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10CV81

**Eighth Semester B.E. Degree Examination, Dec.2017/Jan.2018**

**Advanced Concrete Technology**

Time: 3 hrs.

Max. Marks:100

**Note: 1. Answer any FIVE full questions, selecting at least TWO questions from each part.  
2. Use of IS 10262-2009 is permitted.**

**PART – A**

- 1 a. Enumerate the importance of Bogue's compounds. (06 Marks)  
b. Calculate the Gel/space ratio from the following data:  
i) Weight of cement = 600 gm  
ii) Percentage of hydration = 90%  
iii) Water cement ratio = 0.5 (06 Marks)  
c. What are the factors affecting the strength and elasticity of concrete? (08 Marks)
- 2 a. Explain the mechanism of deflocculation of cement particles by using plasticizers with neat sketches. (06 Marks)  
b. How do you determine the optimum dosage of super-plasticizer using Marsh Cone? (06 Marks)  
c. What are mineral admixtures? Explain: (i) GGBS, (ii) Fly Ash. (08 Marks)
- 3 a. Explain the factors affecting the mix design of concrete. (06 Marks)  
b. Design a concrete mix for M30 from the following data:  
Type of cement = OPC 53 grade  
Maximum size of aggregate = 20 mm  
Minimum cement content = 310 kg/m<sup>3</sup>  
Maximum W/C ratio = 0.45  
Workability = 50-75 mm slump  
Exposure condition = normal  
Degree of supervision = good  
Water absorption = 0.5% (CA)  
Free surface moisture = Nil (CA)  
Specific gravity of cement = 3.15  
Specific gravity of CA = 2.80  
Specific gravity of FA = 2.60  
Specific gravity of super plasticizer = 1.2  
Missing data may be suitably assumed. (14 Marks)
- 4 a. Explain Alkali-Aggregate reaction. (06 Marks)  
b. List the methods of controlling sulphate attack. (06 Marks)  
c. Define durability. Explain the factors affecting durability. (08 Marks)

**PART – B**

- 5 a. Explain briefly advantages of RMC. (06 Marks)  
b. What are the advantages of SCC? (06 Marks)  
c. List the factors affecting the workability. Explain any one workability test conducted on S.C.C. (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.

- 6 a. What is Ferrocement? What are the various applications of Ferrocement? (06 Marks)  
b. What are the different types of fibers used in concrete? (06 Marks)  
c. What is aspect ratio? How does it influence workability and strength of FRC? (08 Marks)
- 7 a. Explain high density concrete. (06 Marks)  
b. What is high performance concrete? (06 Marks)  
c. Explain:  
i) Pumice (08 Marks)  
ii) Volcanic cinders.
- 8 a. What are the factors which affect the compressive strength of concrete? (08 Marks)  
b. Explain any two tests on Hardened concrete. (12 Marks)

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10CV82

**Eighth Semester B.E. Degree Examination, Dec.2017/Jan.2018**  
**Design and Drawing of Steel Structures**

Time: 4 hrs.

Max. Marks:100

**Note : 1. Answer any ONE full questions from Part – A and ONE full question from Part - B.**

**2. Use of IS 800 – 2007 , SP(6) (1) – 1984 or Steel Tables permitted.**

**PART – A**

- 1 a. An un – stiffened seated connection for beam ISLB 500 @ 75kg/m to the flange of a column ISHB400 @ 82.2 kg/m is done using 2 rows of 2 – 16 mm diameter bolts with an angle ISA 110×110×10 mm. Top cleat angle is ISA 100×100×8 mm with 2 – 16 mm diameter bolts on each leg. Draw to a suitable scale i) Front view ii) Side view.  
**(14 Marks)**
- b. A cross beam ISLB 350 @ 0.495kN/m is connected to main beam ISMB 500 @ 0.869kN/m, such that top of flanges are at same level. The framed connection has the following details : i) Connecting cleat angle - 2 ISA 150 × 115 × 10.  
 ii) The connection between cleat angle of length 115mm and web of the cross beam is connected by 5mm fillet weld. Depth of the weld is 180mm.  
 iii) The connection between the cleat angle of length 150mm and web of the main beam is connected by 8mm fillet weld. Depth of the weld is 250mm.  
 iv) Clearance between cross beam and web of main beam is 12mm.  
 Draw to a suitable scale i) Front view ii) Side view.  
**(16 Marks)**
- 2 a. Draw to a suitable scale the front and side elevations of a welded bracket from the following data :  
 \* Column → ISHB 350 @ 710.2N/m  
 \* Bracket → ISLB 350 @ 485.6N/m  
 \* Projection of bracket from flange of the column → 350mm  
 \* Depth of bracket at free end → 150mm  
 \* Size of weld → 8mm  
 \* Bracket is welded to the flange of column.  
**(10 Marks)**
- b. A column ISHB 450 @ 0.925kN/m is supported by Gusseted base. Dimension of the base plate is 1200 × 800 × 22mm with 1200mm edge placed parallel to column flange. Gusset plate is 16mm thick. Gusset angles are of ISA 150 × 115 × 15 mm two in number with 150mm leg connected to Gusset plate. Connection between column flange and Gusset plate has 18 numbers of 18mm bolts in two rows and same number of bolts for connection between Gusset plate and Gusset angle. Provide 6 numbers of 18mm diameter bolts to connect Gusset angle to base plate. Provide two web cleat angles of ISA 100 × 100 × 8mm connected by 3 numbers of 18mm bolts for each leg. Also, 4 numbers of 25mm anchor bolts are provided. Draw to a suitable scale i) Top view ii) Side view iii) Sectional elevation.  
**(20 Marks)**

