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SEMESTER END THEORY EXAMINATION

B.Sc. (Hons.) Agriculture

Semester	**:**	**VIth New**	**Term**	**:**	**IInd**	**Academic Year**	**:**	**2020-21**
Course No.	**:**	**FST-362**	**Title**	**:**	**Principals of Food Sciences and Nutrition**			
Credit	**:**	**2+0**						
Day & Date	**:**	**7/6/2021**	**Time**	**:**	**3.00 – 5.00**	**Total Marks**	**:**	**80**

Note: 1) Solve ANY EIGHT questions from SECTION–A
2) Solve ANY TWELVE questions from SECTION-B
3) ALL questions from SECTION –C are compulsory
4) Send the PDF file of answer sheet to the email id of respective course teacher

SECTION-A		
(Write the answer in 4-5 sentences only. Each question carries 4 marks)		
Q. 1	Enlist different fields of food science and objectives of food science?	04
Ans.	**Fields of food science:** 1) Food Microbiology 2) Food Chemistry 3) Food Engineering and Processing 4) Nutrition 5) Sensory Analysis **Objectives of food science:** 1) To understand the functions of foods, which supply our nutritional and physiological needs 2) To know how to select foods to meet our need for nutrients from available foods or basic food groups. 3) To learn the methods of food preparation which blend acceptability with retention of nutrients.	**02** **02**
Q. 2	Define nutritional disorder and enlist major nutritional disorders	**04**
Ans.	Nutritional disorder is a disease that results from excessive or inadequate intake of food and nutrients which leads to conditions. It refers to any of the nutrient related diseases and conditions that cause illness in humans. **Major nutritional disorders** 1. Kwashiorkar 2. Marasmus 3. Xerophthalmia 4. Nutritional anemia 5. Endemic goiter 6. Flurosis	**01** **03**
Q. 3	Describe pasteurization and enlist methods of pasteurization	**04**
Ans.	Pasteurization is a heat treatment that kills part but not all of the microorganisms present in foods and the temperature applied is below 100^{O}C . Heating may be by steam, hot water, dry heat or electric currents. Products are cooled promptly after the heat treatment. Methods of pasteurization 1) High temperature short time 2) Low temperature long time	**02** **02**

Q. 4	Enlist important chemical properties of food and write in brief about carbohydrates.	**04**
Ans.	**In general, chemical properties of food means the elemental presents in it such as** 1) Carbohydrates 2) Amino acid and protein 3) Lipids 4) Other components 5) Osmotic pressure 6) Food dispersion 7) Food sols and gels 8) Emulsion 9) Browning of food 10) Formation of foam	**03**
	Carbohydrates: It is defined chemically as neutral compounds of carbon, hydrogen and oxygen. It comes in simple forms such as sugars and in complex forms such as starches and fiber. The body break down most sugars and starches into glucose, a simple sugar that the body can use to fed its cell.	**01**
Q. 5	Enlist important reaction of fatty acid and explain in brief antioxidant	**04**
Ans.	**Important reaction of fatty acid are** 1) Lipolysis 2) Autoxidation 3) Antioxident 4) Pro-oxidant	**02**
	Antioxidant: An antioxidant is a molecule that can delay onset, or slow the rate of oxidation of oxidisable material. Oxidation reactions can produce free radical. In turn, these radical can start chain reaction. Antioxidants terminate these chain reactions by removing free radical intermediates, and inhibit other oxidation reaction by acting as hydrogen donors or free radical accepters. $ROO + AH \longrightarrow ROOH + A$	**02**
Q. 6	Define mineral and enlist types of mineral with examples.	**04**
Ans.	**Mineral:** Is a chemical element required as an essential nutrient by organisms to perform functions necessary for life.	**01**
	Types of Minerals **1) Macro Minerals:** The minerals present in more than 0.05 per cent in the human body are defined as macro minerals. Ex. Calcium, Phosphorus **2) Micro Minerals:** The minerals present in less than 0.05 per cent in the human body are called micro minerals. Ex. Iron, Sulphur, Zinc	**03**
Q. 7	Define food spoilage and classify the foods by ease of spoilage	**04**
Ans.	**Food spoilage** is the process in which food deteriorates to the point that it is not edible to humans or its quantity of edibility becomes reduced.	**01**
	Classification **1) Relatively stable or non-perishable foods:** Foods that do not spoil unless handled carefully. Ex. Grain, Flour, Pulses etc. **2) Protectable or semi-perishable foods:** Foods those remains unspoiled for a fairly long period if properly handled and stored. Ex. Potatoes, Apples etc. **3) Perishable Food:** Food that spoil readily unless special preservative methods are used. Ex. Milk, Eggs, Meat etc.	**03**

