

UNIVERSITY OF MYSORE

Ph.D. Entrance Examination, Oct. - 2017



SUBJECT CODE :

01

QUESTION BOOKLET NO.

00001

Entrance Reg. No.

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QUESTION BOOKLET

(Read carefully the instructions given in the Question Booklet)

SUBJECT : **FOOD SCIENCE / FOOD TECHNOLOGY**

MAXIMUM MARKS : 100

MAXIMUM TIME : THREE HOURS

(Including initial 10 minutes for filling O.M.R. Answer sheet)

INSTRUCTIONS TO THE CANDIDATES

1. The sealed questions booklet containing 50 questions enclosed with O.M.R. Answer Sheet is given to you.
2. Verify whether the given question booklet is of the same subject which you have opted for examination.
3. Open the question paper seal carefully and take out the enclosed O.M.R. Answer Sheet outside the question booklet and fill up the general information in the O.M.R. Answer sheet. If you fail to fill up the details in the form of alphabet and signs as instructed, you will be personally responsible for consequences arising during scoring of your Answer Sheet.
4. During the examination:
 - a) Read each question carefully.
 - b) Determine the Most appropriate/correct answer from the four available choices given under each question.
 - c) Completely darken the relevant circle against the Question in the O.M.R. Answer Sheet. For example, in the question paper if "C" is correct answer for Question No.8, then darken against Sl. No.8 of O.M.R. Answer Sheet using Blue/Black Ball Point Pen as follows:

Question No. 8. (A) (B) (C) (D) (Only example) (Use Ball Pen only)

5. Rough work should be done only on the blank space provided in the Question Booklet. Rough work should not be done on the O.M.R. Answer Sheet.
6. If more than one circle is darkened for a given question, such answer is treated as wrong and no mark will be given. See the example in the O.M.R. Sheet.
7. The candidate and the Room Supervisor should sign in the O.M.R. Sheet at the specified place.
8. Candidate should return the original O.M.R. Answer Sheet and the university copy to the Room Supervisor after the examination.
9. Candidate can carry the question booklet and the candidate copy of the O.M.R. Sheet.
10. The calculator, pager and mobile phone are not allowed inside the examination hall.
11. **If a candidate is found committing malpractice, such a candidate shall not be considered for admission to the course and action against such candidate will be taken as per rules.**

INSTRUCTIONS TO FILL UP THE O.M.R. SHEET

1. There is only one most appropriate/correct answer for each question.
2. For each question, only one circle must be darkened with BLUE or BLACK ball point pen only. Do not try to alter it.
3. Circle should be darkened completely so that the alphabet inside it is not visible.
4. Do not make any stray marks on O.M.R. Sheet.

ಗಮನಿಸಿ : ಸೂಚನೆಗಳ ಕನ್ನಡ ಆವೃತ್ತಿಯು ಈ ಪುಸ್ತಕದ ಹಿಂಭಾಗದಲ್ಲಿ ಮುದ್ರಿಸಲ್ಪಟ್ಟಿದೆ.

PART - A

[50 × 1 = 50]

1. Richest source of soluble fibre is :
(A) Mango (B) Rice bran
(C) Sugar cane (D) Bengal gram
2. Table sugar is which type of sugar?
(A) Fructose (B) Glucose
(C) Sucrose (D) Galactose
3. Choose the calorific value of protein per gram
(A) 4 (B) 5
(C) 9 (D) 6
4. An Apo enzyme it is a
(A) vitamin (B) cofactor
(C) fatty acids (D) zymogen
5. In Folin-Lowry method, FC reagent gives brown colour with the protein because of the reaction with
(A) Lysine-Arginine (B) Phenyl Alanine
(C) Tryptophan-Tyrosine (D) None of these
6. The Limiting Amino acid in cereals is :
(A) Arginine (B) Lysine
(C) Tryptophan (D) Methionine
7. Which of the bacteria can grow in alkaline pH?
(A) Lactobacilli (B) Vibrio cholera
(C) Salmonella (D) Staphylococcus
8. Bio piracy means
(A) Use of biopatents
(B) Thefts of plants and animals
(C) Stealing of bioresources
(D) Exploitation of bioresources without authentic permission
9. Allergic reaction are related with
(A) IgA (B) IgG
(C) IgE (D) IgM
10. Which of the following is non-symbiotic biofertilizer?
(A) Anabaena (B) Rhizobium
(C) VAM (D) Azotobacter

