

ENTRANCE EXAMINATION FOR ADMISSION, MAY 2011.

M.Sc. (FOOD SCIENCE AND NUTRITION)

COURSE CODE : 389

Register Number :

*Signature of the Invigilator
(with date)*

COURSE CODE : 389

Time : 2 Hours

Max : 400 Marks

Instructions to Candidates :

1. Write your Register Number within the box provided on the top of this page and fill in the page 1 of the answer sheet using pen.
2. Do not write your name anywhere in this booklet or answer sheet. Violation of this entails disqualification.
3. Read each question carefully and shade the relevant answer (A) or (B) or (C) or (D) or (E) in the relevant box of the ANSWER SHEET using HB pencil.
4. Avoid blind guessing. A wrong answer will fetch you -1 mark and the correct answer will fetch 4 marks.
5. Do not write anything in the question paper. Use the white sheets attached at the end for rough works.
6. Do not open the question paper until the start signal is given.
7. Do not attempt to answer after stop signal is given. Any such attempt will disqualify your candidature.
8. On stop signal, keep the question paper and the answer sheet on your table and wait for the invigilator to collect them.
9. Use of Calculators, Tables, etc. are prohibited.

1. Bacterial cells show maximum resistance against
 - (A) Logarithmic phase
 - (B) Lag phase
 - (C) Late Jag phase
 - (D) Decline phase
2. Dole process is an example of
 - (A) Heat-cool-fill
 - (B) Cold sterilization
 - (C) Batch pasteurization
 - (D) Fast canning
3. Lethal rate is the reciprocal of
 - (A) Z-value
 - (B) Thermal death time
 - (C) F-value
 - (D) None of the above
4. Growth-no-growth method is
 - (A) A method of inoculation
 - (B) A method for obtaining data and plotting TDT curve
 - (C) A method to determine the heat process
 - (D) None of the above
5. _____ is the term used to label foods treated with low level ionizing radiation
 - (A) Picowaved
 - (B) Irradiated
 - (C) Radapertized
 - (D) grayed
6. Which of the following statement is/are correct?
 - (A) Co-60 is the most promising for commercial application
 - (B) Higher the charge of electron, the deeper is the penetration
 - (C) X-rays are not considered economical for use in food industry
 - (D) None of the above
7. Rapid cooling of the cells from an optimal temperature to 0° can also result in cell death. This is referred to as
 - (A) Freezer burn
 - (B) Cold shock
 - (C) Storage death
 - (D) Lethal effect
8. In the preparation of sugar syrup, citric acid is added for
 - (A) The prevention of growth of mold
 - (B) The inversion of sugar
 - (C) The generation of fruity flavor
 - (D) Removal of unwanted impurities in the sugar

9. Heating of frozen food is termed as
(A) Dehydrofreezing (B) Thawing
(C) F-value (D) None of the above
10. Fat of fish prone to oxidation is because of
(A) More saturation
(B) Less saturation
(C) Higher amount of lipoxidase enzyme
(D) Oxidation has nothing to do with saturation
11. An agent used for glazing is
(A) Edible wax (B) Layers of ice
(C) Sodium salt (D) Bee wax
12. Frankfurters sausages are
(A) Cured, cooked and smoked (B) Cured, uncooked and smoked
(C) Fresh, cooked and smoked (D) None of the above
13. Smoking is done
(A) After slaughtering (B) Before curing
(C) After curing (D) At any time
14. The amount of fish, salt and acetic acid in marinade is _____ respectively
(A) 25%, 3% and 0.1% (B) 2%, 1% and 0.5%
(C) 94%, 5.5% and 0.5% (D) 85%, 3% and 0.2%
15. Cured meats are called
(A) Beef (B) Bacon (C) Ham (D) Marinades
16. Which of the following statement is not correct?
(A) Bromelin from pine apple can be used for tenderization of meat
(B) Electrical stimulation of carcasses alter slaughtering of animals can cause tenderization
(C) Ficin is a proteolytic enzyme, obtained from Faba beans can be used for tenderization of meats.
(D) None of the above

