	Uttech
Name:	(4)
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Invigilator's Signature :	

## CS/B.Tech/FT/SEM-7/FT-701/2012-13 2012

## FOOD PACKAGING TECHNOLOGY

Time Allotted: 3 Hours Full Marks: 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

### **GROUP - A**

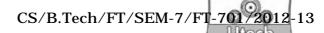
## (Multiple Choice Type Questions)

- 1. Choose the correct alternatives for any ten of the following :  $10 \times 1 = 10$ 
  - i) Which one of the following natural pigments acts as corrosion accelerator of metal cans?
    - a) Xanthophylls
- b) Chlorophyll
- c) Myoglobin
- d) Anthocyanin.
- ii) Which one of the following is a cause of safety concern in vacuum-packaged sausage?
  - a) Salmonella enteritidis
  - b) Listeria monocytogenes
  - c) Clostridium botulinum
  - d) Bacillus cereus.

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iii)	Glass as packaging materials were first industrialized in which of the following civilizations?				
	a)	Egypt	b)	China	
	c)	India	d)	None of these.	
iv)		shness indicator used our charge at pH below	in 1	MAP for Kimchi shows	
	a)	7	b)	6	
	c)	5	d)	all of these.	
v)	Which stage of tin-plate corrosion is slowest?				
	a)	1st stage	b)	2nd stage	
	c)	3rd stage	d)	4th stage.	
vi)	Which one of the following is the correct sequence of the three layers of retort pouch from inner-most layer to the outermost one?				
	a)	PET/PP/Al foil	b)	PP/Al foil/PET	
	c)	PP/PET/Al foil	d)	none of these.	
vii)	Hydrapulper is used to produce which one of the following during paper manufacturing?				
	a)	Pulp	b)	Stock	
	c)	Sheet	d)	All of these.	
viii)	) Which one of the following plastic polymers is not produced by addition polymerization?				
	a)	Nylon	b)	Polypropylene	
	c)	Polyethylene	d)	None of these.	
ix)	Most common application of carbon monoxide in MAP of food is				
	a)	Red meat	b)	Shell fish	
	c)	Fresh fruits	d)	none of these.	



- x) Which one of the following is an example of timetemperature-indicator popularly used in intelligent packaging of food?
  - a) ZERO2 TM
- b) Thinsulate <sup>TM</sup>
- c) RipeSense <sup>TM</sup>
- d) VITSAB TM.
- xi) Acrtive packaging for processed foods provides
  - a) O  $_2$ , N  $_2$  and CO  $_2$
  - b) O<sub>2</sub> and NO
  - c) O<sub>2</sub>, CO<sub>2</sub> and odour scavenger
  - d) CO2, NO2 and odour scavenger.
- xii) PET can be used in primary packaging for
  - a) Bread

- b) Milk powder
- c) Fruit beverage
- d) Fresh apple.

#### **GROUP - B**

### (Short Answer Type Questions)

Answer any *three* of the following.

 $3 \times 5 = 15$ 

- 2. What is aseptic packaging? What are the common properties of aseptic packaging materials? Mention different aseptic packaging applications. 2 + 2 + 1
- 3. Discuss different types of filling system for liquid and dry products.
- 4. What do you mean by the environemental considerations for packaging materials? Differentiate between thermoplastic and thermosetting polymers.  $2\frac{1}{2} + 2\frac{1}{2}$
- 5. Explain the reaction mechanism for condensation polymerization in production of polyethylene terephthalate ( PET ).
- 6. Discuss the applications of nano-composite materials in food packaging.

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# **GROUP - C** ( Long Answer Type Questions )

Answer any *three* of the following.  $3 \times 15 = 45$ 

- 7. Elaborate on three-piece can manufacturing process from a flat-blank tin plate including its double-seam sealing process.
- 8. Elaborate on melt-spinning process of plastic film manufacturing using a neat schematic diagram. Briefly describe polylactyic acid, one of the most commonly used biobased plastic packaging materials. Explain the principle of corrosion in metal cans. 7 + 4 + 4
- 9. What are the common sorbants, permeating and migrating substances generally relevant in interactions between food and packaging materials? Highlight their adverse sequences. "Different factors affect food-packaging interactions." Comment on the statement. Draw a neat diagram of stress-strain curve for flexible packaging.

2 + 4 + 7 + 2

- 10. What is the purpose of lamination of packaging materials? Mention some flexible packaging materials which can be used for lamination purposes. 5 + 10
- 11. Discuss the packaging requirement for various preprocesses foods, fresh fruits and vegetables, carbonated and non-carbonated beverages. 5 + 5 + 5
- 12. Answer any three of the following:

 $3 \times 5$ 

- a) What is tin free steel? Mention its uses.
- b) Antimicrobial and edible materials in food packaging system.
- c) How can you classify the food packaging materials based on their various functions?
- d) Barcodes and other marking of food packages for consumer service.
- e) Disposal of packaging materials.

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