Q. 8	Enlist the principles of food preservation	**04**
Ans.	**Principles of food preservation** 1. Prevention or delay of microbial decomposition of food ➢ By keeping out micro organisms (asepsis) ➢ By removal of micro organisms (filtration) ➢ By hindering the growth or activity of micro organisms (use of low temperature, drying, creating anaerobic condition or using chemical) ➢ By killing the micro-organisms (using heat or irradiation) 2. Prevention or delay of self decomposition of food ➢ By destruction or inactivation of food enzymes (blanching or boiling) ➢ By prevention or delay of purely chemical reactions (use of antioxidants to prevent oxidation) 3. Prevention of damage by insects, animals, mechanical causes etc (use of fumigants, cushioning, packaging etc.)	**04**
Q. 9	Enlist factors affecting growth of micro organisms and explain any one in brief	**04**
Ans.	**Factors affecting growth of microorganisms** 1) Nutrients and other constituents in foods 2) Acidity 3) Water content 4) Physical and environmental factors 5) Availability of oxygen 6) Presence of inhibitory substances 7) Biological structure Explain any one……..	**03** **01**
Q.10	Classify carbohydrate with examples?	**04**
Ans.	**Carbohydrates classified as below** 1) Monosaccharides: Monosaccharides are simple carbohydrate containing between three to eight carbon atoms but only those with five and six carbon atoms are common. Ex. Glucose, Fructose 2) Disaccharides: Disaccharides contain two mono saccharides linked together by glycosidic bond. Es. Sucrose, Maltose, Lactose. 3) Oligosaccharides: Oligosaccharides contains 3 – 10 monosaccharides units linked together by glycosidic bonds. Ex. Rafinose, Stachyose 4) Polysaccharides: A polysaccharides contains more than 10 monosaccharides units linked together by glycosidic bond. Ex. Starch, Cellulose.	**04**

SECTION-B

(Write the answer in one sentence only. Each question carries 2 marks)

Q. 11	(Answer in one sentence/ Do as directed/Define)	
	a)	Enlist physical properties of food
	Ans	1) Shape and size 2) Density 3)Specific gravity 4) Porosity 5) Surface area 6) Volume
	b)	Define Malnutrition
	Ans	Malnutrition defined as the cellular imbalance between the supply of nutrients and energy and the body's demand for them to ensure growth, maintenance and specific functions.
	c)	Define Diet
	Ans	Diet is the sum of food consumed by a person or other organism.

	d)	Define saturated fatty acid
	Ans	These fatty acids are straight chain containing no double bond.
	e)	Define food science.
	Ans	The discipline in which the engineering, biological and physical sciences are used to study the nature of foods, the causes of deterioration, the principles underlying food processing and the improvement of foods for the consuming public.
	f)	Define blanching
	Ans	Blanching is a mild heat treatment given to vegetable before canning, freezing or drying to prevent self decomposition of food by destroying enzymes.
	g)	Enlist sensory properties of food
	Ans	1) Appearance 2) Flavor 3) Taste 4) Texture 5) Aroma 6) Sound
	h)	Define Flavorant
	Ans	Flavorant is defined as a substance that gives another substance flavor, altering the characteristics of the solute causing it to become sweet, sour, tangy etc.
	i)	Define protein and enlist its classification with examples.
	Ans	Protein is large bio molecules or macromolecules consisting of one or more long chain of amino acid residues. Classification of proteins: 1) Simple proteins: Albumin, Globulins 2) Conjugated protein: Phosphoprotein, Glycoprotein 3) Derived protein: Peptides
	j)	Enlist types of bioactive compounds
	Ans	1) Flavonoids 2) Carotenoids 3) Polyphenols
	k)	Define Nutrition.
	Ans	The process of taking in food and using it for growth, metabolism and repair.
	l)	Define fermentation
	Ans	The chemical breakdown of a substance by bacteria, yeasts or other microorganisms, typically involving effervescence and the fiving off of heat.
	m)	Define Asepsis
	Ans	Asepsis refers to keeping out the micro organisms from the food by making use of either natural covering or providing artificial covering around the food.
	n)	Long form of UNICEF
	Ans	United Nations International Children's Educational Fund

