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10CV81

Eighth Semester B.E. Degree Examination, June/July 2014

Advanced Concrete Technology

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.***
3. ***Use of IS:10262-2009 is 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.

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PART – A

1 a. Enumerate the importance of Bogue's compounds in ordinary port land cement. **(07 Marks)**

b. Explain the rheology of concrete in terms of Bingham's parameter. **(07 Marks)**

c. Determine capillary porosity, total porosity and gel space ratio for a cement paste with W/C ratio 0.5 and degree of hydration 90%. **(06 Marks)**

2 a. Explain the mechanism of 'deflocculation' of cement particles by super plasticizers with neat sketches. **(10 Marks)**

b. What is optimum dosage of super plasticizer? How do you determine the optimum dosage of super plasticizer? **(06 Marks)**

c. Explain the effect of fly ash on hardened state of concrete. **(04 Marks)**

3 a. Explain the factors affecting the mix design of concrete. **(06 Marks)**

b. Using Indian standard code M20 grade method of mix design, arrive to a mix proportion for the following data [M20 grade] :
maximum size of aggregate = 20 mm
Degree of workability = 0.90 compactor factor
Degree of quality control = good
Type of exposure = mild
Specific gravity of cement = 3.15
Specific gravity of coarse aggregate = 2.65
Specific gravity of fine aggregate = 2.60
Water absorption coarse aggregate = 0.5%
Water absorption fine aggregate = 1.0%
Free surface moisture-coarse aggregate = Nil
Free surface moisture fine aggregate = 2.0%
Coarse aggregate percentage of different fractions 60% : 40%.
Fine aggregate belongs to zone II. **(14 Marks)**

4 a. Discuss permeability of concrete. **(06 Marks)**

b. Discuss in brief alkali aggregate reaction. What precautions are necessary to minimize, the same? **(06 Marks)**

c. Explain corrosion in reinforced concrete. **(08 Marks)**

PART – B

5 a. What is RMC? Explain briefly advantages of RMC. **(06 Marks)**

b. Explain shot crete and under water concreting. **(08 Marks)**

c. Mention the need for self compacting concrete. Mention its properties. What are different test methods for determining the rheology of SCC? **(06 Marks)**

6 a. What are the factors affecting properties of fibre reinforced concrete. List the various applications of fibre reinforced concrete. **(08 Marks)**

b. What are the different types of fibres used in concrete? **(06 Marks)**

c. What is Ferro-cement? List the various applications of Ferro cement. **(06 Marks)**

7 a. Write short notes on:

i) Light weight concrete

ii) High density concrete **(10 Marks)**

b. Discuss in brief the properties of high performance concrete in fresh and hardened state. **(10 Marks)**

8 Explain the following:

a. Tests on hardened concrete **(08 Marks)**

b. Rebound Hammer Test (NDT) **(06 Marks)**

c. Pulse velocity test [NDT] **(06 Marks)**

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10CV82

Eighth Semester B.E. Degree Examination, June/July 2014
Design and Drawing of Steel Structures

Time: 4 hrs. Max. Marks:100

Note: ***1. Answer ONE full question from Part – A, ONE question from each Part – B.***
2. Use of IS 800 : 2007 Steel tables and SP6(1) is 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.

PART – A

1 a. A secondary beam ISMB 300 @ 433.6 N/m is to be jointed to the main beam ISMB 400 @ @ 604.3 N/m. Two angles ISA 90 × 90 × 6 are used for connection. Three bolts of diameter 20 mm used to connect angle to the web of ISMB 300. 6 bolts of 20 mm diameter are used to connect the angles to the web of ISMB 400. The flanges of both beams are at the same level. Draw to a suitable scale.
i) Sectional elevation ii) side view showing all details. **(16 Marks)**

b. An ISHB 400 @ 759.3 N/m in the lower storey of a building is connected to ISHB 350 @ 661.2 N/m of upper storey. The thickness of bearing plate is 34 mm. The thickness of splice plate is 8 mm. Use suitable filler plate for top column. 6 numbers of 16 mm diameter ordinary bolts are provided for connecting each of column flange with splice. Plate for lower storey column and 6 numbers of 16 mm diameter bolts are provided for connecting each of column flange with splice and filler pate for upper storey column and 2 bolts for connecting only flange and filler plate. Assume pitch of bolts as 60 mm. Draw to a suitable scale :
i) Elevation
ii) Side view. **(14 Marks)**