17. The specific heat of milk is highest at temperature of _____ °C.
 (A) 19.4 (B) 20.4 (C) 21.4 (D) 18.4
18. The first KVK in India is at
 (A) Pondicherry (B) Pattambi (C) Jalna (D) Varanasi
19. The example for c_4 plant is
 (A) Rice (B) Wheat (C) Cotton (D) Maize
20. Golden rice is genetically modified rice with yellow colored seeds rich in
 (A) Vitamin A (B) Vitamin C (C) Vitamin E (D) Vitamin K
21. Pungency of onion is due to
 (A) Allyl propyl disulphide (B) Allyl tertiarybutyl sulphide
 (C) Allicin (D) Propanal
22. Milk is deficient in
 (A) Na (B) K
 (C) Fe (D) None of the above
23. Storage of food under reduced pressure is called
 (A) Aseptic packaging (B) Hyperbaric storage
 (C) Hypobaric storage (D) Gas storage
24. Polystyrene is used for
 (A) Acid foods (B) Neutral foods
 (C) Basic foods (D) All of the above
25. SWMA stands for
 (A) Standard Weight & Measurement Act
 (B) Switzerland Weight and Measurement Act
 (C) Sweden Weight and Measurement Act
 (D) None
26. Nutrition includes the study of
 (A) the organism's food (B) process of digestion
 (C) the way an organism obtains food (D) all of the above

27. Autotrophic organisms include
 (A) green plants and sulphur bacteria (B) green plants and all the bacteria
 (C) bacteria and virus (D) bacteria and fungi
28. Organisms that synthesise their own food are called _____
 (A) green plants (B) sulphur bacteria
 (C) autotrophs (D) purple-sulphur bacteria
29. Amoeba feeds with the help of
 (A) tentacles (B) pseudopodia
 (C) food vacuole (D) none of the above
30. An example of higher plant parasite is
 (A) Pythium (B) Phytophthora
 (C) Agaricus (D) Cuscuta
31. Example of chemosynthetic bacteria are
 (A) E. coli (B) Sulphur bacteria
 (C) Cyanobacteria (D) Nitrobacter
32. An example of a fluid feeder is
 (A) aphid (B) hydra (C) amoeba (D) earthworm
33. In saprophytes, food is digested
 (A) within the cells (B) in the digestive tract
 (C) outside the cells (D) within the food vacuole
34. Parotid gland is a/an
 (A) gastric gland (B) intestinal gland
 (C) salivary gland (D) none of the above
35. Erepsin converts
 (A) proteins into amino acids (B) proteins into peptides
 (C) peptides into amino acids (D) none of the above
36. An enzyme that acts only in an acidic medium is
 (A) Pepsin (B) Trypsin (C) Rennin (D) Amylase

37. A non-enzyme protein present in the saliva is
 (A) Heparin (B) Mucin
 (C) Ptyalin (D) None of the above
38. Coprophagy refers to feeding on
 (A) insects (B) dead matter
 (C) faeces (D) decomposing matter
39. Absorption is maximum in the small intestine because of
 (A) the presence of villi (B) its length
 (C) its thin walls (D) all the above
40. Photolysis is
 (A) the absorption of light by chlorophyll (B) the assimilation of carbon dioxide
 (C) the splitting of water (D) none of the above
41. The optimum level of carbon dioxide in the atmosphere is
 (A) 0.3% (B) 0.04% (C) 0.1% (D) 0.03%
42. Pyloric valve is present in the
 (A) heart (B) liver (C) stomach (D) intestine
43. Mastication is
 (A) digestion (B) absorption (C) assimilation (D) chewing
44. In the mouth the food is formed into
 (A) chyme (B) chyle (C) bolus (D) pellets
45. An example of a herbivore is
 (A) amoeba (B) hydra
 (C) grasshopper (D) none of the above
46. Appendix is a part of
 (A) ileum (B) duodenum (C) caecum (D) colon
47. Bile juice is secreted by
 (A) liver (B) pancreas (C) salivary gland (D) intestine

48. Bile juice is
 (A) alkaline (B) acidic (C) neutral (D) near acidic
49. The three portions of the small intestine, in the correct order, are
 (A) Caecum, colon, rectum (B) ileum, duodenum, jejunum
 (C) colon, caecum, rectum (D) duodenum jejunum, ileum
50. The enzyme that is secreted in an inactive form is
 (A) lipase (B) trypsin (C) rennin (D) ptyalin
51. Exchange of gases in higher plants takes place through
 (A) lenticels (B) roots (C) stomata (D) stem
52. Insectivorous plants grow in soil deficiency in
 (A) calcium (B) phosphorus (C) nitrogen (D) water
53. Photosynthesis is
 (A) a catabolic reaction (B) an anabolic reaction
 (C) an energy releasing reaction (D) none of the above
54. The digestive juice that is almost neutral is
 (A) gastric juice (B) bile juice
 (C) pancreatic juice (D) none of the above
55. Haustoria of parasites are modified
 (A) roots (B) branches
 (C) leaves (D) none of the above
56. The molecules known as the energy currency of the cell are
 (A) NAD (B) NADP (C) ATP (D) ADP
57. The mode of nutrition in non-green plants is called
 (A) autotrophic (B) heterotrophic (C) holozoic (D) holophytic
58. Which of the Following are chiefly digested in the stomach?
 (A) Carbohydrates (B) Proteins (C) Fats (D) Lipids

