6224

BOARD DIPLOMA EXAMINATION, (C-16)

MAY/JUNE—2023

DCE - THIRD SEMESTER EXAMINATION

HYDRAULICS

Time : 3 Hours]　　　　　　　　　　　　　　　　　　[*Total Marks* : 80

PART—A　　　　　　　　　　　3×10=30

Instructions :　(1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Define viscosity. Write the units of dynamic viscosity and kinematic viscosity.

2. A tank contains water to a depth of 2.5 m and oil of specific gravity 0.8 to a depth of 3 m. What is the intensity of pressure at the bottom of the tank?

3. Define *(a)* uniform flow and *(b)* steady flow.

4. What is vena-contracta? State the various hydraulic co-efficients.

5. Define weir. What are the classifications of weirs based on shape of the opening?

6. What are the advantages of V-notch over a rectangular notch?

7. List out any three minor losses in pipe flow giving formula for each.

8. Define most economical section in open channel flow.

9. Define turbine. Name any three turbines.

10. Sketch a typical hydroelectric installation and name the parts.

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. A U-tube differential manometer is used to find out a pressure difference of liquids in pipe A and pipe B as shown in figure (1). If the pipe A contains liquid of specific gravity 1·6 and pipe B contains water, find the difference of pressure between the two points A and B. 10
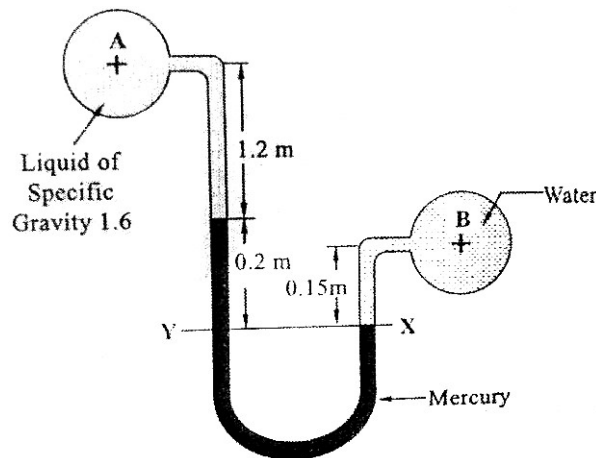
(1)

12. The diameter of a pipe changes gradually from 150 mm at a point A to 80 mm at a point B are situated at 20 m and 14 m respectively above the datum. The pressure at A is 0.2 N/mm^2 and velocity of flow at A is 1.1 m/sec. Neglect losses between A and B, determine the Pressure at B. 10

13. An internal mouth piece of diameter 60 mm is discharging water under a constant head of 9 m. Find the discharge in lit/s, if the mouthpiece is *(a)* running free, take C_d = 0.5 and *(b)* running full, take C_d = 0.707. 5+5

14. A rectangular notch has a discharge of 21.5 m^3/min, when the head of water is half the length of the notch. Find the length of the notch. Take C_d = 0.6. 10

15. Two pipes of lengths 2 kms each and diameter lm and 0.8 m respectively are connected in parallel. The co-efficient of friction for each pipe is 0.01 and the total flow is 300 lit/s. Find the rate of flow in each pipe.   10

16. A compound piping system consists of three pipes of lengths 1200 m, 1000 m and 800 m and of diameters 0.5 m, 0.4 m, 0.3m respectively are connected in series. Convert the system to (a) an equivalent length of 0.5 m diameter pipe and (b) an equivalent size pipe 3000 m long.   5+5

17. A trapezoidal channel has side slopes 1 : 1 and is discharging 20 m^3/s with a bed slope of 0.5 m per 1000 m. Use Manning's formula and take n = 0.01. Design the most economical channel section.   10

18. Distinguish between centrifugal pump and reciprocating pump.   10

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