PSN COLLEGE OF ENGINEERING AND TECHNOLOGY

Department of Mechanical Engineering

II year / III semester

510001 – FLUID MECHANICS AND MACHINERY

MULTIPLE CHOICE QUESTION BANK

COLLEGE VISION & MISSION STATEMENT

VISION

"To provide an academic environment to learn, work and do research and enabling the students to face challenges in life with strong ethical values".

MISSION

- To achieve greater heights of excellence in technical knowledge and skill development through innovative teaching and learning practices.
- To develop the infrastructure to meet the demands of technological revolution.
- To improve and foster research in all dimensions for betterment of society.
- To develop individual competencies to enhance employability and entrepreneurship in students.
- To instil higher standards of discipline among students, inculcating ethical and moral values for societal harmony and peace.

DEPARTMENT VISION & MISSION

VISION

"To provide Mechanical Engineering education to meet global standards through enhanced core activities, skill development and research with ethical values".

MISSION

- To educate students to be creative, inquisitive and innovative to become entrepreneurs. (DM – 1)
- To instil advanced knowledge with research capabilities for global employment. (DM – 2)
- To uphold moral and ethical standards in life and career. (DM – 3)

COURSE OBJECTIVES

The students completing this course are expected to understand the properties of fluids, its kinematic and dynamic behaviour through various laws of fluids like continuity, Euler's, Bernoulli's equations, energy and momentum equations. Further, the student shall be able to understand the theory of boundary layer, working and performance characteristics of various hydraulic machines like pumps and turbines.

UNIT - I INTRODUCTION

Units and Dimensions - Properties of fluids- gas laws - capillarity and surface tension. Flow characteristics: concepts of system and control volume- Application of control volume to continuity equation. **12**

UNIT – II FLOW THROUGH CIRCULAR CONDUITS

Bernoulli's equation - applications - Venturimeter, Orificemeter, Rotameter, Pitot tube –Laminar flow though circular conduits and circular annuli. Boundary layer concepts - Darcy-Weisbach's equation - Flow through pipes in series and in parallel - Losses in pipes. **12**

UNIT - III DIMENSIONAL ANALYSIS

Dimension and units: Buckingham's Π theorem. Discussion on dimensionless parameters. Models and similitude - Applications of dimensionless parameters. **12**

UNIT – IV HYDRAULIC TURBINES

Hydro turbines: definition and classifications - Pelton turbine - Francis turbine - propeller turbine - Kaplan turbine - working principles - velocity triangles - work done - specific speed – efficiencies - performance curve for turbines. **12**

UNIT- V HYDRAULIC PUPMS

Pumps: definition and classifications – Selection of Pumps - Centrifugal pump – Reciprocating pump: classifications, working principles, velocity triangles, specific speed, efficiency and performance curves - rotary pumps: working principles of gear and vane pumps - cavitations in pumps – Jet Pump – Working Principle **12**

Total: 60 Periods

TEXTBOOK:

1. Bansal RK, "Fluid Mechanics and Hydraulics Machines", (5th edition), Laxmi publications (P) Ltd, New Delhi, 2013.
2. Modi PN and Seth SM, "Hydraulics and Fluid Mechanics Including Hydraulics Machines", 19th Edition, Standard Book House, 2013.

REFERENCEBOOK:

1. Streeter VL and Wylie EB, “Fluid Mechanics”, 7th Edition, McGraw-Hill Ltd, New Delhi, 2010.
2. White FM, “Fluid Mechanics”, 7th Edition, Tata McGraw-Hill, New Delhi, 2011.
3. Rathakrishnan E, “Fluid Mechanics”, 2nd Edition, Prentice Hall of India, 2007.
4. Ramamrutham S, “Fluid Mechanics, Hydraulics and Fluid Machines”, Dhanpat Rai & Sons, Delhi, 2004.
5. Kumar KL, “Engineering Fluid Mechanics”, 7thEdition, Eurasia Publishing House Private Limited, New Delhi, 1995.
6. Shiv Kumar, “Fluid Mechanics & Fluid Machines: Basic Concepts & Principles”, Ane Books Pvt. Ltd., New Delhi, 2010
7. http://nptel.ac.in/

COURSE OUTCOMES:

CO 1: Explain the fundamentals of fluid properties and fluid flows. K2

CO 2: Use Euler and Bernoulli’s equations for various applications. K3

CO 3: Apply dimensional analysis to simple problems. K2

CO 4: Apply principles of fluid mechanics to the operation, design, and selection of hydraulics turbines. K2

