

11P/280/3

Question Booklet No. 590

(To be filled up by the candidate by blue/black ball-point pen)

Roll No.

--	--	--	--	--	--	--	--

Roll No.

(Write the digits in words) .....

Serial No. of OMR Answer Sheet .....

Day and Date .....

(Signature of Invigilator)

**INSTRUCTIONS TO CANDIDATES**(Use only **blue/black ball-point pen** in the space above and on both sides of the Answer Sheet)

1. Within 10 minutes of the issue of the Question Booklet, check the Question Booklet to ensure that it contains all the pages in correct sequence and that no page/question is missing. In case of faulty Question Booklet bring it to the notice of the Superintendent/Invigilators immediately to obtain a fresh Question Booklet.
2. Do not bring any loose paper, written or blank, inside the Examination Hall *except the Admit Card without its envelope*.
3. A separate Answer Sheet is given. *It should not be folded or mutilated. A second Answer Sheet shall not be provided. Only the Answer Sheet will be evaluated.*
4. Write your *Roll Number and Serial Number of the Answer Sheet by pen* in the space provided above.
5. **On the front page of the Answer Sheet, write by pen your Roll Number in the space provided at the top, and by darkening the circles at the bottom. Also, wherever applicable, write the Question Booklet Number and the Set Number in appropriate places.**
6. No overwriting is allowed in the entries of Roll No., Question Booklet No. and Set No. (if any) on OMR sheet and also Roll No. and OMR Sheet No. on the Question Booklet.
7. Any change in the aforesaid entries is to be verified by the invigilator, otherwise it will be taken as unfair means.
8. Each question in this Booklet is followed by four alternative answers. *For each question, you are to record the correct option on the Answer Sheet by darkening the appropriate circle* in the corresponding row of the Answer Sheet, by ball-point pen as mentioned in the guidelines given on the first page of the Answer Sheet.
9. For each question, darken only one circle on the Answer Sheet. If you darken more than one circle or darken a circle partially, the answer will be treated as incorrect.
10. *Note that the answer once filled in ink cannot be changed.* If you *do not wish to attempt* a question, leave all the circles in the corresponding row blank (such question will be awarded zero mark).
11. For rough work, use the inner back page of the title cover and the blank page at the end of this Booklet.
12. Deposit *only the OMR Answer Sheet* at the end of the Test.
13. You are not permitted to leave the Examination Hall until the end of the Test.
14. If a candidate attempts to use any form of unfair means, he/she shall be liable to such punishment as the University may determine and impose on him/her.

**No. of Questions/प्रश्नों की संख्या : 120**

**Time/समय : 2 Hours/घण्टे**

**Full Marks/पूर्णांक : 360**

**Note/नोट :** (1) Attempt as many questions as you can. Each question carries 3 marks. One mark will be deducted for each incorrect answer. Zero mark will be awarded for each unattempted question.

अधिकाधिक प्रश्नों को हल करने का प्रयत्न करें। प्रत्येक प्रश्न 3 अंक का है। प्रत्येक गलत उत्तर के लिए एक अंक काटा जाएगा। प्रत्येक अनुत्तरित प्रश्न का प्राप्तांक शून्य होगा।

(2) If more than one alternative answers seem to be approximate to the correct answer, choose the closest one.

यदि एकाधिक वैकल्पिक उत्तर सही उत्तर के निकट प्रतीत हों, तो निकटतम सही उत्तर दें।

1. A volumetric method for estimating fat in milk using sulphuric acid for liberating fat is

- |                               |                              |
|-------------------------------|------------------------------|
| (1) Babcock and Gerber method | (2) Hintoh and Macara method |
| (3) Roese-Gottlieb method     | (4) Walstra-Mulder method    |

2. Reichert-Meissl number of milk fat varies from

- |             |             |              |              |
|-------------|-------------|--------------|--------------|
| (1) 5 to 10 | (2) 8 to 15 | (3) 17 to 35 | (4) 30 to 50 |
|-------------|-------------|--------------|--------------|

