**Roll No. .....**

| Question Booklet Number |
|---|
| |

**O. M. R. Serial No.** | | | | | | | | |

# M. Sc. (Industrial Chemistry) (Fourth Semester)

# EXAMINATION, July, 2022

## FOOD SCIENCE AND AGROCHEMICALS

| Paper Code | | | |
|---|---|---|---|
| MSIC | 4 | 0 | 2 |

| Questions Booklet Series |
|---|
| B |

*Time : 1:30 Hours* ] [ *Maximum Marks : 100*

**Instructions to the Examinee :**

1. Do not open the booklet unless you are asked to do so.
2. The booklet contains 100 questions. Examinee is required to answer any 75 questions in the OMR Answer-Sheet provided and not in the question booklet. If more than 75 questions are attempted by student, then the first attempted 75 questions will be considered for evaluation. All questions carry equal marks.
3. Examine the Booklet and the OMR Answer-Sheet very carefully before you proceed. Faulty question booklet due to missing or duplicate pages/questions or having any other discrepancy should be got immediately replaced.

परीक्षार्थियों के लिए निर्देश :

1. प्रश्न-पुस्तिका को तब तक न खोलें जब तक आपसे कहा न जाए।
2. प्रश्न-पुस्तिका में 100 प्रश्न हैं। परीक्षार्थी को किन्हीं 75 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। यदि छात्र द्वारा 75 से अधिक प्रश्नों को हल किया जाता है तो प्रारम्भिक हल किये हुए 75 उत्तरों को ही मूल्यांकन हेतु सम्मिलित किया जाएगा। सभी प्रश्नों के अंक समान हैं।
3. प्रश्नों के उत्तर अंकित करने से पूर्व प्रश्न-पुस्तिका तथा OMR आन्सर-शीट को सावधानीपूर्वक देख लें। दोषपूर्ण प्रश्न-पुस्तिका जिसमें कुछ भाग छपने से छूट गए हों या प्रश्न एक से अधिक बार छप गए हों या उसमें किसी अन्य प्रकार की कमी हो, तो उसे तुरन्त बदल लें।

**(Remaining instructions on the last page)** (शेष निर्देश अन्तिम पृष्ठ पर)

***(Only for Rough Work)***

1. Photochemical degradation of pesticides is possible in :

(A) Rainy season

(B) Day time

(C) Night

(D) Moon light

2. Physical, nerve, protoplasmic and respiratory poison are the mode of action of :

(A) Pesticides

(B) Insecticides

(C) Herbicides

(D) None of the above

3. How much number of nitrogen molecules is involved in Atrazine ?

(A) Two

(B) Four

(C) Six

(D) Five

4. The molecular formula of Atrazine is :

(A) $C_8H_{12}ClN_5$

(B) $C_8H_{14}ClN_5$

(C) $C_8H_{16}N_5$

(D) $C_8H_{16}Cl$

5. Nimbidin is the constituent of :

(A) Neem

(B) BHC

(C) Seed of palm

(D) Seed of mustard oil

6. Which of the following serve as an ideal medium for transporting dissolved nutrients and wastes throughout the body ?

(A) Oil

(B) Water

(C) Proteins

(D) None of the above

7. Which of the following is an oligosaccharide ?

(A) Glucose

(B) Fructose

(C) Lactose

(D) Starch

8. Gelatinization occurs in :

(A) Starch

(B) Maltose

(C) Lactose

(D) Glucose

9. Which of the following is called as "fuel molecules" ?

(A) Lipids

(B) Proteins

(C) Vitamins

(D) Minerals

10. The process in which fat in contact with air, reacts with oxygen producing products with undesirable flavour and odour, is known as :

(A) Oxidative rancidity

(B) Hydrolytic rancidity

(C) Fermentation

(D) None of the above

11. Which of the following is a fat soluble vitamin ?

(A) A

(B) B

(C) C

(D) All of the above

12. 'Pellagra' disease is due to the deficiency of :

