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| **Scheme of Valuation/Answer Key**  (Scheme of evaluation (marks in brackets) and answers of problems/key) | | | | | |
| **APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  THIRD SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018 | | | | | |
| **Course Code: FT201** | | | | | |
| **Course Name: FOOD MICROBIOLOGY** | | | | | |
| Max. Marks: 100 | | |  | Duration: 3 Hours | |
| **PART A** | | | | | |
|  |  | ***Answer any three full questions, each question carries 10 marks.*** | | | Marks |
| 1 | a) | Who was Robert Koch? What was his contribution to the field of microbiology?  **Koch- Introduction**  **Four postulates** | | | (1)  (4) |
|  | b) | Comment on the important methods used for preservation and maintenance of pure cultures.  **Preservation methods**  **Maintenance methods** | | | (2.5)  (2.5) |
| 2 | a) | Draw the bacterial growth curve and explain the four stages.  **Growth curve -Graphical representation**  **Four stages-Lag,log,stationery and death phase** | | | (2)  (4) |
|  | b) | Describe dye reduction and discuss on the dyes used to distinguish viable from nonviable cells.  **Dye reduction-Principle**  **Detailed description about any one dye** | | | (2)  (2) |
| 3 | a) | Describe how various extrinsic parameters affect the ability of microorganisms to grow in foods.  **List out extrinsic parameters- Relative humidity, Temperature, Gaseous atmosphere**  **Detailed description** | | | (2)  (3) |
|  | b) | List the steps involved in Gram Staining Technique.  **Gram Staining –Definition- Principle**  **Steps-4-Primary stain, Mordant, Decolouriser, Secondary/Counter stain** | | | (1)  (4) |
| 4 | a) | Elaborate on the different bacterial genera normally associated with food.  **Different types of bacteria- Introduction**  **Detailed description**  **Examples** | | | (2)  (4)  (4) |
| **PART B** | | | | | |
| ***Answer any threefull questions, each question carries 10 marks.*** | | | | | |
| 5 | a) | Define the terms intoxication and infection. Give an example for each.  **Intoxication- Definition-Example- Staphylococcal intoxication, Botulism**  **Infection- Definition- Example** | | | (2)  (2) |
|  | b) | List and discuss the various toxin types of *S.aureus.*  **Staphylococcal enterotoxicosis**  **Toxins-types**  **Description** | | | (1)  (3)  (2) |
| 6 | a) | **Mycotoxin- Definition-Fungal metabolites**  **Aflatoxin-definition**  **Types**  **Description** | | | (1)  (1)  (1)  (3) |
|  | b) | Describe the general characteristics of *Clostridium botulinum* and its toxins  ***C.botulinum*- Introduction**  **Toxins- types**  **Description-mode of action** | | | (1)  (1)  (2) |
| 7 |  | **Preliminary steps**  **Describe the principles of HACCP- 7 principles**  **Logical sequence**  **HACCP worksheet** | | | (2)  (3)  (2)  (3) |
| 8 |  | **Food quality standards- introduction**  **FSSAI-objectives and Detailed description**  **CAC- objectives and Detailed description**  **BIS- objectives and Detailed description** | | | (2)  (3)  (2)  (3) |
| **PART C** | | | | | |
| ***Answer any fourfull questions, each question carries 10 marks.*** | | | | | |
| 9 | a) | What are the characteristics of effective probiotics? Give examples of probiotics.  **Characteristics of probiotics**  **Examples** | | | (3)  (2) |
|  | b) | Write about the important enzymes used in food industry.  **Any 5 enzymes -Description** | | | (5) |
| 10 | a) | Explain the preparation of Fermented beverages-Beer and Vinegar.  **Beer-Ingredients**  **Process**  **Vinegar- Basic principle**  **Process- Frings generator** | | | (2)  (3)  (2)  (3) |
| 11 | a) | Name some organisms that are commonly used as starter cultures in dairy fermentation.  **Organism and fermented product-Introduction**  **Examples** | | | (2)  (2) |
|  | b) | Comment on fermented vegetable products.  **Introduction**  **Sauerkraut-Introduction**  **Process**  **Varieties**  **Other products-olives-pickles** | | | (1)  (1)  (2)  (1)  (1) |
| 12 |  | Explain the principle and working of biosensors with suitable examples.  **Principle**  **Diagramatic representation**  **Working**  **Examples** | | | (2.5)  (2.5)  (2.5)  (2.5) |
| 13 | a) | Define and describe immunological methods for detection of microorganisms.  **Mention all methods**  **Detailed description of any two** | | | (1)  (4) |
|  | b) | Flow cytometry-introduction-description  ATP measurement- introduction-description | | | (2.5)  (2.5) |
| 14 |  | Write notes on rapid methods for detection of food borne Pathogens.  **Introduction**  **Detailed description about any 5 methods**  **Diagrams if any** | | | (2)  (4)  (4) |
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