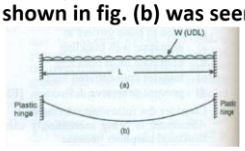
01. A fixed beam as shown in fig. (a) is loaded with a U.D.L. over the entire span, the total load being W; when load was just increased to W_1, the deformed shape as shown in fig. (b) was seen.



The value of W_1 (plastic moment of resistance $=M_p$) is

a. 24 M_p /L
b. 16 M_p /L
c. 12 M_p /L
d. 8 M_p /L

02. Fig. shown a typical section of a crane girder.

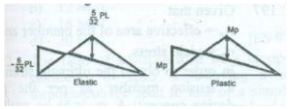
Consider the following statements in this regard: The function of the top channel is to

1. Increase moment of inertia about vertical axis.
2. Reduce moment of inertia about horizontal axis
3. Increase torsional stiffness
4. Increase lateral bucking strength.

Of these statements

a. 1 and 4 are correct
b. 2 and 3 are correct
c. 1, 2 and 4 are correct
d. 1, 3 and 4 are correct

03. For a propped cantilever beam of span L with a central concentrated load P, the elastic and plastic moment diagrams are shown in fig.



From these diagrams, it is clear that

a. Maximum moment are distributed more advantageously in the elastic case.
b. Maximum moment are distributed more advantageously in the plastic case.
c. Bending moment distribution in both the cases is equally advantageous.
d. No definite conclusion can be drawn.

04. The nail diameter should not be more than (t = least thickness of the wooden member to be connected)

a. t/6
b. t/8
c. t/10
d. t/12

05. The stress at which a material fractures under large number of reversals of stress is called

a. Endurance limit
b. Creep
c. Ultimate strength
d. Residual stress

06. A ductile structure is defined as one for which the plastic deformation before fracture

a. Is smaller than the elastic deformation
b. Vanishes
c. Is equal to the elastic deformation
d. Is much larger than the elastic deformation

07. Upper yield point in the stress-strain curve in structural steel can be avoided by

a. Cold working
b. Hot working
c. Quenching
d. Galvanizing

08. The most critical consideration in the design of rolled steel columns carrying axial loads is the.

a. Per cent elongation at yield and the net cross-sectional area.
b. Critical bending strength and axial yield strength of the material
c. Bucking strength based on the net area of the section and per cent Elongation at ultimate load.
d. Compressive strength based on slenderness ratio and gross cross-sectional area of the member.

09. At a section along the span of a welded plate girder, where the web is spliced, the bending moment is M. if the girder has of equal area, then the share of the bending moment which would be taken by the splice plates would be

a. M
b. M/3
c. M/7
d. M/13

10. The allowable shear stress in stiffened webs of mild steel beams decreases with

a. Decrease in the spacing of the stiffeners
b. Increase in the spacing of the stiffeners
c. Decrease in the effective depth
d. Increase in the effective depth

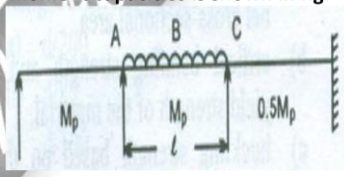
11. In the design of framed connections, the rivets or bolts connecting the web of the beam with the connecting angles are subject to

a. Single shearing and bearing on the web
b. Double shearing and bearing on the web
c. Double shearing and no bearing on the web
d. No shearing but only bearing on the web

12. The effective length of the fillet weld is

a. Total length – 2 x throat size
b. Total length – 2 x weld size
c. 0.7 x total length
d. Total length –weld size / √2

13. A continuous beam with plastic moment capacities is shown in fig.



The correct sequence in which the plastic hinges will form in the beam is

a. C, A , B
b. A and C simultaneously, followed by B
c. B , C , A
d. B first, then A and C simultaneously

14. A thin. Hollow box section of 400 mm x 600 mm deep (outer dimensions)with uniform plate thickness of 10 mm all round is used for a beam. The plastic modulus of section (Z_p) and its shape factor will be

	Z_p (in 10^5 mm^3)	Z_p (in 10^5 mm^3)
a.	36	7/6
b.	36	6/7
c.	42	6/7
d.	42	7/6

15.

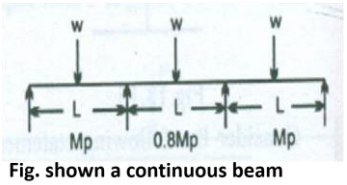


Fig. shown a continuous beam loaded with concentrated loads 'W' at the centre of each span. The value of 'W' at collapse will be

a. 3 . 2 M_p /L
b. 4 M_p /L
c. 5 . 6 M_p /L
d. 6 . 4 M_p /L

16. The rolled steel section used in a cased beam has width 'B' mm and diameter 'D' mm. the minimum width of the finished cased beam is given by

a. (B + 50) mm
b. (B + 100) mm
c. [(B/D) + 100] mm
d. 2 (B + D) mm

17. Given that

A_e = effective area of the member and σ_y = yield stress,
In order to obtain the ultimate strength of a tension member, as per the plastic design concept ; $A_e . \sigma_y$ is to be multiplied by

a. 1 . 1
b. 0 . 95
c. 0 . 85
d. 0 . 75

18. A timber beam of effective span 'l' and of cross-section b x d is said to be laterally supported if d/b and l/b are respectively

a. Less than 1 and less than 48
b. Less than 2 and less than 49
c. Less than 3 and less than 50
d. Less than 4 and less than 51

19. A timber column is made up of two individual members with longitudinal axes parallel, separated at the ends and middle points of their length by blocking, and jointed at the ends by timber connectors such a column is called

a. Built-up column
b. Composite column
c. Spaced column
d. Flitched column

20. A simply supported beam of uniform cross-section has span 'L' and is loaded by a point load 'P' at its mid-span. The length of elastoplastic zone of the plastic hinge will be

a. L/3
b. 2L/5
c. L/2
d. 3L/4