(A) Niacin

(B) Thiamin

(C) Biotin

(D) Folic acid

13. Deficiency of Vitamin E leads to :

(A) Lack of blood clotting

(B) Scurvy

(C) Muscle and nerve damage

(D) Rickets

14. Full form of AGMARK is :

(A) Agricultural Certificate

(B) Agricultural Mark

(C) Agricultural Marketing Act

(D) None of the above

15. 'AGMARK' is related to :

(A) Packaging

(B) Production

(C) Quality

(D) Processing

16. Most suitable pH for the growth of most food poisoning organism :

(A) 4–5

(B) 4–6

(C) 5

(D) Above 6

17. Red colour of meat is due to the pigment :

(A) Haemoglobin

(B) Myoglobin

(C) Chloroplast

(D) Anthocyanin

18. Which of the following is a water soluble vitamin that can be stored in the liver for many years ?

(A) Vitamin K

(B) Vitamin C

(C) Vitamin B-12

(D) Vitamin A

19. Salmonellosis involves :

(A) A cytotoxin and neurotoxin

(B) An enterotoxin and neurotoxin

(C) An enterotoxin and cytotoxin

(D) None of the above

20. Milk protein is called as :

(A) Casein

(B) Globulin

(C) Myosin

(D) None of the above

21. How many types of amino acids are commonly found in proteins ?

(A) 15

(B) 20

(C) 25

(D) 30

22. The protein found in egg white is :

(A) Casein

(B) Oxytocin

(C) Ovalbumin

(D) Keratin

23. Which of the following food products are high in protein content ?

(A) Tofu and eggs

(B) Green leafy vegetables

(C) Rice

(D) Milk

24. Which of the following is not an essential protein (amino acids) ?

(A) Tryptophan

(B) Leucine

(C) Tyrosine

(D) Lysine

25. The best source of vitamin K is :

(A) Spinach

(B) Carrot

(C) Rice

(D) Egg

26. Rich sources of phosphorus in foods are :

(A) Meat and poultry

(B) Pulses and rice

(C) Oils

(D) Fruits

27. Which of the following is a micronutrient ?

(A) Mg

(B) Ca

(C) Fe

(D) Na

28. Deficiency of which mineral leads to the enlargement of thyroid gland ?

(A) Fluorine

(B) Sulphur

(C) Iodine

(D) Copper

29. Anthocyanins are :

(A) Polyphenols

(B) Acids

(C) Aldehydes

(D) None of the above

30. Rich source of Betalains is :

(A) Spinach

(B) Pokebenies

(C) Brinjal

(D) Banana

31. Flavonoid present in oranges and lemon is :

(A) Naringin

(B) Hesperidine

(C) Neral

(D) None of the above

32. Aroma of onion, garlic and cauliflower is due to the presence of :

(A) Terpenoids

(B) Phenols

(C) Sulphur compounds

(D) Hesperidine

33. The characteristic odour of garlic is due to :

(A) Allicin

(B) Naringin

(C) Lemonene

(D) None of the above

34. The compound responsible for the flavour of apple is :

(A) Pentylacetate

(B) Octylacetate

(C) Pentylvalerate

(D) Methyl salicilate

35. The compound responsible for the flavour of strawberries is :

(A) Ethylbutyrate

(B) Pentylacitate

(C) Octylacetate

(D) Pentylvalerate

36. Which food's aroma can be reproduced by the use of a large number of compounds ?

(A) Chocolate

(B) Banana

(C) Almond

(D) Pineapple

37. Flavour of butter is due to :

(A) Alcohols

(B) Esters

(C) Aldehydes

(D) None of the above

38. Formation of bronen colour on the cut surfaces of apple, banana and potatoes is due to action of enzyme :

(A) Lactase

(B) Chlorophyllase

(C) Lipoxygenase

(D) Phenolase

39. Enzyme used in cheese and beer manufacture is :

(A) Lipase

(B) Protease

(C) Invertase

(D) None of the above

40. Enzymes that hydrolyze ester linkages in glycerides are :

(A) Lipases

(B) Proteases

(C) Lymase

(D) None of the above

41. Lipoxygenases bring about the :

(A) Oxidation of ascorbic acid

(B) Oxidation of organic peroxide

(C) Oxidation of essential fatty acids

(D) Oxidation of glucose to gluconic acid