11. Which of the following is a genetic disorder resulting in debilitating protein abnormalities?
(A) Kwashiorkor (B) Marasmus
(C) Cystic fibrosis (D) Acidosis
12. Proteolysis generally starts in ____ by a family of aspartic proteases called pepsin.
(A) Small intestine (B) Stomach
(C) Large intestine (D) Mouth
13. Which among the following is not a fermented food?
(A) Beer (B) Bread
(C) Jam (D) Idli
14. In pre-cooling, water is mostly removed by :
(A) Convection (B) Conduction
(C) Radiation (D) None of these
15. Kjeldhal's method is for estimation of
(A) Carbohydrate (B) Fat
(C) Protein (D) Minerals
16. Which of the following is biodegradable plastic?
(A) Poly propylene (B) Polythene
(C) LDPE (D) Polyhydroxy butyrate
17. Egg white injury factor is
(A) Avidin (B) Ovalbumin
(C) Ovoglobulin (D) Ovomucin
18. Find the odd one out
(A) Palmitic acid, steric acid (B) Oleic acid, linoleic acid
(C) Lenolenic acid, oleic acid (D) Tripalmitin, oleic acid
19. The enzyme which is responsible for browning of fruit and vegetables is
(A) Lipo-oxidase (B) Polyphenol-oxidase
(C) Amylase (D) Protease
20. Condensation is a process which occurs when
(A) Temperature falls below 0°C
(B) Absolute humidity becomes equal to relative humidity
(C) Temperature in the air parcel remains static
(D) Relative humidity becomes 100%

21. Micro-organism associated with food poisoning
 (A) Streptococcus (B) *C. tetanii*,
 (C) *C. botulinum* (D) Lactic acid bacteria
22. 100% pure ethanol is called
 (A) Rectified spirit (B) Absolute alcohol
 (C) Denatured alcohol (D) Power alcohol
23. Examples for class II preservative is
 (A) Pepper (B) Salt
 (C) Oil (D) Benzoic acid
24. Which plants have been developed for expressing antigens derived from animal viruses?
 (A) Tomato (B) Tobacco
 (C) Potato (D) Corn
25. The reaction between fat and NaOH is called
 (A) Esterification (B) Saponification
 (C) Hydrogenolysis (D) Fermentation
26. HTST pasteurization stands for
 (A) High Time slow Treatment
 (B) High temperature slow treatment
 (C) High Temperature short Time
 (D) High Thermal slow time
27. Which is not a gonadal hormone?
 (A) Progesterone (B) Testosterone
 (C) Adrenalin (D) Estrogen
28. Conversion of fumarate to malate is catalyzed by.
 (A) Fumarate hydratase (B) Fumarate dehydrogenase
 (C) Malate synthase (D) Malate dehydrogenase
29. Which of the following is a multienzyme complex _____?
 (A) Pyruvate dehydrogenase
 (B) Creatine kinase
 (C) Lactate dehydrogenase
 (D) Glyceraldehyde-3 -phosphate dehydrogenase
30. Niacin is a part of _____.
 (A) NAD (B) FAD
 (C) FMN (D) HGPRT

