2018-19
B.A.R.C.H. (AUTUMN SEMESTER) EXAMINATION
ARCHITECTURE
CONSTRUCTION & MATERIAL-V
AR-403N

Maximum Marks: 40
Credits: 05
Duration: Two Hours

Assume suitable data if missing.

Q.No. Question

SECTION A
1 Draft detail at ridge for a North light truss.

OR

1’ Draft elevation and fixing details for a Spiral steel staircase.

SECTION B
2 Discuss various planning and designing criteria for making structures earthquake resistant.

3 Discuss in short any 5 of the following.
   (a) Methods for making steel connections
   (b) Types of faults during earthquake
   (c) Types of plates used in steel connections
   (d) Portal frames
   (e) Types of lifts
   (f) Splice details in Multi storied steel structures

4 Discuss the building materials that can be used for fire protection of steel structures and also their fire rating. Draw at least 2 important details for column and beam (each), to show application of these materials.
2018-2019
B. Architecture (7th-Semester Examination)
Subject: Estimating, Costing & Specification Course No.: AR-415
Maximum Marks: 60 Credits: 4 Duration: 2 Hours

Note: Answer all questions, assume any missing data suitably.

| 1(a). | Define general Specification, write general Specification of a first class building | 7 |
|       | **OR** | |
| (a')  | Write detailed specification of any two materials of cement, bricks and sand. | 7 |
| (b)   | Write detailed specification of any one item of work of the following: | 8 |
|       | (i) Earthwork in excavation in foundation trenches | |
|       | (ii) Damp proof course in cement concrete | |

| 2. (a) | Define estimate and describe cubical content method of estimate. | 7 |
|        | **OR** | |
| (a')  | Describe plinth area method of estimate | 7 |
| (b)   | Describe the terms used in estimate contingencies, work-charged establishment and Tools and plants. | 8 |

| 3.     | Prepare bill of quantity of one room building as shown in Fig. 1 for any three items of work of the following: | 5x3=15 |
|        | (i) Earth work in excavation in foundation | |
|        | (ii) First class brick work in 1:6 cement sand mortar in foundation | |
|        | (iii) 2.5 cm thick damp proof course in 1:2: 4 c.c. | |
|        | (iv) First class brick work in 1:6 cement sand mortar in super structure | |
|        | (v) 12 mm thick plastering in 1:6 cement sand mortar | |

| 4. (a) | Analyze the rate of any one item of work of the following: | 8 |
|        | (Assume suitable rate) | |
|        | (i) 12 mm plastering in 1:6 cement sand (course) mortar on wall | |
|        | (ii) First class brick work in 1:6 cement sand (fine) mortar in super structure | |
|        | (iii) 2.5 cm D.P.C. in 1:1.5:3 cement concrete | |

| 4. (b) | Write the points to be observed in recording measurement book. | 7 |

Contd...
A small but irregular plot of land has been earmarked by the owner to be developed as a luxury residential tower in Noida. The site for this residential tower is given below.

The essential requirements are as follows:
Setbacks (Road side 35' sides 20' back 20')
Ground coverage 45%
FAR = 2

You are required to design this tower and represent your design in the form of following drawings.

(a) Concept zoning (for site and units)  
(b) Unit plans with furniture layout and viva-voce  
(c) Floor plans showing service cores  
(d) Landscape and parking plan including site services such as drainage etc.
2018-2019
B.TECH./B.ARCH.(AUTUMN SEMESTER) EXAMINATION
DESIGN OF CONCRETE STRUCTURES - II
(CE - 411)

Max. Marks: 60
Duration: Two Hours

Note: (i) Answer all the questions.
(ii) Assume suitable data, if not given.
(iii) Use of IS codes 456, 3370 and IRC loading charts are allowed.

Q.No.

1. Calculate the reinforcement in a three span continuous beam of a typical interior idealized plane frame of a building. The frames are spaced 5.5m apart and in the typical floor 140mm thick continuous slab is cast monolithically with beams. The thickness of floor finish is 40mm. The beam has three equal spans of length 6.1m. The floor is to support imposed load of 5 KN/m² at the service state. The unit weight of the finishing material is 20KN/m³. The materials to be used are M-20 grade concrete mix and HYSID steel of grade Fe-415 for moderate exposure conditions. Use bending moment and shear force coefficients for the continuous beam given in IS-456.

OR

1'(a) Explain the Redistribution of Moment with suitable example? Also discuss the advantages of Redistribution of Moment.
1'(b) Determine the design moments at support and in the mid span region, before and after redistribution of moments of 30%, for a beam AB of span L, carrying a uniformly distributed load, when (i) it is fixed at both ends A and B; (ii) it is fixed at end A and simply supported at B. Draw the bending moment diagrams in each case and show the points of contra flexures and points of maximum bending moments.

2. Design the top ring beam and cylindrical wall of an Intz type water tank of 750,000 litres capacity, supported on an elevated tower comprising of 8 columns. The base of the tank is 16 m above the ground level. Depth of foundation is 1.5 m below the ground level. Adopt M-25 grade concrete and Fe-500 grade TMT steel. The design of the tank should conform to the stresses specified in IS:3370 and IS:456.

OR

2'. Design the waist slab of a staircase shown in Fig.1. The stairs are simply supported on beams provided at the first riser and at the edge of the upper landing. Assume a finish load of 0.8 kN/m² and a live load of 5.0 kN/m². Use M20 grade concrete and Fe415 grade steel. Assume mild exposure conditions. Take Tread T = 300 mm and Riser R=150 mm.

3. Design the deck of a slab culvert (section and steel reinforcement) for a clear span of 4.5 m having a clear roadway of 10 m between the kerbs for L.R.C. Class AA tracked vehicle. Sketch the outlines for IRC Class AA tracked vehicle on the deck. Use M-20 grade concrete and Fe-500 TMT bars.

Contd...
4(a) Discuss the merits and demerits of prestressed concrete over conventional reinforced concrete.

4(b) In prestressed concrete beam of cross-section 200mm x 300mm and span 6m, an initial prestressing force of 400kN is applied at constant eccentricity of 70mm by tendons of area 400mm². Assuming $E_s = 2 \times 10^5$ N/mm²; $E_c = 0.333 \times 10^5$ N/mm²; anchor slip = 1.5mm; creep coefficient in concrete $C_c = 2.0$; shrinkage coefficient of concrete $= 0.0002$ and creep in steel $= 3.0\%$. Find the total percentage loss of prestress in the tendons.

**FIGURES**

![Diagram](image)

**Fig. 1**

Note: All dimensions are in mm