

BACHELOR OF ARCHITECTURE 3RD YEAR, 2ND SEM.
EXAMINATION, 2018
DESIGN OF STRUCTURE-II
PART-I

Time: Three Hours

Full Marks 100
(50 marks for each part)

Use a separate Answer-Script for each part

[Relevant IS code and section hand books are allowed in the exam hall. For all questions
assume $f_y=250 \text{ N/mm}^2$ and $f_u=410 \text{ N/mm}^2$.]

No. of questions	Part I(Answer Any Two of the following questions.)	Marks (2X25=50)
1(a)	Write a short note on durability of concrete.	5
(b)	Write a short note on strength of concrete.	5
(c)	Calculate the moment carrying capacity of laterally unrestrained ISMB500 member of length 5m.	15
2 (a)	Design a laced column of 9 m long to carry factored axial load of 900 kN. The column is pinned at fixed ends. Provide single lacing system with bolted connection assuming two channels back to back.	20
(b)	What is laterally restrained and laterally unrestrained beam?	5
3 (a)	Design a reinforced concrete supported beam of 5m span carrying a reinforced concrete floor capable of providing lateral restraint to the top compression flange. A 30 kN/m UDL acting through the whole span of the beam. In addition to that, the beam carries 100 kN concentrated load at mid of the beam (assuming stiff bearing length 65 mm).	18
(b)	What is plastic, compact, semi compact and slender section?	7

BACHELOR OF ARCHITECTURE THIRD YEAR**SECOND SEM. EXAM. -2018****Subject: DESIGN OF STRUCTURES-II****Time: Three Hours****Full Marks 100****PART-II****(50 marks for each part)**

Use a separate Answer-Script for each part

[IS 456:2000 and SP 16 are allowed in the exam hall. Assume reasonable values of any data not given but required for design.]

No. of questions	Answer any 2 from question No. 1 to 3	Marks (25x2)=50														
1.	<p>Design a reinforced concrete doubly reinforced beam of rectangular section using the following data.(For maximum moment and shear) Span of the beam =5m.(assume simply supported) Live load intensity =40 kN/m Overall depth =700 mm Width of beam =250 mm Effective cover =60 mm M20 grade of concrete and Fe 415 grade of steel You can use the following table. Draw the reinforcement details with section.</p> <table border="1" data-bbox="532 1251 1162 1535"> <thead> <tr> <th>Strain</th> <th>Stress(N/mm²)</th> </tr> </thead> <tbody> <tr> <td>0.00144</td> <td>288.7</td> </tr> <tr> <td>0.00163</td> <td>306.7</td> </tr> <tr> <td>0.00192</td> <td>324.8</td> </tr> <tr> <td>0.00241</td> <td>342.8</td> </tr> <tr> <td>0.00276</td> <td>351.8</td> </tr> <tr> <td>0.00380</td> <td>360.9</td> </tr> </tbody> </table> <p style="text-align: center;"><u>stress strain value for Fe415 grade steel bar</u></p>	Strain	Stress(N/mm ²)	0.00144	288.7	0.00163	306.7	0.00192	324.8	0.00241	342.8	0.00276	351.8	0.00380	360.9	25
Strain	Stress(N/mm ²)															
0.00144	288.7															
0.00163	306.7															
0.00192	324.8															
0.00241	342.8															
0.00276	351.8															
0.00380	360.9															

2.	<p>Design a two way slab for a room to suit the following data. Size of room = 4 m by 4m. Edge conditions =Interior panel M20 grade of concrete and Fe 415 grade of steel. Assume live load 3 kN/m² and floor finish and partition wall load 2 kN/m². Draw the reinforcement details of the section and plan of slab with neat sketch.</p>	25
3.	<p>Design a column subjected to an axial factored load of 1500 kN together with factored moments of 75 kN-m and 65 Kn-m acting mutually perpendicular directions. The size of column is fixed as 650 by 650 mm. adopt M20 grade of concrete and Fe 415 grade steel. Draw the reinforcement details with section.</p>	25