	116	102	85	71	59	47	39	32	26	22	18	15	10

4 a. Define Flood. List the factors influencing flood. **(05 Marks)**

b. Explain the rational formula of estimation of flood. **(05 Marks)**

c. The values for K and x for a river reach were found to be 12h and 0.2 respectively. Route the following flood through the reach. Inflow values at 6h interval are (in m^3/s) : 10, 20, 50, 60, 55, 45, 35, 27, 20, 15 and 13. **(10 Marks)**

PART – B

5 a. Define Irrigation. What is the necessity for irrigation? **(06 Marks)**

b. Explain briefly : i) Systems of Irrigation ii) Environmental impacts of irrigation. **(14 Marks)**

6 a. Give the classification of Indian soils. **(06 Marks)**

b. Define Irrigation efficiencies. **(06 Marks)**

c. What are the different methods of maintaining soil fertility? **(08 Marks)**

7 a. Define Duty. What are the factors affecting duty of water? Explain. **(10 Marks)**

b. Table gives the necessary data about the crop, their duty and area under each crop, commanded by a canal taking off from a storage tank. Taking time factor for the canal 13/20, calculate the discharge required at the head to the canal. If the capacity factor is 0.8, determine the design discharge. **(10 Marks)**

Crop	Base period (days)	Area (ha)	Duty (ha/cumec)
Sugarcane	320	850	580
Overlap for sugarcane in summer	90	120	580
Wheat (Rabi)	120	600	1600
Bajri (Monsoon)	120	500	2000
Veg (Hot weather)	120	360	600

8 a. What are the consideration for alignment of canals? **(10 Marks)**

b. Design the canal for the discharge of 30 cumec with silt factor 1.0.
Side slope – 0.5H : 1V. **(10 Marks)**

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10CV56

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Transportation Engineering – I

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, selecting atleast TWO questions from each part.*
2. Use of IRC : 37 – 2001 is permitted.

PART – A

1 a. Discuss briefly the role of transportation in the economic social activities of the country. **(06 Marks)**

b. Explain the following :
i) Jayakar committee's recommendations
ii) IRC
iii) CRF. **(06 Marks)**

c. The area of state is 3,08,000 sq. km. The number of towns as per 1981 census was 276. The number of villages were 41,833. Calculate the length of various categories of roads as per 3rd 20 year road plan formulae. **(08 Marks)**

2 a. Briefly describe highway planning surveys. **(06 Marks)**

b. List the salient features of : i) PMGSY ii) KSHIP projects. **(06 Marks)**

c. Four new roads A, B, C and D are to be constructed in a district during a five year plan period. Suggest the order of priority for phasing the development programme based on maximum utility approach. Assume utility units of 0.5, 1, 2 and 4 for population ranges and 1 and 10 for 1000 t of agricultural and industrial products.

Road	Length km	Number of villages with population range				Productivity, t	
		<500	500 - 1000	1000-2000	>2000	Agricultural	Industrial
A	65	40	12	14	8	5000	1000
B	55	22	9	6	4	8000	1200
C	45	32	8	9	6	6000	800
D	72	36	6	3	3	9000	2000

(08 Marks)

3 a. Briefly explain the factors controlling highway alignment. **(06 Marks)**

b. Explain with neat sketch the width of carriage way and mention the IRC standards. **(06 Marks)**

c. Two vehicles A and B are moving in the same direction with speeds of 100 kmph and breaking efficiency of 70% and 50% respectively. An object is seen by both the drivers on the road approximately at a distance of 250m. Find :
i) Which vehicle will meet with an accident
ii) If the accident is to be avoided, what is the breaking efficiency required? **(08 Marks)**

4 a. Explain briefly the attainment of designed super elevation in practice. **(06 Marks)**

b. A NH passing through a plain 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 iii) Length of transition curve. Make suitable assumptions. **(08 Marks)**

c. An ascending gradient of 1 in 50 meets with a descending gradient of 1 in 80. Calculate the length of the summit curve for SSD of 120m and OSD of 470m. **(06 Marks)**

PART – B

5 a. Briefly explain the desirable properties of sub grade soil. **(06 Marks)**

b. Explain the desirable properties of road aggregates. Indicate the test conducted to determine these properties. **(06 Marks)**

c. The following test data pertains to a soil sub-grade specimen. Plot the data and determine the CBR value :

Penetration (mm)	0	0.5	1.0	1.50	2.0	2.5	3.0	4.0	5.0	7.5	10.0	12.5
Load (kg)	0	5	16.2	28.1	40	48.5	56.5	67.5	75.2	89.0	99.5	106.5

(08 Marks)

6 a. Briefly explain the design factors to be considered in pavement design. **(06 Marks)**

b. Explain the following terms :

i) Modulus of subgrade reaction

ii) Radius of relative stiffness

iii) Equivalent radius of resisting section. **(06 Marks)**

c. Design the flexible pavement for construction of a new highway (NH/ Two lane /Single carriageway) with the following data as per IRC : 37–2001 :

i) Number of commercial vehicles as per last count = 1000 CVPD

ii) Period of construction = 3 years

iii) Design life = 15 years

Annual growth rate = 8% . Design CBR of sub-grade soil = 6% **(08 Marks)**

7 a. Explain the construction step for cement concrete roads. **(10 Marks)**

b. Explain the methods of sub-surface drainage to control the seepage flow, capillary rise and water table. **(10 Marks)**

8 a. Explain the various benefits that a road user gets by the improvement of road. **(06 Marks)**

b. Briefly explain the factors to be considered for evaluating the motor vehicle operating cost. **(06 Marks)**

c. Determine the relative economics of two type of flexible pavements by annual cost method from the following data :

Details	Pavement type A	Pavement type B
Total cost per km, Rs. lakhs	3.30	6.20
Design life, years	5.00	12.00
Annual rate of interest, %	10.00	9.00
Salvage value after design life, Rs. Lakhs	2.10	3.00
Average annual maintenance cost per km, Rs. lakhs	0.40	0.20

(08 Marks)

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