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BEY–003

B. SC. (APPLIED SCIENCE AND ENERGY)

(BSCAEY)

Term-End Examination

December, 2024

BEY–003 : FLUID MECHANICS

Time : 3 Hours *Maximum Marks : 70*

Note : *(i) Attempt any* ***seven*** *questions.*

(ii) All questions carry equal marks.

(iii) Use of scientific calculator is allowed.

(iv) Assume suitable data, if any.

1. What are the various properties of fluids ? Explain any *four* properties in detail. 10

2. (a) What is a control volume ? Explain the concept of control volume and its applications. 5

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(b) Determine the total force and its location on the face of an annular disk (circular disk with a hole) with outer and inner diameters of 2 m and 1 m respectively located vertically 2 m below the water surface. 5

3. What is Buoyancy ? Discuss the stability of bodies immersed in a fluid. 10

4. With the help of neat sketches, explain the various types of fluid flow. 10

5. Derive Euler's equation in a streamline coordinates. 10

6. With the help of a neat sketch, describe the construction and working principle of any *one* fluid pressure measuring device. 10

7. (a) Show that the viscous terms become zero for irrotational flow of incompressible fluids. 5

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(b) Two plain boundaries are 6.5 mm apart, the space between them is filled with a liquid of viscosity of 1.2 kg/m-s. What force would be required to move edgewise through the liquid, a plate of 3 mm thick and 25 cm^2 of area at a velocity of 15 cm/sec ? 5

8. Define the following : 2×5=10

(a) Density

(b) Viscosity

(c) Reynolds' number

(d) Surface tension

(e) Flow net

9. Define 'Boundary Layer Separation'. Discuss the methods of controlling separation. 10

10. Write short notes on any *two* of the following : 5+5

(a) Drag and lift

(b) Lift on Aerofoil

(c) River Models

(d) Eddy viscosity

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