Online Examinations (Even Sem/Part-I/Part-II Examinations 2020 - 2021

Course Name - –Continuum Mechanics
Course Code -MSCMC204

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Answer all the questions. Each question carry one mark.

9.   1. A body continues in its state of rest or uniform motion, unless no external force is
       applied to it

Mark only one oval.

◯ Law of inertia

◯ Law of force

◯ Law of action and reaction

◯ None of these

10.   2. The time rate of change of momentum is proportional to impressed force

Mark only one oval.

○ inertia

○ force

○ action and reaction

○ none

11.   3.

The following $I_{zz} = \sum_{i-1}^{n} m_i \left(x_i^2 + y_i^2 \right)$ represents

Mark only one oval.

○ Moment of inertia about X-axis

○ Moment of inertia about Y-axis

○ Moment of inertia about Z-axis

○ None of these

12.   4. The product of generalized coordinate and its conjugate momentum has the dimensions of

Mark only one oval.

○ force

○ energy

○ Linear momentum

○ Angular momentum

13. 5. The angle of inclination of the plane at which the body begins to move down the plane, is called

Mark only one oval.

◯ Angle of friction

◯ Angle of repose

◯ Angle of projection

◯ None of these

14. 6.Pick up wrong statement about friction force for dry surfaces. Friction force is

Mark only one oval.

◯ Proportional to normal load between the surfaces

◯ Dependent on the materials of contact surface

◯ Proportional to velocity of sliding

◯ Independent of the area of contact surfaces

15. 7. The term 'Centroid' is

Mark only one oval.

◯ The same as centre of gravity

◯ The point of suspension

◯ The point of application of the resultant of all the forces tending to cause a body to rotate about a certain axis
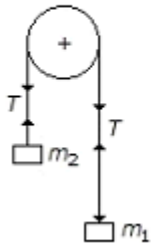
◯ None of these

16. 8.The C.G. of a plane lamina will not be at its geometrical centre in the case of a

Mark only one oval.

$\bigcirc$ Right angled triangle

$\bigcirc$ Equilateral triangle

$\bigcirc$ Square

$\bigcirc$ Circle

17. 9.

If the masses of both the bodies, as shown in the below figure, are reduced to 50
percent, then tension in the string will be

Mark only one oval.

$\bigcirc$ same

$\bigcirc$ half

$\bigcirc$ double

$\bigcirc$ None of these

18. 10. Which of the following equations is a result of momentum conservation for inviscid steady flows?

Mark only one oval.

$\bigcirc$ Bernoulli's equation

$\bigcirc$ Navier-Stokes equation

$\bigcirc$ First law of thermodynamics

$\bigcirc$ Euler's equation

19.   11. The coefficient of friction depends upon

Mark only one oval.

⬭ Nature of surfaces

⬭ Area of contact

⬭ Shape of the surfaces

⬭ None of these

20.   12.A machine having an efficiency greater than 50%, is known as

Mark only one oval.

⬭ Reversible machine

⬭ Non-reversible machine

⬭ Neither reversible nor non-reversible machine

⬭ Ideal machine

21.   13.Coulomb friction is the friction between

Mark only one oval.

⬭ Bodies having relative motion

⬭ Two dry surfaces

⬭ Two lubricated surfaces

⬭ Solids and liquid

22. 14.The Cartesian equation of trajectory is (where u = Velocity of projection, α = Angle of projection, and x, y = Co-ordinates of any point on the trajectory after t seconds.)

Mark only one oval.

- ⬭ y = (gx²/2u² cos²α) + x. tanα
- ⬭ y = (gx²/2u² cos²α) - x. tanα
- ⬭ y = x. tanα - (gx²/2u² cos²α)
- ⬭ y = x. tanα + (gx²/2u² cos²α)

23. 15. A force acting on a body may

Mark only one oval.

- ⬭ Change its motion
- ⬭ Balance the other forces acting on it
- ⬭ Retard its motion
- ⬭ Change its motion,Balance the other forces acting on it & Retard its motion

24. 16. The centre of gravity of a uniform lamina lies at

Mark only one oval.

- ⬭ The centre of heavy portion
- ⬭ The bottom surface
- ⬭ The midpoint of its axis
- ⬭ The centre of heavy portion, The bottom surface and The midpoint of its axis

25.   17. The necessary condition for forces to be in equilibrium is that these should be

Mark only one oval.

○ Coplanar

○ Meet at one point

○ Coplanar and Meet at one point

○ None of these

26.   18. Which of the following is a vector quantity?

Mark only one oval.

