

Program: BE CIVIL Engineering
Curriculum Scheme: Revised 2016
Examination: Third Year Semester V

Course Code: CEC 503 and Course Name: Applied Hydraulics

Time: 1 hour

Max. Marks: 50

Note to the students:- All Questions are compulsory and carry equal marks .

Q1.	What is statement the moment of momentum _____
Option A:	the resulting torque acting on a rotating fluid is equal to the rate of change of moment of momentum
Option B:	the net force acting on a fluid mass is equal to the change in momentum of lay per unit time in that direction
Option C:	the change of Velocity is equal to the resulting torque acting on a rotating fluid
Option D:	the rate of change of momentum is equal to the resulting torque acting on a rotating fluid
Q2.	Estimate the hydraulic depth for a most economical circular channel section in case of maximum velocity.
Option A:	0.2D
Option B:	0.3D
Option C:	0.4D
Option D:	0.5D
Q3.	What is the SI unit of momentum?
Option A:	Kg.m/s
Option B:	Kg. m/s ²
Option C:	Kg. m/s ³
Option D:	Kg.m ²
Q4.	The dimensional formula of coefficient of viscosity is
Option A:	[MLT]
Option B:	[M 'L°T °]
Option C:	[M ¹ L ⁻¹ T ⁻¹].
Option D:	[MLT ²]
Q5.	Which among the following have same forces acting upon them
Option A:	Geometrical similarity
Option B:	kinematic similarity
Option C:	Dynamic similarity
Option D:	conditional similarity
Q6.	The force exerted by a jet of water having velocity V on a vertical plate, moving

	with a velocity u is given by
Option A:	$\rho a (V-u)^2 \sin^2 \theta$
Option B:	$\rho a (V-u)^2$
Option C:	$\rho a (V-u)^2 [1 + \cos \theta]$
Option D:	$\rho a (V-u)^2 [1 - \cos \theta]$
Q7.	A jet of water of diameter 10cm strikes a flat plate normally with a velocity of 15m/s. The Plate is moving with a velocity of 6m/s in the direction of the jet and away from the jet. What will be the force exerted by the jet on the plate?
Option A:	789.15 N
Option B:	859.35 N
Option C:	974.12 N
Option D:	636.17 N
Q8.	The force exerted by a jet of water on an unsymmetrical moving curved plate when jet strikes tangentially at one of its tips is
Option A:	$\rho AV (V_{w1} + V_{w2})$
Option B:	$\rho AV_{r1} (V_{w1} + V_{w2})$
Option C:	$\rho V_{r1} (V_{w1} + V_{w2})$
Option D:	$AV_{w1} (V_{r1} + V_{r2})$
Q9.	The force exerted by a jet on a curved plate is
Option A:	Less than that on flat plate
Option B:	Equal to that on a flat plate
Option C:	More than that on a flat plate
Option D:	Sometime more and sometimes less than that on a flat plate
Q10.	jet after striking a smooth plate comes out with a _____ velocity.
Option A:	Increased
Option B:	Decreased
Option C:	Same
Option D:	Zero
Q11.	The velocity of the flow through the Kaplan turbine is 25m/s. The available head of the turbine is 60m. Find the flow ratio of the turbine (take $g = 10\text{m/s}^2$).
Option A:	0.65
Option B:	0.72
Option C:	0.69
Option D:	0.23
Q12.	In the outlet velocity triangle of a Kaplan turbine, $\beta_2 = 30^\circ$, $V_{f2} = 5\text{m/s}$. What is the relative velocity, V_{r2} of the flow at outlet?
Option A:	10m/s
Option B:	5.77m/s
Option C:	8.66m/s
Option D:	2.88m/s

Q13.	Which of the following is an impulse turbine?
Option A:	Pelton turbine
Option B:	Francis turbine
Option C:	Kaplan turbine
Option D:	Propeller turbine
Q14.	Inward radial flow reaction turbine is a turbine in which water flows across the blades of runner _____
Option A:	Radial direction
Option B:	Radially inward
Option C:	Radially outward
Option D:	Axial direction
Q15.	In inward radial flow reaction turbine the ratio of tangential wheel at inlet to given velocity of jet is known as _____
Option A:	Speed ratio
Option B:	Flow ratio
Option C:	Discharge
Option D:	Radial discharge
Q16.	A lawn sprinkler has two nozzles of diameter 10 mm each at the end of a rotating arm and the velocity of flow of water from each nozzle is 12 m/sec. One nozzle discharges water in the downward direction, while the other nozzle discharges water vertically up. The nozzles are at distance of 42 cm from the center of the rotating arm. Determine the torque required to hold the rotating arm stationary.
Option A:	9.5004 Nm
Option B:	95.004 Nm
Option C:	950.04 Nm
Option D:	9500.4 Nm
Q17.	_____ is the electric power obtained from the energy of the water.
Option A:	Roto dynamic power
Option B:	Thermal power
Option C:	Nuclear power
Option D:	Hydroelectric power
Q18.	Which is not the main part of centrifugal pump
Option A:	Impeller
Option B:	Casing
Option C:	Suction pipe
Option D:	breaking jet
Q19.	find the head developed by one pump. If $N = 800$ rpm, $N_s = 25$, $Q = 0.16 \text{ m}^3/\text{s}$, total head = 89 m

Option A:	29.94 m
Option B:	31.45 m
Option C:	45.78m
Option D:	54.78 m
Q20.	Calculate the mean hydraulic radius for a channel having 20m ² cross sectional area and 50m of wetted perimeter.
Option A:	0.4 m
Option B:	0.5 m
Option C:	0.6 m
Option D:	0.7 m
Q21.	A circular channel has diameter 0.6 m. Calculate the depth of channel (d) and hydraulic mean depth (m) for maximum velocity.
Option A:	d= 0.486 m & m= 0.18 m
Option B:	d= 0.686 m & m= 1.18 m
Option C:	d= 1.686 m & m= 2 m
Option D:	d= 0.286 m & m= 0.08 m
Q22.	Impulse turbine requires
Option A:	High head and low discharge
Option B:	High head and high discharge
Option C:	Low head and low discharge
Option D:	Low head and high discharge
Q23.	For a given specific energy E, the critical depth Y _c for a rectangular channel is given by
Option A:	$Y_c = \frac{3}{2}E$
Option B:	$Y_c = \frac{2}{3}E$
Option C:	$Y_c = \frac{4}{5}E$
Option D:	$Y_c = \frac{3}{5}E$
Q24.	Flow through venture flume is maximum when the depth at the throat is
Option A:	Half
Option B:	One-third
Option C:	Two-third
Option D:	Equal to the total energy of flow
Q25.	What is the Froude's number for a channel having mean velocity 5.65 m/s and mean hydraulic depth of 4m?
Option A:	0.7 m
Option B:	0.65 m

Option C:	0.8 m
Option D:	0.9 m