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15CV61

Sixth Semester B.E. Degree Examination, June/July 2019
Construction Management and Entrepreneurship

Time: 3 hrs. Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

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.

Module-1

1 a. What are the characteristics of Management and explain any two characteristics of Management? **(08 Marks)**

b. Explain the advantages and disadvantages of Planning. **(08 Marks)**

OR

2 a. Explain the purpose of planning process. **(08 Marks)**

b. Explain the Critical Path Method (CPM). **(08 Marks)**

Module-2

3 a. What are the factors affecting the productivity? **(08 Marks)**

b. Explain the function of Materials Management. **(08 Marks)**

OR

4 a. What are the advantages of utilizing the construction equipments? **(08 Marks)**

b. List out the various classification of the construction equipment and explain any one type of construction equipment. **(08 Marks)**

Module-3

5 a. Define Inspection and explain the types of inspection. **(08 Marks)**

b. Explain Integrity and trust worthiness. **(08 Marks)**

OR

6 a. Define Quality and what are the dimensions of quality. **(08 Marks)**

b. Differentiate between Moral the Ethics. **(08 Marks)**

Module-4

7 a. Explain the principles of Engineering Economy. **(08 Marks)**

b. Differentiate between Micro and Macro Economics. **(08 Marks)**

OR

8 a. Determine the effective interest rate for a nominal annual rate of 8% that is compounded.
i) Daily ii) Monthly iii) Quarterly iv) Semi Annually. **(08 Marks)**

b. A person estimates an expenditure of Rs 10 lakh for her daughters medical college from now. He plans to deposit an equal amount at the end of every year for next 10 years at a rate of interest 8% compounded annually. Find the equivalent amount that must be deposited at the end of every year for next 8 years. **(08 Marks)**

Module-5

9 a. What are the function of Entrepreneurship? **(08 Marks)**

b. List out the various objectives and functional activities of Karnataka State Finance Corporation. **(08 Marks)**

OR

10 a. What are the Barriers to Entrepreneurship? **(08 Marks)**

b. Explain the characteristics or importance of market plan. **(08 Marks)**

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15CV62

Sixth Semester B.E. Degree Examination, June/July 2019
Design of Steel Structural Elements

Time: 3 hrs. Max. Marks: 80

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. Use of IS : 800 – 2007 and steel tables are 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.

Module-1

1 a. What are the advantages and disadvantages of using steel structure? **(05 marks)**

b. Explain briefly limit state method of design of structure. Mention the limit states. **(05 marks)**

c. What are rolled used steel sections? Mention different types of RS sections used in constructions. **(06 Marks)**

OR

2 a. Explain the terms : i) plastic hinge ii) collapse mechanism. **(03 marks)**

b. Find the shape factor and plastic moment capacity for a built up beam section shown in fig.Q2(b). **(05 Marks)**

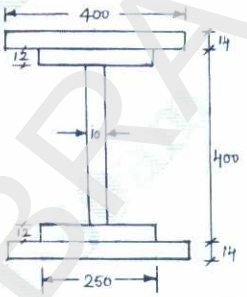

Fig.Q2(b)

c. Determine the plastic moment capacity (Mp) for the beam loaded as shown in Fig. Q2(c). Use load factor = 1.50.

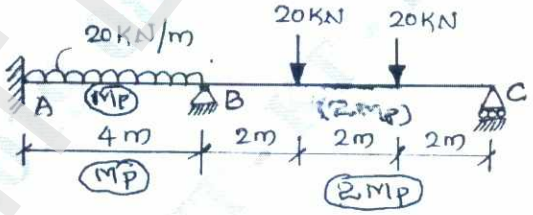

Fig. Q2(c) **(08 Marks)**

Module-2

3 a. Explain various modes of failure of bolted connections. **(06 Marks)**

b. Mention any four advantages and disadvantages of HSFG Bolts. **(04 Marks)**

c. An ISA 100mm × 100mm ×10mm carries a load of 100kN. It is to be joined with a 12mm thick gusset plate. Design the joint using HSFG bolts of 16mm diameter and grade 8.8, when i) no slip is permitted ii) slip is permitted. Steel is of grade Fe410. **(06 Marks)**

