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GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022
 B. Tech Degree Examinations, December – 2020
 (Seventh Semester)
BCHPC7020 – TRANSPORT PHENOMENON
 (Chemical Engineering)

Time: 2hrs

Maximum:50 Marks

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions)**(1 x 10 = 10 Marks)**

- Q.1. Answer ALL questions [CO#] [PO#]
- a. Which one is in a state of failure? 1 2
 (i)Solid (ii)Liquid
 (iii)Gas (iv)Fluid
- b. A small shear force is applied on an element and then removed. If the element regains it's original position, what kind of an element can it be? 1 2
 (i)Solid (ii)Liquid
 (iii)Fluid (iv)Gaseous
- c. In which type of matter, one won't find a free surface? 1 2
 (i)Solid (ii)Liquid
 (iii)Gas (iv)Fluid
- d. The flow separation occurs when the fluid travels away from the _____ 2 2
 (i)Surface (ii)Fluid body
 (iii)Adverse pressure gradient (iv)Inter-molecular spaces
- e. The swirl caused due to eddies are called as _____ 2 2
 (i)Vortices (ii)Vertices
 (iii)Volume (iv)Velocity
- f. Eddy viscosity is a turbulent transfer of _____ 3 2
 (i)Fluid (ii)Heat
 (iii)Momentum (iv)Pressure
- g. Which among the following is a device that converts a laminar flow into a turbulent flow? 3 2
 (i)Dead Weight Gauge (ii)Vacuum Gauge
 (iii)Turbulator (iv)Ionization Gauge
- h. With the boundary layer separation, displacement thickness _____ 4 3
 (i)Increases (ii)Decreases
 (iii)Remains Same (iv)Independent
- i. What is the instrument used for the automatic control scheme during the fluid flow? 4 3
 (i)Rotameters (ii)Pulley plates
 (iii)Rotary Piston (iv)Pilot Static Tube
- j. Diffusivity of the liquids can be determined by 4 2
 (i)Wilke- lee equation (ii)Wilke-chan equation
 (iii)Lee and chan equation (iv)None of the mentioned

PART – B: (Short Answer Questions)

(2 x 5 = 10 Marks)

<u>Q.2. Answer ALL questions</u>	[CO#]	[PO#]
a. What is Transport Phenomena?	1	2
b. What is meant by Shell mass Balance?	1	3
c. Differentiate between natural convection and forced convection.	2	2
d. What is Brinkman number?	3	2
e. What is slip velocity?	4	3

PART – C: (Long Answer Questions)

(6 x 5 = 30 Marks)

<u>Answer ANY FIVE questions</u>	Marks	[CO#]	[PO#]
3. Discuss briefly Shell momentum balances and pressure and velocity distributions in falling film	(6)	1	2
a. Explain the equation of continuity with mass balance.	(6)	1	2
4. Discuss briefly about the heat conduction with an electrical heat source	(6)	2	3
a. Discuss and draw the neat sketch for heat conduction with a viscous heat source	(6)	2	3
b. Explain about the mass balance and diffusivity equations.	(6)	3	3
a. Explain Diffusion through stagnant film.	(6)	3	3
b. Discuss the comparison of laminar and turbulent flows in transport of fluids.	(6)	4	2
a. Explain the time smoothed pressure equations and instantaneous pressure relations of various gas equations.	(6)	4	3

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