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15CV61

Sixth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Construction Management and Entrepreneurship

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Define management. Explain the contributions of Taylor to Scientific Management. (08 Marks)
 b. Briefly explain the various levels and skills required at different levels. (08 Marks)

OR

- 2 a. Briefly explain the important steps in planning. (08 Marks)
 b. Write difference between strategic planning and tactical planning. (08 Marks)

Module-2

- 3 a. What is organization? Explain the purpose and nature of an organization. (08 Marks)
 b. What is appropriate span of control? Explain the factors affect the span of management. (08 Marks)

OR

- 4 a. What is Department? Mention the types and explain the departmentation by geographic area. (08 Marks)
 b. Explain the steps in the selection procedure of an organization. (08 Marks)

Module-3

- 5 a. Explain the comparison of Maslow's and Herzberg theories of Human motivation. (08 Marks)
 b. What are the different steps involved in controlled process. (08 Marks)

OR

- 6 a. Briefly explain the Maslow's hierarchy needs. (08 Marks)
 b. Explain some of the methods of establishing control. (08 Marks)

Module-4

- 7 a. Define the term 'Entrepreneur'. Explain the functions of an Entrepreneur. (08 Marks)
 b. Explain the steps involved in Entrepreneurial process. (08 Marks)

OR

- 8 a. Define 'Small Scale Industry' and state the characteristics of a SSI. (08 Marks)
 b. Explain the WTO, state its functions. (08 Marks)

Module-5

- 9 a. Explain the role of TECSOK in promotion of small enterprises in Karnataka. (08 Marks)
 b. Explain the important activities in establishing small enterprises, with the help of KSSIDC. (08 Marks)

OR

- 10 a. Explain the role of KSFC in promotion of small enterprise. (08 Marks)
 b. Write short notes on : (08 Marks)
 (i) SISI (ii) SIDBI (iii) Project Identification (iv) Barrier in Entrepreneur

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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15CV62

Sixth Semester B.E. Degree Examination, Dec.2018/Jan.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 IS800-2007 and Steel tables permitted.*

Module-1

- 1 a. Mention the failure criteria of steel with examples. Explain any one in brief. (10 Marks)
- b. Explain briefly class 1, class 2 and class 3 sections. (03 Marks)
- c. Name the following elements: (03 Marks)

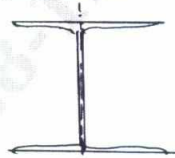


Fig.Q1(c)i

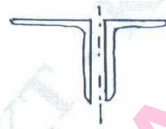


Fig.Q1(c)ii

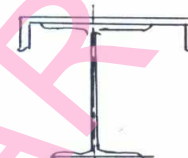


Fig.Q1(c)iii

OR

- 2 a. Determine the shape factor for the section shown in Fig.Q2(a), if permissible yield stress in compression and tension is 200 MPa. and 240 MPa respectively. (06 Marks)

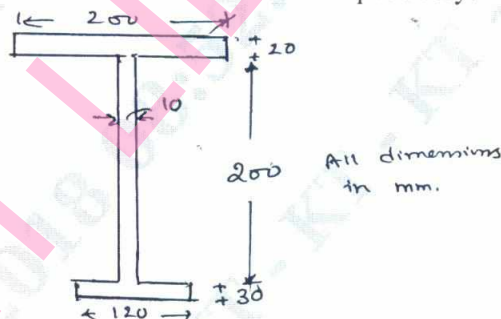


Fig.Q2(a)

- b. Determine plastic moment and draw BMD for collapse assuming M_p constant throughout for the beam as shown in Fig.Q2(b). (10 Marks)

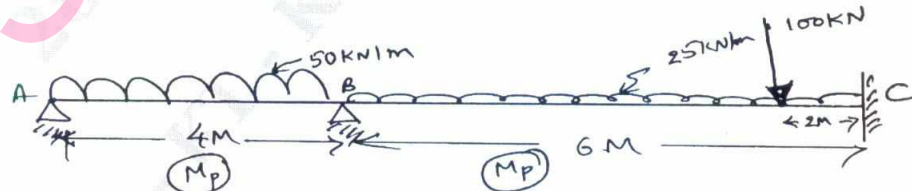


Fig.Q2(b)