2 a. Draw to a suitable scale, beam to column stiffened seat connections :
i) front view showing c/s of beam
ii) side view showing elevation of beam for the following details :
Column – ISHB 400 @ 82.2 kg/m (806.4 N/m)
Beam – ISMB 400 @ 6.6 kg/m (604.3 N/m)
Seat angle - ISA 100 × 100 × 10 mm
Cleat angle – ISA 90 × 90 × 8 mm
Pair of stiffeners – 2 – ISA 90 × 90 × 8, 8 – 20 mm bolts for stiffeners to column in two rows, two – 20 mm bolts for remaining connection. **(15 Marks)**

b. Following are the details of gusseted base :
i) Built up column : 2 – ISWB – 400 @ a spacing of 325 mm between webs
ii) Size of base plate : 600 mm × 750 mm
iii) Thickness of base plate : 28 mm
iv) Gusset angles ISA 150 × 100 × 12 with longer leg connected to gusset plate
v) Thickness of gusset plate : 12 mm
vi) 16 bolts of 20 mm dia connect gusset angles to gusset plate, 16 bolts of 20 mm dia connect gusset angles to the column
vii) Anchor bolts 20 mm - ϕ - 4 no
Draw to a suitable scale :
i) Elevation showing flanges of column
ii) Sectional plan. **(15 Marks)**

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PART – B

3 Design a roof truss in figure shown below Fig. Q3 with forces in each member along with its nature of forces in different members of the truss are given in table Q3. The size of the RC column supporting the truss is 300 × 300 mm. Use M20 concrete for column. Design the truss using bolts of M16, property class 5.6 for connections and also design anchor bolts for an uplist force of 15 kN @ each support.

Draw to suitable scale :

i) Elevation of truss greater than half span
ii) Enlarged view of apex joint of the truss
iii) Enlarged view of left support joint.

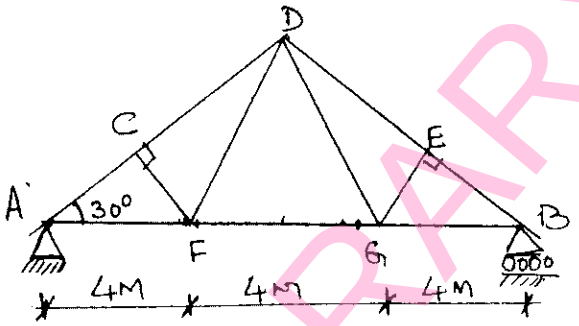

Fig. Q3

MEMBER	FORCE (RO)	LENGTH (M)
AC, EB	80 Kn (C)	3.46 m
CD, DE	70 kN (C)	3.46 m
AF, GB	70 kN (T)	4 m
FG	50 kN(T)	4 m
CF, EG	24 kN(C)	2 m
DG, DF	24 kN (T)	4 m

C = compression ; T = Tension ; AC = CD = DE = EB ; reactions @ A and B $R_A = R_B = 50$ kN.

(70 Marks)

4 Design a simply supported crane gantry girder for the following data. The girder is electrically operated. Yield stress of steel is 250 N/mm^2. Use 16 mm diameter bolts of grade 4.6.

i) Span of crane girder (effective) = 20 m
ii) Effective span of gantry girder = 7 m
iii) Capacity of crane = 220 kN
iv) Self weight of crane excluding crab = 200 kN
v) Weight of crab = 60 kN
vi) Wheel base distance = 3.4 m
vii) Minimum hook approach = 1.1 m
viii) Self weight of rail = 0.3 kN/ m
ix) Height of rail = 75 mm

Draw to a suitable scale :

The c/s of gantry girder and its attachment to supporting column of the bracket

a. Plan details
b. Side elevation.

(70 Marks)

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10CV835

Eighth Semester B.E. Degree Examination, June / July 2014
Industrial Wastewater Treatment

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***
2. Add neat sketches, wherever necessary.

