Q.No. | Question | M.M.
---|---|---
1. | Draw any TWO of the following details on suitable scale.  
   A) Beam to column details (Section and sketch) in steel framed structures.  
   B) Plan and sectional detail of Lift (carrying capacity 06 persons).  
   C) Plan and elevation details of tread in steel spiral stair. | [16] |
2. | Draw the key elevation details of tubular steel roof truss having the span of 15.25m | [12] |
3. | Discuss any TWO of the following  
   A) Advantage and disadvantage of Portal Frames  
   B) Basic rules needed to keep on finger tips while designing a building earth quake resistant.  
   C) Seismic band details for a single storey house. | [12] |
### 2015-2016

**B. Architecture (7th Semester Examination)**

**Subject: Estimating, Costing & Specification**  
**Course No.: AR-415**  
**Maximum Marks: 60**  
**Ct. 04**  
**Duration: 3 Hours**

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

<p>| | |</p>
<table>
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</table>
| **1(a).** | What are correct form of writing specifications-avoiding ambiguity and conflicting statements?  
**OR**  
(a') | What are standard specifications and uses of standard specifications?  
(b) | Write detailed specification of any one item of work of the following:  
(i) Earth work in excavation in foundation trenches  
(ii) Brick work in cement sand mortar in foundation |
|   | 7 |
|   |   |
|   |   |
| **2. (a)** | Define estimate and enumerate various types of estimate.  
(b) | Describe any one method of estimate of the following:  
(i) Plinth Area method  
(ii) Approximate quantity method |
|   | 7 |
|   |   |
|   |   |
| **3.** | Prepare bill of quantity of one room building as shown in Fig. 1 for any three items of work of the following:  
(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 |
|   | 5x3=15 |
|   |   |
| **4.** | Analyze the rate of any two items of work of the following:  
(Assume suitable rate)  
(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 flooring in 1:2:4 cement concrete |
|   | 7.5x2=15 |

*Contd. ....*
B.Arch. VII Semester Examination
Architectural Design - V
AR-451N

Maximum Marks: 40  
Credits: 07  
Duration: Six Hours

Assume suitable data if missing.  
Neat and good drafted drawings will be credited more.

COLLEGE OF ARCHITECTURE

Design a College of Architecture for a newly established Private university in Lucknow. The site measuring 75 m X 110 m having approach road towards north on shorter side of the site is located within the campus of the university.

DESIGN REQUIREMENTS:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Spaces (Carpet Area)</th>
<th>Nos.</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Studio</td>
<td></td>
<td>4</td>
<td>120 sq. m each</td>
</tr>
<tr>
<td>2. Class room</td>
<td></td>
<td>3</td>
<td>60 sq. m each</td>
</tr>
<tr>
<td>3. Labs and Workshops</td>
<td></td>
<td>3</td>
<td>60 sq. m each</td>
</tr>
<tr>
<td>4. Computer Centre</td>
<td></td>
<td>1</td>
<td>60 sq. m</td>
</tr>
<tr>
<td>5. Art Studio</td>
<td></td>
<td>1</td>
<td>60 sq. m</td>
</tr>
<tr>
<td></td>
<td>with semi open space 80 sq. m.</td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>6. Multipurpose Hall</td>
<td></td>
<td>1</td>
<td>400 sq. m</td>
</tr>
<tr>
<td>7. Resource Centre</td>
<td></td>
<td>1</td>
<td>60 sq. m</td>
</tr>
<tr>
<td>8. Library</td>
<td></td>
<td>1</td>
<td>120 sq. m</td>
</tr>
<tr>
<td>9. Submission &amp; Exam Room</td>
<td></td>
<td>1</td>
<td>30 sq. m</td>
</tr>
<tr>
<td>10. Students' Centre</td>
<td></td>
<td>1</td>
<td>30 sq. m</td>
</tr>
<tr>
<td>11. Girls' Common Room</td>
<td></td>
<td>1</td>
<td>30 sq. m</td>
</tr>
<tr>
<td></td>
<td>(With attached toilet)</td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>12. Staff Rooms / Cabins</td>
<td></td>
<td>2</td>
<td>12 sq. m each</td>
</tr>
<tr>
<td>Professor</td>
<td></td>
<td></td>
<td>8 sq. m each</td>
</tr>
<tr>
<td>Associate Professor</td>
<td></td>
<td>4</td>
<td>6 sq. m each</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>13. Staff Lounge</td>
<td></td>
<td>1</td>
<td>30 sq. m</td>
</tr>
<tr>
<td>For visiting faculty</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Principal's Room</td>
<td></td>
<td>1</td>
<td>30 sq. m</td>
</tr>
<tr>
<td>With attached toilet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Administrative Office</td>
<td></td>
<td>1</td>
<td>60 sq. m</td>
</tr>
<tr>
<td></td>
<td>As required</td>
<td></td>
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<tr>
<td>16. Toilets, Corridors, Lobbies, Store, Parking etc.</td>
<td>[ ]</td>
<td></td>
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<tr>
<td>17. Construction Yard</td>
<td></td>
<td>1</td>
<td>200 sq. m</td>
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<tr>
<td>(Open/semi open)</td>
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P.T.O.