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Module-2

- 3 a. The lower chord joint of a roof truss is as shown in Fig.Q3(a). Determine (i) Design strength of the bolt (ii) Number of bolts required to connect the angles to Gusset. Assume M20 bolts, $A_{sb} = 314 \text{ mm}^2$ and $A_{nb} = 245 \text{ mm}^2$. Assume $A_{sb} = 201 \text{ mm}^2$. (06 Marks)

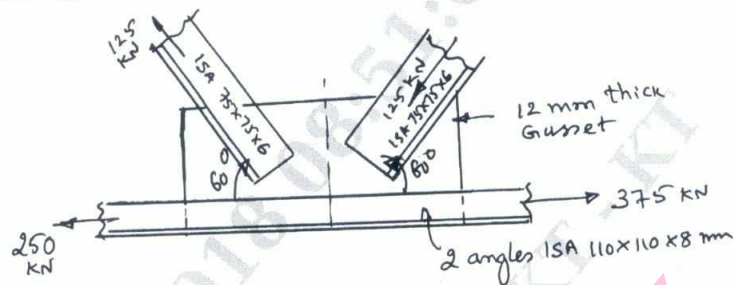


Fig.Q3(a)

- b. Determine the ultimate load carrying capacity in tension for the Lap Joint shown in Fig.Q3(b). Assume bolts threads are outside the shear plane. Adopt M16 bolts – Grade C of property class 4.6. Assume yield and ultimate strengths of the flats as 250 MPa and 410 MPa respectively. (10 Marks)

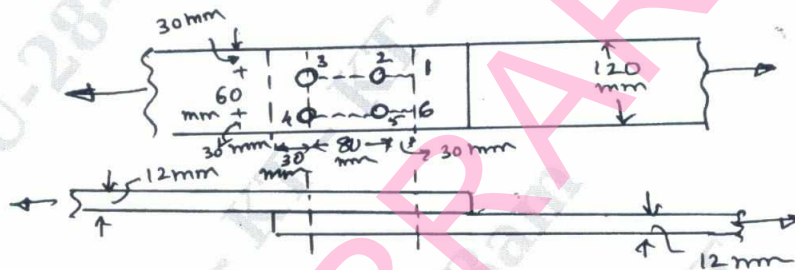


Fig.Q3(b)

OR

- 4 a. In a truss, ISA 100×100×8 mm is subjected to a factored tension of 200 kN. It is to be connected to a gusset using fillet welds at the toe and back. Find the lengths of welds required so that centre of gravity of welds lies in the plane of centre of gravity of the angle. Assume $f_u = 410 \text{ MPa}$. (08 Marks)
- b. Determine the size and effective length of the side fillets to connect two plates with cross sections of 150×10mm and 100×10 mm subjected to a tension of 125 kN (working load). Assume $f_u = 410 \text{ MPa}$. (08 Marks)

Module-3

- 5 a. Determine design load capacity of a single discontinuous angle ISA 50×50×5 mm used as a compression member in a roof truss connected to gusset by two bolts. Centre to centre distance between end connections is 1.5m. Adopt E250 steel. (08 Marks)
- b. Determine the design load carrying capacity of a discontinuous strut 2.50 m long comprising of two ISA 70×70×6 mm if connected to same side of 8mm gusset plate by more than one bolt in each angle. (08 Marks)

OR

- 6 a. Mention design specifications for Battening as per IS 800-2007. (04 Marks)
- b. Design single lacing system for a column of effective length 5 m to carry 900 kN axial loading. Adopt E250 grade steel. Also design suitable fillet welds. (12 Marks)

Module-4

- 7 Design the end connection for ISA 100×100×10 mm using lug angle for its full design strength. Adopt M20 bolts – Grade C, Property class 4.6. Provide E250 steel. Sketch the connection details. (16 Marks)

OR

- 8 a. Distinguish Slab base from Gusseted base. (02 Marks)
b. Explain with neat sketch, components of a gusseted base. (04 Marks)
c. Design a column splice using HSFG bolts of class 8.8 for the following details;
Factored Axial force = 750 kN
Factored Bending moment = 150 kN-m
Factored shear force = 75 kN.
Section of the column is SC250. Assume ends of the column are milled and bearing type connection are provided. (10 Marks)

Module-5

- 9 Design a simply supported I section to support the slab of a hall of 9m × 24m with beams spaced at 3 m c/c. slab is of 100mm thick. Consider floor finish load of 0.5 kN/m² and live load of 3 kN/m². Adopt E250 steel. Assume adequate lateral support to the compression flange. Also check for deflection. (16 Marks)

OR

- 10 Explain briefly ;
a. Shear strength of steel beams
b. Laterally unsupported beams
c. Factors affecting lateral stability
d. Column splices. (16 Marks)

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15CV63

Sixth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Highway Engineering

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain various characteristics of Road Transport. (05 Marks)
b. Explain briefly the salient features of third twenty year road development plan. (05 Marks)
c. There are three alternate proposals of road plans for a district in Karnataka state. Suggest the order of priority for planning road based on the maximum utility approach. Assume utility units of 0.5, 1.0, 2.0 for the three population ranges and utility of 1.0 and 10.0 per 1000 tonnes of agricultural and industrial products served.

