

**\*\*\* EXAMINATION \*\*\***

**COMBINED BUOYANCE-AND PRESSURE-DRIVEN  
FLOW THROUGH A HORIZONTAL VENT**

1. **Theory comprises mathematical methods that are used to find**
  - a) approximate solution to a problem is perturbation theory
  - b) approximate solution to a problem is quantum field theory
  - c) approximate solution to a problem is tensor theory
  - d) approximate solution to a problem is classical theory
  
2. **The symbol that stands for a value that may vary is**
  - a) eigenvalues
  - b) variable
  - c) standard deviation
  - d) Cartesian axes
  
3. **A generalization of a vector that is a mathematically entity**
  - a) specified to a given coordinate system is inertia
  - b) specified to a given coordinate system is torque
  - c) specified to a given coordinate system is tensor
  - d) specified to a given coordinate system is tractive force
  
4. **A measure of the resistance of a fluid which is being**
  - a) deformed by either shear stress is ductility
  - b) deformed by either shear stress is density
  - c) deformed by either shear stress is thixotropy
  - d) deformed by either shear stress is viscosity
  
5. **The pascal-second is the SI physical unit of**
  - a) dynamic viscosity
  - b) kinematic viscosity
  - c) volume viscosity
  - d) eddy viscosity
  
6. **In mathematics, the function that is locally given by a**
  - a) convergent power series is a holomorphic function
  - b) convergent power series is an analytic function
  - c) convergent power series is a rational function
  - d) convergent power series is an algebraic function

7. **The change from high to low levels or from one thing to**
  - a) another in an unpredictable way is radiation
  - b) another in an unpredictable way is conduction
  - c) another in an unpredictable way is fluctuation
  - d) another in an unpredictable way is convection
8. **The amount of energy possessed by a thermodynamic system for**
  - a) transfer between itself and its environment is entropy
  - b) transfer between itself and its environment is isotropy
  - c) transfer between itself and its environment is buoyancy
  - d) transfer between itself and its environment is enthalpy
9. **The dimensionless number in fluid dynamics which approximate**
  - a) the ratio of the buoyancy is the Grashof number (Gr)
  - b) the ratio of the buoyancy is the Prandtl number (Pr)
  - c) the ratio of the buoyancy is the Ruark number (Rr)
  - d) the ratio of the buoyancy is the Taylor number (Tr)
10. **A dimensionless number approximating the ratio of momentum**
  - a) diffusivity and thermal diffusivity is the Grashof number
  - b) diffusivity and thermal diffusivity is the Prandtl number
  - c) diffusivity and thermal diffusivity is the Ruark number
  - d) diffusivity and thermal diffusivity is the Taylor number
11. **The differential equation together with a set of additional**
  - a) restraints are periodic boundary conditions
  - b) restraints are initial value problem
  - c) restraints are boundary value problem
  - d) restraints are Dirichlet boundary condition
12. **An ordinary differential equation together with specified**
  - a) value initial conditions is a periodic boundary conditions
  - b) value initial conditions is an initial value problem
  - c) value initial conditions is a boundary value problem
  - d) value initial conditions is a Dirichlet boundary condition
13. **The process of converting mechanical energy of downward**
  - a) flowing water into thermal energy is dissipation
  - b) flowing water into thermal energy is diffusion
  - c) flowing water into thermal energy is titration
  - d) flowing water into thermal energy is combustion
14. **A dimensionless number comparing inertia and gravitational**
  - a) forces is the Grashof number (Gr)
  - b) forces is the Prandtl number (Pr)
  - c) forces is the Froude number (Fr)
  - d) forces is the Taylor number (Tr)

15. **The movement of air into and out of buildings driven by**
- a) buoyancy is ventilation shaft
  - b) buoyancy is natural ventilation
  - c) buoyancy is room air distribution
  - d) buoyancy is stack effect
16. **The volume of fluid which passes through a given surface per**
- a) unit time is called the Couette flow
  - b) unit time is called the volume flow rate
  - c) unit time is called the gravity current
  - d) unit time is called the homentropic flow
17. **The relative measure of its efficiency at allowing fluid**
- a) flow is the flow coefficient of a device
  - b) flow is the flow velocity of a device
  - c) flow is the flow visualization of a device
  - d) flow is the flow tracer of a device
18. **The strength and direction of a linear relationship between**
- a) two random variables is indicated by magnitude
  - b) two random variables is indicated by correlation
  - c) two random variables is indicated by volume
  - d) two random variables is indicated by velocity
19. **A substance that continually deforms under an applied shear**
- a) stress is fuel
  - b) stress is oil
  - c) stress is fluid
  - d) stress is coolant
20. **The force acting on surface divided by the area over which**
- a) it acts is magnitude
  - b) it acts is volume
  - c) it acts is velocity
  - d) it acts is pressure

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