University of Mumbai
Online Examination 2020

Program: BE Chemical Engineering

Curriculum Scheme: Revised 2016

Examination: Third Year Semester VI

Course Code: CHC603

Course Name: Transport Phenomena

Time: 1 hour
Max. Marks: 50

Note to the students:- All Questions are compulsory and carry equal marks .

Q1.	Reynolds analogy is applicable only for
Option A:	Turbulent flow
Option B:	Laminar flow
Option C:	Transient flow
Option D:	Laminar and turbulent flow
Q2.	Shear stress for a Newtonian fluid is ------ at the interface between gas and liquid.
Option A:	0
Option B:	μdu/dy
Option C:	infinity
Option D:	finite
Q3.	What is the unit of thermal conductivity ?
Option A:	W/m.K
Option B:	W/m2•K
Option C:	W/m
Option D:	W
Q4.	Fick's first law of Diffusion for the Z direction is
Option A:	$J_A = -D_{AB} (dC_A/dt)$
Option B:	$JA = -D_{AB} (dC_A/dZ)$
Option C:	$JA = -D_{AB} (d^2CA/dZ^2)$
Option D:	$JA = -D_{AB} (d^2CA/dt^2)$
Q5.	Two horizontal plates placed 250mm have an oil of viscosity 20 poises. Calculate the shear stress in oil if upper plate is moved with velocity of 1250 mm/s.

Option A:	20 N/m^2
Option B:	2 N/m^2
Option C:	10 N/m^2
Option D:	200 N/m^2
Q6.	Schmidt number is
Option A:	Ratio of momentum diffusivity to mass diffusivity.
Option B:	Ratio of momentum diffusivity to thermal diffusivity.
Option C:	Ratio of mass diffusivity to thermal diffusivity.
Option D:	Ratio of thermal diffusivity to mass diffusivity.
Q7.	An insulators should have
Option A:	Low thermal conductivity
Option B:	High thermal conductivity
Option C:	Less resistance to heat flow
Option D:	A porous structure
Q8.	Steady fluid flow occurs, when the derivative of flow variables satisfy the following condition.
Option A:	$\frac{\partial}{\partial s} = 0$
Option B:	$\frac{\partial}{\partial t} = 0$
Option C:	$\frac{\partial}{\partial s} = \text{constant}$
Option D:	$\frac{\partial}{\partial t} = \text{constant}$
Q9.	Which law is followed by the velocity distribution in the turbulent boundary layer?
Option A:	Parabolic law
Option B:	Linear law
Option C:	Logarithmic law
Option D:	Polynomial law
Q10.	For turbulent flow,flux equations are NOT written using:
Option A:	Turbulent eddy momentum diffusivity
Option B:	Turbulent eddy thermal diffusivity
Option C:	Molecular diffusivity
Option D:	Turbulent eddy mass diffusivity.
Q11.	The overall resistance for heat transfer through a series of flat resistance, is the ---------- of the resistances
Option A:	Average
Option B:	Geometric mean
Option C:	Product
Option D:	Sum

Q12.	Euler's equation of motion is applicable for
Option A:	Non ideal fluids
Option B:	Non Newtonian fluids
Option C:	Inviscid fluids
Option D:	Real fluids
Q13.	The unit of heat transfer co-efficient is
Option A:	$W/m^2 \bullet K$
Option B:	W/s
Option C:	W
Option D:	W/m.K
Q14.	Unit of mass flux is
Option A:	kg/m^2 sec
Option B:	kg/m sec
Option C:	kg/sec
Option D:	kg/m^3 sec
Q15.	When a fluid flows over a solid surface, the
Option A:	velocity is uniform at any cross-section.
Option B:	velocity gradient is zero at the solid surface.
Option C:	resistance between the surface & the fluid is lesser as compared to that between the fluid layers themselves.
Option D:	velocity is not zero at the solid surface.
Q16.	Combined momentum flux is
Option A:	Vector
Option B:	Scalar
Option C:	Second order tensor
Option D:	Third order tensor
Q17.	The dimension of diffusion coefficient is given by
Option A:	$M L T^{-2}$
Option B:	$L^2 T^{-1}$
Option C:	$L T^{-1}$
Option D:	$M L^{-2} T$
Q18.	What is Nusselt Number ?
Option A:	$C_p.\mu/ k$
Option B:	h.D/ k
Option C:	$h.C_p / \mu$
Option D:	$C_p. \mu/ h$
Q19.	In a circular pipe, which of the factors primarily decide whether the flow is laminar or turbulent?
Option A:	The Prandtl Number
Option B:	The Pressure gradient along the length of the pipe

Option C:	The dynamic viscosity coefficient
Option D:	The Reynolds Number
Q20.	Mass transfer co-efficient is defined as
Option A:	Flux = Co-efficient/concentration difference
Option B:	Coefficient = Flux/concentration difference
Option C:	Flux=concentration difference/coefficient
Option D:	Flux = Coefficient x (concentration difference)^2
Q21.	Equation of continuity is not valid for system where :
Option A:	Chemical reactions are taking place
Option B:	Nuclear reactions are taking place
Option C:	Biological reactions are taking place
Option D:	Catalytic reforming is taking place
Q22.	In case of heat flow by conduction for a cylindrical body with an internal heat source, the nature of temperature distribution is
Option A:	Linear
Option B:	Hyperbolic
Option C:	Parabolic
Option D:	Circular
Q23.	In Fick's law of diffusion,D_{AB} is
Option A:	Mass flux
Option B:	Concentration gradient
Option C:	Mass velocity
Option D:	Mass diffusivity
Q24.	$C_p\mu/K$ is termed as the _____ number.
Option A:	Grasshoff
Option B:	Nusselt
Option C:	Prandtl
Option D:	Stanton
Q25.	Which of the following correctly states how the viscosities of a liquid and a gas will change with temperature?
Option A:	Viscosity increases with the increase in temperature of a liquid and decreases with the increase in temperature of a gas
Option B:	Viscosity increases with the increase in temperature of a liquid and increases with the increase in temperature of a gas
Option C:	Viscosity decreases with the increase in temperature of a liquid and decreases with the increase in temperature of a gas
Option D:	Viscosity decreases with the increase in temperature of a liquid and increases with the increase in temperature of a gas

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