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C16-C-**404**

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BOARD DIPLOMA EXAMINATION, (C-16)
OCTOBER/NOVEMBER-2018
DCE-FOURTH SEMESTER EXAMINATION

THEORY OF STRUCTURES

Time : 3 Hours] [Total Marks: 80

PART-A

3X10=30

Instructions :
1. Answer **All** questions.
2. Each question carries **Three** marks.
3. Answer should be brief and straight to the point and shall not exceed five simple sentences.

1. Calculate the specific weight, mass density and specific gravity of an oil weighting 130 KN and occupies a volume of 15 m^3.
2. Define (a) Gauge pressure (b) Absolute pressure (c) Vacuum pressure.
3. State Bernoulli's theorem and list any two limitations.
4. An internal mouthpiece of diameter 50mm is discharging water under a constant head of 8m. Find the discharge if the mouthpiece is running free.
5. A Broad crested weir 10m long find the maximum discharge the head of water on upstream side of weir 11m. cd = 0.62.
6. Define (a) Notch b) Weir c) Nappe.
7. State formulae for the following minor losses in pipe flows
   a. Head loss due to sudden contraction
   b. Head loss at the entrance of pipe
   c. Loss of energy at the exit from a pipe
8. Define (a) Wetted perimeter (b) Hydraulic Radius (c) Hydraulic depth.
9. List any six main components of a centrifugal pump.
10. Draw a neat sketch of Hydro electric power station and name the components.

PART-B

10X5=50

Instructions :

1. Answer any **Five** questions.
2. Each question carries **ten** marks.
3. Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer

11. (a) Define Total Pressure and Centre of Pressure.

    (b) A circular plate 2m in diameter is immersed in water so that its plane makes an angle of 30^0 to the water surface and the highest point of the plate is 1.6m below the surface. Calculate the total pressure and centre pressure.

12. (a) A vertical tapering pipe has top diameter 0.7m and bottom diameter 0.9m. the water is flowing down in full. The pipe is 6m long. The velocity at the inlet is 6m/sec. determine the pressure at top in N/mm^2 when the pressure head at the bottom is 8.8m of water.

    (b) State the formula to calculate the actual discharge of flaming liquid through a venturimeter stating what the terms represent for.

13. Water flows through a sharp edged circular orifice 7.5mm diameter on the side of the tank. The head of water above the centre of the orifice is 1.22m. The jet passes through a ring whose centre is 1.22m horizontally and 330mm vertically from the centre of the vena contracta. The time required to discharge 66 lit of water was 500 sec. Find the hydraulic coefficients.

14. Water flows over a rectangular notch of 1m length over a depth of 15cm. The same quantity of water passes through triangular right angled notch. Find the depth of water through the notch if the coefficient of discharge for rectangular and triangular notch as 0.62 and 0.59 respectively.

15. A compound piping system consists of three pipes of length 1000, 1500 and 1100m and of diameters 0.5m, 0.3m and 0.3m respectively are connected in series convert the system to

    a. An equivalent length of 04.m diameter pipe.
    b. An equivalent size pipe of 3600m long.

16. (a) Calculate the discharge through a pipe diameter 20cm when the difference of pressure head between the two ends of a pipe 500m apart is 4 m of water. Take the value of f as 0.009.

    (b) A rectangular channel having most economical section is 6m wide. Find the discharge if the bed slope is 1 in 1200. Assume as C as 50.

17. A Trapezoidal channel with a base 3m wide and side slopes 1:1 carries water with a depth of 1.5m the bed slope is 1 in 1600. Estimate the discharge, take value of n in manning's formula as 0.04.
18. Explain the working of pelton wheel with neat sketch.

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