SECTION-C				
(Choose the correct option. Each question carry 1 mark)				
Q.12	**1)** IS an important physical property characterizing the texture and the quality of dry and intermediate moisture foods			
	a)	Surface area	**b)**	**Porosity**
	c)	Specific gravity	d)	Density
	2) The bond angle in water molecule is			
	a)	102.5^0	b)	103.5^0
	c)	**104.5^0**	d)	110.5^0

3) IS the state of complete physical, mental and social well being not merely the absence of disease or infirmity				
a)	Food science	b)	Nutrition
c)	Food technology	**d)**	**Health**
4) World Health Day celebrated on				
a)	**7th April**	b)	7Th May
c)	8th June	d)	7th August
5) Is a system in which distributed particles of one material are dispersed in a continuous phase of another material				
a)	**Food dispersion**	b)	Osmotic pressure
c)	Emulsion	d)	Food gel
6) Is an example of water soluble vitamins				
a)	Vitamin A	**b)**	**Vitamin C**
c)	Vitamin E	d)	Vitamin D
7) Mid – Day meal programme was started from				
a)	15th August, 1955	b)	15th August, 1960
c)	**15th August, 1995**	d)	15th August, 1975
8) Is the example of tetroses				
a)	Arabinose	b)	Ribose
c)	**Erythrose**	d)	Glucose
9) Food that do not spoil unless handled carefully				
a)	**Non perishable food**	b)	Semi perishable food
c)	Perishable food	d)	Essential food
10) Heating at temperature for 15 second is termed as high temperature short time method of pasteurization				
a)	82°C	b)	62°C
c)	**72°C**	d)	75°C
11) National Food Security Mission launched in				
a)	2008	**b)**	**2007**
c)	2009	d)	2010
12) Blue Revolution related with				
a)	Oilseed production	**b)**	**Fish production**
c)	Milk production	d)	Grain production
13) The breakdown of food tissue material is called				
a)	Food processing	**b)**	**Catabolism**
c)	Anabolism	d)	Metabolism
14) The mineral present in less than 0.05 mg in the human body are called				
a)	Macro mineral	b)	Primary mineral
c)	Major mineral	**d)**	**Micro mineral**
15) Are polymers of monosaccharides				
a)	Oligosaccharides	b)	Monosaccharides
c)	Disaccharides	**d)**	**Polysaccharides**
16) Also known as sunshine vitamin				
a)	Vitamin A	b)	Vitamin K
c)	Vitamin E	**d)**	**Vitamin D**

	17) Is an example of Hexoses			
	a)	Arabinose	b)	Xylose
	c)	**Glucose**	d)	Ribose
	18) Is an example of polysaccharide			
	a)	Glucose	b)	Fructose
	c)	**Starch**	d)	Sucrose
	19) The best temperature range for flavor evaluation in most of food material is			
	a)	1- 10 ^{O}C	b)	10- 20 ^{O}C
	c)	**20- 30 ^{O}C**	d)	30- 40 ^{O}C
	20) World food day			
	a)	16th March	**b)**	**16th October**
	c)	18th October	d)	16th November
	21) Is an example of macro mineral			
	a)	Iron	b)	Sulphur
	c)	**Calcium**	d)	Zinc
	22) In adults, overweight is defined as a body mass index			
	a)	05	b)	10
	c)	15	**d)**	**25 or more**
	23) Yellow revolution related with			
	a)	Coffee production	**b)**	**Oilseed production**
	c)	Grain production	d)	Fish production
	24) Contain 3 – 10 monosaccharides units linked together by glycosidic bonds			
	a)	Polysaccharides	b)	Monosaccharides
	c)	**Oligosaccharides**	d)	Disaccharides

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Signature of course teacher

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