CO 5: Analyse the performance of hydraulic pump. K4

UNIT – I: INTRODUCTION

1. What is fluid mechanics?
   a. Study of fluid behaviour at rest
   b. Study of fluid behaviour in motion
   c. Study of fluid behaviour at rest and in motion
   d. Study of fluid behaviour at rest and in motion

Answer: c

2. Which of the following is the basic principle of fluid mechanics?
   a. Momentum principle
   b. Energy equation
   c. Continuity equation
   d. All of the mentioned

Answer: d

3. What is fluid mechanics used for?
   a. Fluid mechanics enables to comprehend the behaviour of solid fluids under pressure
   b. Fluid mechanics enables to comprehend the behaviour of fluids under a variety of forces & atmospheric conditions

c. Fluid mechanics enables to comprehend the behaviour of fluids under various temperatures only
d. None of the mentioned

Answer: c

4. If a person studies about a fluid which is at rest, what will you call his domain of study?
   a. Fluid Dynamics
   b. Fluid Mechanics
   c. Fluid Statics
   d. Fluid Kinematics

Answer: c

5. Which among the following provides the third principle in fluid mechanics?
   a. Conservation of Heat
   b. Conservation of volume
   c. Conservation of linear momentum
   d. Conservation of mass

Answer: c

6. When a fluid is subjected to resistance, it undergoes a volumetric change due to _____
   a. Cohesion
   b. Strain
   c. Compressibility
   d. Adhesion

Answer: c

7. Principle of fluid mechanics works on the utilization of_____
   a. Velocity
   b. Accelerating mass
   c. Volume
   d. Work

Answer: d

8. Which of the following is a type of fluid based on viscosity?
   a. Real Fluid
   b. Ideal Fluid
   c. Newtonian Fluid
   d. All of the mentioned

Answer: c

9. Which among the following is not global parameters of fluid?

a. Mass flow rate
b. Density
c. Viscosity
d. External diameter

Answer: d

10. Which one of the following is the unit of mass density?

a. kg /m^3
b. kg / m^2
c. kg / m
d) kg /ms

Answer: a

11. The specific gravity of a liquid has

a) the same unit as that of mass density
b) the same unit as that of weight density
c) the same unit as that of specific volume
d) no unit

Answer: d

12. The specific volume of a liquid is the reciprocal of

a) weight density
b) mass density
c) specific weight
d) specific volume

Answer: b

13. Which one of the following is the unit of specific weight?

a) N/m^3
b) N/m^2
c) N/m
d) N/ms

Answer: b

14. Two fluids 1 and 2 have mass densities of p1 and p2 respectively. If p1 > p2, which one of the following expressions will represent the relation between their specific volumes v1 and v2?

a) v1 > v2
b) v1 < v2
c) v1 = v2
d) Cannot be determined due to insufficient information.

Answer: b

15. A beaker is filled with a liquid up to the mark of one litre and weighed. The weight of the liquid is found to be 6.5 N. The specific weight of the liquid will be
    a) 6:5 kN/m^3
    b) 6:6 kN/m^3
    c) 6:7 kN/m^3
    d) 6:8 kN/m^3

Answer: a

16. A beaker is filled with a liquid up to the mark of one litre and weighed. The weight of the liquid is found to be 6.5 N. The specific gravity of the liquid will be
    a) 0.65
    b) 0.66
    c) 0.67
    d) 0.68

Answer: b

17. A beaker is filled with a liquid up to the mark of one litre and weighed. The weight of the liquid is found to be 6.5 N. The specific volume of the liquid will be
    a) 1 l m^3 /kg
    b) 1:5 l m^3 /kg
    c) 2 l m^3 /kg
    d) 2:5 l m^3 /kg

Answer: b

18. For an incompressible fluid does density vary with temperature and pressure?
    a) It varies for all temperature and pressure range
    b) It remains constant
    c) It varies only for lower values of temperature and pressure
    d) It varies only for higher values of temperature and pressure

Answer: b

19. Specific gravity is what kind of property?
    a) Intensive
    b) Extensive
    c) None of the mentioned
    d) It depends on external conditions