42. Which of the following factors does not favour the growth of microorganism ?

(A) Moisture

(B) Hydrogen ion concentration

(C) Oxidation-reduction potential

(D) None of the above

43. The value of $a_w$ for dried fruits is in the range of :

(A) 0.93–0.98

(B) 0.85–0.93

(C) 0.60–0.85

(D) below 0.60

44. The water activity $(a_w)$ is :

(A) Water present in food

(B) Amount of water needed for growth of microorganism

(C) Water of crystallization

(D) All of the above

45. $a_w$ value for sweetened condensed milk is :

(A) 0.98 and above

(B) 0.93–0.98

(C) 0.85–0.93

(D) 0.60–0.85

46. Botulism is caused by bacteria :

(A) Staphylococcus

(B) Clostridium

(C) Salmonella

(D) None of the above

47. Staphylococcus aureus is responsible for :

(A) Food infection

(B) Food intoxication

(C) Both (A) and (B)

(D) None of the above

48. Salmonellosis is due to :

(A) Gram positive–non spore forming bacteria

(B) Gram positive–spore forming bacteria

(C) Gram negative–non spore forming bacteria

(D) Gram negative–spore forming bacteria

49. Leavening agents in food industry are :

(A) bleaching and maturing agents

(B) moisture retention agents

(C) used to produce light and fluffy bakery goods

(D) nutrient supplements

50. Which organism of Clostridium is responsible for botulism in human ?

(A) Type A, B and C

(B) Type A, D and F

(C) Type A, B and E

(D) Type C, D and E

51. Foods involved in causing Staphylococcus food poisoning is :

(A) Custard and cream sauces

(B) Pickles

(C) Juices

(D) Completely cooked vegetables

52. Bacteria 'Clostridium perfringens' release :

(A) Neurotoxin

(B) Enterotoxin

(C) Cytotoxin

(D) None of the above

53. During 'Botulism' disease, the bacteria releases :

(A) Neurotoxin

(B) Enterotoxin

(C) Cytotoxin

(D) None of the above

54. Diethyl pyrocarbonate is used as an antimicrobial food additive for :

(A) Milk

(B) Chocolate

(C) Fruit juices and carbonated beverages

(D) None of the above

55. Most bacteria, yeasts and moulds show a growth optimum between :

(A) 5°–15°C

(B) 16°–38°C

(C) 10°–25°C

(D) 20°–42°C

56. In air blast freezing, food packages are carried at a temperature of :

(A) 4°–10°C

(B) –4°–4°C

(C) (–10°)–(–22°C)

(D) (–29°)–(–46°C)

57. 'Explosive puffing' is a process of drying :

(A) Vegetables

(B) Spices

(C) Cereals and grains

(D) None of the above

58. Additives which are used to presence meat and give them desirable colour and flavour are called as :

(A) Flavour enhancers

(B) Flour improvers

(C) Curing agents

(D) Emulsions

59. Food additives which retain moisture in foods are called as :

(A) Humecants

(B) Leavening agents

(C) Emulsions

(D) None of the above

60. Aspartame, sucralose, and cyclamate are used as :

(A) Anticaking agents

(B) Pigments

(C) Sweeteners

(D) Chelating agents

61. Which of the following is not used as food preservative ?

(A) Sodium chloride

(B) Sugar

(C) Acetic acid

(D) Calcium chloride

62. 'Blanching' is :

(A) Heat treatment

(B) Cold treatment

(C) Chill storage

(D) None of the above

63. Temperature range for chill storage is :

(A) 4°–8°C

(B) 1°–4°C

(C) (–1°)–(–4°C)

(D) None of the above

64. The main source of carbohydrates in the diet is :

(A) Pulses

(B) Starch and sugar

(C) Green vegetables

(D) Olive oil

65. Which of the following is also known as "accessory nutrients" ?

(A) Vitamins

(B) Proteins

(C) Minerals

(D) All of the above

66. Acid used in food preservation includes :

(A) Sulphuric acid

(B) Hydrochloric acid

(C) Boric acid

(D) Benzoic acid

67. $SO_2$ cannot be used to preserve naturally coloured juices because of its :

