



c16-c-303

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BOARD DIPLOMA EXAMINATION, (C-16)

OCT/NOV—2017

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 the terms (a) mass density (b) specific weight (c) specific gravity.
2. State the relation among atmospheric pressure, gauge pressure and absolute pressure.
3. State any three limitations of Bernoulli's theorem.
4. State the classification of mouth pieces according to shape and according to position.
5. Find the discharge over a triangular notch of an angle 60° when the head over the notch is 0.2 m. Take $C_d = 0.64$.
6. Write any three advantages of V-notch over a rectangular notch.
7. List out any three minor losses in pipes giving formula for each.
8. State empirical formulae for determining the value of Chezy's constant.

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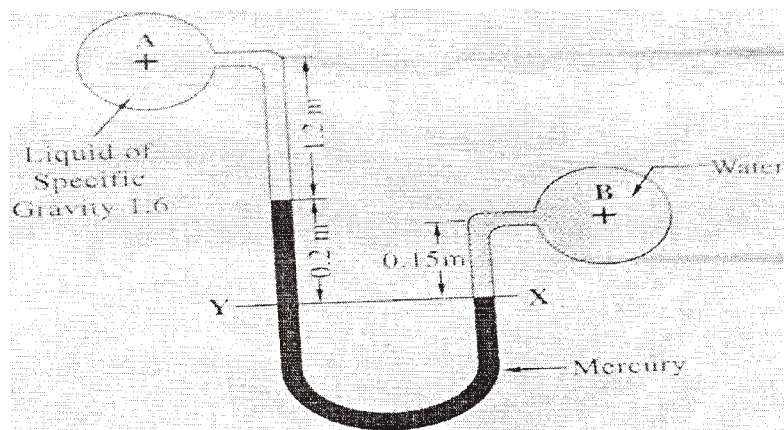
9. What is air vessel and state any two functions of air vessel fitted to a reciprocating pump.
10. Draw a neat sketch of hydroelectric power plant.

PART—B

10×5=50

- Instructions :** (1) Answer any **five** questions.
 (2) Each question carries **ten** marks.
 (3) Answers should be comprehensive and the 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.



12. (a) Write any three assumptions of Bernoulli's theorem. 3
 (b) Water is flowing through a horizontal tapering pipe AB with a discharge of 0.5 cumec. The diameter at A and B are 30 cm and 60 cm. If the pressure at A is 7 m of water, find the pressure at B neglecting the losses. 7
13. (a) Define the terms Coefficient of discharge and coefficient of velocity. 3
 (b) Water is discharged through an external cylindrical mouth piece under a constant head of 4 m. Find the discharge through it, if the diameter of the mouth piece is 4 cm. 7

14. What passing over a rectangular notch flows subsequently over a right angled triangular notch. The length of the rectangular notch is 0.6 m and the coefficient of discharge is 0.62. If the coefficient of discharge of triangular notch is 0.59, what will be the head through the triangular notch when the head over rectangular notch is 0.15 m?
15. (a) State the Darcy's weishbach equation for head loss due to friction in pipes and name the terms. 3
 (b) A 2 km long water main has to carry a discharge of 0.5 cumec. If the maximum allowable loss of head due to friction is 26 m, find the minimum diameter required. Use Darcy's equation. Assume $f = 0.008$. Neglect the minor losses. 7
16. A compound piping system consists of three pipes of lengths 1500 m, 1200 m and 1000 m and diameters 0.5 m, 0.4 m and 0.3 m respectively are connected in series. Convert the system to
 (a) an equivalent Length of 0.4 m diameter pipe;
 (b) an equivalent size of pipe 3700 m long. 5+5
17. A rectangular channel carries water at the rate of 400 litres/sec when bed slope is 1 in 2000. Find the most economical dimensions of the channel. Take manning's constant n as 0.012.
18. Distinguish between centrifugal pump and reciprocating pump.

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