Answer: a

20. If there is bucket full of oil and bucket full of water and you are asked to lift them, which one of the two will require more effort given that volume of buckets remains same?
    a) Oil bucket

b) Water bucket

c) Equal effort will be required to lift both of them

d) None of the mentioned

Answer: b

21. If the fluid has specific weight of 10N/m3 for a volume of 100dm3 on a planet which is having acceleration due to gravity 20m/s2 , what will be its specific weight on a planet having acceleration due to gravity 4m/s2?

a) 5 N/m^3

b) 50 N/m^3

c) 2 N/m^3

d) 10 N/m^3

Answer: c

22. Should Specific Wieght of incompressible fluid only be taken at STP?

a) Yes, as specific weight may show large variation with temperature and pressure

b) No, it can be taken for any temperature and pressure

c) It should be taken at standard temperature but pressure may be any value

d) It should be taken at standard pressure but temperature may be any value

Answer: b

23. An instrument with air as fluid was involved in some experiment(specific volume was the characteristic property utilized) which was conducted during day in desert. Due to some reason experiment couldn't be conducted during day and had to be conducted during night. However there were considerable errors in obtained values. What might be the reason of these errors?

a) It was human error

b) It was instrumental error

c) Error was due to the fact that experiment was conducted at night

d) None of the mentioned

Answer: c

24. A stone weighed 177 N on earth. It was dropped in to oil of specific gravity 0.8 on a planet whose acceleration due to gravity is 5m/s2. It displaced oil having weight of 100N. What was the volume of oil displaced by the stone?

a) 25 Litres

b) 15 Litres

c) 25 m3

d) None of the mentioned

Answer: a

25. A compressible fluid's specific gravity was measured on earth, on a planet having acceleration due to gravity 5.5 times that of earth, and in space at STP. Where will it be having highest value?
    a) on the earth
    b) on the planet
    c) in the space
    d) it will be constant everywhere

Answer: d

UNIT – II FLOW THROUGH CIRCULAR CONDUITS

1. For a fully-developed pipe flow, how does the pressure vary with the length of the pipe?
    a) Linearly
    b) Parabolic
    c) Exponential
    d) Constant

Answer: a

2. When a problem states "The velocity of the water flow in a pipe is 20 m/s", which of the following velocities is it talking about?
    a) RMS velocity
    b) Average velocity
    c) Absolute velocity
    d) Relative velocity

Answer: b

3. The flow through a circular pipe is laminar. Now, the fluid through the pipe is replaced with a more viscous fluid and passed through the pipe again with the same velocity. What can we say about the nature of this flow?
    a) The flow will become turbulent
    b) The flow will be a transition flow
    c) The flow will remain laminar
    d) The Reynolds number of the earlier flow is required to answer this question

Answer: c

4. Which one of the following is a major loss?
    a) frictional loss
    b) shock loss
    c) entry loss
    d) exit loss

Answer: a

5. Which property of the fluid accounts for the major losses in pipes?

   a) density

   b) specific gravity

   c) viscosity

   d) compressibility

Answer: c

6. The frictional resistance for fluids in motion is

   a) proportional to the velocity in laminar flow and to the square of the velocity in turbulent flow

   b) proportional to the square of the velocity in laminar flow and to the velocity in turbulent flow

   c) proportional to the velocity in both laminar flow and turbulent flow

   d) proportional to the square of the velocity in both laminar flow and turbulent flow

Answer: a

7. The frictional resistance for fluids in motion is

   a) dependent on the pressure for both laminar and turbulent flows

   b) independent of the pressure for both laminar and turbulent flows

   c) dependent on the pressure for laminar flow and independent of the pressure for turbulent flow

   d) independent of the pressure for laminar flow and dependent on the pressure for turbulent flow

Answer: b

8. The frictional resistance for fluids in motion is

   a) inversely proportional to the square of the surface area of contact

   b) inversely proportional to the surface area of contact

   c) proportional to the square of the surface area of contact

   d) proportional to the surface area of contact

Answer: d

9. The frictional resistance for fluids in motion varies

   a) slightly with temperature for both laminar and turbulent flows

   b) considerably with temperature for both laminar and turbulent flows

   c) slightly with temperature for laminar flow and considerably with temperature for turbulent flow

   d) considerably with temperature for laminar flow and slightly with temperature for turbulent flow

Answer: d

10. Which one of the following is correct?

    a) the frictional resistance depends on the nature of the surface area of contact

    b) the frictional resistance is independent of the nature of the surface area of contact

c) the frictional resistance depends on the nature of the surface area of contact for laminar flows but is independent of the nature of the surface area of contact for turbulent flows

d) the frictional resistance is independent of the nature of the surface area of contact for laminar flows. but depends on the on the nature of the surface area of contact for turbulent flows.

