

**ROYAL CIVIL SERVICE COMMISSION
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2021
EXAMINATION CATEGORY: TECHNICAL**

PAPER III: SUBJECT SPECIALISATION PAPER FOR NUTRITION AND DIETETICS

Date	: October 31, 2021
Total Marks	: 100
Writing Time	: 150 minutes (2.5 hours)
Reading Time	: 15 Minutes (prior to writing time)

GENERAL INSTRUCTIONS:

1. Write your Registration Number clearly and correctly on the Answer Booklet.
 2. The first 15 minutes is to check the number of pages of Question Paper, printing errors, clarify doubts and to read the instructions. You are NOT permitted to write during this time.
 3. This paper consists of **TWO SECTIONS**, namely SECTION A & SECTION B:
 - **SECTION A** has two parts: Part I - 30 Multiple Choice Questions
Part II - 4 Short Answer QuestionsAll questions under SECTION A are COMPULSORY.
 - **SECTION B** consists of two Case Studies. Choose only **ONE** case study and answer the questions of your choice.
4. All answers should be written on the Answer Booklet provided to you. Candidates are not allowed to write anything on the question paper. If required, ask for additional Answer Booklet.
 5. All answers should be written with correct numbering of Section, Part and Question Number in the Answer Booklet provided to you. Note that any answer written without indicating the correct Section, Part and Question Number will NOT be evaluated and no marks would be awarded.
 6. Begin each Section and Part in a fresh page of the Answer Booklet.
 7. You are not permitted to tear off any sheet(s) of the Answer Booklet as well as the Question Paper.
 8. Use of any other paper including paper for rough work is not permitted.
 9. **You are required to hand over the Answer Booklet to the Invigilator before leaving the examination hall.**
 10. This paper has **7 printed pages**, including this instruction page.

GOOD LUCK

SECTION A

PART I: Multiple Choice Questions (30 marks)

Choose the correct answer and write down the letter of your chosen answer in the Answer booklet against the question number e.g. 31 (d). Each question carries ONE mark. Any double writing, smudgy answers or writing more than one choice shall not be evaluated.

1. Which of the following is called Metabolic regulators?
 - a) Vitamins and Minerals
 - b) Vitamins and Water
 - c) Minerals and Roughage
 - d) Carbohydrates and Vitamins

2. How much energy will you get from one gram of glucose?
 - a) 3.8 kilocalories
 - b) 4.2 kilocalories
 - c) 4.8 kilocalories
 - d) 5.2 kilocalories

3. What percent of calories are contributed by carbohydrates in most of our diets?
 - a) 45%
 - b) 48%
 - c) 50%
 - d) 40%

4. Oligosaccharides are formed by how many sugar molecules?
 - a) 2 to 5 monosugars
 - b) 3 to 6 monosugars
 - c) 2 to 10 monosugars
 - d) 5 to 10 monosugars

5. In which form does our body stores glucose?
 - a) Cellulose
 - b) Starch
 - c) Glycogen and cellulose
 - d) Glycogen

6. If a person has not consumed food for a period of time, then the blood glucose levels starts decreasing. Which organ of body release glucose into the bloodstream to maintain healthy levels?
 - a) Liver
 - b) Heart
 - c) Muscles
 - d) Heart and Liver

7. Starch ($C_6H_{10}O_5$)_n is broken down to form glucose ($C_6H_{12}O_6$) units when hydrolysed by
 - a) Alkaline base
 - b) Acidic base
 - c) Neutral base
 - d) Salty base

8. Condensation of glucose molecules ($C_6H_{12}O_6$) results in
 - a) Starch
 - b) Cellulose
 - c) Glycogen
 - d) Glucagon

9. The digestive enzymes of cellular compounds are confined to
 - a) Ribosome
 - b) Polysomes
 - c) Lysome
 - d) Peroxisome

10. The most active site of protein synthesis is
 - a) Cell sap
 - b) Ribosome
 - c) Nucleus
 - d) Mitochondrion

11. Which of the vitamins is not present in the milk?
 - a) Vitamin C
 - b) Vitamin A
 - c) Vitamin B₂
 - d) Vitamin K

12. HDL is synthesized and secreted from
 - a) Pancreas
 - b) Liver
 - c) Kidney
 - d) Muscle

13. Which of the following is a reducing sugar?
 - a) Sucrose
 - b) Agar
 - c) Trehalose
 - d) Isomaltose

14. Which of the following enzymes is not involved in HMP shunt?
 - a) Glyceraldehyde-3-p dehydrogenase
 - b) Glucose-6-p-dehydrogenase
 - c) Transketolase
 - d) Phosphogluconate dehydrogenase