OR

4 a. What are common defects in welding? Explain briefly with neat sketches. **(06 Marks)**

b. A tie member of roof truss consists of 2 ISA 100 × 75× 8mm and are connected to both the sides of 10mm gusset plate, by longer legs. Factored axial force in the member is 500kN. Design the welded joint by providing weld i) along two parallel sides of angle ii) along all 3 sides of connected angle. Assume shop weld. **(10 Marks)**

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Module-3

5 a. Explain the possible modes of failure of axially loaded columns. **(03 Marks)**

b. A double angle discontinuous strut ISA 150 × 75 × 10mm, long leg back to back is connected to either side of 10mm gusset plate by 2 bolts in a row. The length of strut between point of intersection is 3.5m and are tack bolted all along the length. Determine the safe load that the strut can carry. **(05 Marks)**

c. A built up column consists of ISMB 250@ 366N/m with two side plates 250mm × 10mm as shown in Fig.Q5(c). Compute the maximum compressive load that the column can carry, if the length of the column is 6.25m ends of columns are restrained in position at both the ends, and one end is restrained against rotation. **(08 Marks)**

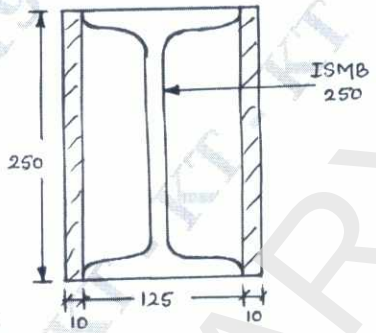

Fig.Q5(c)

OR

6 Design a built up column comprising of two channel section placed back to back to carry a load of 1000 kN over a length of 10m. The ends of compression member are restrained in position but not in direction/rotation. Design single lacing system also with 20mm diameter bolts for connections. **(16 Marks)**

Module-4

7 a. What are lug angles? Briefly explain advantages and disadvantages of using lug angles in bolted connections. **(06 Marks)**

b. Design an unequal single angle section to carry a load of 140 kN in tension. Use M20, 4.6grade bolts. The length of the member is 3m. **(10 Marks)**

OR

8 a. Distinguish between slab base and gusseted base. **(03 Marks)**

b. Design a gusseted base for a built up column ISHB 350@ 674 N/m with 400mm × 20mm flange plates carrying an axial load of 2000 kN. Assume M_{20} grade concrete and M_{24} bolts of grade 4.6. SBC = 200 kN/M^2. **(13 Marks)**

Module-5

9 a. Briefly explain the factors affecting lateral stability of beams. **(04 Marks)**

b. Design one of the internal beams of span 6m (clear), spaced in the hall at 3.5m c/c, supports 130mm thick RCC slab. Take imposed load of 5kN/m^2 and finishes 1.5 kN/m^2. Bearing of wall 300mm. The beam is laterally restrained. Check for shear, moment capacity and deflection. **(12 Marks)**

OR

10 a. Write a note on Laterally unsupported beam. **(04 Marks)**

b. Briefly explain different types of seated connections. **(05 Marks)**

c. Explain the necessities of providing column splices. With neat sketches write about any two types of column splices. **(07 Marks)**

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15CV63

Sixth Semester B.E. Degree Examination, June/July 2019
Highway Engineering

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

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.

Module-1

1 a. Mention different modes of transportation. Explain the characteristics of road transport in comparison with other systems. **(08 Marks)**

b. Determine the length of different categories of roads in a state in India by the year 2021 as per 3rd year road plan formulae. The area of state is 3,08,000 km^2. Number of Towns as per 1981 census was 276. Overall road density aimed at 82km per 100km^2. **(08 Marks)**

OR

2 a. What are the types of roads and its classification? Briefly outline classification or urban roads. **(08 Marks)**

b. Three new roads A, B and C are to be completed in a district during a five year plan period. Workout the order of priority for phasing the plan programme by maximum utility principle, from the data given below. Adopt utility unit of 1.0 for serving a village with population range 2000-5000, for catering for 1000T of agricultural products or per 100T of industrial products. Assume any other required data suitably.

