

Name:	
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester/Supplementary Examination, July 2020

Course: Design of Steel Structure	Semester: VI
Program: B.Tech. Civil Engineering	Time: 03 hrs.
Course Code: CIVL 3007/CEEG312	Max. Marks: 100
Instructions: IS 800:2007 and IS 808:1989 should be Allowed/Provided	

SECTION A

S. No.	Question	Marks	CO
Q 1	What are the factors that govern will govern the structural design?	4	CO3
Q 2	Name the different modes of failure of a bolted joint?	4	CO1
Q 3	Classify the compression members according to the slenderness ratios.	4	CO2
Q 4	Why does buckling of web occur in beams?	4	CO3
Q 5	Sketch five various types of roof truss.	4	CO4

SECTION B

Q 6	Design a butt joint connect two plates 240 x 12 mm ($f_y = 250 \text{ N/mm}^2$) using ordinary M20 bolts. Arrange the bolts to give maximum efficiency.	10	CO1
Q 7	An ISLC 300 @ 324.7 N/m is used to transmit a force 600 kN. The channel section is connected to a gusset plate 10mm thick. Design a fillet weld if the overlap is limited to 350mm. Use slot welds if required.	10	CO1
Q 8	Design a single angle discontinuous strut to carry a load of 47 kN. The length of the strut is 3m between intersections. The strut is connected to 12 mm thick gusset plate with 24mm dia HSFG bolts.	10	CO2
Q 9	The main tie of a roof truss consists of ISA 150 x 115 x 8mm and is connected to a gusset plate by 18 mm diameter bolts. Find out the maximum tensile load it can carry.	10	CO2

SECTION-C

Q 10	Design angle section purlins for a truss roof system to support sheeting weighing 160 N.m ² . The trusses are spaced 4 m c/c and the purlins are provided 2 m c/c. The building is situated in an area where the wind pressure is 1500 N/m ² . Use steel with yield stress 260 N/mm ² . Yield strength may be assumed as 250 MPa.	20	CO4
Q 11	Design a beam 11 m in clear span and subjected to a system of loads as shown in figure. Yield strength may be assumed as 250 MPa.	20	CO3

