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C16-C-303

**6224**

**BOARD DIPLOMA EXAMINATION, (C-16)**

**JUNE/JULY—2022**

**DBME - 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. State the values of specific weight, mass density and specific gravity for water.
2. List the different types of pressure measuring devices.
3. State and explain the equation of continuity of flow.
4. Define coefficient of discharge, coefficient of velocity and coefficient of contraction.
- \* 5. State the formulae for the discharge over rectangular and triangular notches.
6. Define notch and weir.
7. Define laminar flow and turbulent flow in pipe flow.
8. Write any three differences between flow through pipes and flow through open channel.
9. What is turbine? List the different types of turbines.
10. Sketch a typical hydroelectric power plant layout and name the parts.

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**PART—B**

10×5=50

- 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. Determine the total pressure and depth of centre of pressure on a rectangular plate of 1 m wide and 3 m deep when its upper edge is horizontal and coincides with the water surface and immersed vertically.
12. Water is flowing through a horizontal tapering pipe *AB* with a discharge of 0.6 cumecs. The diameters at *A* and *B* are 30 cm and 60 cms if the pressure at *A* is 7.4 m of water. Find the pressure at *B* neglecting the losses.
13. A 25 mm dia. orifice connects two tanks. Water levels on the two sides are 2.0 m and 1.0 m above the axis of the orifice. Calculate the discharge through the orifice. Take  $C_d = 0.61$ .
14. A right angled V-notch was used to measure the discharge of a centrifugal pump. If the depth of water at V-notch is 200 mm, calculate the discharge over the notch in liters per minute. Take  $C_d$  as 0.62.
15. Two reservoirs are connected by a straight pipe 1.6 km long. For the first half of its length, it is 160 mm diameter and then suddenly reduced to 80 mm. The water levels in the two reservoirs differ by 30 m. Tabulate all the losses of head and determine the rate of flow in lt/min. Take  $f = 0.01$ .
16. Calculate the discharge through a pipe of diameter 20 cm when the difference of pressure head between the two ends of the pipes 450 m apart is 4 m of water. Take Chezy's constant as 50.
17. Find the most economical cross-section of a rectangular channel to carry 0.25 m<sup>3</sup>/sec of water when the bed slope is 1 in 1000. Assume  $C = 60$ .
18. Explain the working of double acting reciprocating pump with a neat sketch.

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