3. Viscosity of cow milk at 20 °C is  
(1) 1.0-1.5 cp      (2) 1.5-2.0 cp      (3) 2.0-2.5 cp      (4) 2.5-3.0 cp
4. Maximum limit of over-run in butter manufacture is  
(1) 10%      (2) 15%      (3) 20%      (4) 25%
5. Ageing of ice cream mix  
(1) increases bacterial count      (2) decreases melting resistance  
(3) decreases whipping capacity      (4) maximises over-run
6. A semi-hard cheese is  
(1) Brick cheese      (2) Cheddar cheese  
(3) Edam cheese      (4) Gouda cheese
7. Protein content of Cheddar cheese is  
(1) 13-15%      (2) 22-24%      (3) 32-34%      (4) 38-40%
8. Soggy defect of ice cream is due to  
(1) low sugar content      (2) less stabilizer content  
(3) low over-run      (4) low total solids
9. Steam required to evaporate 1 kg of water from milk during drum drying is  
(1) 0.6-0.7 kg      (2) 1.2-1.3 kg      (3) 1.8-1.9 kg      (4) 2.4-2.5 kg
10. For condensed milk, homogenization is carried out after  
(1) milk clarification      (2) pre-warming milk  
(3) condensing milk      (4) crystallizing condensed milk

11. Crystallization in condensed milk is done to
- (1) remove lactose crystals                      (2) reduce size of lactose crystals  
 (3) reduce sweetness level                      (4) remove sucrose crystals
12. Reynolds number for a fluid (density— $\rho$ ; viscosity— $\mu$ ) flowing at mass average velocity of  $V$  in a tube (inner diameter— $D$ ; length— $L$ ) and pressure drop across the tube is  $P$  is
- (1)  $\frac{2D}{V^2 \cdot \rho \cdot L}$               (2)  $\frac{D \cdot P}{2\rho \cdot L \cdot V^2}$               (3)  $\frac{D \cdot V \cdot \rho}{\mu}$               (4)  $\frac{D \cdot V \cdot \rho}{\mu \cdot L}$
13. For streamline flow, Reynolds number should be
- (1) less than 2000                      (2) less than 3000  
 (3) 2000-3000                      (4) above 4000
14. Plunger pumps are
- (1) centrifugal pumps                      (2) positive displacement pumps  
 (3) reciprocating pumps                      (4) regenerative pumps
15. A spray nozzle commonly used in spray drier is
- (1) pressure nozzle                      (2) centrifugal spray nozzle  
 (3) rotary atomizer                      (4) Any of the above
16. Button formation defect is observed in
- (1) butter                      (2) milk powders              (3) cream                      (4) condensed milk
17. Isoelectric point of casein is
- (1) 3.8                      (2) 4.2                      (3) 4.6                      (4) 5.2

**18.** For homogenizing ice cream mix, pressures ( $\text{kg/cm}^2$ ) maintained at first and second stages are

- (1) 50 and 100      (2) 80 and 90      (3) 110 and 80      (4) 140 and 70

**19.** NaCl concentration in aqueous phase of butter is

- (1) 2.5%              (2) 5.0%              (3) 10.0%              (4) 15.0%

**20.** Cooked flavour in heated milk is due to

- (1) -proteose peptone                      (2) -SH groups  
(3) -serum albumin                      (4) -SS groups

**21.** Alcohol ppt. test determines

- (1) milk adulteration                      (2) percentage of fat in milk  
(3) acidity of milk                      (4) heat stability of milk

**22.** Meat is a poor source of

- (1) calcium              (2) iron              (3) potassium              (4) phosphorus

**23.** During Resorcinol Test, development of green colour in heated samples shows the presence of

- (1) brominated vegetable oil              (2) cottonseed oil  
(3) saccharin                      (4) sorbitol

24. Sequence of plant nutrients indicated in fertilizer grade is
- (1) nitrogen, potash and phosphoric acid
  - (2) nitrogen, phosphoric acid and potash
  - (3) potash, nitrogen and phosphoric acid
  - (4) potash, phosphoric acid and nitrogen
25. Potash, nitrogen and phosphoric acid content (fresh weight basis) of green manure is about
- (1) 0.5-0.7%, 0.6-0.8% and 0.1-0.2% respectively
  - (2) 0.1-0.2%, 0.5-0.7% and 0.6-0.8% respectively
  - (3) 0.1-0.2%, 0.6-0.8% and 0.5-0.7% respectively
  - (4) 0.6-0.8%, 0.5-0.7% and 0.1-0.2% respectively
26. A handful of loamy soil when squeezed firmly, forms a ball which crumbles upon being rolled. It shows that
- (1) irrigation is overdue
  - (2) time appropriate for irrigation
  - (3) irrigate after a few days
  - (4) irrigate after few weeks
27. For seed multiplication, minimum safe distance between two varieties of often cross-pollinated crops is
- (1) 30 metres
  - (2) 150 metres
  - (3) 180 metres
  - (4) 270 metres
28. Desirable fat-to-SNF ratio of milk for the production of condensed milk is
- (1) 1:0.44
  - (2) 1:1.44
  - (3) 1:2.00
  - (4) 1:2.44