59. The reactants of photosynthesis reaction are carbon dioxide and
 (A) chlorophyll (B) sunlight (C) water (D) oxygen
60. Large intestine in man mainly carries out
 (A) digestion of fats (B) absorption
 (C) assimilation (D) digestion of carbohydrates
61. Mode of nutrition in green plants is called
 (A) heterotrophic (B) holozoic (C) holophytic (D) saprotrophic
62. The part of the digestive system where no digestion takes place is
 (A) mouth (B) oesophagus (C) ileum (D) stomach
63. The largest gland of the body is
 (A) parotid gland (B) liver
 (C) pancreas (D) submandibular gland
64. Which of the following nutritional factors has been shown to BEST predict long term morbidity and/or mortality?
 (A) >10% weight gain in the previous 6 months
 (B) Percent body fat >22% (men) or >35% (women)
 (C) Total fat intake >30% of consumed calories
 (D) Total protein intake <40% of consumed calories
65. There is much evidence in favor of diets high in monounsaturated fat. The potential drawback of this diet compared with diets high in complex carbohydrates is that monounsaturated fat may result in
 (A) Higher energy intake (B) Higher cholesterol Levels
 (C) Higher triglyceride levels (D) Lower HDL levels
66. Which one of the following options represents historical features of the Subjective Global Assessment?
 (A) Weight loss and gastrointestinal symptoms
 (B) Malignancy and nausea
 (C) Family history of IBD and personal history of weight loss
 (D) Family history of Celiac Disease

67. Which of the following is an ABSOLUTE contraindication to parenteral nutrition?
- (A) Diarrhea (B) Liver cirrhosis
(C) Malignancy (D) Active infection
68. Which one of the following options represents potential complications of enteral nutrition?
- (A) Osteoporosis and refeeding syndrome (B) Diarrhea and cholestasis
(C) Esophagitis and pancreatitis (D) Aspiration and refeeding syndrome
69. Enteral nutrition is preferred over parenteral nutrition for all of the following reasons EXCEPT
- (A) Lower risk of electrolyte abnormalities (B) Lower risk of refeeding
(C) Lower risk of liver disease (D) Improved glycemic control
(E) Stimulate gut harrier function

Questions 70 and 71 refer to the following stem :

You are asked to see a 26 year old man with Crohn's disease. He has been admitted to hospital 3 days ago with a small bowel obstruction secondary to fibrostenotic disease of the terminal ileum. Prior to 3 days ago, his oral intake was normal despite ongoing abdominal pain and diarrhea related to his Crohn's disease. He has lost 2 kg since hospitalization, but his weight was stable prior to that. He is scheduled for surgery tomorrow for terminal ileal resection.

His surgeon asks for your advice regarding nutrition support.

70. Would you start TPN today, expecting post-operative benefit?
- (A) No; studies of benefit of pre-operative nutrition have shown benefit only in patients who receive TPN for >7 days prior to surgery.
(B) Yes; he is at risk for poor wound healing and infection based on his recent weight loss
(C) Yes; studies of benefit of pre-operative nutrition have shown benefit in patients who receive TPN in the immediate peri-operative setting
(D) Yes; studies of benefit of pre-operative nutrition have shown benefit in preventing recurrence of Crohn's disease at the anastomotic site
(E) No; he is young with no major comorbidities therefore at low risk of nutritional complications.
71. Would you recommend delaying surgery for TPN to improve outcome?
- (A) Yes; he is at risk for poor wound healing and infection based on his underlying disease and recent weight loss
(B) Yes; he may have reduced oral intake post-operatively and lose more weight
(C) No; he is young with no major comorbidity therefore at low risk of nutritional complications
(D) No, however he should maximize enteral nutrition for 24 hours preoperatively
(E) No; patients who are severely malnourished are most likely to benefit.

