DR KALAMPOLYTECHNIC COLLEGE
DEPARTMENT OF CIVIL ENGINEERING
HYDRAULICS

UNIT -1

PART-A

1. What is static pressure ?
2. Define capillarity
3. Define centre of pressure
4. Define total pressure
5. What is micro manometer
6. What is pizometer
7. Define viscosity
8. In terms MLT write the dimension of power
9. What are the type of mechanical pressure gauge?
10. Define surface tension
11. Define vapors pressure
12. Define gauge pressure
13. Define specific gravity
14. Define intensity of pressure
15. State pascal's law
16. Define compressibility.
17. Explain gauge, absolute and vacuum pressure.
18. Define cohesion and adhesion.
19. Define mass density and specific gravity and state their units
20. Describe different types of manometer.

PART-B

1. Write the dimensions and units for density, discharge and power? (APR-2014)

2. What is the absolute pressure in KN/m^2 (a) when the gauge pressure at a point is 2m of a water. (b) when the vacuum pressure at a point is 200mm of mercury(vacuum) . (APR -2014)

3. Explain the term atmospheric pressure, gauge pressure, vacuum pressure and absolute pressure? (OCT -2014)

4. Find the depth of oil of relative density 0.80, which will produce a pressure intensity of $5000N/m^2$. Find the corresponding pressure head in term water and mercury. ? (OCT -2014)

5. A U- tube containing mercury has its two limbs connected to two pressure points in a pipeline carrying oil of relative density 0.85. if the deflection of mercury is 0.50m, Find the differential pressure in term of meters of oil and meters of water. ? (OCT-2014)

6. Calculate the pressure due to a column of 0.2m of (a) water (b) an oil of specific gravity 0.9 and (c) mercury of specific gravity 13.6.

a. (APR - 2015)

7. Two pressure points in pipe carrying water are connected to an U-tube mercury manometer. Calculate the difference in pressure in Pascal's, if the deflection of mercury is 0.5m in the manometer.(OCT -2015)

8. Describe different types of manometer.

9. The pressure water at point in a pipe line is $5N/m^2$.What is the corresponding pressure head in terms of water? What is

the corresponding pressure head in terms of kerosene of specific gravity 0.8?

10. A circular plate 2m diameter is inverted vertically water such that the center is depth of 2m from the free water surface. find the total pressure and depth of center pressure.

11. A triangular plate base of 2m and height of 4m is inverted of specific such away that it's plan inclined at 30^0 to the horizontal place of the plan parallel it's depth of 1.5m above the free water surface oil 0.8.find the total pressure and depth of center pressure.

12. A simple manometer containing mercury useful to measure of oil flatting the pipe line the mercury level in over the tube is 90mm and height of oil in other side tube is 40mm above the taken tube in the relative density of oil 0.8. Find the intensity of pressure in Pascal all so the pressure in water of meter.

UNIT -2
PART-A

1. List the type of flow of pipe.
2. Type of losses of pipe.
3. Define uniform flow.
4. Define small orifice
5. What is mean by vena contracta?
6. Define co - efficient of contraction in orifice.
7. Different between laminar and turbulent flow
8. What is mouth piece?
9. Define critical depth
10. How are mouth piece.
11. What is limitation Bernoulli's theorem?
12. What is the major of the head?
13. What is an orifice?
14. What is turbulent flow ?
15. State bernoulli's thermo.
16. Explain the term vena- contracta.

PART-B

1. A venture meter is inside in a horizontal pipe line 0.3m dia the dia of the thread is 0.15m different normal manometer s0 the deflection of 0.2m determine the discharge of the Cd =0.98 specific gravity 0.9

2. An Orifice meter is fitted in pipe line 0.5m dia carry rate of tank diagram of 0.2m is treat is meter as 300mm is Cd =0.82.determine the pressure height discharge line.

