KUMARAGURU
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Register Number:……..

**B.E DEGREE EXAMINATIONS: NOV / DEC 2014**

(Regulation 2009)

Sixth Semester

**CIVIL ENGINEERING**

CEE119**:** Design of Steel structures

**Time: Three Hours** **Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. The basic design stress adopted for the design of light gauge steel member is ____
   a) The permissible stress b) The yield stress
   c) The stress at the limit of proportionality d) The yield stress multiplied by 0.6
2. If the design wind speed is V,then the design wind pressure will be given as___
   a) 0.6 $V^2$ b) 0.5 $V^2$
   c) 0.7 $V^2$ d) 0.45 $V^2$
3. Web crippling in steel beam occurs due to ____
   a) Column action of compression flange b) Failure of web under concentrated load
   c) Excessive bending moment d) Secondary bending moment
4. As per IS 800/2007 the purlins are designed as
   a) Simply supported beam b) Cantilever beam
   c) Continuous beam d) Compression member
5. For economical spacing of roof struss,if t,p,r are the cost of truss,purlin and roof covering respectively then
   a) t= p+r b) t=2p+r
   c) t=p=3r d) t=p+2
6. The wind load on a steel truss for an Industrial building will depend upon__
   a) Location of the structure b) Shape of the structure
   c) Shape and height of the structure d) Location shape and height of the structure

7. The beam column flexible connections are expected to resist and transfer
   a) Only moment
   b) Only stress
   c) Both stress and moment
   d) Only 50% of shear and moment
8. Connections which are designed to transmit end moments in addition to the end stress are called as
   a) Rigid connection
   b) Flexible connection
   c) Pin connection
   d) Semi rigid connection
9. The allowable stresses for the design of steel tanks are adopted as__ as given in IS 800/2007
   a) same
   b) 80% reduced
   c) 50% reduced
   d) 25% reduced
10. A self supporting steel chimney transmits the lateral forces to the foundation by __action
   a) Propped beam
   b) Cantilever
   c) Simply supported
   d) Fixed beam action

**PART B (10 x 2 = 20 Marks)**

11. What is structural steel? Write any two properties of structural steel.
12. Distinguish between partial safety factor and factor of safety.
13. Differentiate laterally restrained and unrestrained beam with example.
14. What is plate grider? Where it is used?
15. Define the term pitch of truss and state its importance.
16. Draw the profile of a gantry girder.
17. Define the term framed connection.
18. What do you understand by the term light moment connection?
19. What are stand pipes? Mention its uses.
20. List the various types of steel tanks.

**PART C (5 x 14 = 70 Marks)**

21. a) Explain briefly various types of loads and its combinations to be considered in the design of steel structures.

**(OR)**

b) A light gauge steel rectangular box section 200 mm X 100 mm X 2mm is used for column. The effective length of the column is 3.60 m. Detrmine the safe load

carrying capacity of the section. Take basic design stress as 125 $N/mm^2$.

22. a) Design a simply supported beam of effective span 1.5m carrying a factored load of 360kN at mid span. Apply usual check for deflection.

**(OR)**

b) Design a simply supported beam of 10m effective span carrying a total factored load of 60kN/m.The depth of beam should not exceed 500mm.The compression flange of the beam is laterally supported by the floor construction. Assume stiff end bearing is 75mm.

23. a) Design a simply supported gantry girder to carry an electric overhead travelling crane for the following data : Span of gantry girder 6.50m,span of crane girder 16m,carne capacity 250kN,self wt of crane excluding trolley 200kN,self weight of trolley 50kN,minimum hook approach 1.0m,Distance between wheels 3.50m,and self weight of rails 0.3 kN/m.

**(OR)**

b) Design a I section purlin for an industrial building to support a galvanized corrugated iron sheet roof for the following data spacing of trusses 5.0m, spacing of purling 1.5m, Inclination of main ratter to horizontal $30^0$.weight of G.I sheets including laps and connecting bolts $130N/mm^2$.Wind load 1.0 $kN/m^2$ (suction).

24. a) A ISMB 500 at the rate 0.869 kN/m transmits an end reaction of 130kN to the flange of column ISHB 250 at the rate 0.510kN/m. Design an un stiffened welded seat connections.

**(OR)**

b) A ISMB 300 at the rate 0.442 kN/m transits an end reaction of 11 kN and an end moments of 80 kN/m to the flange of a column ISHB 300 at the rate 0.630 kN/m. Design the welded connection.

25. a) A self supporting steel stack is 80 mts high and its diameter at the top is 3mts.Design the plates for the stack. Adopt the wind force as per IS

875/2007.The location of place is such that the intensity of wind pressure up to 30m height is 1.50 kN/$m^2$.

**(OR)**

b) An elevated rectangular steel water tank upon at top is required to have a capacity of 90,000lts with a free board of not less than 150mm.The bottom of the tank is at 10m above ground level. Using 1.25m x1.25m standard pressed steel plates and suitable allowable stresses. Design the tank.

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