Answer: c

11. Which one of the flowing is correct?

a) the frictional resistance is always dependent on the nature of the surface area of contact

b) the frictional resistance is always independent of the nature of the surface area of contact

c) the frictional resistance is dependent on the nature of the surface area of contact when the liquid flows at a velocity less than the critical velocity

d) the frictional resistance is independent of the nature of the surface area of contact when the liquid flows at a velocity less than the critical velocity

Answer: d

12. Which one of the following is correct?

a) Darcy-Weisbach's formula is generally used for head loss in flow through both pipes and open channels

b) Chezy's formula is generally used for head loss in flow through both pipes and open channels

c) Darcy-Weisbach's formula is generally used for head loss in flow through both pipes and Chezy's formula for open channels

d) Chezy's formula is generally used for head loss in flow through both pipes and Darcy-Weisbach's formula for open channels

Answer: c

13. A liquid flows through pipes 1 and 2 with the same flow velocity. If the ratio of their pipe diameters d1 : d2 be 3:2, what will be the ratio of the head loss in the two pipes?

a) 3:2

b) 9:4

c) 2:3

d) 4:9

Answer: c

14. A liquid flows through two similar pipes 1 and 2. If the ratio of their flow velocities v1 : v2 be 2:3, what will be the ratio of the head loss in the two pipes?

a) 3:2

b) 9:4

c) 2:3

d) 4:9

Answer: d

15. A liquid flow with the same velocity through two pipes 1 and 2 having the same diameter. If the length of the second pipe be twice that of the first pipe, what should be the ratio of the head loss in the two pipes?
    a) 1:2
    b) 2:1
    c) 1:4
    d) 4:1

Answer: a

16. The head loss at the entrance of the pipe is that at it's exit
    a) equal to
    b) half
    c) twice
    d) four times

Answer: b

17. On which of the factors does the co-efficient of bend in a pipe depend?
    a) angle of bend and radius of curvature of the bend
    b) angle of bend and radius of the pipe
    c) radius of curvature of the bend and pipe
    d) radius of curvature of the bend and pipe and angle of bend

Answer: d

18. In which method of fluid flow analysis do we describe the motion parameters at a point?
    a) Langragian method
    b) Eulerian Method
    c) Control volume analysis
    d) None of the mentioned

Answer: b

19. Which method is most commonly used in fluid mechanics for analysis?
    a) Langragian method
    b) Eulerian Method
    c) Control volume analysis
    d) None of the mentioned

Answer: b

20. In unsteady flow, the flow parameters change with respect to position.
    a) True
    b) False

Answer: b

21. Uniform flow is defined as the type of flow in which acceleration is zero i.e velocity is constant.
    a) True
    b) False

Answer: b

22. In laminar flow fluid particles flow along a streamline.

a) True

b) False

Answer: a

23. Eddies formed in the turbulent flow are major cause of the energy loss in the turbulent flow.
    a) True
    b) False

Answer: a

24. For compressible flow specific gravity remains same.
    a) True
    b) False

Answer: b

25. When the flow particles flow in zigzag manner and rotate about their own axis it is what type of flow?
    a) Turbulent flow
    b) Irrotational flow
    c) Rotational flow
    d) None of the mentioned

Answer: d

26. If the velocity is function of two space coordinates along with time then fluid flow is three dimensional in nature.
    a) True
    b) False

Answer: a

27. What is unit for flow rate for gases?
    a) m3/s
    b) litres/s
    c) cm3/s
    d) kgf/s

Answer: d

28. What will be the shape of the pathline for an one-dimensional flow be like?
    a) straight line

b) parabolic

c) hyperbolic

d) elliptical

Answer: a

29. The velocity of a point in a flow is

a) along the streamline

b) tangent to the streamline

c) along the pathline

d) tangent to the pathline

Answer: b

30. Which of the following is correct?

a) A streamline can intersect itself and two streamlines can cross

b) A streamline cannot intersect itself but two streamlines can cross

c) A streamline can intersect itself but two streamlines cannot cross

d) A streamline cannot intersect itself and two streamlines cannot cross

Answer: d

31. The streamlines of the particles in a flow are recorded. If the streamline distribution remain the same even after sometime, what type of flow can it be?