Proposal	Road length in km	Number of villages served pollution range			Productivity in 1000 tonnes	
		<2000	2001-5000	>5000	Agriculture	Industrial
A	200	80	40	10	90	12
B	250	75	45	12	105	22
C	300	85	50	18	110	26

(06 Marks)

OR

- 2 a. Explain the role of transportation in social and economic development of the country. (05 Marks)
b. Explain briefly the following :
(i) Jayakar Committee (ii) Indian Road Congress (IRC) (iii) Central Road Fund (CRF) (05 Marks)
c. The area of a certain district in India is 13,400 sq.km and there are 12 towns as per 1981 census. Determine the lengths of different categories of roads to be provided in third twenty year road development plan. (06 Marks)

Module-2

- 3 a. What are the basic requirements of an ideal highway alignment? List and explain briefly. (05 Marks)
b. Briefly explain the role of pavement surface characteristics in highway geometric design. (05 Marks)
c. Calculate the safe stopping sight distance for design speed of 50 kmph. For (i) Two way traffic on two lane road (ii) Two way traffic on a single lane road. Assume $f = 0.37$ and reaction time, $t = 2.5$ sec. (06 Marks)

OR

- 4 a. Briefly explain how MAE study is helpful in the alignment of new highway. (05 Marks)
b. Give the details of drawings to be prepared in highway project and discuss briefly. (05 Marks)
c. The radius of a horizontal circular curve is 100 m. The design speed is 50 kmph and the design co-efficient of lateral friction is 0.15.
(i) Calculate the super elevation required if full lateral friction is assumed to develop
(ii) Calculate the co-efficient of friction needed if no super elevation is provided.
(iii) Calculate the equilibrium super-elevation if the pressure on inner and outer wheels should be equal. (06 Marks)

Module-3

- 5 a. List and explain the desirable properties of subgrade soil. (05 Marks)
 b. List and explain the various design factors to be considered for pavements. (05 Marks)
 c. A load penetration values of CBR tests conducted on a specimen of a soil sample are given below. Determine the CBR value of soil, if 100 divisions of load represents 190 kg and in the calibration chart of proving ring. (06 Marks)

Penetration of plunger, in mm	0.0	0.5	1.0	1.5	2.0	2.5	3.0	4.0	5.0	7.5	10.0	12.5
Load dial readings (Divisions)	0	8	15	23	29	34	37	43	48	57	63	67

OR

- 6 a. Explain the desirable properties of aggregates to be used in pavement construction. (05 Marks)
 b. Explain the significance of ESWL in pavement design. (05 Marks)
 c. Calculate the stresses at interior, edge and corner regions of a cement concrete pavement using Westergaard's stress equation. Use the following data; wheel load, $P = 5100$ kg, Modulus of elasticity, $E = 3 \times 10^5$ kg/cm², Pavement thickness, $h = 18$ cm, Poisson's ratio of concrete, $\mu = 0.15$, Modulus of subgrade reaction, $k = 6$ kg/cm³, Radius of contact area, $a = 15$ cm. (06 Marks)

Module-4

- 7 a. Briefly explain the different types of pavement construction. (08 Marks)
 b. Explain the construction steps for cement concrete pavement slab. (08 Marks)

OR

- 8 a. Explain the construction steps for water bound macadam roads. (08 Marks)
 b. Write a short note on the following :
 (i) Bituminous macadam (ii) Bituminous concrete (iii) Prime coat (iv) Seal coat (08 Marks)

Module-5

- 9 a. What are the requirements of highway drainage system? (05 Marks)
 b. Explain the various road user benefits of highway improvements. (05 Marks)
 c. The maximum quantity of water expected in one of the open longitudinal drain on clayey soil is 0.9 m³/sec. Design the cross-section of trapezoidal drain, assuming the bottom width of the trapezoidal section to be 1 m and cross slope to be 1 vertical to 1.5 horizontal. The allowable velocity of flow in the drain is 1.2 m/sec. (06 Marks)