(A) characteristic flavour

(B) characteristic aroma

(C) bleaching action

(D) None of the above

68. Process of adding vitamins to milk is known as :

(A) Sterilization

(B) Pasteurization

(C) Flavouring

(D) Fortification

69. The removal of moisture from the food materials for preservation is known as :

(A) Heat processing

(B) Freezing

(C) Dehydration

(D) Chilling

70. Sausage is :

(A) a solution

(B) a precipitate

(C) a highly viscous liquid

(D) an emulsion

71. Which of the following preservatives is not recommended in food application ?

(A) Sorbic acid

(B) Vinegar

(C) Formaldehyde

(D) Benzoic acid

72. Which of the following is true for nitrate and nitrite for meat processing ?

(A) Increases juiciness

(B) Improves colour

(C) Increases tenderness

(D) None of the above

73. The time of heating at a temperature to cause 90% reduction in count of viable spores is called :

(A) Lethal rate

(B) Z value

(C) D value

(D) F value

74. What is the strength of brine solution for the canning of vegetables ?

(A) 40%

(B) 32%

(C) 12%

(D) 2%

75. Lecithin is used as a/an :

(A) Anticaking agent

(B) Emulsifier

(C) Stabilizer

(D) Leavening agent

76. Insecticides are substances used to kill :

(A) Insect

(B) Pest

(C) Herbs

(D) All of the above

77. Which one of the following is both systemic and contact herbicides ?

(A) Glyphosate

(B) Triazine

(C) Fenec

(D) Atrazine

78. Which of the following is not a pesticide ?

(A) BHC

(B) Aldrin

(C) DDT

(D) Ephedrine

79. Insecticides kill :

(A) Harmful insects

(B) Both harmful and useful insects

(C) Specific insects

(D) Only plant pest

80. DDT is :

(A) Carbamate

(B) Organophosphate

(C) Organochlorine

(D) Triazine

81. Pesticides generally attack :

(A) Muscular system

(B) Respiratory system

(C) Nervous system

(D) Circulatory system

82. The common mode of action of herbicides is :

(A) Blocking of xylem channels

(B) Blocking of phloem

(C) Blocking of photosystem II

(D) Blocking of photosystem I

83. Calcium arsenate is a :

(A) Stomach poison

(B) Contact insecticide

(C) Fumigant

(D) None of the above

84. TEPP is a/an :

(A) Fumigant

(B) Contact insecticide

(C) Stomach poison

(D) Inorganic insecticide

85. $CS_2$ is a :

(A) Stomach poison

(B) Contact insecticide

(C) Fumigant

(D) None of the above

86. Lead arsenate is a :

(A) Pesticide

(B) Herbicide

(C) Insecticide

(D) All of the above

87. Pyrethrine is found in :

(A) Neem plant

(B) Pyrethrum plant

(C) Coconut plant

(D) Stem cell

88. Dinitrophenols is used as :

(A) Insecticides

(B) Fungicides

(C) Both (A) and (B)

(D) None of the above

89. Chloral is used for the preparation of :

(A) DDT

(B) BHC

(C) Aldrin

(D) Carbomate

90. How much number of benzene-derivative molecules are involved in the preparation of DDT ?

(A) One

(B) Two

(C) Three

(D) Four

91. How much number of chlorine molecules is involved in the preparation of BHC ?

(A) One

(B) Two

(C) Three

(D) Four

92. TEPP is :

(A) Tetra ethyl phosphate

(B) Tetra ethyl phosphorous

(C) Tetra ethyl pyrophosphate

(D) Tetra ethyl polyphosphate

93. The formula of phosphorous oxychloride is :

(A) $PCl_3$

(B) $POCl_3$

(C) $PO_2Cl_2$

(D) $POCl_4$

94. The compound ethyl maleate is used for the preparation of :

(A) Parathion

(B) Malathion

(C) BHC

(D) DDT

95. The hazards associated with pesticide residues depend mainly on two factors :

(A) Concentration of residues

(B) Concentration of level of residues

(C) Toxicity to human or other life forms

(D) Both (B) and (C)