a) steady

b) unsteady

c) uniform

d) non-uniform

Answer: a

32. If the streamlines of the particles in a flow are parallel to each other, what type of flow can it be?

a) steady

b) unsteady

c) uniform

d) non-uniform

Answer: c

33. Which of the following is correct?

a) the movement of fluid mass can either be along the streamlines or across them

b) the movement of fluid mass can be along the streamlines but never across them

c) the movement of fluid mass can never be along the streamlines but can be across them

d) the movement of fluid mass can neither be along the streamlines or across them

Answer: b

34. Which of the following is correct?

a) In steady flow, pathlines and streamlines are identical

b) In steady flow, pathlines and streaklines are identical

c) In steady flow, streaklines and streamlines are identical

d) In steady flow, pathline, streamlines and streaklines are all identical

Answer: d

35. Which of the following is correct?

a) There will be no flow across the streamtube

b) There will be no flow along the streamtube

c) There will be no flow both across the streamtube and along it

d) There will be flow both across the streamtube and along it

Answer: a

UNIT: III - DIMENSIONAL ANALYSIS

1. Identify the primary quantity from the following.

a) Mass

b) Density

c) Speed

d) Volume

Answer: a

2. Which of the following is a use of dimensional analysis?

a) To check the dimensional correctness of an equation

b) To solve the equation dimensionally

c) To get the number of dimensional constants

d) To understand the dimensional equation

Answer: a

3. The dimension whose unit does not depend on any other dimension's unit is known as _____

a) Fundamental dimension

b) Dependent dimension

c) Independent dimension

d) Absolute dimension

Answer: a

4. Which one of the following is a dimensionless quantity?

a) Mass

b) Weight

c) Specific weight

d) Reynold's number

Answer: d

5. How is dimensional homogeneity related with fundamental units of measurements?

   a) Independent

   b) Dependent

   c) Dependent but can vary

   d) Twice

Answer: a

6. The principle of dimensional homogeneity serves the following useful concepts

   (i) It helps to check whether an equation of any physical phenomenon is dimensionally homogenous or not

   (ii) It helps to determine the dimensions of a physical quantity

   (iii) It helps to convert the units from one system to another

   Identify the correct statements

   a) i and ii

   b) ii and iii

   c) i, ii and iii

   d) ii only

Answer: c

7. How many fundamental quantities are there?

   a) 1

   b) 2

   c) 3

   d) 4

Answer: c

8. Which among the following is not a fundamental dimension?

   a) [L]

   b) [M]

   c) [T]

   d) [kg]

Answer: d

9. The fundamental dimensional quantities are related by_____

   a) Avagadaro's law

   b) Newton's second law

   c) Newtons first law

   d) Newton's third law

Answer: b

10. Force can be written as_____

    a) $[M][L][T]^{-2}$

    b) $[M][L][T]^{2}$

    c) [M][L][T]

    d) $[M][L][T]^{3}$

Answer: a

11. How can we write power using the MLT system?

    a) $[M][L][T]-^{2}$

    b) $[M][L]2[T]^{3}$

    c) [M][L][T]

    d) $[M][L][T]^{3}$

Answer: b

12. How can we write dynamic viscosity using the MLT system?

    a) $[M][L][T]-^{2}$

    b) $[M][L]2[T]^{3}$

    c) $[M][L]-1[T]^{-1}$

    d) $[M][L][T]^{3}$

Answer: c

13. How can we write kinematic viscosity using the MLT system?

    a) $[M][L][T]^{-2}$

    b) $[M]0[L]2[T]^{-1}$

    c) $[M][L]-1[T]^{-1}$

    d) $[M][L][T]^{3}$

Answer: b

14. How can we write momentum using the MLT system?

    a) $[M][L][T]^{-2}$

    b) $[M]0[L]2[T]^{-1}$

    c) $[M][L][T]^{-1}$

    d) $[M][L][T]^{3}$

Answer: c

15. How can we write specific weight using the MLT system?

    a) [M]

    b) [M][T]

    c) $[M][L]^{-2}[T]^{-2}$

    d) [L]

Answer: c

16. How can we write specific mass using the MLT system?

    a) [M][L][T]-2

    b) [M]0[L]2[T]-1

    c) [M][L]-3[T]0

    d) [M][L][T]3

Answer: c

17. How can we write energy using the MLT system?

    a) [M][L]2[T]2

    b) [M]0[L]2[T]-1

    c) [M][L]-3[T]0

    d) [M][L][T]3

Answer: a

18. Which one of the following is the dimension of specific volume of a liquid?

    a) $[M^1 L\text{-}3\ T^0]$.

    b) $[M^{-1} L3\ T^0]$.

    c) $[M^{-1} L\text{-}3\ T^0]$.

    d) $[M^0 L3\ T^0]$.

