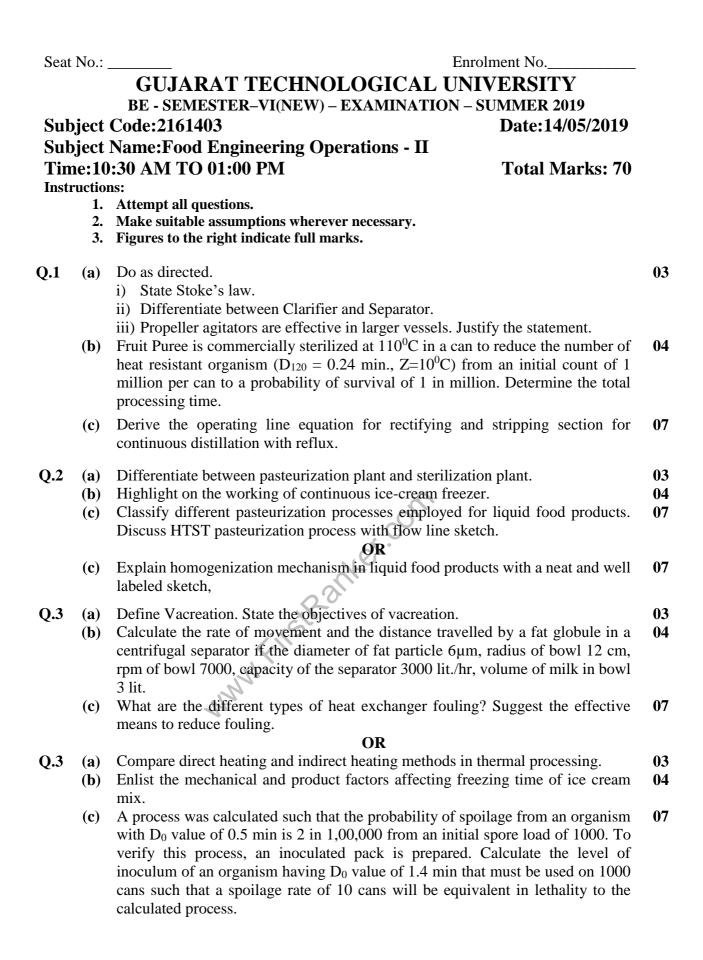


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07

Q.4	(a)	Draw a feed line on the equilibrium diagram for various values of 'q', $q<0$, $q=0$, $q=1$, $q>1$ and $0. Also write the thermal condition of the feed in each case.$	03
	(b)	Describe the stepwise procedure for obtaining the number of theoretical plates	04
	(a)	required in a fractionating column. What do you understand by flash distillation?	07
	(c)	A feed containing 50 mole % hexane and 50 mole % octane is fed to a pipe still through a pressure reducing valve and then into flash separator. The vapour and liquid leaving the separator are assumed to be in equilibrium. If 50 mole % of the feed is vaporised, find the composition of top and bottom products. The equilibrium data for the system is:	07
		Mole fraction of hexane in liquid 1 0.69 0.4 0.192 0.045 0	
		Mole fraction of hexane in vapour 1 0.932 0.78 0.538 0.1775 0	
		OR	
Q.4	(a)	Write the overlapping principle for crystallization.	03
	(b)	A salt solution weighing 10000 kg with 30% weight Na ₂ CO ₃ is cooled to 293 K. The salt crystallizes as decahydrate. What will be the yield of Na ₂ CO ₃ .10H ₂ O crystal if the solubility is 21.5 kg anhydrous Na ₂ CO ₃ /100 kg of total water? Do this for following cases: (i) Assume that no water is evaporated. (ii) Assume that 3 % of total weight of the solution is lost by evaporation of water in cooling.	04
	(c)	What are the methods of generation of supersaturation? Describe a crystallization equipment where method of achieving supersaturation is by adiabatic evaporation and cooling alone.	07
Q.5	(a)	Describe in brief with suitable diagram supercritical fluid extraction process.	03
	(b)	Write important applications of the solid–liquid extraction in the food industry. What are the factors that influence the rate of leaching?	04
	(c)	Derive the lever arm rule for a ternary system A (solvent), B (solute), and C (carrier).	07
0.5	(a)	OR What are the three main groups of filters? Write one important property of each.	03
Q.5	(a)		
	(b)	Describe the centrifugal sedimentation process for the separation of solids from liquid with suitable diagram.	04

constant pressure filtration.

Discuss the principle of cake formation in filtration. Derive the equation for