BRAINWARE UNIVERSITY

Term End Examination 2023
Programme – B.Tech.(ME)-2021/B.Tech.(CE)]-2021
Course Name – Fluid Machinery
Course Code - PCC-ME403
(Semester IV)

Full Marks : 60
Time : 2:30 Hours
[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question)
1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Choose the correct turbine whose inlet and outlet blade velocities of vanes are equal.

    a) Francis turbine
    b) Kaplan turbine
    c) Pelton turbine
    d) Propeller turbine

(ii) Pelton turbine is operated under_____

    a) Low head and high discharge
    b) High head and low discharge
    c) Medium head and high discharge
    d) Medium head and medium discharge

(iii) Tangential velocity of blade of Pelton wheel is proportional to _____

    a) Speed of wheel
    b) Angular velocity of wheel
    c) Rpm of wheel
    d) Speed, angular velocity, RPM of the wheel

(iv) _____ Number of jets, generally employed in an impulse turbine without jet interference.

    a) 2
    b) 3
    c) 4
    d) 6

(v) _____ types of turbines can be classified on the basis of direction of flow through runner.

    a) 6
    b) 3
    c) 4
    d) 7

(vi) _____ is the water flow direction in the runner of a Francis turbine.

    a) Axial and then tangential
    b) Tangential and then axial
    c) Radial and then axial
    d) Axial and then radial

(vii) Identify the correct equation which is applied to determine the flow.

    a) Newtons equation
    b) Rutherford's equation
    c) Bernoulli's equation
    d) Faradays equation

(viii) Turbomachines work under _____

    a) Newtons first law
    b) Newtons second law
    c) Newtons third law
    d) Kepler's law

(ix) 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

(x) The fluid coming into the centrifugal pump is accelerated by _____

    a) Throttle   b) Impeller

    c) Nozzle   d) Governor

(xi) The ratio of actual mass flow rate ($\dot{m}$ to ideal mass flow rate ($\dot{m}i$) is called as_____

    a) nozzle coefficient   b) coefficient of nozzle friction

    c) coefficient of discharge   d) coefficient of mass

(xii) Choose the correct shape of the diffuser in the centrifugal pump.

    a) Round   b) Dough nut

    c) Rectangle   d) Cylindrical

(xiii) Choose the correct from following is not a characteristic curve for centrifugal pump.

    a) Transfer speed vs Transfer pressure   b) Head vs Flow rate

    c) Power input vs pump efficiency   d) Specific speed vs pump efficiency

(xiv) Unit speed is directly proportional to_____

    a) Head race distance   b) Specific speed

    c) Pressure   d) Turbine performance

(xv) Choose the correct type of runners in ehich the velocity of whirl at inlet is greater than the blade velocity.

    a) Such a case is practically impossible   b) Slow Runner

    c) Medium Runner   d) Fast Runner

Group-B
(Short Answer Type Questions)
         3 x 5=15

2. Write down the use of a centrifugal pump.   (3)
3. Describe the significance of Euler's equation for fluid machines.   (3)
4. Describe the moment of momentum equation   (3)
5. Distinguish between impulse and reaction turbines   (3)
6. Classify Steam Turbines.   (3)

OR

    Explain the losses of steam turbine   (3)

Group-C
(Long Answer Type Questions)
         5 x 6=30

7. Briefly explain different types of draft tube with neat sketches used in reaction hydraulic turbines.   (5)
8. With the help of neat diagram describe the construction and working of a Pelton wheel.   (5)
9. Explain the principle of operation of the steam turbine.   (5)
10. Explain the various casings used in centrifugal pumps with a neat sketch.   (5)
11. Explain the working principle of Parson's turbine.   (5)
12. Write the classification of the steam turbine and explain the construction of an impulse turbine with a neat sketch.   (5)

OR

    Explain the principle, construction, and working of the reaction turbine.   (5)

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