- 43.** Cow milk required to produce 1 kg butter is about
- (1) 18 kg                      (2) 23 kg                      (3) 28 kg                      (4) 33 kg
- 44.** Amount of air incorporated into food product which are basically foams is expressed in terms of
- (1) bulk density      (2) foamability      (3) over-run      (4) porosity
- 45.** Eutectic mixture of sodium chloride solution is
- (1) 17% NaCl and 83% water                      (2) 20% NaCl and 80% water  
(3) 23% NaCl and 77% water                      (4) 26% NaCl and 74% water
- 46.** Melting point of eutectic ice is
- (1) -21 °C                      (2) -24 °C                      (3) -27 °C                      (4) -30 °C
- 47.** Final eutectic point of ice cream is close to
- (1) -40 °C                      (2) -45 °C                      (3) -50 °C                      (4) -55 °C
- 48.** Sandiness in ice cream is caused by
- (1) denaturation of milk proteins                      (2) formation of large ice crystals  
(3) crystallization of lactose                      (4) crystallization of sucrose
- 49.** Monosaccharides constituting a molecule of lactose are
- (1) glucose and glucose                      (2) galactose and glucose  
(3) galactose and galactose                      (4) glucose and fructose

50. An intermediate product formed during ethanolic fermentation of sugars is
- (1) acetic acid (2) galacturonic acid  
(3) lactic acid (4) pyruvic acid
51. An intermediate compound formed during caramelization of sugars under acidic conditions is
- (1) 2,3-diketogulonic acid (2) furfural  
(3) hydroxy methyl furfural (4) oxalic acid
52. Lactose chloride number of milk is
- (1) 0.5-2.0 (2) 1.5-3.0 (3) 2.5-4.0 (4) 3.5-5.0
53. Constituent contributing most towards cooked flavour in dairy products is
- (1) lactoalbumin (2) lactoglobulin  
(3) alpha casein (4) beta casein
54. Corn protein is deficient in
- (1) lysine (2) lysine and methionine  
(3) tryptophan (4) tryptophan and lysine
55. Protein requirement (g per kg body weight per day) of an Indian adult is
- (1) 1.0 g vegetable protein (2) 1.0 g egg protein  
(3) 1.2 g egg protein (4) 1.2 g vegetable protein

56. A method of preservation in which food is heated to destroy vegetative forms of microorganisms followed by germinating spores into vegetative forms and reheating to destroy the later is called

- (1) appertization      (2) broiling      (3) Tyndallization      (4) uperization

57. Microorganism referred to as FS1518 is

- (1) *Bacillus coagulans*      (2) *Bacillus stearothermophilus*  
(3) *Clostridium sporogens*      (4) *Clostridium butyricum*

58. A fatty acid essential for human being is

- (1) arachidonic acid      (2) elaidic acid  
(3) Linoleic acid      (4) linolenic acid

59. Enzymes present in pancreatic juice of humans are

- (1) trypsin, lipase and enterokinase      (2) trypsin, amylase and enterokinase  
(3) trypsin, lipase and amylase      (4) trypsin, lecithinase and amylase