Road	Length km	Number of village served population			Productivity 1000T	
		<2000	2000 – 5000	>5000	Agricultural	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

(08 Marks)

Module-2

3 a. Clarify the features of ideal alignment and enumerate factors affecting alignment. **(08 Marks)**

b. Write a brief outline on engineering surveys. **(08 Marks)**

OR

4 a. With neat sketches illustrate different cross section elements. **(08 Marks)**

b. The speed of overtaking and overtaken vehicles are 70 and 40 kmph respectively on a two way traffic road. If the acceleration of overtaking vehicle is 0.99 m/sec^2.

i) Calculate safe overtaking sight distance.
ii) Mention the minimum length of overtaking zone
iii) Draw a neat sketch of the overtaking zone and show the positions of the sign posts.

(08 Marks)

Module-3

5 a. With neat sketches illustrate conduction of plate load test to determine modulus of subgrade reaction. **(08 Marks)**

b. Distinguish between :

i) Tar and Bitumen
ii) Cutback and Emulsion. **(08 Marks)**

OR

6 a. Enumerate different types of pavements with their component parts and functions of each component. **(08 Marks)**

b. Calculate ESWL of a dual wheel assembly carrying 2004 kg each for pavement thickness of 15, 20 and 25 cms. Centre to centre tyre spacing = 27cm and distance between the walls of the tyres = 11cm. Use graphical method. **(08 Marks)**

Module-4

7 a. Briefly outline the design procedure of soil aggregate mixes by Rothfuch's method. **(08 Marks)**

b. Explain the procedure of marshall mix design of Bituminous mixes. **(08 Marks)**

OR

8 a. Enumerate in detail the requirements, specifications of materials and the construction steps for a wet mix macadam (WMM) layer. **(08 Marks)**

b. Explain in detail the requirements, specifications of materials and the construction steps for pavement quality concrete. **(08 Marks)**

Module-5

9 a. Explain with sketches how the subsurface drainage system is provided to lower the water table. **(08 Marks)**

b. The maximum quantity of water expected in one of the open longitudinal drains on clayey soil is 0.9 m^3/sec. Design the cross section and longitudinal slope of trapezoidal drain assuming the bottom width of the trapezoidal section to be 1.0m and cross slope to be 1.0 vertical to 1.5 horizontal. The allowable velocity of flow in the drain is 1.2 m/sec and n = 0.02. **(08 Marks)**

OR

10 a. Briefly describe the different methods of economic analysis of a highway. **(08 Marks)**

b. Calculate the annual cost of a stretch of a highway from the following particulars:

Item	Total cost (Rs. in lakh)	Estimated life (years)	Rate of interest (%)
Land	12	100	6
Earthwork	9.0	40	8
Bridges and culverts	7.5	60	8
Pavement	14	15	10

(08 Marks)

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15CV64

Sixth Semester B.E. Degree Examination, June/July 2019
Water Supply and Treatment Engineering

Time: 3 hrs. Max. Marks: 80

Note: 1. *Answer any FIVE full questions, choosing ONE full question from each module.*
2. *Assume suitable data wherever necessary.*

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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Module-1

1 a. Explain the importance and need for protected water supply. **(06 Marks)**

b. Enumerate the fire demand in water supply. **(03 Marks)**

c. The population of a city in three consecutive years i.e. 1991, 2001 and 2011 in 80,000, 2,50,000 and 4,80,000 respectively. Determine: (i) The saturation population (ii) The equation of logistic curve (iii) The expected population in 2021. **(07 Marks)**

OR

2 a. What is meant by per capita demand? **(02 Marks)**

b. Explain geometrical and incremental increase method of population forecasting. **(07 Marks)**

c. The following population data are available for a town. Estimate the probable population in the year 2031 by geometrical and incremental increase methods:

Year	1971	1981	1991	2001
Population	80,000	1,20,000	1,68,000	2,28,000

(07 Marks)

Module-2

3 a. Explain the objectives of water treatment. **(06 Marks)**

b. List the physical water quality characteristics. **(03 Marks)**

c. Discuss the complete sequence of water treatment plant with a flow diagram. **(07 Marks)**

OR

4 a. What are the objectives of water quality management? **(05 Marks)**

b. Discuss the effect of excess concentration of hardness, nitrogen and fluoride in drinking water. **(06 Marks)**

c. Explain the importance of bacteriological tests in determining the quality of drinking water. **(05 Marks)**

Module-3

5 a. Define surface flow rate and detention period for a sedimentation tank. **(04 Marks)**

b. Describe briefly the various constituents of coagulation sedimentation tank. **(06 Marks)**

c. A rectangular settling tank without mechanical equipment is to treat 1.8 MLD of raw water. The sedimentation period is to be 4h, the velocity of flow is 8 cm/min, and the depth of the water and sediment is 4.2 m. If an allowance of 1.2 m for sediment is made, what should be (i) the length of the basin (ii) the width of the basin? **(06 Marks)**

OR

6 a. Explain with a neat sketch the working and back washing of rapid gravity sand filter. **(10 Marks)**

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b. Find the area and number of units required for rapid sand filtration to serve a population of 2,00,000. Take average rate of demand = 160 ℓpcd and maximum demand as 1.8 times.
Rate of filtration = 5 $m^3/h/m^2$
Size of each filter = 10 m × 5 m **(06 Marks)**

Module-4

7 a. List the requirement of good disinfectant. **(03 Marks)**
b. Explain the theory of chlorination of water with chemical equations. **(08 Marks)**
c. Enumerate the treatment of swimming pool water. **(05 Marks)**

OR

8 a. What is softening of water? Discuss the lime soda process of water softening with chemical equations. **(10 Marks)**
b. Explain the reverse osmosis process of softening of water. **(06 Marks)**

Module-5

9 a. Discuss the factors governing the selection of source of water for water supply scheme. **(04 Marks)**
b. Explain with a neat sketch a wet intake tower structure. **(06 Marks)**
c. For water supply of a town, water is pumped from a river 3 km away into a reservoir. The maximum difference of levels of water in river and the reservoir is 20 m. The population of the town is 50000 and per capita demand is 120 c/d. If pumps are to operate for a total of 8 hr and the efficiency of pumps is 80%, determine the horse power of the pumps. Assume average daily demand as 1.5 times the average, f' = 0.03 and v = 2m/sec. **(06 Marks)**

OR

10 a. Discuss the various methods of distribution of water and give the advantages and disadvantages of any two systems. **(08 Marks)**
b. What is service reservoir? Explain with a neat diagram. **(08 Marks)**

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15CV651

Sixth Semester B.E. Degree Examination, June/July 2019
Solid Waste Management

Time: 3 hrs. Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

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.

Module-1

1 a. Explain the different sources and types of solid wastes. **(06 Marks)**

b. Estimate the density of a solid waste sample, on as discarded basis. Take 1000kg sample. **(10 Marks)**

Component	% by mass	Density (kg/m^3)
Food waste	20	300
Paper	40	100
Plastics	5	90
Garden trimmings	15	150
Wood	5	250
Tin cans	5	100
Cardboard	10	80

OR

2 a. With a neat sketch, explain hauled container system and stationary container system. **(10 Marks)**

b. With a neat sketch, explain the different types of Transfer stations. **(06 Marks)**

Module-2

3 a. Explain the process of incineration with the aid of neat sketch. **(08 Marks)**

b. Explain the following :
i) Mechanical volume reduction ii) Component separation. **(08 Marks)**

