

CBCS SCHEME

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15CV61

Sixth Semester B.E. Degree Examination, June/July 2018 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 Construction management. Explain the objectives of construction management. (08 Marks)
- b. What are the functions of management? Explain any two of them. (08 Marks)

OR

- 2 a. What is construction planning? List the objectives of construction planning. (06 Marks)
- b. Explain Bar chart or Gantt chart. Write its limitations. (04 Marks)
- c. Draw the network for the project based on the following data of events:
Find Early start time, Early finish time, Late finish time, and determine the least number of days required to complete the work. Draw the critical path.

Event	Duration (Days)	Preceders
A	2	-
B	4	-
C	1	A
D	6	B
E	7	C, D

(06 Marks)

Module-2

- 3 a. Explain the importance of resource management in the construction of a project. (08 Marks)
- b. Explain (i) Minimum wages act 1948 (ii) Labour production rate of productivity. (08 Marks)

OR

- 4 a. Explain the advantages of utilization of construction equipments in construction field. List the various classifications of equipments. (08 Marks)
- b. Describe material management and objectives of material management. (08 Marks)

Module-3

- 5 a. Define quality. Describe quality control and quality assurance. (08 Marks)
- b. Explain the importance of safety in construction. Explain the safety measures during (i) Excavation (ii) Drilling and blasting (08 Marks)

OR

- 6 a. Describe the safety insurance. Explain constructors all risk insurance. (08 Marks)
- b. Differentiate between morals and values. (04 Marks)
- c. List the professional rights. (04 Marks)

Module-4

- 7 a. What is economics? List the goals of economics. (08 Marks)
- b. Differentiate between Microeconomics and Macroeconomics. (08 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.

OR

- 8 a. Explain : (i) Time value of money (ii) Simple interest (iii) Compound interest. (10 Marks)
b. Mr. X is planning to build his own house. He plans to deposit Rs. 40,000/- every year for next 10 years in a bank. The bank gives 12% interest rate compound annually. Find the maturity value of his account after 10 year. (06 Marks)

Module-5

- 9 a. Explain in brief the role of entrepreneurship in economic development. (08 Marks)
b. What do you mean by small-scale industry? List the characteristics of small scale industries. (08 Marks)

OR

- 10 a. What is business plan? Explain the importance of business plan. (08 Marks)
b. Explain in detail the contents of a good project report. (08 Marks)

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15CV62

Sixth Semester B.E. Degree Examination, June/July 2018 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, SP(6)-I or Steel table is permitted.*

Module-1

- What are the advantages and disadvantages of steel structures? (08 Marks)
 - What are rolled steel sections? Mention any six shapes used as structural elements with sketches. (08 Marks)

OR

- Identify plastic hinge distance 'X' is 0.414ℓ from the simple support of a propped cantilever beam supporting a UDL of w kN/m over the entire span. (08 Marks)
 - Analyse the continuous beam ABC subjected to working loads shown in Fig.Q2(b) and determine the maximum plastic moment. Take load factor of 1.85. (08 Marks)

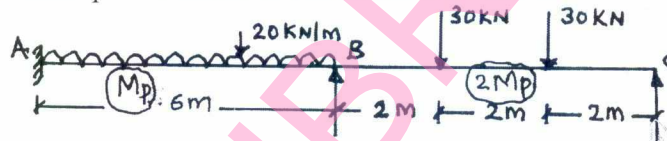


Fig.Q2(b)

Module-2

- What are HSFG bolts? What are the advantages of HSFG bolts? (06 Marks)
 - Design a bolted connection for a lap joint of plate thickness 10 mm and 12 mm to carry a factored load of 150 kN. Use M_{16} and 4.6 grade bolt. Assume the bolts as fully threaded. (10 Marks)

OR

- What are the advantages and disadvantages of welded connections? (08 Marks)
 - 18 mm thick plate is joined to a 16 mm thick plate by 200 mm (Effective) butt weld. Determine the strength of joint if, (i) A double V-butt weld is used (ii) A single V-butt weld is used. Take $f_u = 410$ N/mm² and $\gamma_{mw} = 1.25$. (08 Marks)

Module-3

- Explain Laced and Battened columns with sketches. (06 Marks)
 - Determine the design strength of a column section ISHB 350@67 kg/m. The column is 3m height with one end fixed and other end hinged. Take $f_y = 250$ N/mm². (10 Marks)

OR

- Design a compression member using double channel section (2ISLC300@33.1 kg/m) face to face to carry a factored load of 1600 kN. The length of the column is 5 m with one end fixed and one end hinged. Assume M_{18} bolts and $f_{cd} = 200$ N/mm². Also design single lacing system. (16 Marks)

