

University of Mumbai

Examination 2020

Program: Civil Engineering

Curriculum Scheme: Rev2012

Examination: Third Year Semester V

Course Code: CE-C501 and Course Name: Strcural Analysis II

Time: 1 hour

Max. Marks: 50

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

Q1.	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
Q2.	If there are m unknown member forces, r unknown reaction components and j number of joints, then the degree of static indeterminacy of a pin-jointed plane frame is given by
Option A:	$m + r + 2j$
Option B:	$m - r + 2j$
Option C:	$m + r - 2j$
Option D:	$m + r - 3j$
Q3.	Number of unknown internal forces in each member of a rigid jointed plane frame is
Option A:	1
Option B:	2
Option C:	3
Option D:	6
Q4.	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
Q5.	Degree of kinematic indeterminacy of a pin-jointed plane frame is given by
Option A:	$2j - r$
Option B:	$j - 2r$
Option C:	$3j - r$
Option D:	$2j + r$
Q6.	Independent displacement components at each joint of a rigid-jointed plane frame are
Option A:	three linear movements
Option B:	two linear movements and one rotation
Option C:	one linear movement and two rotations
Option D:	three rotations

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Q7.	If in a pin-jointed plane frame $(m + r) > 2j$, where m is number of members, r is reaction components and j is number of joints, then the frame is
Option A:	stable and statically determinate
Option B:	stable and statically indeterminate
Option C:	unstable
Option D:	none of the above
Q8.	The principle of virtual work can be applied to elastic system by considering the virtual work of
Option A:	internal forces only
Option B:	external forces only
Option C:	internal as well as external forces
Option D:	none of the above
Q9.	Castigliano's first theorem is applicable
Option A:	for statically determinate structures only
Option B:	when the system behaves elastically
Option C:	only when principle of superposition is valid
Option D:	none of the above
Q10.	Principle of superposition is applicable when
Option A:	deflections are linear functions of applied forces
Option B:	material obeys Hooke's law
Option C:	the action of applied forces will be affected by small deformations of the structure
Option D:	none of the above
Q11.	In moment distribution method, the sum of distribution factors of all the members meeting at any joint is always
Option A:	zero
Option B:	less than 1
Option C:	1
Option D:	greater than 1
Q12.	The carryover factor in a prismatic member whose far end is fixed is
Option A:	0
Option B:	$\frac{1}{2}$
Option C:	$\frac{3}{4}$
Option D:	1
Q13.	In column analogy method, the area of an analogous column for a fixed beam of span L and flexural rigidity EI is taken as
Option A:	L/EI
Option B:	$L/2EI$
Option C:	$L/3EI$
Option D:	$L/4EI$
Q14.	The degree of static indeterminacy up to which column analogy method can be

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	used is
Option A:	2
Option B:	3
Option C:	4
Option D:	Unrestricted
Q15.	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
Q16.	In the slope deflection equations, the deformations are considered to be caused by i) bending moment ii) shear force iii) axial force The correct answer is
Option A:	Only i)
Option B:	i) And ii)
Option C:	ii) and iii)
Option D:	i), ii) and iii)
Q17.	The three moments equation is applicable only when
Option A:	the beam is prismatic
Option B:	there is no settlement of supports
Option C:	there is no discontinuity such as hinges within the span
Option D:	the spans are equal
Q18.	While using three moments equation, a fixed end of a continuous beam is replaced by an additional span of
Option A:	zero length
Option B:	infinite length
Option C:	zero moment of inertia
Option D:	none of the above
Q19.	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
Q20.	Bending moment at any section in a conjugate beam gives in the actual beam
Option A:	slope
Option B:	curvature
Option C:	deflection
Option D:	bending moment
Q21.	For a two-hinged arch, if one of the supports settles down vertically, then the horizontal thrust

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Option A:	is increased
Option B:	is decreased
Option C:	remains unchanged
Option D:	becomes zero
Q22.	For a symmetrical two hinged parabolic arch, if one of the supports settles horizontally, then the horizontal thrust
Option A:	is increased
Option B:	is decreased
Option C:	remains unchanged
Option D:	becomes zero
Q23.	A single rolling load of 8 kN rolls along a girder of 15 m span. The absolute maximum bending moment will be
Option A:	8 kN.m
Option B:	15 kN.m
Option C:	30 kN.m
Option D:	60 kN.m
Q24.	The maximum bending moment due to a train of wheel loads on a simply supported girder
Option A:	always occurs at centre of span
Option B:	always occurs under a wheel load
Option C:	never occurs under a wheel load
Option D:	none of the above
Q25.	When a uniformly distributed load, longer than the span of the girder, moves from left to right, then the maximum bending moment at mid section of span occurs when the uniformly distributed load occupies
Option A:	less than the left half span
Option B:	whole of left half span
Option C:	more than the left half span
Option D:	whole span