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**PART – B**

3 Draw a simply supported crane Gantry Girder for the following data :

- i) Span of crane Girder = 18m.
- ii) Span of Gantry Girder = 7m.
- iii) Capacity of the crane = 230 kN.
- iv) Self wt. of crane excluding the crab = 200kN.
- v) Weight of crab = 60kN.
- vi) Wheel base distance = 3.2m.
- vii) Self weight of Rail = 0.25 kN/mm.
- viii) Height of Rail = 80mm.
- ix) Minimum Hook approach = 1.00 mt.

(40 Marks)

Draw to a suitable scale :

- a. Plan details.
- b. Side elevation.
- c. Section through Gantry.

(30 Marks)

4 Design a welded plate girder of span 24 mt, carrying super imposed load of 50kN/m and two concentrated loads of 150 kN each at one third points of the span. Assume the girder as laterally supported throughout and yield strength = 250 MPa. Provide two curtailments. (40 Marks)

Draw to a suitable scale :

- i) Plan for full span (sectional)
- ii) Front Elevation.
- iii) Cross section at support and mid span.

(30 Marks)

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10CV835

**Eighth Semester B.E. Degree Examination, Dec.2017/Jan.2018**  
**Industrial Waste Water Treatment**

Time: 3 hrs.

Max. Marks:100

**Note: 1. Answer FIVE full questions, selecting at least TWO questions from each part.**  
**2. Any missing data may be assumed suitably.**

**PART – A**

- 1 a. Differentiate between Domestic waste water and industrial waste water. (06 Marks)  
b. Explain types of sampling. (06 Marks)  
c. Explain effluent and stream standard with examples. (08 Marks)
- 2 a. Explain different zones of pollution in streams. (10 Marks)  
b. A town discharges 80 cumecs of sewage into a stream having a rate of flow of 1200 cumecs during lean days, at a 5-day BOD of sewage at the given temperature is 250mg/ℓ. Find the amount of critical Dissolved oxygen deficit and its location in the downstream portion of the stream. Assume deoxygenation coefficient K as 0.1 and coefficient of self purification as 3.5. Assume saturated D.O at given temperature as 9.2 mg/ℓ? (10 Marks)
- 3 a. Explain different method of strength Reductions. (10 Marks)  
b. Explain methods used for Neutralization of Acidic and Alkaline wastes. (10 Marks)
- 4 a. Explain any two method used for Removal of suspended solids. (06 Marks)  
b. List the methods used for sludge disposal. Explain any two methods briefly. (06 Marks)  
c. Write short notes on : i) Reverse osmosis ii) Ion exchange. (08 Marks)

**PART – B**

- 5 a. What are the advantages and disadvantages of combined treatment of industrial waste water with municipal waste water? (10 Marks)  
b. With a flow diagram, explain the units used for treatment of cotton textile mill waste. (10 Marks)
- 6 a. Explain the treatment options for Distillery waste water in India. (10 Marks)  
b. Explain the sources and characteristics of tannery waste. (10 Marks)
- 7 a. Explain with a flow diagram, treatment option for Sugar Mill Waste. (10 Marks)  
b. Discuss effect of Dairy waste on receiving stream. Also suggest suitable treatment option for Dairy Industry. (10 Marks)
- 8 a. Explain How pharmaceutical wastes is treated. (10 Marks)  
b. Explain with a flow diagram the treatment of paper and pulp mill waste. (10 Marks)

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