31. Food processing in India is concentrated in which sector, maximum?
(A) Organized Sector (B) Unorganized sector
(C) Small Scale (D) None of the mentioned
32. Which of the following is untrue?
(A) Basmati rice has gained international recognition
(B) Wine industry is gaining support in India, especially the Maharashtra
(C) Dairy industry of India is the largest in the world
(D) None of the mentioned
33. The biggest processing segment under food processing is the meat, poultry, vegetables and oil industry.
(A) True (B) False
34. Cider is the product obtained from
(A) Fermentation of plum (B) Fermentation of Peach
(C) Fermentation of Apple (D) Distillation of wine
35. Pasteurization involves the :
(A) Exposure of food to high temperatures for short periods to destroy harmful microorganisms.
(B) Exposure of food to heat to inactivate enzymes that causes undesirable effects in foods during storage.
(C) Fortification of foods with vitamins A and D
(D) Use of irradiation to destroy certain pathogens in foods
36. Food additives widely used for many years without apparent ill effects are on the list
(A) FDA (B) GRAS
(C) Additive safety (D) Delaney
37. Which refrigerant is commonly used is used in cold storage in our country.
(A) Ethylene (B) Carbide
(C) Ammonia (D) Sodium Benzoate
38. Which of the following fact about radiation/ irradiation is true?
(A) All food items consumed by man are radioactive
(B) Alpha and beta particles and gamma photons are the radiations available for food preservation applications
(C) Energy lost per ion pair formed is greater than the ionization energy
(D) All of the mentioned

39. What change does ionizing radiation produce in milk casein?
(A) Increase in rennet coagulation (B) Reduction of its stability to heat
(C) Both of the mentioned (D) Neither of the mentioned
40. Units for radiation energy is
(A) Radura (B) Gray (Gy)
(C) Percentage (D) MeV
41. An Oil Press is called
(A) Expresser (B) Boiler
(C) Expeller (D) Extractor
42. If surface area of liquid is large then evaporation will be
(A) Small (B) Large
(C) Moderate (D) None of above
43. Evaporation causes
(A) Cooling (B) Heating effect
(C) Increase in weight (D) Increase in density
44. Water in freezing form may break rocks in to pieces by force of
(A) Reduction (B) Evaporation
(C) Expansion (D) Condensation
45. If air is heated, it
(A) Compresses (B) Expands
(C) Falls down (D) Gets denser
46. Which of the following is NOT a characteristic of freeze-dehydration?
(A) Moisture loss by sublimation from boundary of ever receding ice crystal zone
(B) Continuous process
(C) Temperatures sufficiently low to prevent thawing used
(D) None of the mentioned
47. In the history of packaging of the food industry, which among these was never a material of packaging?
(A) Bakelite (B) Pottery and vases
(C) Iron and tin plated steel (D) None of the mentioned

48. Solvent extraction is better if repeated extractions are done using
 (A) Large solvent (B) Small solvent
 (C) Extra solvent (D) None of the mentioned
49. Simple distillation is a _____ process.
 (A) Batch (B) Continuous
 (C) Adiabatic (D) None of the mentioned
50. Which of the following is a food infection?
 (A) Salmonellois (B) Botulism
 (C) Staphylococcal intoxication (D) None of these

PART - B

[5 × 10 = 50]

1. a) Explain in detail on various physical agents used to control growth of micro-organisms.
 b) Give an account on extraction and processing of essential oils.
[5 + 5 = 10]
2. a) Explain bacterial transformation with figure.
 b) Write on the physicochemical properties of proteins.
[4 + 6 = 10]
3. a) Discuss the isolation and purification of enzymes.
 b) Write on the biological role of ω-3 fatty acids in health and diseases.
[6 + 4 = 10]
4. a) What are bioreactors? Explain the role of fed batch and continuous batch bioreactors.
 b) Describe in brief about hurdle technology.
[5 + 5 = 10]
5. a) What are the different types of preservatives? Give their role in product development.
 b) Explain any TWO of the followings :
 i) Psychometric charts for drying
 ii) Refrigerated storage, and
 iii) Mass transfer operations
[5 + 5 = 10]



ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸೂಚನೆಗಳು

1. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯ ಜೊತೆಗೆ 50 ಪ್ರಶ್ನೆಗಳನ್ನು ಹೊಂದಿರುವ ಮೊಹರು ಮಾಡಿದ ಪ್ರಶ್ನೆ ಪುಸ್ತಕವನ್ನು ನಿಮಗೆ ನೀಡಲಾಗಿದೆ.
2. ಕೊಟ್ಟಿರುವ ಪ್ರಶ್ನೆ ಪುಸ್ತಕವು, ನೀವು ಪರೀಕ್ಷೆಗೆ ಆಯ್ಕೆ ಮಾಡಿಕೊಂಡಿರುವ ವಿಷಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದ್ದೇ ಎಂಬುದನ್ನು ಪರಿಶೀಲಿಸಿರಿ.
3. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಮೊಹರು ಜಾಗ್ರತೆಯಿಂದ ತೆರೆಯಿರಿ ಮತ್ತು ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯಿಂದ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯನ್ನು ಹೊರಗೆ ತೆಗೆದು, ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಸಾಮಾನ್ಯ ಮಾಹಿತಿಯನ್ನು ತುಂಬಿರಿ. ಕೊಟ್ಟಿರುವ ಸೂಚನೆಯಂತೆ ನೀವು ನಮೂನೆಯಲ್ಲಿನ ವಿವರಗಳನ್ನು ತುಂಬಲು ವಿಫಲರಾದರೆ, ನಿಮ್ಮ ಉತ್ತರ ಹಾಳೆಯ ಮೌಲ್ಯಮಾಪನ ಸಮಯದಲ್ಲಿ ಉಂಟಾಗುವ ಪರಿಣಾಮಗಳಿಗೆ ವೈಯಕ್ತಿಕವಾಗಿ ನೀವೇ ಜವಾಬ್ದಾರಾಗಿರುತ್ತೀರಿ.
4. ಪರೀಕ್ಷೆಯ ಸಮಯದಲ್ಲಿ:
 - a) ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಯನ್ನು ಜಾಗ್ರತೆಯಿಂದ ಓದಿರಿ.
 - b) ಪ್ರತಿ ಪ್ರಶ್ನೆಯ ಕೆಳಗೆ ನೀಡಿರುವ ನಾಲ್ಕು ಲಭ್ಯ ಆಯ್ಕೆಗಳಲ್ಲಿ ಅತ್ಯಂತ ಸರಿಯಾದ/ ಸೂಕ್ತವಾದ ಉತ್ತರವನ್ನು ನಿರ್ಧರಿಸಿ.
 - c) ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯಲ್ಲಿನ ಸಂಬಂಧಿಸಿದ ಪ್ರಶ್ನೆಯ ವೃತ್ತಾಕಾರವನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ತುಂಬಿರಿ. ಉದಾಹರಣೆಗೆ, ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಪ್ರಶ್ನೆ ಸಂಖ್ಯೆ 8ಕ್ಕೆ "C" ಸರಿಯಾದ ಉತ್ತರವಾಗಿದ್ದರೆ, ನೀಲಿ/ಕಪ್ಪು ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್ ಬಳಸಿ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯ ಕ್ರಮ ಸಂಖ್ಯೆ 8ರ ಮುಂದೆ ಈ ಕೆಳಗಿನಂತೆ ತುಂಬಿರಿ:
 ಪ್ರಶ್ನೆ ಸಂಖ್ಯೆ 8.(A) (B) ● (D) (ಉದಾಹರಣೆ ಮಾತ್ರ) (ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್ ಮಾತ್ರ ಉಪಯೋಗಿಸಿ)
5. ಉತ್ತರದ ಪೂರ್ವಸಿದ್ಧತೆಯ ಬರವಣಿಗೆಯನ್ನು (ಚಿತ್ತು ಕೆಲಸ) ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಒದಗಿಸಿದ ಖಾಲಿ ಜಾಗದಲ್ಲಿ ಮಾತ್ರವೇ ಮಾಡಬೇಕು (ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಮಾಡಬಾರದು).
6. ಒಂದು ನಿರ್ದಿಷ್ಟ ಪ್ರಶ್ನೆಗೆ ಒಂದಕ್ಕಿಂತ ಹೆಚ್ಚು ವೃತ್ತಾಕಾರವನ್ನು ಗುರುತಿಸಲಾಗಿದ್ದರೆ, ಅಂತಹ ಉತ್ತರವನ್ನು ತಪ್ಪು ಎಂದು ಪರಿಗಣಿಸಲಾಗುತ್ತದೆ ಮತ್ತು ಯಾವುದೇ ಅಂಕವನ್ನು ನೀಡಲಾಗುವುದಿಲ್ಲ. ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯಲ್ಲಿನ ಉದಾಹರಣೆ ನೋಡಿ.
7. ಅಭ್ಯರ್ಥಿ ಮತ್ತು ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರು ನಿರ್ದಿಷ್ಟಪಡಿಸಿದ ಸ್ಥಳದಲ್ಲಿ ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯ ಮೇಲೆ ಸಹಿ ಮಾಡಬೇಕು.
8. ಅಭ್ಯರ್ಥಿಯು ಪರೀಕ್ಷೆಯ ನಂತರ ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರಿಗೆ ಮೂಲ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆ ಮತ್ತು ವಿಶ್ವವಿದ್ಯಾನಿಲಯದ ಪ್ರತಿಯನ್ನು ಹಿಂದಿರುಗಿಸಬೇಕು.
9. ಅಭ್ಯರ್ಥಿಯು ಪ್ರಶ್ನೆ ಪುಸ್ತಕವನ್ನು ಮತ್ತು ಓ.ಎಂ.ಆರ್. ಅಭ್ಯರ್ಥಿಯ ಪ್ರತಿಯನ್ನು ತಮ್ಮ ಜೊತೆ ತೆಗೆದುಕೊಂಡು ಹೋಗಬಹುದು.
10. ಕ್ಯಾಲ್ಕುಲೇಟರ್, ಪೇಜರ್ ಮತ್ತು ಮೊಬೈಲ್ ಫೋನ್‌ಗಳನ್ನು ಪರೀಕ್ಷಾ ಕೊಠಡಿಯ ಒಳಗೆ ಅನುಮತಿಸಲಾಗುವುದಿಲ್ಲ.
11. ಅಭ್ಯರ್ಥಿಯು ದುಷ್ಕೃತ್ಯದಲ್ಲಿ ತೊಡಗಿರುವುದು ಕಂಡುಬಂದರೆ, ಅಂತಹ ಅಭ್ಯರ್ಥಿಯನ್ನು ಕೋರ್ಸ್‌ಗೆ ಪರಿಗಣಿಸಲಾಗುವುದಿಲ್ಲ ಮತ್ತು ನಿಯಮಗಳ ಪ್ರಕಾರ ಇಂತಹ ಅಭ್ಯರ್ಥಿಯ ವಿರುದ್ಧ ಕ್ರಮ ಕೈಗೊಳ್ಳಲಾಗುವುದು.
ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯನ್ನು ತುಂಬಲು ಸೂಚನೆಗಳು

1. ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಗೆ ಒಂದೇ ಒಂದು ಅತ್ಯಂತ ಸೂಕ್ತವಾದ/ಸರಿಯಾದ ಉತ್ತರವಿರುತ್ತದೆ.
2. ಪ್ರತಿ ಪ್ರಶ್ನೆಗೆ ಒಂದು ವೃತ್ತವನ್ನು ಮಾತ್ರ ನೀಲಿ ಅಥವಾ ಕಪ್ಪು ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್ನಿನಿಂದ ಮಾತ್ರ ತುಂಬತಕ್ಕದ್ದು. ಉತ್ತರವನ್ನು ಮಾರ್ಪಡಿಸಲು ಪ್ರಯತ್ನಿಸಬೇಡಿ.
3. ವೃತ್ತದೊಳಗಿರುವ ಅಕ್ಷರವು ಕಾಣದಿರುವಂತೆ ವೃತ್ತವನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ತುಂಬುವುದು.
4. ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯಲ್ಲಿ ಯಾವುದೇ ಅನಾವಶ್ಯಕ ಗುರುತುಗಳನ್ನು ಮಾಡಬೇಡಿ.

Note : English version of the instructions is printed on the front cover of this booklet.

SEAL

SEAL