Reg. No.

MANIPAL INSTITUTE OF TECHNOLOGY



## VI SEMESTER B.TECH. (BIOTECHNOLOGY)

## END SEMESTER EXAMINATIONS, APR/MAY 2017

## SUBJECT: Elective II FOOD PROCESSING TECHNOLOGY [BIO 4016] REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

## Instructions to Candidates:

- ✤ Answer ALL the questions.
- ✤ Missing data may be suitable assumed.

1A.	The energy to humans are provided by a variety of food and food substances, each	
	substances has nutritive value. Define nutritive value of food. How does cooking affect the	4
	nutritional value of food?	
1 <b>B</b> .	The nutrient intake needs to be assessed and estimated to maintain the BMI, the terms,	
	DRI, RDA, UL and EAR recommended by the institute of medicine of the US national	2
	academy of sciences. Expand and explain the each in reference to intake.	
1 <b>C</b> .	Discuss on the participation of lactic acid bacteria in preparation of healthy foods.	2
1D.	The seasoning and controlling the agricultural products from deterioration is a critical	n
	factor. List the parameters responsible for deterioration of raw vegetables and fruits	2
2A.	Food poisoning can be the result of microbial ingestion of toxicant or chemical poisoning.	
	The toxicant leads to outbreaks of diseases. Explain the classification of food borne illness	4
	with one example to each class.	
2B.	The invasion of microorganism into the meat changes its quality and spoil the texture	
	(shrinkage of meat). List the primary sources of microorganism and mechanism of fresh	3
	and processed meat spoilage.	
2C.	Explain the spoilage of egg.	3
3A.	Write short notes on preservation using the following,	
	a. LTHT	6
	b. UTH treatment.	0
	c. HTST	
3B.	The radiation ionizes the molecules in their path so they destroy the microorganisms	
	without raising the temperature. But the radiation treatments affect the different	2
	constituents of food. Explain the effect of radiation on different nutrients.	
3C.	Discuss the factors influencing the preservation by freezing	2

4A.	Explain the different methods of food production. Discuss the effect of various processing	Λ
	on food constituents.	4
4B.	Food labels provide more than just nutrition facts, there are rules and regulation of	3
	constituent labelling in food. List the important guideline and parts of food label.	5
4C.	Proximate analysis of a food sample is reported as percentage composition of the product.	3
	Explain the method used to estimate the total protein content in food with neat sketch.	5
5A.	A spherical food product is being frozen in an air-blast freezer. The initial product	
	temperature is 10°C and the cold air-40°C. The product has a 7 cm diameter with density	
	of 1000 kg/m 3 , the initial freezing temperature is -1.25°C, the thermal conductivity of the	4
	frozen product is 1.2 W/(m K), and the latent heat of fusion is 250 kJ/kg. Convective heat-	
	transfer coefficient hc= 50 W/(m 2 K). Compute the freezing time.	
5B.	Calculate the time necessary to dry a food material from 80% to 20% moisture content.	
	The food is dried on trays, from one side. Loading rate is 10 kg per m <sup>2</sup> . Drying air data:	
	Temperature DB =70°C WB=30°C, Velocity, v= 10 m/s, Density $\rho$ =1 kg/m <sup>3</sup> . Critical	3
	moisture of the food =45%, Equilibrium moisture of the food= 0, All moisture data are w/w,	
	wet basis. Assume that there is no shrinkage and the value of $h=20.G^{0.8}$ , where G=v p	
5C.	Explain in detail the manufacturing process of fruit juice concentrates.	3