60. Percentage of total energy provided by dietary fat in the Indian diet is

- (1) 10-30      (2) 20-40      (3) 25-50      (4) 30-60

61. Death usually follows when loss of water from human body is about

- (1) 5%      (2) 10%      (3) 15%      (4) 20%



- 68.** Ergot is a mycotoxin produced on rye and other cereals by
- (1) *Claviceps purpurea* (2) *Aspergillus flavus*  
(3) *Aspergillus parasiticus* (4) *Penicillium molds*
- 69.** Vatator is a/an
- (1) centrifuge (2) filter press (3) evaporator (4) heat exchanger
- 70.** Thiobarbituric acid test is used to determine
- (1) hydrolytic rancidity (2) oxidative rancidity  
(3) volatile acidity (4) protein breakdown
- 71.** Flat sour spoilage in canned non-acid foods is caused by
- (1) *Bacillus stearothermophilus* (2) *Bacillus cereus*  
(3) *Bacillus subtilis* (4) *Bacillus mequaterium*
- 72.** Sulphide stinker in canned foods is due to
- (1) *Clostridium botulinum* (2) *Clostridium pasteurinum*  
(3) *D. nigrificans* (4) *C. perfringens*
- 73.** Hard swell of canned foods is caused by
- (1) *B. coagulans* (2) *B. subtilis*  
(3) *C. pasteurinum* (4) *C. thermosaccharolyticum*
- 74.** Beta oxalyl amino alanine is found in
- (1) soybeans (2) cotton seeds (3) Khesari dal (4) Green gram

75. A soybean protein is  
(1) glycinin                      (2) gluten                      (3) zein                      (4) kafirin
76. Bacteriostatic method of food preservation  
(1) destroys all bacteria  
(2) extends stationary phase of bacterial growth  
(3) kills all pathogenic bacteria only  
(4) extends lag phase of bacterial growth
77. Full form of GMP is  
(1) Good Manufactured Product                      (2) Good Milk Product  
(3) Good Milled Product                      (4) Good Manufacturing Practices
78. Improper venting of retort during thermal processing results in  
(1) higher retort temperature  
(2) lower retort temperature  
(3) lower vacuum inside canned product  
(4) higher vacuum inside canned product
79. *Clostridium botulinum* cannot grow and produce toxin in canned foods with pH below  
(1) 4.8                      (2) 4.9                      (3) 5.0                      (4) 5.2
80. Cofactor coenzyme involved in oxidative decarboxylation of pyruvic acid is  
(1) NADPH                      (2)  $\text{Ca}^+$                       (3) TPP                      (4) PFK
81. Metabolic water produced per day in an adult human by oxidation of food is nearly  
(1) 200 ml                      (2) 400 ml                      (3) 600 ml                      (4) 800 ml

- 82.** An amino acid essential for infants is  
(1) alanine                      (2) arginine                      (3) glycine                      (4) histimine
- 83.** Pellagra disease in human is caused by the deficiency of  
(1) thiamine                      (2) riboflavin                      (3) niacin                      (4) folic acid
- 84.** 500 kg milk of 7.5% fat is separated to obtain 70.5 kg cream of 52.5% fat. Separation efficiency of cream separator is  
(1) 93.5%                      (2) 97.6%                      (3) 98.7%                      (4) 99.1%
- 85.** pH of canned product which can be processed in boiling water is below  
(1) 5.2                      (2) 4.8                      (3) 4.5                      (4) 4.2
- 86.** Countercurrent tunnel driers give dehydrated food products with  
(1) more case hardening                      (2) lower moisture content  
(3) lesser browning                      (4) better rehydration properties
- 87.** Information required to determine relative humidity of drying air is  
(1) dry bulb temperature                      (2) wet bulb temperature  
(3) wet bulb depression                      (4) dry and wet bulb temperatures
- 88.** If  $D_{121} = 1.4$  and  $Z = 10$  °C for spores of PA3679,  $D_{111}$  will be  
(1) 0.21 min                      (2) 0.45 min                      (3) 4.10 min                      (4) 14.00 min
- 89.** A good refrigerant for a cold storage should have  
(1) very low boiling point                      (2) low specific heat  
(3) high latent heat of vaporization                      (4) low latent heat of vaporization