15. All proteins contain the
- same 20 amino acids.
 - different amino acids.
 - 300 amino acids occurring in nature.
 - only few amino acids.
16. Clinical features of Kwashiorkor include all of the following, EXCEPT
- Mental retardation
 - Muscle wasting
 - Oedema
 - Anaemia
17. In case of severe denaturation of protein, there is
- reversible denaturation.
 - moderate reversible denaturation.
 - irreversible denaturation.
 - None of the above
18. The milk protein in the stomach in an adult is digested by
- Pepsin
 - HCl
 - Rennin
 - Chymotrypsinogen
19. Deterioration of food (rancidity) is due to presence of
- Cholesterol
 - Vitamin E
 - Peroxidation of lipids
 - Phenolic compounds
20. A fatty acid which is not synthesized in human body and has to be supplied in the diet is
- Palmitic acid
 - Oleic acid
 - Linoleic acid
 - Stearic acid
21. In the type II (a) hyper lipoproteinemia, there is an increase in
- Chylomicron bond
 - β
 - Pre beta
 - α
22. Fat soluble vitamins are
- soluble in alcohol.
 - one or more propene units.
 - stored in liver.
 - All of the above

23. During deficiency of thiamine, the concentration of which of the following compound rises in blood and intracellular fluid?
- Glycogen
 - Sugar
 - Amino acids
 - Pyruvic acid
24. Pyridoxine deficiency leads to
- Megaloblastic anemia
 - Aplastic anemia
 - Hypochromic microcytic anemia
 - Pernicious anemia
25. The pancreatic amylase activity is increased in the presence of
- Hydrochloric acid
 - Bile salts
 - Thiocyanate ions
 - Calcium ions
26. The enzyme used in Polymerase Chain Reaction (PCR) is
- Taq polymerase
 - Ribonuclease
 - RNA polymerase
 - Endonuclease
27. A rise in blood calcium may indicate
- Paget's disease
 - Rickets
 - Osteomalacia
 - Hypervitaminosis D
28. BMR is increased in all of the following, EXCEPT
- Hyperthyroidism
 - Anaemia
 - Addison's disease
 - Pregnancy
29. Selenium is a constituent of the enzyme_____.
- glutathione peroxidase
 - homogentisate oxidase
 - tyrosine hydroxylase
 - phenylalanin hydroxylase
30. Body water is regulated by which of the following hormone?
- Oxytocin
 - ACTH
 - FSH
 - Epinephrine

PART II – Short Answer Questions (20 marks)

This part has 4 Short Answer Questions. Answer ALL the questions. Each question carries 5 marks. Mark for each sub-question is indicated in the brackets.

1. The two fruits in the table below contain carbohydrate and therefore have a Glycaemic Index (GI) rating.

Orange	Watermelon
GI = 42 ; Sugar content = 8g/100g	GI = 72; Sugar content = 6.4g/100g

- a) Explain what GI is a measure of? (2 marks)
- b) What are the three GI ratings? And how would you categorize the fruits in the above table? (2 marks)
- c) List two groups of people for which a knowledge of GI is useful. Explain why? (1 mark)
2. Classify amino acids according to their structure and give one example of each class. (5 marks)
3. Discuss the functions of PUFA and MUFA. (5 marks)
4. What are the steps of glycogenesis? (5 marks)

SECTION B: Case Study (50 marks)

Choose either CASE I OR CASE II from this section. Each case study carries 50 marks. Mark for each sub-question is indicated in the brackets.

CASE I

Ap. Dawala, 58-years-old from Paro has a height of 5ft and weighs 96 kg. Since his retirement he has been leading a sedentary lifestyle. With a backache recently he decided to visit the Paro Hospital where the doctor got him referred to the dietician. Now as the dietician, answer the following questions:

1. Calculate his BMI and explain the severity of his condition based on the cut off categories? (5 marks)
2. Explain the ways you would assess such condition in general? (10 marks)
3. Explain the etiology of such condition in general? (10 marks)
4. Write down the principle of nutrition given the severity of the condition? (5 marks)
5. What instructions will you provide him on counselling? (10 marks)
6. Plan a day's menu as per his BMI? (10 marks)

CASE II

Aum Peday, 45-years-old female visited the hospital where the nurse recorded her height (158 cm) and weight (45 kg) and referred her to the doctor. After thorough investigation, she was later diagnosed to have gastric ulcer. Taking the scenario, answer the following questions:

1. Write down the etiology of gastric ulcer in general? (10 marks)
2. Describe the symptoms and clinical findings? (8 marks)
3. Clearly explain the ways to diagnose such disease? (5 marks)
4. Given her condition, what would be some of the treatment objectives? (2 marks)
5. Explain the dietary management in detail? (10 marks)
6. List down the food that are to be included and excluded under such condition? (5 marks)
7. Plan a day's menu given her condition? (10 marks)

TASHI DELEK