University of Mumbai

Examination 2021 under cluster __ (Lead College: _KJSIEIT_)

Examinations Commencing from 1 June 2021

Program: **_Civil Engineering**

Curriculum Scheme: Rev - 2016

Examination: TE Semester VI

Course Code: (CE-C602) and Course Name: Design and Drawing of Steel Structure

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	What should be the effective length of column whose both ends are held in position and restrained against rotation
Option A:	1.00L
Option B:	0.80L
Option C:	0.65L
Option D:	2L
2.	Buckling class of Channel, angle , T and solid sections is
Option A:	d
Option B:	c
Option C:	a
Option D:	b
3.	The angle of inclination ɵ of lacing bar with the longitudinal axis kept in between angle
Option A:	40-70 degree
Option B:	35-65 degree
Option C:	30-70 degree
Option D:	25-45 degree
4.	The slenderness ration KL/r for lacing bar should not exceed
Option A:	165
Option B:	135
Option C:	155
Option D:	145
5.	Slenderness ratio for lacing system should be
Option A:	(kL/r)
Option B:	1.05(kL/r)
Option C:	1.5(kL/r)
Option D:	2(kL/r)
6.	Condition to find the spacing between channels in built column should be
Option A:	Iyy=Izz
Option B:	Iyy>Izz

Option C:	Iyy<Izz
Option D:	Iyy≠Izz
7.	If h/bf is greater than 1.2 and thickness of flange tf is less than or equal to 40, the buckling class about Y-Y axis should be
Option A:	b
Option B:	c
Option C:	a
Option D:	d
8.	The area of slab base may be computed by
Option A:	A=P/2fck
Option B:	A=P/fck
Option C:	A=P/0.65fck
Option D:	A=P/0.45fck
9.	Size of base plate for a column for a column ISHB 300 @ 618 N/m subjected to a factored axial compressive load of 1200 kN should be
Option A:	400x450
Option B:	350x500
Option C:	400x350
Option D:	350x450
10.	Section is plastic when
Option A:	b/tf > 8.4E
Option B:	b/tf ≤ 8.4E
Option C:	b/tf ≤ 9E
Option D:	b/tf > 9E
11.	For Column most economical section is
Option A:	Solid section
Option B:	I-section
Option C:	Angle section
Option D:	Tubular section
12.	web will cripple due to
Option A:	Concentrated load
Option B:	Deflection at center
Option C:	Torsion at ends
Option D:	Maximum bending moment
13.	A simply supported beam carrying a central load, will be safe in deflection if the ratio span/depth is
Option A:	<15
Option B:	<20
Option C:	<24
Option D:	>15
14.	Minimum pitch of bolt of diameter d should not be less than

Option A:	2.5d
Option B:	1.25d
Option C:	3d
Option D:	2d
15.	For shop welded members, partial factor of safety is
Option A:	1.10
Option B:	1.25
Option C:	1.20
Option D:	1.5
16.	Row of bolts parallel to direction of stress
Option A:	Edge line
Option B:	End line
Option C:	Pitch line
Option D:	Gauge ling
17.	βb for plastic section is
Option A:	1
Option B:	Ze/Zp
Option C:	2
Option D:	Zp/Ze
18.	Condition for no shear buckling
Option A:	Vp=1.5Vn
Option B:	Vp>Vn
Option C:	Vp=Vn
Option D:	Vp<Vn
19.	Ductility is
Option A:	Buckling due to compression
Option B:	Toughness of material
Option C:	Bending without cracks
Option D:	Stretching without breaking
20.	Economical depth of plate girder corresponds to
Option A:	Minimum Thickness
Option B:	Minimum depth
Option C:	Minimum weight
Option D:	Minimum width

Q2 **(20 Marks)**	**Solve any Two out of three** **10 marks each**
A	A simply supported welded plate girder of an effective span of 25m subjected to a UDL of 30kN/m excluding self-weight. Flanges are laterally supported throughout span. Solve till… a) Cross Section design and draw neatly b) Provide check for bending stress

B	Design a simply supported beam of 7m span. Total UDL acting on beam is 30kN/m.
C	A tension member 3m long carries a factored tensile load of 150kN. Design with suitable angle section connection made with 20mm dia. bolts with grade 4.6

Q3 **(20 Marks)**	**Solve any Two out of three** **10 marks each**
A	A column is subjected to a factored load of 1000kN. It has an effective length of 8m. Consider both ends are fixed. Design a column take fy=250N/mm^2
B	An 8m long column under the effect of 1200kN factored axial load. Design a buildup column with two channel sections back to back and single lacing system.
C	A steel column ISHB250@536.6N/m is subjected to a factored load of 1200kN. Design a slab base for column. Use M20 grade of concrete.