90. Common ammonia-based refrigeration plants are
- (1) vapour compression systems
  - (2) vapour absorption systems
  - (3) Planten-Munters continuous systems
  - (4) electrolux gas refrigeration systems
91. Separation of a constituent of a liquid mixture by partial vaporization of the mixture and recovery of vapour is
- (1) distillation
  - (2) evaporation
  - (3) drying
  - (4) pervaporation
92. A machine not associated with the manufacture of tin cans is
- (1) reformer
  - (2) hardening machine
  - (3) flanger
  - (4) double seamer
93. Capacity of refrigeration plant, (expressed as refrigeration tons) capable of removing 966120 kcal/hr of head is
- (1) 80.5
  - (2) 121.2
  - (3) 291.0
  - (4) 335.0
94. Drum drying is based primarily on
- (1) conduction heating
  - (2) convection heating
  - (3) radiation heating
  - (4) conduction and radiation heating
95. Foods dried in a very dry and hot air exhibit
- (1) excessive shrinkage
  - (2) case hardening
  - (3) non-enzymatic browning
  - (4) enzymatic browning



- 96.** Drying rate during falling rate period depends mainly upon
- (1) dry bulb temperature of air
  - (2) rate of water diffusion within food
  - (3) velocity of drying air
  - (4) wet bulb depression
- 97.** In the process of instantization, small product particles are
- (1) agglomerated
  - (2) clumped
  - (3) free fat removed from product surface
  - (4) treated product with wetting agents
- 98.** 'Decimal reductions' required for safe thermal processing is equivalent to
- (1) D/F ratio
  - (2) F/D ratio
  - (3) 12D value
  - (4) 5D value
- 99.** ICMR recommendations for daily dietary intake of vitamins A and C by an adult Indian man are
- (1) 350  $\mu\text{g}$  retinol and 25 mg vitamin C
  - (2) 450  $\mu\text{g}$  retinol and 25 mg vitamin C
  - (3) 600  $\mu\text{g}$  retinol and 40 mg vitamin C
  - (4) 750  $\mu\text{g}$  retinol and 40 mg vitamin C
- 100.** Percentage of nitrogen absorbed from intestinal tract that is actually retained by the body is
- (1) biological value
  - (2) chemical value
  - (3) net protein utilization
  - (4) protein efficiency ratio

101. Microorganism not significant in foods packed under modified atmosphere is

- (1) *Bacillus coagulans* (2) *Bacillus subtilis*  
(3) *Clostridium botulinum* (4) *Clostridium pasteurinum*

102. After drying, moisture content within dried fruits is equalized by a process called

- (1) equilibrating (2) finishing (3) diffusing (4) sweetening

103. Crop producing maximum protein per hectare of land is

- (1) gram (2) maize (3) potato (4) rice

104. Best temperature for storage of frozen foods is

- (1) 4 °C (2) 0 °C (3) -10 °C (4) -18 °C

105. Dose of  $\gamma$ -radiation used for disinfection of food grains is

- (1) 5000-15000 rad (2) 10000-100000 rad  
(3) 100000-500000 rad (4) about 2500000 rad

106. Maximum dose of ionizing radiation permitted for food irradiation is

- (1)  $10 \times 10^6$  rep (2) 15 M rad (3) 25 K roentgen (4) 10 K Gy

107. Chief type of cells in the edible part of most of the fruits and vegetable are

- (1) epidermal cells (2) parenchyma cells  
(3) phloem (4) xylem

**108.** One Gray (Gy) of radiation is equivalent to

- (1) 100 rad
- (2) 100 roentgen
- (3) 100 rep
- (4)  $10^{-5}$  joules absorbed per g of absorbing material

**109.** Diameter of mouth of glass jar is more than or equal to

- (1) 16 mm
- (2) 22 mm
- (3) 28 mm
- (4) 34 mm

**110.** Rate of water diffusion within food during drying determines

- (1) extent of case hardening
- (2) rate of drying during constant rate period
- (3) rate of drying during falling rate of phase
- (4) final water activity of the product

**111.** Radiation not permitted for food irradiation is

- (1) X-rays
- (2)  $\gamma$ -rays
- (3)  $\beta$ -rays
- (4) fast moving electrons

**112.** Microwave frequencies permitted for ISM purposes are

- (1) 915, 2450, 5800 and 22150 MHz
- (2) 500, 4000, 10000 and 25000 MHz
- (3) 915, 2450, 8500 and 25000 MHz
- (4) 915, 2450, 18715 and 32500 MHz



**119.** Separating fruits and vegetables on the basis of degree of acceptability is

- (1) classification      (2) grading      (3) sorting      (4) rejecting

**120.** Rate of thawing frozen food

- (1) is more than rate of freezing  
(2) is less than rate of freezing  
(3) is equal to rate of freezing  
(4) cannot be compared with rate of freezing