3. A water jet issuming from an orifice 0.025mdia,water head 100cm falls 0.035m vertically in horizontal distance of 0.35m from vena contracta if $1.35*10^{-3}$ m^3/s. determine i.Cd ii. Cv iii. Cc

4. A pipe of $0.09m^2$ area suddenly enlarge to $0.36m^2$ area the discharge in the pipe is $0.283m^3/s$ the pressure at smaller part the pipe $84.4*10^3$ pascal determine i. Velocity at smaller part ii. Velocity large part iii. Loss of head due to sudden enlargement.

5. A rectangular orifice pipe fitted in the side of large time 2500mm wide and 1000mm deep depth of water upstream above the top edge 1500mm if the orifice of discharge. Freely in to atmospheric discharge. Calculate the discharge Cd=0.62 i. Using small orifice ii. Using large orifice iii. Estimate the percentage of error. (APR -2014)

6. A pipe 3000mm long vertical in tapers from 0.3m dia at higher end 0.5m dia lower end continuity of water flowing is o.$30m^3/s$. Pressure at large at lower end 58.86

N/mm^2.calculate i. Velocity the lower ii. Velocity higher end iii. Pressure at higher end. (OCT – 2014)

7. Compare venturimeter and orifice meter.
   State an give the mathematical expressions for (i) Equation for continuity of flow (ii) Bernoullis theorem.

8. A pipe line tape as from 100mm to 50mm dia. The quantity of water flowing is $0.10m^3/s$. find the average velocities at the two sections.

9. A pipe 3m long is vertical. It tapers from 300mm dia at the high end to 500mm at the low end. Quantity of water flowing is 300lps. Pressure at the low end is $58.86X10^3$pa. find (a) velocity at low end (b) velocity at high end and (c) pressure at high end. (OCT -2014)

10. The section of a tapering pipe varies from 200mm to 50mm . the larger end and the smaller end or at a height 5m and 3m above the datum respectively. the pressure of water at the larger section is $490.5x10^3$ pa and the velocity of flow at the large section is 1m/s . determine the velocity and pressure at the smaller section. (APR -2015)

UNIT -3
PART-A

1. Define notch
2. Define crest and nape?
3. What is weir?
4. Types of weir?
5. What is spillways?
6. What is cippletted weir?
7. Explain end contraction of weir?
8. What is mean by velocity approach?
9. Using franic's formula for discharge?
10. Using basins formula for discharge?
11. Using formula for discharge rectangular notch?
12. Using formula for discharge triangular notch?
13. Using formula for discharge end contraction?
14. Using formula for discharge stepped weir?
15. What is ogee weir?
16. What is siphon spillway of a dam?
17. What are the advantages of V- notch over rectangular notch?

PART-B

1. Derive the equation for discharge through a triangular notch. (APR - 2014)
2. A trapezoidal weir with a sill length of 6m and side slope 1:1 discharge surplus water. From a tank with a head of 0.6m.if this discharge flows over a rectangular weir to the Same head, what would be length of the weir? Account for end contraction C_d =0.60 for both the weir. (APR - 2014)
3. A triangular notch is discharging under a head of 0.7m. If the co-efficient of discharge of the notch is 0.60 and the angle of the notch is 60^0, Find the discharge. (OCT - 2014)
4. A rectangular notch 2 meters wide has constant head of 500mm. find the discharge over the notch in lps if co efficient of discharge for the notch is 0.62
5. Write short notes on End contraction of a weir and sketch it.
6. A rectangular weir 6m long is divided in to three equal bays by two vertical post each 0.3m thick.find the discharge when the head is 0.45m using bazin's formula.
7. Derive the equation for discharge through a rectangular notch.
8. Water flow over a rectangular notch of 1m length over a depth of 200mm. then the same quantity of water passes through a right angled triangular notch .take the Cd value for rectangular triangular notch as 0.61 and 0.58 respectively.
9. A rectangular weir is 2m long and has a head of 0.675m find the discharge. Account for end contraction. Take Cd=0.62

10. A submerged weir 3m long has upstream and downstream water levels. 2m and 1m respectively above the crest of the weir. Find the discharge over the weir. Take co efficient of discharge for the free portion as 0.62 and that for the drowned portion as 0.83.