OR

- 10 a. Briefly explain the types of cross drainage structures. (05 Marks)
 b. Describe the various methods of economic analysis of a highway. (05 Marks)
 c. Compare the annual costs of two types of pavement structures (i) WBM with thin bituminous surface at total cost of Rs.2.2 lakhs per km, life of 5 years, interest at 10%, salvage value of Rs.0.9 lakhs after 5 years; Annual average maintenance cost of Rs. 0.35 lakhs per km and (ii) Bituminous macadam base and bituminous concrete surface, total cost of Rs. 4.2 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 Rs.0.25 lakhs per km. (06 Marks)

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15CV64

Sixth Semester B.E. Degree Examination, Dec.2018/Jan.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 any suitable data if necessary.

Module-1

- 1 a. Explain the different types of water demand. (06 Marks)
b. What is meant by per capita demand? List and discuss the factors that affect the per capita demand. (10 Marks)

OR

- 2 a. The population of the city in successive decennial census is given as 41500 and 57500. Assuming the census date as 10th April, find the midyear population as 10th July for
i) 3rd Inter – Censal year and (08 Marks)
ii) 6th Post – Censal year by Arithmetical increase method and Geometrical increase method.
b. With the help of neat sketch, explain in detail the variations in demand of water and effect of these variations on the design of various units of water supply scheme. (08 Marks)

Module-2

- 3 a. Write a neat flow sheet of municipal water treatment plant with significance of each unit. (08 Marks)
b. Discuss on surface and subsurface water sources with regard to their quality and quantity. (08 Marks)

OR

- 4 a. List the objectives of water quality analysis. (04 Marks)
b. Differentiate between composite sampling and grab sampling. (04 Marks)
c. Write desirable limits of the following parameters as per BIS 10500 – 2012.
i) Colour ii) pH iii) Total hardness iv) Nitrate v) Iron vi) Fluoride
vii) Total dissolved solids viii) Chlorides. (08 Marks)

Module-3

- 5 a. The maximum daily demand at a water purification plant has been estimated as 12 million litres per day. Design the dimensions of a suitable sedimentation tank (Fitted with mechanical sludge removal arrangements) for the raw supplies, assuming a detention period of 6 hours and velocity of flow as 20cm/min. (06 Marks)
b. Explain in detail the theory of filtration. (10 Marks)

OR

- 6 a. Discuss in detail the operational problems in filters. (10 Marks)
b. Bring out the differences between ultra and micro filtration. (06 Marks)

Module-4

- 7 a. A sample of raw water contains 200 mg/l alkalinity, 50mg/l hardness as CaCl₂ and 75mg/l hardness as MgSO₄. Compute the quantities of lime and soda required to treat 1 million litres of water. If slaked lime 85% purity is available in place of pure lime. What will be the required quantity of slaked lime? (08 Marks)

- b. Explain the concept of reverse osmosis in water treatment with aid of neat sketch. (08 Marks)

OR

- 8 a. Differentiate between the following : (08 Marks)
- Plain chlorination and Super chlorination.
 - Double chlorination and de – chlorination.
 - Pre – chlorination and Post – chlorination.
 - Disinfection and Sterilization.
- b. Explain Defluoridation and Fluoridation. (08 Marks)

Module-5

- 9 a. For a water supply of a town, water is pumped from a river 2 km away into a reservoir. The maximum difference of levels of water in river and reservoir is 25m. the population of town is 80000 and per capita water demand is 125 litres per day. If pumps are to operate for a total of 8 hours and the efficiency of the pump is 80%. Determine the horse power of the pumps. Assume friction factor as 0.03 and velocity of the flow as 2m/s and maximum daily demand as 1.5 times the average daily demand. (08 Marks)
- b. With the help of neat sketch, explain twin well type of river intake. (08 Marks)

OR

- 10 a. Write short notes on any two : (08 Marks)
- Corrosion in pipes
 - Reflux valve
 - Fire hydrant.
- b. List the advantages and disadvantages of dead end system. (04 Marks)
- c. Differentiate between continuous and intermittent system of water supply. (04 Marks)

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15CV651

Sixth Semester B.E. Degree Examination, Dec.2018/Jan.2019

Solid Waste Management

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. With a neat schematic diagram, explain the functional elements of solid waste management. (10 Marks)
- b. Estimate the energy content of a solid waste sample in unit energy on dry basis and ash free dry basis, assume ash 5%.