\*\*\*

## अभ्यर्थियों के लिए निर्देश

(इस पुस्तिका के प्रथम आवरण-पृष्ठ पर तथा उत्तर-पत्र के दोनों पृष्ठों पर केवल नीली या काली बाल-प्वाइंट पेन से ही लिखें)

1. प्रश्न पुस्तिका मिलने के 10 मिनट के अन्दर ही देख लें कि प्रश्नपत्र में सभी पृष्ठ मौजूद हैं और कोई प्रश्न छूटा नहीं है। पुस्तिका दोषयुक्त पाये जाने पर इसकी सूचना तत्काल कक्ष-निरीक्षक को देकर सम्पूर्ण प्रश्नपत्र की दूसरी पुस्तिका प्राप्त कर लें।
2. परीक्षा भवन में लिफाफा रहित प्रवेश-पत्र के अतिरिक्त, लिखा या सादा कोई भी खुला कागज साथ में न लायें।
3. उत्तर-पत्र अलग से दिया गया है। इसे न तो मोड़ें और न ही विकृत करें। दूसरा उत्तर-पत्र नहीं दिया जायेगा, केवल उत्तर-पत्र का ही मूल्यांकन किया जायेगा।
4. अपना अनुक्रमांक तथा उत्तर-पत्र का क्रमांक प्रथम आवरण-पृष्ठ पर पेन से निर्धारित स्थान पर लिखें।
5. उत्तर-पत्र के प्रथम पृष्ठ पर पेन से अपना अनुक्रमांक निर्धारित स्थान पर लिखें तथा नीचे दिये वृत्तों को गाढ़ा कर दें। जहाँ-जहाँ आवश्यक हो वहाँ प्रश्न-पुस्तिका का क्रमांक तथा सेट का नम्बर उचित स्थानों पर लिखें।
6. ओ० एम० आर० पत्र पर अनुक्रमांक संख्या, प्रश्न-पुस्तिका संख्या व सेट संख्या (यदि कोई हो) तथा प्रश्न-पुस्तिका पर अनुक्रमांक सं० और ओ० एम० आर० पत्र सं० की प्रविष्टियों में उपरिलेखन की अनुमति नहीं है।
7. उपर्युक्त प्रविष्टियों में कोई भी परिवर्तन कक्ष निरीक्षक द्वारा प्रमाणित होना चाहिये अन्यथा यह एक अनुचित साधन का प्रयोग माना जायेगा।
8. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं। प्रत्येक प्रश्न के वैकल्पिक उत्तर के लिये आपको उत्तर-पत्र की सम्बन्धित पंक्ति के सामने दिये गये वृत्त को उत्तर-पत्र के प्रथम पृष्ठ पर दिये गये निर्देशों के अनुसार पेन से गाढ़ा करना है।
9. प्रत्येक प्रश्न के उत्तर के लिये केवल एक ही वृत्त को गाढ़ा करें। एक से अधिक वृत्तों को गाढ़ा करने पर अथवा एक वृत्त को अपूर्ण भरने पर वह उत्तर गलत माना जायेगा।
10. ध्यान दें कि एक बार स्याही द्वारा अंकित उत्तर बदला नहीं जा सकता है। यदि आप किसी प्रश्न का उत्तर नहीं देना चाहते हैं, तो सम्बन्धित पंक्ति के सामने दिये गये सभी वृत्तों को खाली छोड़ दें। ऐसे प्रश्नों पर शून्य अंक दिये जायेंगे।
11. रफ कार्य के लिये प्रश्न-पुस्तिका के मुखपृष्ठ के अन्दर वाले पृष्ठ तथा अंतिम पृष्ठ का प्रयोग करें।
12. परीक्षा के उपरान्त केवल ओ०एम०आर० उत्तर-पत्र परीक्षा भवन में जमा कर दें।
13. परीक्षा समाप्त होने से पहले परीक्षा भवन से बाहर जाने की अनुमति नहीं होगी।
14. यदि कोई अभ्यर्थी परीक्षा में अनुचित साधनों का प्रयोग करता है, तो वह विश्वविद्यालय द्वारा निर्धारित दंड का/की, भागी होगा/होगी।