Answer: b

19. Find the correct MLT system for torque.

    a) $[M^1 L^{-3}\ T^0]$.

    b) $[M^{-1} L^3\ T^0]$.

    c) $[M^{-1} L^{-3}\ T^0]$.

    d) $[M^1 L^2\ T^{-2}]$.

Answer: d

20. The dimensional formula of Relative density is

    a) $[M^1 L^{-3}\ T^0]$.

    b) $[M^{-1} L^3\ T^0]$.

    c) $[M^{-1} L^{-3}\ T^0]$.

    d) dimensionless

Answer: d

21. The dimensional formula of surface tension is

    (a) $[M^{-1} L^3\ T^0]$.

    (b) $[M^1\ T^{-2}]$.

    c) $[M^{-1} L^{-3}\ T^0]$.

    d) $[M^1 L^2\ T^{-2}]$.

Answer: b

22. Choose the correct dimensional formula for shear stress
    a) $[M^{-1} L^{3} T^{0}]$.
    b) $[M^{1} T^{-2}]$.
    c) $[M^{-1} L^{-3} T^{0}]$.
    d) $[M^{1} L^{-1} T^{-2}]$.

Answer: d

23. $M^{1} L^{-1} T^{-2}$ is the dimensional formula of
    a) force
    b) coefficient of friction
    c) modulus of elasticity
    d) energy

Answer: c

24. Which of the following quantities has the dimensions $M^{0}L^{0}T^{0}$?
    (a) Density
    (b) Stress
    (c) Strain
    (d) Strain Rate

Answer: c

25. Find the MLT system for angular velocity
    a) $[M^{0} L^{0} T^{-2}]$.
    b) $[M^{0}L^{0}T^{-1}]$.
    c) $[M^{-1} L^{-3} T^{0}]$.
    d) $[M^{1} L^{2} T^{-2}]$.

Answer: a

26. Choose the correct dimensional formula for angular acceleration
    a) $[M^{-1} L^{3} T^{0}]$.
    b) $[M^{1} L^{0} T^{-1}]$.
    c) $[M^{-1} L^{-3} T^{0}]$.
    d) $[M^{0} L^{0} T^{-2}]$.

Answer: d

27. The dimensional formula $ML^{-1}T^{-2}$ is common to three given physical quantities. Find the physical quantity which does not have the dimensional formula as $ML^{-1}T^{-2}$
    a) Pressure intensity
    b) Modulus of elasticity
    c) Shear stress
    d) Specific weight

Answer: d

28. Principles of similitude form the basis of
    a) performing acceptance tests
    b) comparing two identical types of equipment
    c) comparing the similarity between design and actual equipment
    d) designing and testing models so that the results can be worked out for the prototype

Answer: d

29. A similitude is a concept applicable to the testing of
    a) mathematical models
    b) physical models
    c) engineering models
    d) chemical models

Answer: c

30. The dynamic similarity between model and prototype implies that
    a) the forces acting at corresponding locations are the same
    b) the flow pattern is similar
    c) there is a point to point correspondence between the two systems
    d) both the systems undergo similar rates of change of motion

Answer: a

UNIT – IV HYDRAULIC TURBINES

1. 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

2. In hydraulic turbines, inlet energy is greater than the outlet energy.
    a) True
    b) False

Answer: a

3. Which principle is used in Hydraulic Turbines?
    a) Faraday law
    b) Newton's second law
    c) Charles law

Answer: b

4. 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

Answer: a

5. _____is the electric power obtained from the energy of the water.
   a) Roto dynamic power
   b) Thermal power
   c) Nuclear power
   d) Hydroelectric power