Component	% by mass	% moisture content	Energy (kJ/kg)
Food waste	15	70	4650
Paper	45	06	16750
Card board	10	05	16300
Plastics	10	02	32600
Garden trimming	10	60	6500
Wood	05	20	18600
Tincans	05	03	700

(06 Marks)

OR

- 2 a. With a neat schematic diagram explain
- Hauled container system
 - Stationary container system. (10 Marks)
- b. An area consisting of 1000 houses of average 5 person per home is contributing solid waste to a transfer station designed for a week. The waste is carried in 2 types of vehicle i.e., compactor trucks and flat bed trucks whose volume are 15 and 1.15 m³ with their densified of the material is 400 and 50 kg/m³ respectively. Assuming 10 compactor trucks loads and 40 flat bed trucks loads per weeks. Estimate the unit waste generation rate. (06 Marks)

Module-2

- 3 a. Explain the following processing techniques briefly:
- Mechanical volume reduction
 - Mechanical size reduction. (10 Marks)
- b. Explain chemical volume reduction. (06 Marks)

OR

- 4 a. Give list of component separation techniques, explain them. (10 Marks)
- b. What are 3T's of incineration process? Explain them. (06 Marks)

Module-3

- 5 a. Explain the following composting methods:
- Bangalore method
 - Indore method. (10 Marks)
- b. With a neat sketch, explain the trench method of sanitary land filling. (06 Marks)

OR

- 6 a. Discuss the important affecting the aerobic composting process. (10 Marks)
b. Determine the landfill area required for municipality with a population of 50,000 given that solid waste generation = 360gm/person/day compacted density of landfill = 504 kg/m³. Average depth off compacted solid waste = 3m. (06 Marks)

Module-4

- 7 a. Explain briefly the bio medical waste classification and disposal techniques. (10 Marks)
b. Write a note on: i) Hazardous waste; ii) Construction waste. (06 Marks)

OR

- 8 a. Explain the Cell vent and Well vent methods of controlling gas movement in land fills. (08 Marks)
b. Define E-waste. List the sources and disposal methods of E-waste. (08 Marks)

Module-5

- 9 Explain any four types of incinerators. (16 Marks)

OR

- 10 a. Define pyrolysis. With the help of flow chart explain the process of pyrolysis. (08 Marks)
b. Explain the various factors to be considered in selection of a site for sanitary land fill. (08 Marks)

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15CV661

Sixth Semester B.E. Degree Examination, Dec.2018/Jan.2019

Water Resources Management

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain Hydrologic cycle, with neat sketch. (08 Marks)
b. What is an Aquifer? Explain various types of aquifers with sketches. (08 Marks)

OR

- 2 a. What is Scarcity of water? Give causes and effects of scarcity of water. (08 Marks)
b. Write a detailed note on Indian water resources. (08 Marks)

Module-2

- 3 a. Explain the need of Water Resources Management. (06 Marks)
b. Give three approaches of planning. Discuss the advantages of each one. (10 Marks)

OR

- 4 a. List various aspects of planning of water resources. Explain in detail. (08 Marks)
b. In adaptive integrated policies, which are the questions to be answered by the planners and managers? (08 Marks)

Module-3

- 5 a. Give Integrated Water Resources Management (IWRM) definition as put up by Global Water partnership (GWP). Also give Dublin principles. (08 Marks)
b. Explain types and forms of private sector involvement in IWRM. (08 Marks)

OR

- 6 a. Explain the frame work of IWRM , developed by GWP , consisting of three 'E's. (08 Marks)
b. Give IWRM tools of implementation. (08 Marks)

Module-4

- 7 a. Write in detail about National Water policies. (08 Marks)
b. Give a broad roadmap for implementation of water policies. (08 Marks)

OR

- 8 a. Write a note on "the role of community based organization" in WRM. (08 Marks)
b. Explain Water laws, Policies and Administration in India. (08 Marks)

Module-5

- 9 a. Explain various methods of Rain water harvesting. (08 Marks)
b. Write in detail about Micro catchment, with neat sketch. (08 Marks)

OR

- 10 a. Give details of farm pond, as a water harvesting structure. (08 Marks)
b. How percolation tanks help in water harvesting? Give the design considerations for the same. (08 Marks)

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