These are sample MCQs to indicate pattern, may or may not appear in examination

University of Mumbai
Online Examination 2020

Program: TE Mechanical Engineering

Curriculum Scheme: Revised 2012

Examination: Third Year Semester VI

Course Code: MEC606 and Course Name: FINITE ELEMENT ANALYSIS

Time: 1 hour Max. Marks: 50

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

Q1.	In a particular axial Deformation of Bar problem, if one end is supported by spring with stiffness K, then the type of boundary condition is ----------
Option A:	Robin's
Option B:	Neumann's
Option C:	Dirichlet's
Option D:	Mixed Boundary Condition
Q2.	If four springs are attached in series, extreme end points of this spring cart system are fixed. Assume node numbers are given from left to right serially, at which nodes displacements will be observed?
Option A:	1,2,3
Option B:	3,4,5
Option C:	2,3,4,5
Option D:	2,3,4
Q3.	In FEA, the use of smaller-sized elements will lead to _____ computational time
Option A:	Less
Option B:	More
Option C:	depends on other factors
Option D:	Infinite
Q4.	Finite element is ----------
Option A:	Small unit having definite shape and nodes
Option B:	Small unit having definite shape and no nodes
Option C:	Small unit only
Option D:	Only nodes
Q5.	The domain of the problem is represented by a collection of simple sub domains, are called as ----------

Option A:	Finite Nodes
Option B:	Finite Area
Option C:	Finite Elements
Option D:	Finite Volumes
Q6.	A solution is ideally converged if ----------
Option A:	The results for two consecutive iterations are the same
Option B:	The results match with the exact solution
Option C:	The results for two different boundary conditions are the same
Option D:	The results are same with experimental results
Q7.	In finite element analysis, what the error resulting out of use of element that do not describe behaviour of the physical problem is called as?
Option A:	Formulation error
Option B:	Rounding off error
Option C:	Numerical error
Option D:	Discretization error
Q8.	In bar analysis, the reactions can be found by using the equation _____.
Option A:	R=KQ+F
Option B:	R=KQ-F
Option C:	R=K+QF
Option D:	R=K-Q
Q9.	Shape functions are called as----------
Option A:	Shape size functions
Option B:	FEM Functions
Option C:	Interpolation functions
Option D:	Meshing functions
Q10.	The total potential energy of an elastic body is defined as _____.
Option A:	Strain energy - Work potential
Option B:	Strain energy + Work potential
Option C:	Strain energy + Kinetic energy - Work potential
Option D:	Strain energy + Kinetic energy + Work potential
Q11.	The determinant of an element stiffness matrix is always
Option A:	3
Option B:	2
Option C:	1
Option D:	0
Q12.	Which type of vibrations are also known as transient vibrations?
Option A:	Undamped vibrations
Option B:	Damped vibrations

Option C:	Torsional vibrations
Option D:	Transverse vibrations
Q13.	Choose the correct option to complete the sentence: A long prismatic shaft under plain strain is considered as a 2D problem because-
Option A:	The longitudinal strain is zero
Option B:	The shearing strain is zero
Option C:	It is subjected to uniform strain
Option D:	It is so long as compared to other dimensions that the change length may be neglected
Q14.	Identify the sequence of steps in Finite Element Method: 1. Solving for primary variables 2. Imposition of boundary conditions 3. Post processing 4. Finite Element Discretization 5. Assemblage. 6. Deriving element equations.
Option A:	1-2-3-4-5-6
Option B:	2-1-4-3-6-5
Option C:	4-1-5-2-6-3
Option D:	4-6-5-2-1-3
Q15.	When a thin plate is subjected to loading in its own plane only the condition is called?
Option A:	Plane stress
Option B:	Plane strain
Option C:	Zero stress
Option D:	Zero strain
Q16.	Out of following options, when the element will be considered to be completely passing the patch test?
Option A:	If computed stresses are equal to exact stresses of physical problem modeled.
Option B:	If computed stresses are less than the exact stresses of physical problem modeled.
Option C:	If computed stresses are more than the exact stresses of physical problem modeled.
Option D:	If aspect ratio is minimum
Q17.	For 1-D bar elements are used for solving the structure , if it is having 3 noded mesh then the size of the stiffness matrix formed is an order of ----------
Option A:	2 x 2
Option B:	3 x 3
Option C:	4 x 4
Option D:	6 x 6

Q18.	The size of assembled global stiffness matrix equation depends on ----------
Option A:	degrees of freedom of a node
Option B:	number of nodes in a mesh
Option C:	size of an element
Option D:	number of nodes in a mesh and degrees of freedom
Q19.	For the fluid flow analysis which mathematical concept is used----------
Option A:	CFD
Option B:	Transient analysis
Option C:	Fatigue Analysis
Option D:	Modal Analysis
Q20.	For two dimensional plane stress problems normal and shear stress are---------- -------
Option A:	Zero
Option B:	Equal
Option C:	Not Equal
Option D:	Infinity
Q21.	FEM is a generalization of ----------
Option A:	Spectral Density
Option B:	Weighted residual method
Option C:	Finite difference method
Option D:	Finite volume method
Q22.	Stress concentration problems , stress analysis of pressure vessels, pistons etc in Mechanical Design applications, the problems treated as
Option A:	Boundary Value
Option B:	Propagation
Option C:	Initial Value
Option D:	Eigen Value
Q23.	During assembly of element equations, the connectivity conditions pertaining to primary variables at junction node are assumed to be ----------
Option A:	Balanced
Option B:	Continuous
Option C:	Un balanced
Option D:	Discontinuous
Q24.	A two dimensional element has how many number of degrees of freedom at each node?
Option A:	1
Option B:	2
Option C:	3
Option D:	4

Q25.	If global stiffness matrix [K] is a banded matrix, meaning of banded matrix is all the elements---------- of the band are ----------
Option A:	Outside, Unit y
Option B:	Inside, Zeros
Option C:	Outside, Zeros
Option D:	Inside, Unit y