Answer: d

6. 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

Answer: a

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

Answer: d

8. 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

Answer: a

9. 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

Answer: c

10. Which type of turbine is a Francis Turbine?

    a) Impulse Turbine

    b) Screw Turbine

    c) Reaction turbine

    d) Turgo turbine

Answer: c

11. How many types of Reaction turbines are there?

    a) 5

    b) 4

    c) 3

    d) 9

Answer: a

12. Maximum Number of jets, generally, employed in an impulse turbine without jet interference can be?

    a) 2

    b) 3

    c) 4

    d) 6

Answer: d

13. The overall efficiency of a reaction turbine is the ratio of

    a) Actual work available at the turbine to the energy imparted to the wheel

    b) Work done on the wheel to the energy (or head of water) actually supplied to the turbine

    c) Power produced by the turbine to the energy actually supplied by the turbine

    d) Actual work available at the turbine to energy imparted to the wheel

Answer: a

14. In a reaction turbine, the draft tube is used to _____

    a) To increase the head of water by an amount that is equal to the height of the runner outlet above the tail race

    b) To prevent air to enter the turbine

    c) To increase pressure energy of water

    d) To transport water to downstream

Answer: a

15. In reaction turbine hydraulic efficiency is_____

    a) Ratio of actual work at the turbine to the energy imparted to the wheel

b) Ratio of work done on the wheel to energy that is supplied to the turbine

c) Ratio of power produced by the turbine to the energy actually supplied by the turbine

d) Ratio of Work done on the wheel to the energy (or head of water) actually supplied to the turbine

Answer: b

16. The working of which of the following hydraulic units is based on Pascal's law?

a) Air lift pump

b) Hydraulic coupling

c) Hydraulic press

d) Jet pump

Answer: c

17. Which kind of turbine is a Pelton Wheel turbine?

a) Tangential flow turbine

b) Radial flow turbine

c) Outward flow turbine

d) Inward flow turbine

18. In what type of turbine water enters in radial direction and leaves axial direction?

a) Tangential flow turbine

b) Axial flow turbine

c) Outward flow turbine

d) Mixed flow turbine

Answer: d

19. Among the following which turbine requires more head?

a) Pelton Turbine

b) Kaplan Turbine

c) Francis turbine

d) Tube Turbine

Answer: a

20. Total head of turbines is_____

a) Pressure head + Static head

b) Kinetic head + Static head

c) Static head + Pressure head

d) Pressure head + Kinetic head + Static head

Answer: d

21. Head under which Kaplan turbine is operated_____

a) 10-70 meters

b) 70 -100 meters

c) 100-200 meters

d) Above 200 meters

Answer: a

22. Head under which Francis turbine is operated?

a) 10-70 meters

b) 70-100 meters

c) 100-200 meters

d) 40-600 meters

Answer: d

23. The turbine is preferred for 0 to 25 m head of water?

a) Pelton wheel

b) Kaplan turbine

c) Tube turbine

d) Francis turbine

Answer: b

24. Under what head is Pelton turbine operated?

a) 20-50 meters

b) 15-2000 meters

c) 60-200 meters

d) 50-500 meters

Answer: b

25. The head available at inlet of turbine is _____

a) Net positive suction head

b) Gross head

c) Net head

d) Manometric head

Answer: c

26. The difference between gross head and friction losses is _____

a) Net head

b) Gross head

c) Manometric head

d) Net positive suction head

Answer: a

27. _____ is defined as ratio between power delivered to runner and power supplied at inlet of turbine.

a) Mechanical efficiency

b) Volumetric efficiency

c) Hydraulic efficiency

d) Overall efficiency

Answer: c

28. The ratio of power at the shaft of turbine and power delivered by water to runner is known as?

a) Mechanical efficiency

b) Volumetric efficiency

c) Hydraulic efficiency

d) Overall efficiency

Answer: a

29. The product of mechanical efficiency and hydraulic efficiency is known as?

a) Mechanical efficiency

b) Volumetric efficiency

c) Hydraulic efficiency

d) Overall efficiency

Answer: d

30. Among the following which turbine has highest efficiency?

a) Kaplan turbine

b) Francis turbine

c) Pelton turbine

d) Propeller turbine

Answer: a

31. _____ is ratio of volume of water actually striking the runner and volume of water supplied to turbine.

a) Mechanical efficiency

b) Volumetric efficiency

c) Hydraulic efficiency

d) Overall efficiency

Answer: b

32. To obtain maximum hydraulic efficiency of pelton turbine, blade velocity should be _____ Times the inlet velocity of jet.