Module-4

- 7 a. What is lug angle? Explain briefly with sketch. (04 Marks)
b. A single unequal angle ISA 100×75×6 mm is connected to 10 mm thick gusset plate with six 16 mm ϕ bolts to transfer tension. Determine design tensile strength if longer legs are connected to gusset. Assume pitch and edge distance of 40 mm each. (12 Marks)

OR

- 8 a. Briefly explain types of column bases. (04 Marks)
b. Design a slab base for a column ISHB 300@58.8 kg/m subjected to a service load of 1500 kN. The grade of concrete for pedestal is M₂₀ and SBC of soil is 180 kN/m². Design slab base and concrete base with welded connection. (12 Marks)

Module-5

- 9 A floor of hall measuring 9m × 21m is of 150 mm thick R.C. slab supported on steel beams [I section] spaced at 3.5 m c/c. The finishing load of floor is 1.5 kN/m² and live load is 3 kN/m². Design the steel beam and apply the necessary checks. Assume self weight of beam = 1 kN/m and thickness of wall = 0.3 m. (16 Marks)

OR

- 10 Simply supported beam ISMB 350@52.4 kg/m is used over a span of 5 m. The beam carries an Udl live load of 20 kN/m and dead load 15 kN/m. The beam is laterally supported throughout check the safety of the beam. (16 Marks)

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15CV63

Sixth Semester B.E. Degree Examination, June/July 2018 Highway Engineering

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- Explain the various characteristics of road transport. (08 Marks)
 - What are the significant recommendations of Jayakar committee report? Explain how it is implemented in the road development of a country. (08 Marks)

OR

- Briefly explain about planning surveys for a highway project. (08 Marks)
 - The area of a district is 13400 sq km and there are 12 towns as per 1981 census. Determine the length of different categories of roads to be provided in the district by the year 2001. Assume over all density of road length is 82 km per 100 sq km area. (08 Marks)

Module-2

- Explain with sketches the various factors controlling the alignment of a road. (08 Marks)
 - What are the objectives of preliminary survey for highway alignment? Enumerate the details to be collected and the various steps to be followed in the conventional method. (08 Marks)

OR

- Derive an expression for finding the extra widening required on horizontal curve. (08 Marks)
 - The speeds of overtaking and over taken vehicles are 70 kmph and 40 kmph respectively on a two way traffic road. The average acceleration during overtaking may be assumed as 0.99 m/sec^2 . Calculate safe overtaking sight distance and show the details of overtaking zone with sketch. (08 Marks)

Module-3

- What are the desirable properties of sub grade soil? Enumerate the identification and classification tests of soils. (08 Marks)
 - Design a flexible pavement for a two lane undivided carriage way using the following data: Design CBR value of subgrade 5.0% initial traffic on completion of construction is 300 C.V/day. Average growth rate is 6.0% per year. Design life is 10 years VDF value is 2.5. Lane distribution factor is 0.75. (08 Marks)

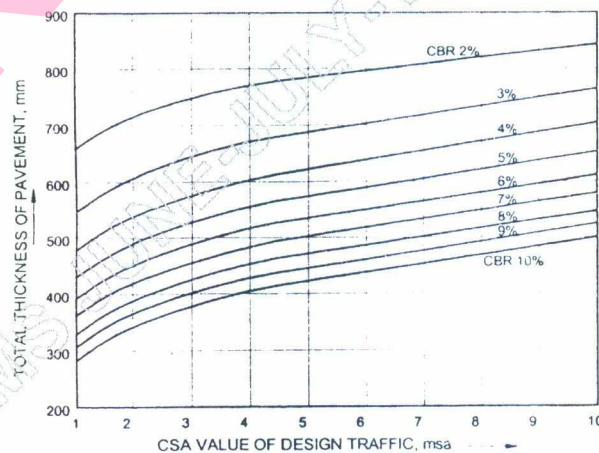


Fig.5(b) CBR design chart for determination of total pavement thickness for traffic with CSA of 1.0 to 10 msa.

OR

- 6 a. What are the desirable properties of road aggregates? What tests are conducted for judging the desirable properties? Mention the significance of each test. (08 Marks)
- b. A plate load test was conducted on a soaked sub grade during monsoon using a plate diameter of 30cm. The load values corresponding to the mean settlement dial readings are given below. Determine the modulus of sub grade reaction for the standard plate. (08 Marks)

Mean settlement values, mm	0.0	0.24	0.52	0.76	1.02	1.23	1.53	1.76
Load values kg	0.0	460	900	1180	1360	1480	1590	1640

Module-4

- 7 a. What are the desirable properties of Bituminous mixes? Discuss briefly. (08 Marks)
- b. What are the essential requirements of soil properties suitable for the construction of highway sub grade? Explain the method of construction of highway sub grade. (08 Marks)

