

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2024

B.Tech – IIIrd Semester (BT)

COURSE CODE (CREDITS):18B11BT313(4)

MAX. MARKS: 25

COURSE NAME: Thermodynamics and Chemical Processes

COURSE INSTRUCTORS: Dr. Poonam Sharma

MAX. TIME: 1 Hour 30 Minutes

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1(a)	Electron transfer via redox reactions generates biological energy. Justify this statement	CO-2	2
(b)	Elucidate how the Reynolds number is related to fluid flow.	CO-5	2
Q2(a)	Discuss the arrangement of baffles in mixing equipments.		2
(b)	Counter current and co-current flow both play role in double tube pass heat exchanger. Explain with diagram	CO-6	4
Q3(a)	Heat is transferred from one fluid to a second fluid across metal wall. The film coefficients are 1.5 and $2 \text{ K W m}^{-2} \text{ K}^{-1}$. The metal is 10 mm thick and has a thermal conductivity of $10 \text{ W m}^{-1} \text{ K}^{-1}$. On one side of the wall there is scale deposit with a fouling factor estimated at $830 \text{ W m}^{-2} \text{ K}^{-1}$. Calculate the overall heat transfer coefficient.	CO-6	3
(b)	Elaborate the classification of Non-Newtonian fluids based on Rheology.	CO-5	4
Q4.	Differentiate between (a). Rheopectic and Thixotropic fluids (b). Conduction and Convection (c). Heat Transfer and Heat flux	CO-5,6	3
Q5.	Initial rate data is listed below. Calculate V_{\max} and K_m	CO-3	5
	<u>Lactose concentration ($\text{mol l}^{-1} \times 10^2$)</u> <u>Initial reaction velocity ($\text{mol l}^{-1} \text{ min}^{-1} \times 10^3$)</u>		
	2.50	1.94	
	2.27	1.91	
	1.84	1.85	
	1.35	1.80	
	1.25	1.78	
	0.730	1.46	