a) Half

b) One quarter

c) Twice

d) Thrice

Answer: a

33. Among the following which turbine has least efficiency?

    a) Pelton turbine

    b) Kaplan turbine

    c) Francis turbine

    d) Propeller turbine

Answer: a

UNIT- V HYDRAULIC PUPMS

1. Centrifugal pump is a_____

    a) Turbomachinery

    b) Flow regulating device

    c) Drafting device

    d) Intercooling device

Answer: a

2. The main function of centrifugal pumps are to _____

    a) Transfer speed

    b) Transfer pressure

    c) Transfer temperature

    d) Transfer energy

Answer: d

3. Centrifugal pumps transfer energy from _____

    a) Rotor to fluid

    b) Fluid to rotor

    c) Draft to rotor

    d) Rotor to draft

Answer: a

4. Turbines and compressors work with the gas, while centrifugal pump transfers energy.

    a) True

    b) False

5. The inlet passage of water entry is controlled by _____

    a) Head race

    b) Gate

    c) Tail race

    d) Pump

Answer: b

6. Centrifugal pumps are used to transport _____

a) Pressure

b) Speed

c) Power

d) Fluid

Answer: d

7. 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

Answer: a

8. The fluid coming into the centrifugal pump is accelerated by _____

a) Throttle

b) Impeller

c) Nozzle

d) Governor

Answer: b

9. The fluid gains _____ while passing through the impeller.

a) Velocity

b) Pressure

c) Temperature

d) Velocity and pressure

Answer: d

10. What is the shape of the diffuser in the centrifugal pump?

a) Round

b) Dough nut

c) Rectangle

d) Cylindrical

Answer: b

11. When the casing in a centrifugal pump decelerates the flow, what increases?

a) Pressure

b) Temperature

c) Volume

d) Flow rate

Answer: a

12. The velocity imparted by the impeller is converted into _____

    a) Pressure energy

    b) Kinetic energy

    c) Momentum

    d) Potential energy

Answer: a

13. What is a major advantage of centrifugal pump?

    a) Cost

    b) Simple in construction

    c) Efficiency

    d) Pump parameters

Answer: b

14. Centrifugal pumps are used to transport _____

    a) Pressure

    b) Speed

    c) Power

    d) Fluid

Answer: d

15. Different velocities in a centrifugal pump are determined by using _____

    a) Velocity triangle

    b) Reynolds number

    c) Froude number

    d) Overall efficiency

Answer: a

16. With the increase in the input power, efficiency _____

    a) Increases

    b) Decreases

    c) Same

    d) Independent

Answer: b

17. Reciprocating pump is a _____

    a) Negative displacement pump

    b) Positive displacement pump

    c) Diaphragm pump

    d) Emulsion pump

Answer: b

18. What happens to the reciprocating pump when left untouched?
    a) Efficiency decreases
    b) Wear and tear
    c) Surface expansion
    d) Pressure change

Answer: c

19. Reciprocating pumps operate by drawing _____ into the chamber
    a) Liquid
    b) Pressure
    c) Heat
    d) Electricity

Answer: a

20. The cylinder of reciprocating cylinder is made up of _____
    a) Cast iron
    b) Wrought iron
    c) Aluminium
    d) Copper

Answer: a

21. Reciprocating pumps are also called as _____
    a) Force pumps
    b) Mass Pumps
    c) Heat pumps
    d) Speed pumps

Answer: a

22. Reciprocating pumps are classified according to _____
    a) Drag force
    b) Number of cylinders
    c) Shock waves
    d) Flow speed

Answer: b

23. Internal cavitation in reciprocating pumps occurs due to _____
    a) Drag force
    b) Cyclic stress
    c) Shock waves
    d) Flow speed

Answer: c

24. Operation of reciprocating motion is done by a _____ source

    a) Power

    b) Energy

    c) Momentum

    d) Inertia

Answer: a

25. High pressure reciprocating pumps are generally from 1500 HP.

    a) True

    b) False

Answer: a

26. Reciprocating pump is divided into how many types, based on its cylinders?

    a) 0

    b) 5

    c) 2

    d) 3

Answer: b

27. What type of flow does the reciprocating pump have?

    a) Uniform

    b) Continuous

    c) Pulsating

    d) Non-uniform

Answer: b

28. The maximum speed of reciprocating pump is _____

    a) 20m/min

    b) 30m/min

    c) 40m/min

    d) 50m/min

Answer: b

29. In a reciprocating pump, with the change in discharge pressure, _____

    a) The Volume delivered increases

    b) The volume delivered decreases

    c) Volume delivered remains the same

    d) Volume delivered is independent

Answer: c

30. If the slip is above 5 percent, the pumps needs to be _____

    a) Dragged

b) Overhauled

c) Retracted

d) Intermittent

Answer: b