96. Which type of agrochemical causing mutation or genes or cancer diseases ?

(A) Herbicides

(B) Pesticides

(C) Insecticides

(D) None of the above

97. Sort the way which the general population can be exposed to pesticides :

(A) Vector control

(B) Residues in the environment

(C) Residues in the food

(D) All of the above

98. Action of herbicides is :

(A) Plant sex cell killer

(B) A growth inhibitor

(C) Plant growth regulators cum weed killer

(D) All of the above

99. The name of DDE is :

(A) Dinitrotriphenol

(B) Dinitro dichloro ethane

(C) Dichloro diphenyl dichloroethane

(D) Dinitro tripheno acetic acid

100. Difference between parathion and paraoxon is :

(A) S = O

(B) N = O

(C) O = P

(D) S = T

4. Four alternative answers are mentioned for each question as—A, B, C & D in the booklet. The candidate has to choose the most correct/appropriate answer and mark the same in the OMR Answer-Sheet as per the direction :

**Example :**

**Question :**

Q. 1 (A) ● (C) (D)
Q. 2 (A) (B) ● (D)
Q. 3 (A) ● (C) (D)

Illegible answers with cutting and over-writing or half filled circle will be cancelled.

5. Each question carries equal marks. Marks will be awarded according to the number of correct answers you have.

6. All answers are to be given on OMR Answer sheet only. Answers given anywhere other than the place specified in the answer sheet will not be considered valid.

7. Before writing anything on the OMR Answer Sheet, all the instructions given in it should be read carefully.

8. After the completion of the examination candidates should leave the examination hall only after providing their OMR Answer Sheet to the invigilator. Candidate can carry their Question Booklet.

9. There will be no negative marking.

10. Rough work, if any, should be done on the blank pages provided for the purpose in the booklet.

11. To bring and use of log-book, calculator, pager and cellular phone in examination hall is prohibited.

12. In case of any difference found in English and Hindi version of the question, the English version of the question will be held authentic.

**Impt. :** On opening the question booklet, first check that all the pages of the question booklet are printed properly. If there is ny discrepancy in the question Booklet, then after showing it to the invigilator, get another question Booklet of the same series.

4. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार सम्भावित उत्तर— A, B, C एवं D हैं। परीक्षार्थी को उन चारों विकल्पों में से एक सबसे सही अथवा सबसे उपयुक्त उत्तर छाँटना है। उत्तर को OMR आन्सर-शीट में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

उदाहरण :

प्रश्न :

प्रश्न 1 (A) ● (C) (D)
प्रश्न 2 (A) (B) ● (D)
प्रश्न 3 (A) ● (C) (D)

अपठनीय उत्तर या ऐसे उत्तर जिन्हें काटा या बदला गया है, या गोले में आधा भरकर दिया गया, उन्हें निरस्त कर दिया जाएगा।

5. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।

6. सभी उत्तर केवल ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर ही दिये जाने हैं। उत्तर-पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।

7. ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाये।

8. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी OMR Answer Sheet उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें। परीक्षार्थी अपने साथ प्रश्न-पुस्तिका ले जा सकते हैं।

9. निगेटिव मार्किंग नहीं है।

10. कोई भी रफ कार्य, प्रश्न-पुस्तिका के अन्त में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।

11. परीक्षा-कक्ष में लॉग-बुक, कैलकुलेटर, पेजर तथा सेल्युलर फोन ले जाना तथा उसका उपयोग करना वर्जित है।

12. प्रश्न के हिन्दी एवं अंग्रेजी रूपान्तरण में भिन्नता होने की दशा में प्रश्न का अंग्रेजी रूपान्तरण ही मान्य होगा।

महत्वपूर्ण : प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्न-पुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरीज की दूसरी प्रश्न-पुस्तिका प्राप्त कर लें।