

KATHMANDU UNIVERSITY
End Semester Examination [C]
May/June, 2019

Marks Scored:

Level : B.E.

Year : IV

Exam Roll No. :

Time : 30 mins.

Registration No. :

Course : CIEG 402

Semester : I

F. M. : 10

Date 30 MAY 2019

SECTION "A"

[20 Q × 0.5 = 10 marks]

Encircle the most appropriate answer.

- The effective throat thickness of a fillet weld is K times the size of weld. For 85° angle between fusion faces, the value of K is
a) 0.7 b) 0.65 c) 0.6 d) 1.0
- The partial safety for the material of shop weld is
a) 1.0 b) 1.10 c) 1.15 d) 1.25
- Design of steel joist is primarily governed by
a) shear b) bearing c) flexure d) axial
- In a fillet weld cross section, the throat is the
a) Minimum Dimension b) Average Dimension
c) Maximum Dimension d) Leg Length
- A steel plate is 20 cm wide and 10 mm thick. If the diameter of bolt is 18mm, the net sectional area of plate is _____ cm².
a) 20 b) 17.46 c) 174 d) 25.23
- The check for design bending strength for simply supported beams is given by
a) $M_d = 2.4Z_p f_y / \gamma_{m_0}$ b) $M_d \leq 1.5Z_p f_y / \gamma_{m_0}$
c) $M_d \leq 1.2Z_p f_y / \gamma_{m_0}$ d) $M_d \geq 1.5Z_p f_y / \gamma_{m_0}$
- For same load, unsupported length and end conditions, a batten column when compared to the lacing column is:
a) Stronger b) Weaker c) Equal d) cannot be compared
- Minimum number of battens required in a built up column are:
a) 2 b) 3 c) 4 d) 5
- Area of opening for building of normal permeability is in the range _____ % of wall area.
a) 20 - 30 b) 10 - 20 c) 20 - 50 d) 15

10. The topography is called as inclined plane if the slope of hill is more than ___ degrees.
a) 3 b) 5 c) 7 d) 10
11. For a single ISA 100×75×10mm tie member, the leg preferred for making connection is:
a) 100 mm b) 90 mm
c) 75mm d) 100mm if bolted 75mm if welded
12. The actual failure mode in yielding of tension member depends on
a) modulus of elasticity of member b) Yield Stress of material
c) Unit weight d) bolt diameter
13. The efficiency of welded joint is _____ than bolted joint.
a) More b) Less c) Same d) Can't say
14. The value of s/d of a solid teak wood column is 5.625. The column is classified as:
a) Short b) Long c) intermediate d) not enough data
15. Bending moment of timber beam should be multiplied by form factor and it depends on _____ of beam.
a) Width b) Depth c) Area d) Length
16. To ensure that compression flange of beam is restrained from moving laterally, the cross section must be:
a) Plastic b) semi compact c) compact d) Thin
17. Snow load is taken as ___ N/m^2 per mm depth of snow.
a) 1 b) 1.5 c) 2 d) 2.5
18. If M16 bolts are used in lacing bar for connection then minimum width of lacing bar must be:
a) 40 mm b) 45mm c) 48mm d) 50mm
19. As per IS:800, the maximum Slenderness ratio of Lacing bar should not exceed:
a) 120 b) 140 c) 145 d) 155
20. A Compression member consists of two channel section placed back to back. Such member lies in buckling Class:
a) A b) B c) C d) D

KATHMANDU UNIVERSITY
End semester Examination
May/June, 2019 [C]

30 MAY 2019

Level : B.E.
Year : IV
Time : 2 hrs. 30 mins.

Course : CIEG 402
Semester : I
F. M. : 40

SECTION "B"

Assume the suitable data wherever necessary. Attempt *ALL* Questions. Use of code IS800:2007, IS 808, IS883, IS 875 part 3 is allowed.

1. A tie member 80mmx10mm is welded to a 12 mm thick Gusset Plate using Fillet weld to transfer 350 kN load. Design Fillet weld taking Fe410 Steel. [5]
2. Design a tension member carrying a service tensile load of 425 kN using single angle section with bolted connections. Perform necessary checks. [8]
3.
 - a. Design a base plate for an ISHB 450 @ 87.2Kg/m column carrying a service load of 950 kN with a neat sketch. Assume Fe410 grade of steel and M25 Grade of Concrete. [5]
 - b. An ISHB 300 @ 63.0Kg/m is to be used in a column 5m long with both ends restrained against Rotation and Translation. Determine the axial compressive load it can carry. Take Fe410 steel. [4]
4. A floor of a hall measuring 8mx14m consists of 127mm thick reinforced concrete slab on rolled steel I-beams spaced 3.5m C/C with the flange laterally supported. The floor slab is to support the dead and live load of 3kN/m² and 2 kN/m² respectively. The end bearing of beam is 280mm. Design a suitable hot rolled sections of grade Fe410. Perform necessary checks. [8]
5.
 - a. Determine live load and maximum wind pressure for design of a steel roof truss for cinema hall at Narayangarh, Chitwan. The span of truss is 24m and its pitch is 1/5. Height of the eaves above ground level is 7.5m. Take permeability of building as zero. Take design wind speed factors $K_1 \times K_2 \times K_3=1.10$. Adopt basic wind speed from Indian Standard (from the nearest Indian City/ Town) [5]
 - b. Design a Teak timber beam carrying a maximum bending moment of 4kNm. [5]