OR

- 8 a. Explain the method of construction of water Bound Macadam base. (08 Marks)
- b. What are the functions of granular material sub base? Explain the construction method of granular sub base. (08 Marks)

Module-5

- 9 a. Discuss the importance of highway drainage. (08 Marks)
- b. The maximum quantity of water expected in longitudinal drains on clayey soil is $0.9 \text{ m}^3/\text{sec}$. 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 Manning's roughness coefficient is 0.02. (08 Marks)

OR

- 10 a. Discuss the various components of quantifiable and non-quantifiable benefits to the road users due to highway development project. (08 Marks)
- b. Calculate the annual cost of a stretch of highway from the following particulars:

Item	Total cost lakhs	Estimated life years	Rate of interest
Land	35.0	100	6%
Earthwork	40.0	40	8%
Bridges, culverts, drainage	50.0	60	8%
Pavement	100.0	15	10%
Traffic signs and road appurtenance	15.0	5	10%

The average cost of maintenance of the road is Rs.1.5 lakhs per year.

(08 Marks)

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15CV64

Sixth Semester B.E. Degree Examination, June/July 2018 Water Supply and Treatment Engineering

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Enumerate points to be considered for water supply scheme. (08 Marks)
b. What is fire demand? Compute fire demand for a city having population 1,40,000 by various formula. (08 Marks)

OR

- 2 a. What is peaking factor? Explain the factor governing design period. (08 Marks)
b. The population of 5 decades from 1970 to 2010 are given in the table. Find the population after one, two and three decades beyond the last known decade by : i) geometric increase method ii) incremental increase method.

Year	1970	1980	1990	2000	2010
Population	25000	28000	34000	42000	47000

(08 Marks)

Module-2

- 3 a. What is the purpose of analysis of water point out significant of each unit in water treatment? (08 Marks)
b. What is sampling? Explain the steps involved in collection of river water sample. (08 Marks)

OR

- 4 a. Enumerate the necessity of microbiological examination of water. Explain membrane filter technique for bacteriological examination of water. (08 Marks)
b. Write the permissible limits and effects of following water quality parameter according (IS10500 – 1991) i) Turbidity ii) p^H iii) Chloride iv) Lead. (08 Marks)

Module-3

- 5 a. Briefly explain mechanism of filtration. (08 Marks)
b. A rectangular settling tank without mechanical equipment is to treat 1.8 million liters per day of raw water. The sedimentation period is to be 4 hours, the velocity of flow 8cm/min and the depth of water and sediment 4.2m. If an allowance of 1.2m for sediments is made. Design the dimension of the tank. (08 Marks)

OR

- 6 a. Briefly explain design elements of a rectangular sedimentation tank. (08 Marks)
b. What are the characteristics of good coagulant? (04 Marks)
c. Explain the causes for Fouling of membrane and how it can be controlled. (04 Marks)

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Module-4

- 7 a. What is permanent hardness? With the help of chemical formula explain zeolite process of removing hardness. (08 Marks)
- b. Discuss the importance of nano filtration and explain different forms of chlorination. (08 Marks)

OR

- 8 a. Discuss the characteristics of ideal disinfectants and explain the mechanism of disinfection. (08 Marks)
- b. Explain reverse osmosis principle with the help of neat sketch. (04 Marks)
- c. Enumerate importance of defluoridation. Mention the methods of defluoridation. (04 Marks)

Module-5

- 9 a. Briefly explain economical diameter of raising main. (04 Marks)
- b. Mention the points to be considered for selection of a site for intake structure. (04 Marks)
- c. A city has a population of 1,50,000 water is to be supplied at the rate of 160 liters per head per day. If the static lift of the pump is 40 meters. Calculate the B.H.P of motor. The raising main is 300m long and its diameter is 50cm. Assume that motor efficiency is 85%. Pump efficiency is 60% $f = 0.04$ and peak hour demand is 1.5 times of average demand. (08 Marks)

OR

- 10 Briefly explain the following :
- a. Sluice valve
- b. Reflux valve
- c. Post fire hydrant
- d. Air valve.

(16 Marks)

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15CV651

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

Solid Waste Management

Time: 3 hrs.

Max. Marks: 80

- Note: 1. Answer any FIVE full questions, choosing one full question from each module.
2. Missing data if any, may be suitably assumed.

