APPLIED HYDRAULICS

1. Which of the following statements are true for dimensional analysis?

(A) The functional relationship between dependent and non-dependent variables can be expressed into dimensionless terms by dimensional analysis.

(B) It is used to change the theoretical equation into a dimensionless form.

(C) It helps to convert the units of quantities from one system to another system.

(D) All of the above.

2. Dimensional analysis is useful in

(A) checking the correctness of a physical equation

(B) determining the number of variables involved in a particular phenomenon

(C) determining the dimensionless groups from the given variables

(D) the exact formulation of a physical phenomenon

3. The unit of a physical quantity which does not depend on the unit of any other physical quantity is called

(A) independent dimension

(B) fundamental dimension

(C) core dimension

(D) Finite dimension

4. Which of the following is not a primary quantity?

(A) Mass

(B) Temperature

(C) Time

5. What are the dimensions of force?

(A) *M1L1T-2*

(B) *M1L1T-1*

(C) *M1L2T-2*

(D) M1L2T2

6. Which of the following quantities has the dimensions *M0L0T0*?

(A) Density

(B) Stress

(C) Strain

(D) Strain Rate

***M1L-1T-2* is the dimensional formula of**

(A) force

(B) coefficient of friction

(C) modulus of elasticity

(D) energy

7. The dimensional formula of the coefficient of viscosity is

(A) *M1L1T-1*

(B) *M-1L2T-2*

© M1L1T-1

8. The dimensions of surface tension are

(A) *M1L1T-2*

(B) *M1T-2*

(C) *M1L2T-2*

(D) *M1L1T-1*

9. The dimensional formula of Relative density is

(A) *M1L-3*

(B) *M1L1T-1*

(C) M1L1T-2

10. Principle of fluid mechanics works on the utilization of_____
    a) Accelerating mass
    b) Volume
    c) Work
    d) Velocity
11. The propulsive force drives the jet in the _____
    a) Backward direction
    b) Forward direction
    c) Perpendicular direction
    d) Parallel movement
12. The force analysis on a curved vane is understood using_____
    a) Velocity triangles
    b) Angle of the plate
    c) Vane angles
    d) Plate dimensions
13. Jet propulsion works on the principle of_____
    a) Newton's first law
    b) Newton's second law
    c) Newton's third law
    d) Thermodynamic properties

14. How is absolute velocity at inlet denoted?
    a) V
    b) V_1
    c) C
    d) v

16. The relative velocity is obtained by the equation_____
a) u – V_1
b) V1
c) u*V1
d) u/V1

17. If the friction is neglected, then_____
a) $V_{r1} > V_{r2}$
b) $V_{r1} < V_{r2}$

c) V_{r1} = V_{r2}

d) V_{r1} is a zero

18. If the pressure remains a constant, then _____

a) V_{r1} > V_{r2}

b) V_{r1} < V_{r2}

c) V_{r1} = V_{r2}

d) V_{r1} is a zero

19. Through inlet orifices, which are facing the direction of motion of the ship, the water from the sea can be taken by the pump.

a) True

b) False

20. The efficiency of the vane is given by_____

a) $1-V_2^2/V_1^2$

b) $1-(V_2^2/V_1^2)$

c) V_2^2/V_1^2

d) $1- V_1^2$

21. Hydraulic energy is converted into another form of energy by hydraulic machines. What form of energy is that?

a) Mechanical Energy

b) Electrical Energy

c) Nuclear Energy

d) Elastic Energy

Answer:a

22. In hydraulic turbines, inlet energy is greater than the outlet energy.

a) True

b) False

23. Which principle is used in Hydraulic Turbines?

a) Faraday law

b) Newton's second law

c) Charles law

d) Braggs law

24. Buckets and blades used in a turbine are used to:

a) Alter the direction of water

b) Switch off the turbine

c) To regulate the wind speed

d) To regenerate the power

25. _____is the electric power obtained from the energy of the water.

a) Roto dynamic power

b) Thermal power

c) Nuclear power
d) Hydroelectric power

26. Which energy generated in a turbine is used to run electric power generator linked to the turbine shaft?
a) Mechanical Energy
b) Potential Energy
c) Elastic Energy
d) Kinetic Energy

27. Hydraulic Machines fall under the category :
a) Pulverizers
b) Kinetic machinery
c) Condensers
d) Roto-dynamic machinery

28. Which kind of turbines changes the pressure of the water entered through it?
a) Reaction turbines
b) Impulse turbines
c) Reactive turbines
d) Kinetic turbines

29. Which type of turbine is used to change the velocity of the water through its flow?
a) Kinetic turbines
b) Axial flow turbines
c) Impulse turbines
d) Reaction turbines

30. How many types of Reaction turbines are there?
a) 5
b) 4
c) 3
d) 9

31. Centrifugal pump is a_____
a) Turbomachinery
b) Flow regulating device
c) Drafting device
d) Intercooling device

32. The main function of nozzle is to _____
a) Varying temperatures
b) Pressure variations
c) Load variations
d) Heat variations

33. The main function of centrifugal pumps are to _____
a) Transfer speed
b) Transfer pressure

c) Transfer temperature
d) Transfer energy

34.Centrifugal pumps transfer energy from _____
a) Rotor to fluid
b) Fluid to rotor
c) Draft to rotor
d) Rotor to draft

35.Which among the following control the flow rate?
a) Valve
b) Pump
c) Head
d) Tank pipe

36.Turbines and compressors work with the gas, while centrifugal pump transfers energy.
a) True
b) False

37. The inlet passage of water entry is controlled by _____
a) Head race
b) Gate
c) Tail race
d) Pump

38.Centrifugal pumps are a sub class of dynamic axisymmetric work absorbing turbomachinery.
a) True
b) False

39. Centrifugal pumps are used to transport _____
a) Pressure
b) Speed
c) Power
d) Fluid

40.Centrifugal pumps transport fluids by converting _____
a) Kinetic energy to hydrodynamic energy
b) Hydrodynamic energy to kinetic energy
c) Mechanical energy to kinetic energy
d) Mechanical energy to Hydrodynamic energy