○ Energy

○ mass

○ momentum

○ angle

27.   19. Mohr' s circle is a graphical method to find

Mark only one oval.

○ Bending stresses

○ Principal stresses

○ Torsional shear stresses

○ None

28.   20. When does Mohr's stress circle method fail

Mark only one oval.

○ the given two normal stresses are of the same magnitude and same nature

○ the given two normal stresses are of the same magnitude and are of opposite nature

○ the given two normal stresses are of the unequal magnitude and same nature

○ None

29.   21.The ordinate of the Mohr's circle is a

Mark only one oval.

○ Shear stress

○ Normal stress

○ Normal as well as shear stress

○ None

30.   22. The relation between the elastic constant is

Mark only one oval.

○ E = 2G (1−2μ)

○ E = 2G (1+2μ)

○ E = 2G (1+μ)

○ None

31. 23. The relation between the elastic constant is

Mark only one oval.

○ E = 3 K(1 − 2µ)

○ E = 6 K (1 − 2µ)

○ E = 9K(1 − 3µ)

○ None

32. 24. Which among these forces used in momentum equation is a tensor?

Mark only one oval.

○ Gravitational forces

○ Pressure forces

○ Viscous forces

○ Electromagnetic forces

33. 25. What do the two subscripts of stress tensors represent?

Mark only one oval.

○ Directions of stress and strain

○ Directions of stress and normal to the surface on which they are acting

○ Directions of strain and normal to the surface on which they are acting

○ Direction of stress and the flow direction

34.   26. The Bernoulli's equation in fluid dynamics is valid for

Mark only one oval.

⬭ Compressible flows

⬭ Transient flows

⬭ Continuous flows

⬭ Viscous flows

35.   27.The divergence of the stress tensor is

Mark only one oval.

⬭ Scalar

⬭ Vector

⬭ 0

⬭ 11

36.   28. What are the two viscosity coefficients involved in the relationship between stress tensor and strain rate of fluids?

Mark only one oval.

⬭ Kinematic viscosity and bulk viscosity

⬭ Dynamic viscosity and kinematic viscosity

⬭ Dynamic viscosity and bulk viscosity

⬭ Kinematic viscosity and volume viscosity

37.　29. If compressibility force and surface tension force are neglected from the Newton's second law of motion, which of the following equations result?

Mark only one oval.

◯ Navier-Stokes equation

◯ Euler's equation

◯ Bernoulli's equation

◯ Reynolds equation

38.　30. Viscous forces fall into which kind of the following forces acting on a body?

Mark only one oval.

◯ Pressure force

◯ Tensile force

◯ Body forces

◯ Surface forces

39.　31.The slope of the stress-strain curve in the elastic deformation region is
_____

Mark only one oval.

◯ Elastic modulus

◯ Plastic modulus

◯ Poisson's ratio

◯ None of the mentioned

40.   32. Which point on the stress strain curve occurs after yield plateau?

Mark only one oval.

○ lower yield point

○ Upper yield point

○ Ultimate point

○ Breaking point

41.   33.Which point on the stress strain curve occurs after the ultimate point?

Mark only one oval.

○ Last point

○ Breaking point

○ Elastic limit

○ Material limit

42.   34. According to equation of continuity, when water falls its speed increases, while its cross sectional area

Mark only one oval.

○ increases

○ decreases

○ remain same

○ different

43.   35. If layers of fluid have frictional force between them, then it is known as

Mark only one oval.

○ viscous

○ non-viscous

○ In compressible

○ both a and b

44.   36.If every particle of fluid has irregular flow, then flow is said to be

Mark only one oval.

○ laminar flow

○ turbulent flow

○ fluid flow

○ both laminar flow and turbulent flow

45.   37. A flow whose streamline is represented by a curve, is called

Mark only one oval.

○ One-dimensional flow

○ Two-dimensional flow

○ Three-dimensional flow

○ Four-dimensional flow

46.   38. A flow in which the viscosity of fluid is dominating over the inertia force is called

Mark only one oval.

⬭ Steady flow

⬭ Unsteady flow

⬭ Laminar flow

⬭ Turbulent flow

47.   39. A flow in which the volume of a fluid and its density does not change during the flow is called _____ flow.

Mark only one oval.

⬭ Incompressible

⬭ Compressible

⬭ Viscous

⬭ None of these

48.   40. Euler's number is the ratio of _____ force to pressure force.

Mark only one oval.

⬭ Inertia

⬭ Gravity

⬭ Viscous

⬭ None of these

49.   41. The locus of all points at which the Joule-Kelvin coefficient is ____ is the
       inversion curve.

