



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:III
Class:SY	Program:B.Tech
Branch Code:CIV	Pattern:2023
Name of Course:Hydraulics	Course Code:2304206
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains __02 pages.
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome

Marks CO

Question No. 1

- 1a) Differentiate between: (i) Liquids and gases, (ii) Real fluids and ideal fluids, (iii) Specific weight and specific volume of a fluid. (6) 1

Question No. 2

- 2a) What are the gauge pressure and absolute pressure at a point 3 m below the free surface of a liquid having a density of $1.53 \times 10^3 \text{ kg/m}^3$ if the atmospheric pressure is equivalent to 750 mm of mercury? The specific gravity of mercury is 13.6 and density of water = 1000 kg/m^3 (6) 2

Question No. 3

- 3a) Differentiate between (8) 3
- 1) Steady flow and unsteady flow
 - 2) Uniform and non uniform flow
 - 3) Laminar and turbulent flow
 - 4) Compressible and Incompressible flow

OR

- 3b) An oil of sp. gr. 0.8 is flowing through a venturimeter having inlet diameter 20 cm and throat diameter 10 cm. The oil-mercury differential manometer shows a reading of 25 cm. Calculate the discharge of oil through the horizontal venturimeter. Take $C_d = 0.98$. (8) 3
- 3c) Derive Euler's equation of motion (8) 3

OR

- 3d) Explain Pitot tube with neat sketch (8) 3

Question No. 4

- 4a) What are the methods of determination of coefficient of viscosity. Explain in detail about capillary tube method (8) 4

OR

- 4b) Derive the expression for average velocity if the flow is laminar in circular pipe (8) 4
- 4c) A laminar flow is taking place in a pipe of diameter 200 mm. The maximum velocity is 1.5 m/s. (8) 4
Find the mean velocity and the radius at which this occurs. Also calculate the velocity at 4 cm from the wall of the pipe.

OR

- 4d) Write short note on (8) 4
- 1) Reynold's expression for turbulent shear stress
 - 2) Prandtl's Mixing length

Question No. 5

- 5a) Derive Darcy Weisbach Equation for loss of head due to friction in pipe (8) 5

OR

- 5b) Enlist all minor energy losses in pipe and write the formulae for loss due to sudden enlargement and sudden contraction (8) 5
- 5c) Explain and write down the procedure to plot following terms with neat sketch 1) Hydraulic Grade line 2) Total Energy line (8) 5

OR

- 5d) Write a short note on hydrodynamically smooth and hydrodynamically rough boundary (8) 5

..... End of question paper.....