

University of Mumbai

Examination 2020

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: Civil Engineering

Curriculum Scheme: Rev2016

Examination: Third Year Semester V

Course Code: CEC501 and Course Name: Structural Analysis-II

Time: 2 hour

Max. Marks: 80

For the students:- All the Questions are compulsory and carry equal marks .

Q1.	Internal deformation caused by real loads will be in a linear elastic member, when P is normal force, L is length of member, A is cross-sectional area of member, E is modulus of elasticity
Option A:	$1/4 PL/AE$
Option B:	$1/3 PL/AE$
Option C:	$1/2 PL/AE$
Option D:	PL/AE
Q2.	The Flexibility in the structure can be defined as
Option A:	Displacement or rotation produced by unit force or moment
Option B:	Rotation produced by non-unit force
Option C:	Slope produced by non-unit force
Option D:	Unit displacement produced by non-unit force
Q3.	The order of matrix is defined in the flexibility is based on
Option A:	Number of Redundant present in the beam externally and available equilibrium equation
Option B:	Number of Redundant present in the beam internally
Option C:	Number of unknown reactions
Option D:	Equilibrium equation
Q4.	Moment required to rotate near end of prismatic beam through unit angle, the far end being fixed, will be
Option A:	EI/L
Option B:	$2EI/L$
Option C:	$3EI/L$
Option D:	$4EI/L$
Q5.	A beam is hinged at end A and fixed at B. If moment M is applied at end A, the moment developed at end B will be
Option A:	-M
Option B:	M
Option C:	$M/2$
Option D:	$-M/2$
Q6.	The shape factor for a solid Rectangular c/s 230 mm x 500 mm section is equal to
Option A:	2

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Option B:	1.5
Option C:	2.5
Option D:	3
Q7.	In Clapeyron's theorem, in case of support settlement _____ support is considered as origin and w.r.t origin, height of adjacent support is measured
Option A:	Left
Option B:	Right
Option C:	Fixed
Option D:	Central
Q8.	If the displacement at the co-ordinate " i" due to unit force at co-ordinate j is δ_{ij} then according to flexibility method
Option A:	$\delta_{ij} = \delta_{ji}$
Option B:	$\delta_{ij} \geq \delta_{ji}$
Option C:	$\delta_{ij} \leq \delta_{ji}$
Option D:	$\delta_{ij} \neq \delta_{ji}$
Q9.	For linear elastic frame, if stiffness matrix is doubled with respect to the existing stiffness matrix, the deflection of the resulting frame will be
Option A:	Twice the existing value
Option B:	Half the existing value
Option C:	The same as existing value
Option D:	Indeterminate value
Q10.	The moment distribution method is best suited for
Option A:	Indeterminate pin jointed truss
Option B:	Rigid frame
Option C:	Space frame
Option D:	Trussed frame
Q11.	In a fixed beam of span L subjected to a central concentrated load W the fixed end moment and moment at mid span are respectively
Option A:	$WL/12$ and $WL/6$
Option B:	$WL/8$ and $WL/8$
Option C:	$WL/6$ and $WL/12$
Option D:	$WL^2/12$ and $WL/6$
Q12.	The shape factor of circular section is
Option A:	$16/3\pi$
Option B:	$1.5/\pi$
Option C:	$4/\pi$
Option D:	$2/16\pi$

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Q13.	The number of independent equations to be satisfied for static equilibrium of a plane structure is
Option A:	1
Option B:	2
Option C:	3
Option D:	6
Q14.	Degree of static indeterminacy of a rigid-jointed plane frame having 15 members, 3 reaction components and 14 joints is
Option A:	2
Option B:	3
Option C:	6
Option D:	8
Q15.	The Castigliano's second theorem can be used to compute deflections
Option A:	In statically determinate structures only
Option B:	For any type of structure
Option C:	At the point under the load only
Option D:	For beams and frames only
Q16.	Collapse load for a fixed beam of span L carrying uniformly distributed load over entire span is
Option A:	$8M_p/L^2$
Option B:	$48M_p/L^2$
Option C:	$24M_p/L^2$
Option D:	$16M_p/L^2$
Q17.	For a both end fixed beam of length 'L' the eccentric point load of 'W' is acting at distance 'a' from support A and at distance 'b' from support B, the fixed end moment FMba will be
Option A:	Wa^2b/L^2
Option B:	$Wa^2b/12$
Option C:	$Wa^2b/8$
Option D:	Wab/L^2
Q18.	Normally, which of the following things may/may not be symmetric to develop symmetry?
Option A:	Material
Option B:	Geometry
Option C:	Loading
Option D:	Dki
Q19.	Which of the following conditions form the basis of displacement method?
Option A:	Equilibrium conditions
Option B:	Force-displacement conditions
Option C:	Load applied

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Option D:	Compatibility conditions
Q20.	The deflection at any point of a perfect frame can be obtained by applying a unit load at the joint in
Option A:	Vertical direction
Option B:	Horizontal direction
Option C:	Inclined direction
Option D:	The direction in which the deflection is required

Subjective/Descriptive questions

Q.2	Analyse the given problems by flexibility method and draw BMD, Deflected shape 20 MARKS

Q.3.	Analyse frame by slope deflection method and draw B.M.D. & Deflected shape 20 MARKS