Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FOURTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MAY 2019

Course Code: FT208

Course Name: ENGINEERING THERMODYNAMICS AND REACTION KINETICS (FT)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any threefull questions, each question carries 10 marks. Marks

1	a)	Define enthalpy. Derive the general expression for enthalpy.	(5)
	b)	What is meant by a heat engine.	(5)
2		State the second law of thermodynamics. What are the limitations of first law of thermodynamics?	(10)
3	a)	What is a system? Discuss about closed system, open system and isolated system with example.	(5)
	b)	Explain the equivalence of Kelvin Plank's and Clausius statements of second law of thermodynamics.	(5)
4	a)	Explain the P-V-T behaviour of pure fluids.	(5)
	b)	From a reservoir at 600K, 1000 J of heat is transferred to an engine that operates on a carnot's cycle. The engine rejects heat to a reservoir at 300K. Determine the thermal efficiency of the cycle and the work done by the engine.	(5)
5		Explain the dependency of temperature on rate of reaction from collision theory.	(10)
6	a)	Derive Maxwell's equations.	(10)
7	a)	A rocket engine burns a stochiometric mixture of fuel (liquid hydrogen) in oxidant (liquid oxygen) .The combustion chamber is cylindrical ,75 cm long and 60cm in diameter and the combustion produces 108 kg/s of exhaust gases. If combustion is complete find the rate of reaction hydrogen and of oxygen.	(10)
8	a)	What is the activity of pure fluids? Explain the effect of pressure and temperature on activity of fluids.	(10)

9	Explain the rate equation for irreversible second order reaction.	(10)
10	Derive the equation for the time required for the conversion in ideal batch reactor	(10)
11	With neat sketch explain the working of a continuous stirred tank reactor.	(10)
12	Differentiate integral method of analysis and differential method of analysis in determine the rate of reactions.	(10)
13	Discuss the effect of different variables in enzymatic activity	(10)
14	Discuss the Monod Equation in study of cell growth kinetics	(10)

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