Contd....2.
Drawing Requirements:

1. Design concept, Site Plan (1:200) and Plans (1:100)
   (to be evaluated through viva)  
   25

2. Elevation/s (1:100)  
   8

3. Section (1:100)  
   7
2015-2016
B.Arch. / B.Tech. (Autumn Semester) Examination
(Architecture / Civil Engineering)
Design of Concrete Structures-II
(CE-411)

Maximum Marks: 60  Credits: 04  Duration: Three Hours

Note: (i) Answer all the questions.
(ii) Assume suitable data, if not given.
(iii) Use of IS codes 456, 1893, 3370 and IRC loading charts are allowed.

Q1. Design a continuous reinforced concrete beam of rectangular section to support a dead load of 10 kN/m and a service live load of 15 kN/m over three simply supported spans of 8 m each. The materials to be used are M-20 grade concrete mix and HYSF steel of grade Fe-415 for moderate exposure conditions. Use bending moment and shear force coefficients for the continuous beam given in IS-456. (12)

OR

Q1'(a). 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. (08)

Q1'(b). The plan and elevation of a three storey RCC school building is shown in Fig.1(a-b). The building is located in seismic zone V. The type of soil encountered is medium stiff and it is proposed to design the building with a special moment resisting frame. The intensity of dead load is 10.0 kN/m² and floors are to cater to an imposed load 3.0 kN/m². Calculate the design seismic load at the top story level. (04)

Q2. Design the top ring beam and cylindrical wall of an Intz-type water tank of 1 million 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-415 grade tor steel. The design of the tank should conform to the stresses specified in IS:3370 and IS:456. (12)

OR

Contd.....2.
Q2'. Design the long wall of a rectangular water tank of capacity 70,000 litres. The tank rests on firm ground. Use M-25 grade concrete and Fe-415 grade for steel. The design of the tank should conform to the stresses specified in IS:3370 and IS:456.

Q3. Design a slab culvert (section and steel reinforcement) for a clear span of 5m having a clear roadway of 10m between kerbs for I.R.C. Class AA single wheeled vehicle. Use M-20 grade concrete and Fe-415 grade steel.

Q4. 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.

Q5. Design a waist slab type of a dog-legged staircase for an office building for the following data:

Height between the floor = 3.2 m
Tread T = 270 mm
Riser R = 160 mm
Width of flight = landing width = 1.25 m
Live load = 5.0 kN/m²
Finished load = 0.6 kN/m²

Assume the stairs to be supported on 230 mm thick masonry walls at the outer edges of the landing, parallel to the risers. Use M20 grade concrete and Fe415 grade steel.

OR

Q5'. Design the vertical stem of a T-shaped retaining wall for a height of 3m above the ground level. The top of the earth retained is surcharged at an angle of $10^\circ$ with the horizontal. The angle of repose of earth is $29^\circ$ and its density is $17kN/m^3$. The safe bearing pressure is 100 kN/m². Use M-20 grade concrete and Fe- 500 grade TMT bars.

Contd.....3.