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

1 a. Differentiate between Domestic sewage and Industrial wastewater. **(05 Marks)**

b. Write a note on stream protection measures. **(05 Marks)**

c. How any discharge of Industrial waste water into the sewer affect the Municipal sewage treatment plants? **(10 Marks)**

2 a. Explain the different zones of pollution in stream. **(12 Marks)**

b. A wastewater effluent of 600ℓ/s with a BOD = 60 mg/ℓt , DO = 2.5 mg/ℓt and temperature of 25^0C enters a river where the flow is $30m^3$/sec and BOD = 3 mg/ℓt, DO = 8.5mg/ℓt and temperature of 16^0C. Deoxygenation constant for the waste is 0.10 per day at 20^0C. The velocity of water in the river downstream is 0.15m/s and depth of flow is 1.5m. Determine the following after mixing of waste water with the river water : i) Combined discharge ii) BOD of mix iii) DO of mix and iv) Temperature of mix. **(08 Marks)**

3 a. In what different ways the neutralization of industrial wastes is achieved? Explain. **(10 Marks)**

b. Why equalization and proportioning is of much importance in Industrial wastewater treatment? How is it carried out? **(10 Marks)**

4 a. What do you understand by sludge thickening? Enumerate various methods and describe with the help of sketch the gravity sludge thickener. **(10 Marks)**

b. Write a note on removal of suspended solids form industrial wastes. **(10 Marks)**

PART - B

5 a. What are the advantages and disadvantages of combined treatment of Industrial raw waste with the domestic waste? **(10 Marks)**

b. Write an ill effects of discharging raw industrial wastes to the streams. **(10 Marks)**

6 a. Explain briefly with the help of flow diagram of treatment of distillery wastewater. **(10 Marks)**

b. With process flow diagram, explain the cotton textile mill wastes origin. **(10 Marks)**

7 a. What kind of wastes will origin from a typical dairy industry? Explain. **(10 Marks)**

b. What are the different methods of cement manufacturing? Discuss sources of waste water and treatment options. **(10 Marks)**

8 a. Enumerate the effects of discharging paper and pulp industrial wastes into water bodies (or) sewers. **(10 Marks)**

b. How do you treat a synthetic drug waste from pharmaceutical industry? **(10 Marks)**

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10CV843

Eighth Semester B.E. Degree Examination, June/July 2014
Urban Transport Planning

Time: 3 hrs. Max. Marks:100

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

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

1 a. Define transport planning? Explain the "interdependence of land use and traffic". **(10 Marks)**

b. Explain briefly the various stages involved in transportation planning process. **(10 Marks)**

2 a. Define 'zone'. Mention the different factors considered in dividing the whole area into zones. **(10 Marks)**

b. Explain any five types of surveys carried out in urban transport planning. **(10 Marks)**

3 a. Explain in detail, the various factors governing trip generation. **(10 Marks)**

b. What is category analysis? Mention the basic assumptions considered in the analysis. **(10 Marks)**

4 a. What is trip distribution? Explain growth factor methods in trip distribution. **(10 Marks)**

b. Trip originating from zone 1, 2, 3 of study area are 78, 92 and 82 respectively and those terminating at zones 1, 2, 3 are given as 88, 96 and 78 respectively. If the growth factor is 1.3 and cost matrix is shown below, find the expanded origin – constrained growth trip table.

	1	2	30	O_i
1	20	30	28	78
2	36	32	34	92
3	22	34	26	82
d_j	88	96	78	252

(10 Marks)

PART – B

5 a. Define modal split? Explain in brief the factors affecting modal split. **(10 Marks)**

b. What are the advantages and disadvantages of pre-distribution modal split? **(10 Marks)**

6 a. What is traffic assignment? Explain the application of the traffic assignment. **(10 Marks)**

b. Write a flow chart of fundamental structure of Lowry model. and explain the principal components of the model. **(10 Marks)**

7 a. Explain the diffieulties in transport planning for small and medium cities. **(10 Marks)**

b. Explain the concept of quick response technique. **(10 Marks)**

8 Write short notes on :

a. Scope of urban transport planning

b. Basic movements in transportation survey

c. Home based trip and non – home based trip

d. Fratar method in trip distribution. **(20 Marks)**

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