OR

4 a. Describe the effect of 3T's in incineration process of solid waste. **(08 Marks)**

b. Write a note on Air pollution and its control. **(08 Marks)**

Module-3

5 a. What are the important factors for the design consideration in Anaerobic composting? **(06 Marks)**

b. Write a note on Vermi composting. **(04 Marks)**

c. Determine the amounts of oxygen required to oxidize 1 tonne of waste and also to stabilize Ammonia in having the chemical equation $C_{50}\ H_{100}\ O_{40}\ N$. **(06 Marks)**

OR

6 a. Determine the landfill area required for municipality with a population of 50,000 given that Solid waste generation = 350gm/person/day ; Compacted density of landfill = 504 kg/m^3 ; Average depth of compacted solid waste = 3m. **(04 Marks)**

b. What is Leachate? What are its effects on ground water? **(04 Marks)**

c. List and explain briefly the various factors that must be considered in evaluating a potential landfill site. **(08 Marks)**

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Module-4

7 a. Explain the Bio – medical waste disposal methods. **(08 Marks)**

b. List the various sources of e – waste, hazardous and construction waste. **(08 Marks)**

OR

8 a. Explain the categories of hazardous waste and its method of disposal. **(08 Marks)**

b. Discuss about collection , treatment and disposal of construction waste. **(08 Marks)**

Module-5

9 a. Describe about the various types of incinerations. **(08 Marks)**

b. Write short notes on :

i) Energy recovery operation ii) Significance of Reuse in solid waste. **(08 Marks)**

OR

10 a. Define Pyrolysis. Briefly explain the process of pyrolysis. **(08 Marks)**

b. Explain the design criteria for incineration. **(08 Marks)**

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15CV661

Sixth Semester B.E. Degree Examination, June/July 2019
Water Resource Management

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

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.

Module-1

1 a. Write a detailed note on availability of 'Global Water Resources' and distribution of 'Global Fresh Water'. **(08 Marks)**

b. Explain 'Major', 'Medium' and 'Minor' water basins in India and list a minimum of six major water basins identified in our country. **(08 Marks)**

OR

2 a. Explain water balance equation and its importance. **(08 Marks)**

b. Explain the process of 'Hydrologic Cycle' along with representative diagram. **(08 Marks)**

Module-2

3 a. Explain in detail the necessity of water resources planning and management. **(08 Marks)**

b. Write a detailed note on post planning and management issues to be addressed in case of a river valley development project. **(08 Marks)**

OR

4 a. What are the planning and management aspects in case of water resource development project? **(06 Marks)**

b. Explain in detail the following:

i) Top-down approach of water resource planning and management.

ii) Demand based bottom-up approach of water resource management. **(10 Marks)**

Module-3

5 a. Analyze the four basic principles of "Integrated Water Resources management" recommended as per Dublin's International conference on 'Water and Environment' (1992). **(10 Marks)**

b. Comment on the 'Role of Government' in providing 'Enabling Environment' for achieving integrated water resource management in our country. **(06 Marks)**

OR

6 a. Bring out the advantages/disadvantages of private sector involvement in the field of water resources management. **(08 Marks)**

b. Explain the process of 'integrated water resources management' involving integration of natural water system and human system. **(08 Marks)**

Module-4

7 a. Elaborate the salient features included in the 'National Water Policy (2002)' and discuss the water sector reforms needed to be adopted in India. **(10 Marks)**

b. Discuss the role of 'Water user associations' and its effectiveness for effective water governance and management of water resources. **(06 Marks)**

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OR

8 a. Write a detailed note on existing legal framework for water and constitutional provisions for water usage by the citizens of India. **(08 Marks)**

b. Elaborate the role of local institutions and its importance for good water governance. **(08 Marks)**

Module-5

9 a. Define the term 'Rain Water Harvesting'. Elaborate Rural technological systems being adopted for water conservation. **(08 Marks)**

b. Explain the design principles for small water harvesting structures for a micro catchment. **(08 Marks)**

OR

10 a. What is ground water recharge? With neat sketches explain
i) Basin method and ii) Pit method of Ground Water recharge. **(10 Marks)**

b. Explain the importance of water harvesting and conservation along with basic principles involved in the process. **(06 Marks)**

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