       Mark only one oval.

       ⬭ negative

       ⬭ positive

       ⬭ zero

       ⬭ infinity

50.   42.Which of the following correctly states how the viscosities of a liquid and a gas
       will change with temperature?

       Mark only one oval.

       ⬭ Viscosity increases with the increase in temperature of a liquid and decreases with the
       increase in temperature of a gas

       ⬭ Viscosity increases with the increase in temperature of a liquid and increases with the
       increase in temperature of a gas

       ⬭ Viscosity decreases with the increase in temperature of a liquid and increases with the
       increase in temperature of a ga

       ⬭ Viscosity decreases with the increase in temperature of a liquid and decreases with
       the increase in temperature of a gas

51.   43. Navier- Stokes equation describes the motion of _____

       Mark only one oval.

       ⬭ Solid substance

       ⬭ Non-viscous fluid

       ⬭ Viscous fluid

       ⬭ Gas

52.   44.Froude number depends upon_____

Mark only one oval.

⬭ Flow velocity, external field and characteristic length

⬭ Flow velocity and mass

⬭ Mass flow rate and volume

⬭ Characteristic length and volume

53.   45. Which among the following cannot be used as an alternative term for a "solenoidal vector field"?

Mark only one oval.

⬭ Incompressible vector field

⬭ Divergence- free vector field

⬭ Transverse vector field

⬭ Continuous random field

54.   46. Which among the following is not an example of magneto fluids?

Mark only one oval.

⬭ Plasma

⬭ Liquid metal

⬭ Salt wate

⬭ Alcohol

55.   47. What is the velocity profile for Poiseuille flow?

Mark only one oval.

⬭ Zero

⬭ Constant

⬭ Linear

⬭ Quadratic

56.   48. What are the Newtonian constitutive assumptions regarding relationship between stress tensor and velocity gradients?

Mark only one oval.

⬭ Linear and isotropic

⬭ Constant

⬭ Linear

⬭ Non-Uniform

57.   49. The velocity profile of the Couette flow is _____

Mark only one oval.

⬭ Quadratic

⬭ Constant

⬭ Linear

⬭ Zero

58.   50.Which branch of fluid mechanics deals with translation, rotation and deformation of the fluid element without considering the force and energy causing such motion is called as

Mark only one oval.

⬭ fluid dynamics

⬭ fluid kinematics

⬭ fluid kinetics

⬭ hydraulics

59.   51. Turbulence problems particularly depend on this term of the Navier-Stokes equations. Which is that term?

Mark only one oval.

⬭ Rate of change term

⬭ Convection term

⬭ Diffusion term

⬭ Source term

60.   52. The Navier-Stokes equations are ____ system of equations.

Mark only one oval.

⬭ coupled

⬭ uncoupled

⬭ exponential

⬭ radical

61.   53. Which method is used exclusively in fluid mechanics?

Mark only one oval.

( ) Lagrangian method

( ) Eulerian method

( ) Both Lagrangian and Eulerian methods

( ) Neither Lagrangian nor Eulerian method

62.   54. What type of flow can be taken for granted in a pipe of a uniform cross-section?

Mark only one oval.

( ) steady

( ) unsteady

( ) uniform

( ) non-uniform

63.   55. Can the flow inside a nozzle be steady and uniform?

Mark only one oval.

( ) yes

( ) never

( ) it can be steady but never uniform

( ) it can be uniform but never steady

64.		56. The fluid is subdivided into fluid parcels and every fluid parcel is followed as it moves through space and time. Which kind of formulation is this?

Mark only one oval.

◯ Cartesian

◯ Eulerian

◯ Lagrangian

◯ Euclidean

65.		57. Each parcel in the Lagrangian formulation is tagged using

Mark only one oval.

◯ Time-dependent position vector

◯ Time-independent position vector

◯ Time-dependent velocity vector

◯ Time-independent velocity vector

66.		58. Which of these will best define positions of the parcel in increasing time?

Mark only one oval.

◯ Streamline

◯ Streakline

◯ Boundary line

◯ Pathline

67.   59. According to Eulerian approach, which of these is correct?

Mark only one oval.

    ⬭ Both location and fluid move

    ⬭ Location moves and fluid is stationary

    ⬭ Both location and fluid are stationary

    ⬭ Location is stationary and fluid moves

68.   60.Which of the following is NOT a type of force considered in the Navier-Stokes equation?

Mark only one oval.

    ⬭ Gravity force

    ⬭ Pressure force

    ⬭ Surface tension force

    ⬭ Viscous force

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