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Code No. : 14126

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (Civil Engg. : CBCS) IV-Semester Main Examinations, January-2021
Fluid Mechanics

Time: 2 hours

Max. Marks: 60

Note: Answer any *NINE* questions from *Part-A* and any *THREE* from *Part-B**Part-A (9 × 2 = 18 Marks)*

Q. No.	Stem of the question	M	L	CO	PO
1.	Compare absolute pressure atmospheric and gauge pressure with a diagram.	2	2	1	1
2.	Define buoyancy and center of buoyancy.	2	1	1	1
3.	Explain the concept of stream line with a sketch.	2	2	2	1
4.	List the various uses and limitations of flow net	2	1	2	1
5.	Discuss the various limitations of Bernoulli's equation.	2	6	3	2
6.	Determine the discharge through rectangular notch when head over notch is 20cm, length of notch as 25 cm with coefficient of discharge of 0.63.	2	5	3	2
7.	Distinguish between TEL and HGL with a sketch.	2	4	4	2
8.	List various minor losses in pipe flow.	2	3	4	1
9.	Distinguish between geometric and kinematic similarity and give examples for each.	2	4	5	4
10.	Compare distorted and undistorted models.	2	2	5	4
11.	Find the relation between compressibility of water and compressibility of air	2	1	1	1
12.	Compare local acceleration and convective acceleration.	2	2	2	1
<i>Part-B (3 × 14 = 42 Marks)</i>					
13. a)	Show that the equation for total pressure is $P = w \cdot A \cdot y$ when an inclined plane surface is immersed in a static fluid of specific weight 'w', where A is area of plane surface and y is centre of gravity distance of plane surface from free liquid surface.	8	1	1	2
b)	Evaluate the value of dynamic viscosity in N-sec/m ² when density of fluid flowing is 0.8 gm/cm ³ and Kinematic viscosity of flowing fluid is 3 X 10 ⁻⁴ stokes.	6	5	1	2
14. a)	Define (i) Stream line (ii) Streak line (ii) Path line (iv) Stream tube	8	1	2	1
b)	Outline the characteristics of stream function (Ψ) and velocity potential function (ϕ).	6	2	2	1

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15. a)	Identify the significance and limitations of Bernoulli's equation?	8	1	3	2
b)	Evaluate the coefficient of discharge through horizontal Venturi meter of inlet diameter 300mm and throat diameter 150mm . The discharge of water flowing through it is 65 Litres/sec. A differential gauge is connected to it shows a deflection of fluid of specific gravity 1.6.	6	5	3	2
16. a)	Develop Darcy-Weisbach equation with basic principles by writing assumptions.	8	3	4	2
b)	Compare pipes in series and pipes in parallel with neat sketches.	6	4	4	2
17. a)	Develop a relation between torque T which is needed to rotate a disc of diameter D at an angular velocity of ω in a fluid with density ρ and viscosity μ of the disc is at a distance h from a fixed wall. Use Buckingham- Π Theorem.	6	3	5	2
b)	Explain similarity laws. List the significance of Reynolds's and Froude number.	8	4	5	2
18. a)	Define capillarity and derive the equation of capillary rise when a glass tube is immersed in a static fluid.	8	1	1	1
b)	Explain the various classifications of fluid flow with examples.	6	2	2	1
19.	Answer any <i>two</i> of the following:				
a)	Discuss Impulse momentum equation with derivation and write its applications	7	6	3	1
b)	Define water hammer and explain the difference between gradual closure and sudden closure of valve.	7	1	4	2
c)	Explain the dimensional Homogeneity and show its application with three examples	7	2	5	2

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	50
2	Knowledge on application and analysis (Level-3 & 4)	40
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	10