Module-1

- 1 a. Briefly explain physical and chemical characteristics of solid waste. (10 Marks)
b. From the following data estimate the waste generation rate per day for a residential area consisting of 1200 houses. The observation location is a local transfer station that receives all the waste collected for disposal. The observation period is for one week. Assume 5 persons in each house. (06 Marks)

Vehicle type	No. of loads	Vol. of vehicle (m ³)	Sp. Wt. of solid waste (kg/m ³)
Compactor truck	10	15.30	296.50
Flat bed load	08	1.53	133.40
Private cars/trucks	25	0.23	88.90

OR

- 2 a. With a neat sketch, explain the operational sequence of Hauled Container System. (08 Marks)
b. Estimate the moisture content, bulk density and energy content of 1000kg sample of solid waste with the following composition. Also estimate energy content on dry weight basis and on ash free dry basis. Take ash content as 7 percent. (08 Marks)

Component	Food waste	Paper	Cardboard	Plastics	Wood
% by mass	45	5	15	15	20
Moisture %	70	6	5	2	20
Bulk density kg/m ³	290	85	50	65	240
Energy content kJ/kg	4650	16750	16300	32600	18600

Module-2

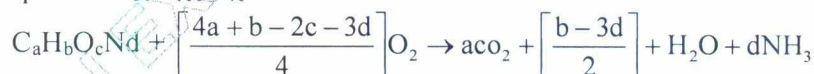
- 3 a. Explain with a neat sketch, working of a municipal incinerator. (08 Marks)
b. Explain briefly the following processing technique : (08 Marks)
i) Mechanical volume reduction ii) Mechanical size reduction.

OR

- 4 a. Explain briefly the following component separation techniques : (08 Marks)
i) Magnetic separation ii) Air separation.
b. Write a short note on following : (08 Marks)
i) Garbage chutes ii) Bailing and Compaction.

Module-3

- 5 a. Explain the factors that governs the selection of site for sanitary land filling. (08 Marks)
b. Determine the amount of air required to oxidize one tone of waste having the chemical equation C₅₀H₁₀₀O₄₀N. (08 Marks)



OR

- 6 a. Explain with neat sketch, Indore process and Bangalore process of composting of municipal solid waste. (08 Marks)
- b. Determine the landfill area required for municipality with population 50,000. given that,
- i) Solid waste generation rate = 450 gm/person/day. (08 Marks)
 - ii) Compacted density of landfill = 504 kg/m³.
 - iii) Avg. depth of compacted solid work = 5mt.

Module-4

- 7 a. Define Hazardous waste. Explain briefly about collection and disposal of hazardous waste. (08 Marks)
- b. Explain the characteristics of Bio – medical waste and its disposal method. (08 Marks)

OR

- 8 a. Briefly explain about E – Waste and its environmental significance. (08 Marks)
- b. Explain briefly about reuse of construction and demolition waste in Construction Industry. (08 Marks)

Module-5

- 9 a. What are 3Ts of incineration process? Explain briefly. (08 Marks)
- b. Define Pyrolysis. Briefly explain about process of Pyrolysis. (08 Marks)

OR

- 10 a. Explain with a flow diagram, energy recovery system from solid waste. (08 Marks)
- b. Define Incineration. Explain briefly about air pollution control methods adopted in an incineration process. (08 Marks)

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15CV661

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

Water Resources Management

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. With a sketch, explain hydrologic cycle. (08 Marks)
b. Give a summary on global water resources and Indian water resources. (08 Marks)

OR

- 2 a. With a sketch, explain confined and un-confined aquifer. (08 Marks)
b. What is water scarcity? Summarize the contributing factors of water scarcity. (08 Marks)

Module-2

- 3 a. Explain the necessity of water resources planning and management. (08 Marks)
b. Explain the spatial and temporal scales of planning and management. (08 Marks)

OR

- 4 a. With a typical analytical frame work for water resources management studies, explain inception, development and selection phases. (08 Marks)
b. Summarize the questions addressed in adaptive integrated policy an activities of water resources planning and management. (08 Marks)

Module-3

- 5 a. With a sketch showing the components, explain the principles of integrated water resources management (IWRM). (08 Marks)
b. Explain the guiding principles : Dublin statement and Rio declaration of integrated water resources management. (08 Marks)

OR

- 6 a. With a figure of three pillars: Economic efficiency, equity and environmental sustainability, explain the implementation process of IWRM. (08 Marks)
b. Summarize the sectors benefited by IWRM. (08 Marks)

Module-4

- 7 a. Explain the existing legal framework and constitutional provisions for water in India. (08 Marks)
b. Explain the various deficiencies in the existing legal framework of water resources development in India. (08 Marks)

OR

- 8 a. Summarize the salient features of Indian National Water Policy 2012. (08 Marks)
b. Summarize the scope of Water User's Association (WUA) and list it's functions. (08 Marks)

Module-5

- 9 a. What is rainwater harvesting? Explain the needs for rainwater harvesting. (08 Marks)
b. Explain the different types of lining done to control seepage in Ponds. (08 Marks)

OR

- 10 a. What is Percolation tank? Describe the general guidelines to be followed in proposing a percolation tank. (08 Marks)
b. Briefly explain the various techniques of rain water harvesting in urban area. (08 Marks)

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