

**ANURAG Engineering College**

(An Autonomous Institution)

III B.Tech II Semester Regular/Supplementary Examinations, June/July-2024

**STRUCTURAL ENGINEERING-II**

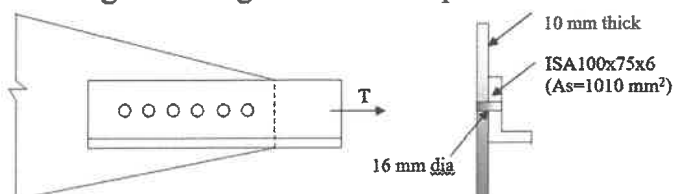
(CIVIL ENGINEERING)

**Time: 3 Hours****Max. Marks: 75****Section – A (Short Answer type questions)****(25 Marks)****Answer All Questions**

	Course Outcome	B.T Level	Marks
1. How do you calculate the efficiency of the steel joint.	CO1	L2	2M
2. Write a short note on prying action.	CO1	L1	3M
3. What is design strength of compression member and explain with equations as per IS 800:2007.	CO2	L1	2M
4. How lug angle is connected to the tension member. Explain.	CO2	L2	3M
5. Differentiate between slab base and gusset base.	CO3	L2	2M
6. Draw a neat sketch of lacing and batten of a column member.	CO3	L2	3M
7. Write a short note on stiffened seated connections.	CO4	L1	2M
8. When do you go for built-up sections of column members.	CO4	L1	3M
9. Draw a neat sketch of plate girder with stiffeners and identify the components.	CO5	L2	2M
10. How to calculate the economical depth of plate girder.	CO5	L2	3M

**Section B (Essay Questions)****Answer all questions, each question carries equal marks.****(5 X 10M = 50M)**

11. A) Design a flange angle connection using M16 bolts of grade 4.6 to transfer a factored moment of 12 kN.m and a shear of 150 kN from a beam of ISMB 350 to a column of ISHB 300 using Bolted connection.
- OR**
- B) Design a connection to joint two plates of size 250 x 12 mm of grade Fe410, to mobilize full plate tensile strength using shop fillet welds, if i) a lap joint is used, and ii) a double cover butt joint is used
12. A) A single unequal angle 100 x 75 x 6 mm is connected to a 10 mm thick gusset plate at the ends with six 16 mm diameter bolts to transfer tension as shown in figure. Determine the design tensile strength of the angle assuming that the yield and the ultimate stress of steel used are 250 MPa and 410 MPa: i) if the gusset plate is connected to the 100 mm leg, and ii) if the gusset plate is connected to the 75 mm leg. Take edge distance and pitch as 40 mm.

**OR**

- B) Write a short note on the various modes of failures of tension members.

13. A) A column of ISMB 400 is subjected to an axial force of 750kN. Analyze and design suitable base plate. Assume necessary data required. CO3      L3      10M

**OR**

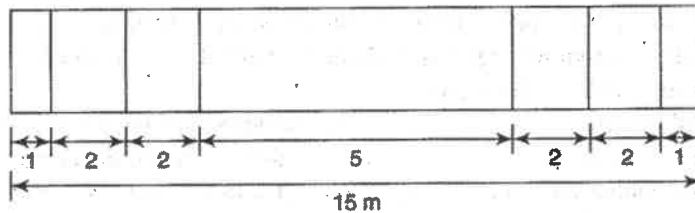
B) Write down step-by-step procedure for design of lacing of a column member. CO3      L2      10M

14. A) Design a simply supported beam of span 7 m carrying a RC floor capable of providing lateral restraint to the top compressive flange. The total load is made up of 100 kN and UDL of 150 kN at mid span. Assume Fe410 grade steel. CO4      L3      10M

**OR**

B) Explain the step-by-step procedure for a design of a stiffened seated connection in a beam. CO4      L2      10M

15. A) A plate girder of grade 410 steel is composed of a 10 x 2000 mm web and 30 x 500 mm flanges. The girder span is 15 m as shown in figure. Stiffeners are placed at 1 m, 3 m, and 5 m from both ends. Determine the shear capacity of each panels. CO5      L3      10M



**OR**

B) Determine the buckling resistance moment for a welded plate girder consisting of 500 x 30 mm flange plates and a 1250 x 12 mm web plates in grade 410 steel. Assume a laterally braced span of 5.5 m. CO5      L3      10M