UNIT -4
PART-A

1. What is mean by open channel?
2. State the two use of lining canals.
3. Mention the types of open channel.
4. What is condition for an economical rectangular section
5. What are contour canals
6. What is mean by hydraulics mean depth.
7. Define critical depth.
8. Method of measurement of velocity channels.
9. Write the chez's formula for open channel
10. State the formula mannin^{g}'s discharge
11. Define specific energy of liquid?
12. Define hydraulic mean depth.
13. Define wetted perimeter
14. Define hydraulic slope.
15. Define bazin's formula , kutter's formula , manning's formula.
16. Define specific energy , critical depth, critical velocity.
17. What are the types of lining?

PART-B

1. Find the discharge rectangular channel with 2m having a bed slope 1 in 2000 deep of the through 1.5m and the value of mannin^{g}'s constant N may be taken as 0.012. (apr-14)
2. Define canal with types explain them. Ii. Advantage of lining canals.
3. Explain any two methods of measurement of velocity in an open channel
4. Design on earthen trapezoidal channel with a velocity of 1 m/s to discharge 3m^3/s.have in side slope of 2 in 1 C = 55.
5. An economical rectangular channel has a discharge 15 cumecs with a velocity 1.60 m/s. Taking chezy's constant as 60.Find the depth of flow, bed width, bed fall.
6. A trapezoidal channel is 3m wide and slope 1:1 water with a depth of 1m is bed slope is 1 in 1600 estimate the discharge take value of N may be 0.04 manning's.
7. Write short notes on types of channels. (APR -2015)
8. Write in details about the advantages of lining of canals. (APR 2015)
9. A trapezoidal channel is 5m wide at bottom. The side slope are 1:1. The bed fall is 1 in 1600 and C IS 50. Find the discharge when the depth of flow is 1m. (APR -2015)
10. A rectangular channel is 2m wide and depth of flow is 1m. if the discharge is 1.18 m^3/s and K is 1.54, using bazin's formula . find the longitudinal slope of the channel.

(OCT -2014)

11. Design a trapezoidal channel with a velocity of flow of 1m/s to discharge 4.5m^3/s . Assume side slopes of 1 to 1 and C = 50. (OCT -2014)

UNIT -5

PART-A

1. Define specific yield weir?
2. What are the different efficiency of centrifugal pump
3. Define water table.
4. Define yield of well.
5. Define specific energy of liquid?
6. Types of well construction.
7. What are the Types of reciprocating pump.
8. List the factor affecting yield of pump
9. What are selection of pump
10. Define lift and maximum recomental section
11. Define pump.
12. Define Classification of pump.
13. What is aquifer?
14. Define Dam proof used pump.

PART B

1. Define bore well? Types explain them. (OCT -2014)
2. A single acting reciprocating pump has a plunger diameter of 500mm and stroke of 0.40m.The speed of the pump is 60rpm and the coefficient of discharge is 0.97.Determine i)actual discharge ii)percentage of slip of the pump. (OCT -2014)
3. What is rainwater harvestings and method of rain water harvestings. (OCT -2014)
4. A centrifugal pump delivery to a pipe 40lps of water to a height of 20m through the pipe of 100mm dia and 100m long if the overall efficiency 75%.Find the power (APR -2015)
5. A double acting reciprocating pump has a plunger diameter of 125mm and stroke of 0.25m.The speed of the pump is 30rpm and the coefficient of discharge is 0.97.Determine i)actual discharge ii)percentage of slip of the pump (APR -2015)
6. Write in short notes on open well and explain..ii. Write short notes on types of well construction (APR -2015)
7. What is mean by sanitary production of well and explain them and measure?
8. State explain the various method of tapping ground water
9. Draw centrifugal pump and reciprocating pump with components parts.
10. Write short notes on exploring the availability of ground water. (APR – 2014)
11. Write short notes on working and action of a centrifugal pump. (APR – 2014)
12. Write short notes on any one method of testing for yield of well. (APR – 2014)
13. A double acting reciprocating pump has a stroke of 0.25m and C piston diameter of 125mm. the center of the pump is 4m above the level of water in the sump and 30m below the delivery valve. If the pump is working at 30 rpm , find the theoretical power required to drive the pump. (APR – 2014)