Register Number: ……..

B.E DEGREE EXAMINATIONS: APRIL/MAY 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. Unit mass of structural steel is_____

   a) 7000kg/m^3 b) 7850kg/m^3

   c) 6850kg/m^3 d) 6000kg/m^3

2. Of the following rolled steel I-section which is not a standard form_____

   a) ISJB b) ISMB

   c) ISBB d) ISHB

3. If the compression flanges are laterally supported by flooring it is called as_____

   a) Laterally supported beam b) Laterally unsupported beam

   c) Built-up beam d) Stiffeners

4. A built up I-section with two flange plates connected to a web plate of required depth is called as_____

   a) Stiffeners b) Bracings

   c) Plate girder d) Lacings

5. The member of a trun which do not belong to top or bottom chord and subjected to compressive forces is called as_____

   a) Struts b) Stings

   c) Saglie d) Chord member

6. The size of crab, wheel spacing of a gandry girder depends upon_____

   a) Spacing of trun b) Capacity of the crane

   c) Amount of load d) Type of operation method

7. When significant bending is present in a column in addition to an axial load the member is called as_____

   a) Stiffened column b) Beam column

   c) Laterally supported column d) Laterally unsupported column

8. The ratio $\psi=M_A/M_B$ is called as_____

   a) Moment reduction factor b) Moment incremental factor

   c) Moment deduction factor d) Moment enhancement factor

9. In chimney design the wind (or) earthquake forces are transferred to the foundation by_____

   a) Direct action b) Cantilever action

   c) Transition method d) Indirect action

10. The maximum deflection at the top of the chimney w/o taking the dynamic effect shall not be_____

    a) Greater than L/200 b) Less than L/200

    c) Greater than L/250 d) Less than L/250

PART B (10 x 2 = 20 Marks)

11. Write the special consideration required in steel design.
12. Draw the different forms of light gauge section.
13. What is web crippling?
14. How the beam C/S are classified as per IS 800:2007.
15. Define purlin.
16. List out the imported loads to be considered during the design of gantry girder.
17. List out the different types of beam connection.
18. What are the factors affecting the value of risk coefficient?
19. As per IS 800:1984 what are the permissible stresses in water tanks?
20. What do you mean by breech opening?

PART C (5 x 14 = 70 Marks)

21. a) Explain general design requirements of a speed structure and applicable IS codes for load estimation.

    (OR)

    b) Explain in detail the various loads acts on a steel structure.

22. a) Design a simply supported beam of effective span 1.5m carrying a factored concentrated load of 360KN at mid span.

    (OR)

    b) Design a welded plate girder of span 24m to carry a superimposed load of 35KN/m. Avoid use of bearing and intermediate stiffeners. Use Fe415 steel.

23. a) Design a simply supported gantry girder to carry one elective over head

travelling crane, given: Span of gantry girder = 6.5m,

Span of crane girder = 16m,

Crane capacity = 250KN,

S/W of crane girder excluding trolley = 280KN,

S/W of trolley = 50KN,

Minimum hook approach = 1m,

Distance b/w wheels = 3.5m,

S/W of rails = 0.3 KN/m.

(OR)

b) Symmetric trusses of span 20m and height 5m are spaced at 4.5m c/c. Design channel section purlin to be placed at suitable distances to resist the following loads: Weight of sheeting including bolts = 171 N/m^2

Live load = 0.4KN/m^2

Spacing of purlin = 1.4 m

Wind load = 1.2 KN/m^2, suction.

24. a) An ISMB 450 is connected to the flange of a column ISHB 300 @ 168 N/m. The end reaction transmitted by the beam is 120KN. Design an unstiffened seated connection. Use M20 black bolts.

(OR)

b) An ISMB 400 beam is to be connected to an ISHB 250 @ 537 N/m to transfer at end force of 140KN. Design double plated welded connection.

25. a) Design a water tank of capacity 70kl.

(OR)

b) Design a self supporting steel stack of 72m height above the foundation located at New Delhi. The diameter of the cylindrical part of chimney is 3m. The foundation has to rest on medium soil having a bearing capacity of 200N/m^2. The thickness of the fire brick work lining is 100mm and the lining is supported by the steel slack throughout its height. The chimney has breech opening. The topography at the site is almost flat. The location is of terrain category 2.

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