C16-**C-303**

6224

BOARD DIPLOMA EXAMINATIONS

SEPTEMBER/OCTOBER - 2020

DCE – THIRD SEMESTER

HYDRAULICS

Time: 3 hours Max. Marks: 80

PART – A **3 X 10 = 30**

Instructions: *1. Answer **all** questions.*
*2. Each question carries **Three** Marks.*
3. Answer should be brief and straight to the point and should not exceed Five simple sentences.

1. Define the terms a) Surface tension and b) Capillarity
2. Determine the height of an oil column of specific gravity0.9, Which will cause a Pressure of 3 N/mm^2. What shall be the height of mercury column corresponding to this pressure?
3. State any three limitations of Bernoulli's theorem.
4. List the classification of orifices based on their shape, size and sharpness.
5. Define a notch and state types of notches based on the shape of opening.
6. Differentiate between sharp crested weir and broad crested weir.
7. Define laminar flow and turbulent flow in a pipe flow.

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8. State Darcy-weisbach equation for head loss due to friction in pipes and name the terms.

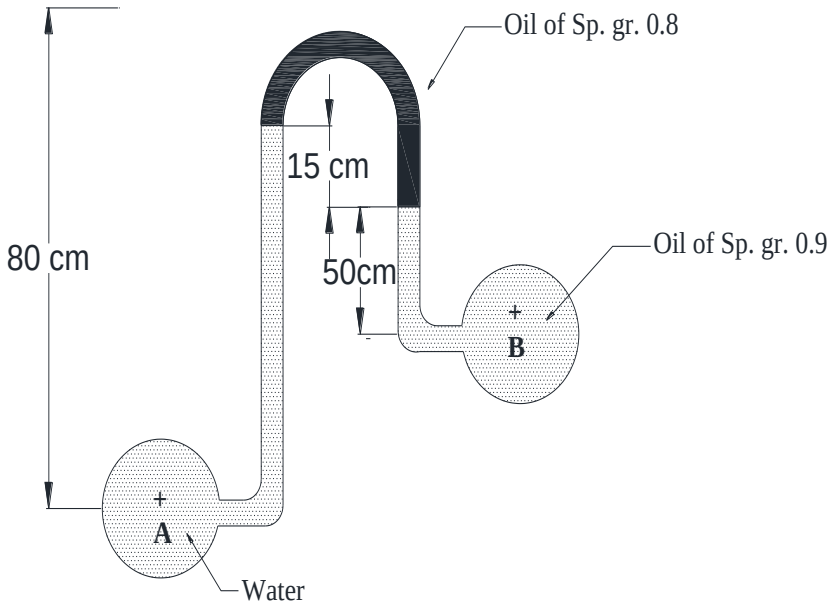
9. Write any three differences between Centrifugal and Reciprocating pumps.

10. Write any three functions of a surge tank.

PART – B **5 X 10 = 50**

Instructions: *1. Answer any **Five** questions*
*2. Each question carries **TEN** Marks.*
3. Answer should be comprehensive and a criterion for valuation is the content but not the length of the answer.

11. An inverted differential manometer, when connected to pipes A and B gives the readings as shown in below figure. Determine the pressure of pipe 'B' if the pressure in pipe A is 0.1 N/mm^2.



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12. A pipe 320 mm long slopes down at 1 in 80 and taper from 600 mm dia at the high end to 300 mm dia at the lower end and carries 1000 lilt/sec of oil of specific gravity 0.8. If the pressure gauge at lower end reads 60 kPa, Determine the velocities at the two ends and the pressure at the high end. Neglect all losses.

13. A Circular tank of diameter 3 m contains water up to a height of 8 m. An orifice of diameter 600 mm is provided at the bottom of the tank. Find the time required a) To lover water level from 8 m to 3 m

b) For completely emptying the tank.

Take C_d as 0.62.

14. Determine the discharge over a broad crested weir 20 m long with a head of 70 cm over the crest. $C_d = 0.95$. The width of approach channel is 40 m and its depth below the crest of weir is 60 cm.

15. Two reservoirs are connected by a straight pipe of 300 mm diameter and in the first half of the length. Then it suddenly changes to 200 mm diameter for the second half of the length. The difference of water levels in the two tanks is 20 m. The distance between the two reservoirs is 2000 m. Determine the discharge neglecting all other losses except frictional loss. Assuming the coefficient of pipe friction as 0.008.

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16. A main pipe divides into two parallel pipes which again form into one pipe. The length and diameter for the first parallel pipe are 2000 m and 1.0 m respectively, while the length and diameter of second parallel pipe are 2000 m and 0.8 m. Find the rate of flow in each parallel pipe, if total flow in the main is 3.0m^3/s. The co-efficient of friction for each parallel pipe is same and equal to 0.005.

17. A most economical trapezoidal channel has an area of flow 3.33 m^2. Find the discharge in the channel when running 1 m deep. Take C = 60 and bed slope 1 in 800.

18. Explain the working of single-acting reciprocating pump with the help of a neat sketch.