72. Which of the following statements regarding enteral nutrition formulas is TRUE?
- (A) Polymeric formulas are those that contain all macronutrients in whole (ie non-hydrolyzed) form; semi-elemental formulas do not contain all three macronutrients
 - (B) For acute pancreatitis within 48 hours of hospital admission, jejunal delivery of semi-elemental formulas is the preferred form of nutrition support
 - (C) Enteral formulas are formulated to provide adequate micronutrients if caloric requirements are being met
 - (D) Specialty formulas for liver and pulmonary disease are superior to regular polymeric formulas in patients with cirrhosis and COPD, respectively
 - (E) Semi-elemental formulas are more cost-effective than polymeric formulas
73. Which of the following is an acceptable method for determining caloric needs for nutrition support?
- (A) Caloric needs per kilogram of body weight LC 25-30 Kcal/kg body weight)
 - (B) Underwater weighing
 - (C) Cockcroft-Gault equation with activity modifier
 - (D) Anthropometry and Body impedance analysis
 - (E) Maintaining and interpreting a 7-day detailed food record
74. Which of the following is NOT a clinical consequence of refeeding syndrome?
- (A) Hypophosphatemia
 - (B) Hypomagnesemia
 - (C) Hypervolemia
 - (D) Hyperphosphatemia
 - (E) Hyperglycemia
75. Which one of the following micronutrients is routinely added to TPN?
- (A) Vitamin D
 - (B) Iron
 - (C) Vitamin E
 - (D) Vitamin K
76. A 50 year old man had a massive Small bowel resection secondary to a volvulus 1 year ago, leaving him with 75 cm of small bowel. If he did not receive adequate nutrition support, how long would it take to develop biochemical or clinical evidence of essential fatty acid deficiency?
- (A) 4 days
 - (B) 4 weeks
 - (C) 4 months
 - (D) 1 year
77. Which one of the following medications can be added to TPN in the appropriate clinical circumstance?
- (A) H2 Receptor Antagonists
 - (B) Proton pump inhibitors
 - (C) Fluroquinolones
 - (D) Narcotics

78. Which one of the following statements is TRUE regarding central venous catheter infections in patients receiving long term home total parenteral nutrition?
- (A) The most common organism causing catheter infection is *Staphylococcus Aureus*
 - (B) Double lumen catheters reduce the risk of catheter infection compared with single lumen catheters
 - (C) Femoral catheters reduce the risk of catheter infection compared with subclavian catheters
 - (D) In an uncomplicated catheter infection the accepted standard of care is to start antibiotic therapy without removing the catheter
79. In which of the following clinical situations should > 1.0 g protein per kg body weight be provided in nutrition support?
- (A) Patients with renal failure on hemodialysis
 - (B) Hospitalized patients
 - (C) Obese patients
 - (D) Cirrhosis with hepatic encephalopathy
80. Which one of the following gut hormones is responsible for promoting appetite?
- (A) Leptin
 - (B) Ghrelin
 - (C) Peptide YY
 - (D) CCK
 - (E) Insulin
81. Which one of the following hormones plays an important role in inhibiting appetite?
- (A) Ghrelin
 - (B) Resistin
 - (C) $\text{TNF } \alpha$
 - (D) Peptide YY
82. Which of the following statements is TRUE regarding weight reducing agents and mechanism of weight loss?
- (A) Orlistat exerts its action by selectively blocking cannabinoid-1 receptors
 - (B) Sibutramine exerts its action by inhibiting pancreatic lipase
 - (C) Sibutramine exerts its action by selectively blocking cannabinoid-2 receptors
 - (D) Rimonabant exerts its action by selectively blocking cannabinoid-1 receptors
 - (E) Rimonabant exerts its action by selectively blocking pancreatic lipase
83. Which of the following statements regarding the side effects of weight reducing agents is TRUE?
- (A) Orlistat can predispose to cardiac arrhythmias
 - (B) Rimonabant can predispose to cardiac arrhythmias
 - (C) Sibutramine can predispose toward abdominal diarrhea and steatorrhea
 - (D) Sibutramine can predispose toward cardiac arrhythmias

84. Which of the following is NOT an adipocytokine?
 (A) Leptin (B) Resistin (C) Adiponectin (D) Ghrelin
85. Which of the following is an acceptable indication for pharmacotherapy to induce weight loss in overweight/obese adults?
 (A) BMI > 27 and unsuccessful attempt at lifestyle modification for preceding 6 months
 (B) BMI > 30 and unsuccessful lifestyle modification for preceding 6 months
 (C) Waist circumference > 102 cm in males
 (D) Waist circumference > 88 cm in females
86. Which of the following statements is TRUE regarding *probiotics*?
 (A) Probiotics are organisms that contribute toward intestinal microbial balance
 (B) Probiotics are non-digestible food products that selectively stimulates the growth of one or a limited number of bacteria in the colon to confer health benefit for the host
 (C) There is good evidence to suggest that probiotics have a beneficial role in preventing post-operative recurrence of Crohn's Disease
 (D) Milk is an example of a food source containing probiotics.
87. Which of the following is an example of a *prebiotic*?
 (A) Yogurt (B) Inulin (C) Creatinine (D) Fish Oil
88. All of the following are manifestations of zinc deficiency EXCEPT
 (A) diarrhea (B) dysgeusia (C) alopecia (D) rash
89. Excess of a carotene in the diet acts as anti vitamin against
 (A) Vitamin A (B) Vitamin C (C) Vitamin D (D) Vitamin E
90. What is etiology?
 (A) it is study of dietary deficiency diseases
 (B) It is a study if causative factors
 (C) it is study of toxic substances
 (D) It is study of mode of action of antinutritional compounds
91. When does MAXIMAL small bowel adaptation occur in post small bowel resection?
 (A) 2 months (B) 6 months (C) 8 months (D) 18 months

92. Which of the following components of energy expenditure generally accounts for the largest proportion of the 24h energy expenditure total?
- (A) Thermic Effect of Food (B) Resting Energy Expenditure
(C) Activity related energy expenditure (D) Energy of fidgeting
93. A 85 year old male patient has decreased his intake of animal protein and increased his intake of whole grain toast, cereal and salads over the past 12 months. Which of the following micronutrient deficiencies is he at risk for?
- (A) Chromium (B) Selenium (C) Folate (D) Zinc
94. What is the percentage of calories provided by fat in this product?
- (A) 30% (B) 34% (C) 38% (D) 42%
(E) 50%
95. A 35 year old morbidly obese female underwent vertical band gastroplasty (VBG) 6 months ago. She has lost 22 kg of weight over 6 months. She is now complaining of 6-8 loose watery bowel movements per day ongoing for the past 2 months. Prior to 2 months ago she was having one formed bowel movement per day for years. Which of the following statements regarding this scenario is TRUE?
- (A) The diarrhea is likely related to malabsorption from the VBG and is the primary mechanism of weight loss
(B) The diarrhea is likely a consequence of small bowel bacterial overgrowth which may be a consequence of the VBG
(C) She is immunosuppressed secondary to the weight loss and the diarrhea may be related to C. Difficile colitis
(D) She has been consuming mainly liquids due to the small pouch capacity, consequently this limits formation of stools.
96. Which of the following statements regarding protein intake in patients with chronic liver disease is TRUE?
- (A) Protein restriction should NOT be considered routinely in patients with chronic liver disease including in those with hepatic encephalopathy
(B) Patients with chronic liver disease and encephalopathy should receive protein in quantities between 0.25-0.5 g/kg/d
(C) Animal sources of protein should be consumed more frequently in patients with chronic liver disease
(D) Patients with chronic liver disease should receive protein in quantities between 2-2.5 g/kg/day

97. Which of the following statements regarding macronutrient energy value is TRUE?
- (A) Carbohydrates provide 9 kcal/gram consumed
 - (B) Protein provides 2 kcal/gram consumed
 - (C) Fat provides 7 kcal/gram consumed
 - (D) Protein provides 4 kcal/gram consumed
98. Which of the following values represent the recommended daily intake of fiber per day?
- (A) 35-40 g
 - (B) 25-30 g
 - (C) 15-20 g
 - (D) 10-15 g
99. A 50 year old male is admitted to the CU with respiratory distress secondary to pneumonia. He is now ventilator dependant. He is started on polymeric enteral feeds at 20cc/hour. After 2 clays of feeds, his nurse notices that the gastric residual is 100 cc and she is concerned about the risk ol aspiration. The best recommendation in this situation is
- (A) Stop enteral feeds and start parentcral nutrition
 - (B) Reduce the rate of the enteral feed to 10cc/hour
 - (C) Change the polymeric formula to semi-elemental formula
 - (D) Start Domnperidone 10 mg
100. Which of the following patients with short bowel syndrome is likely to require long term Home Total Parenteral Nutrition?
- (A) Small bowel length of 200 cm with end jejunostomy
 - (B) Small bowel length 200 cm with jejunocolic anastomosis
 - (C) Small bowel length 100 cm with jejunocolic anastornosis
 - (D) Small bowel length 75 cm with end jejunostomy
-