**ROYAL CIVIL SERVICE COMMISSION**

**BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2014**

**EXAMINATION CATEGORY: TECHNICAL**

**PAPER III: SUBJECT SPECIALIZATION PAPER for *Nutrition & Dietetics***

**Date** : 12 October 2014

**Total Marks** : 100

**Examination Time** : 150 minutes (2.5 hours)

**Reading Time** : 15 Minutes (prior to examination time)

**GENERAL INSTRUCTIONS:**

1. Write your Roll Number clearly and correctly on the Answer Booklet.
2. The first 15 minutes is being provided 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 and SECTION B:
* **SECTION A** has two parts: Part I - 30 Multiple-Choice Questions

Part II - 4 Short Answer Questions

All questions under SECTION A are COMPULSORY.

* **SECTION B** consists of two Case Studies. Choose only ONE case study and answer the questions under your choice.
1. 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 any or correct Section, Part and Question Number will NOT be evaluated and no marks would be awarded.
2. Begin each Section and Part in a fresh page of the Answer Booklet.
3. You are not permitted to tear off any sheet(s) of the Answer Booklet as well as the Question Paper.
4. Use of any other paper including paper for rough work is not permitted.
5. You are required to hand over the Answer Booklet to the Invigilator before leaving the examination hall.
6. This paper has **09** printed pages in all, 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. DRI in Nutrition stands for:

1. Dietary Reference Index
2. Dietary Reference Intake
3. Dietary Recommended Intake

2. In relation to heart disease, which of the following is the best recommendation?

1. [avoid all saturated fats and cholesterol-containing foods](http://www.allenandunwin.com/food/tryagain.html)
2. [use only vegetable fats and have a high intake of insoluble fiber](http://www.allenandunwin.com/food/tryagain.html)
3. [limit all fats, particularly saturated fats, while encouraging some unsaturated fats, particularly omega-3 fatty acids](http://www.allenandunwin.com/food/correct.html)
4. [limit all fats, particularly saturated fats, while encouraging monounsaturated fats such as omega-6 fatty acids](http://www.allenandunwin.com/food/tryagain.html)
5. [include hydrogenated fats and trans fatty acids](http://www.allenandunwin.com/food/tryagain.html)

3. The enzyme trypsin is found in

1. Pancreatic juice
2. Saliva
3. Bile juice
4. intestinal juice

4. Brunner’s glands are found in?

1. stomach
2. Duodenum
3. Illeum
4. Rumen

5. Which of the following is not true?

1. [oils are usually liquid at room temperature](http://www.allenandunwin.com/food/tryagain.html)
2. [oils contain mostly unsaturated fatty acids](http://www.allenandunwin.com/food/tryagain.html)
3. [oils are a good source of vitamin E](http://www.allenandunwin.com/food/tryagain.html)
4. [oils contain all essential fatty acids](http://www.allenandunwin.com/food/correct.html)

**6.** Syndrome X can be best described as a:

1. [disorder of unknown origins with symptoms similar to, but not the same as, diabetes](http://www.allenandunwin.com/food/tryagain.html)
2. [condition with symptoms identical to diabetes but able to be cured with surgery](http://www.allenandunwin.com/food/tryagain.html)
3. [group of disorders including diabetes, arthritis and osteoporosis](http://www.allenandunwin.com/food/tryagain.html)
4. [group of disorders including impaired glucose tolerance, hypertension and obesity](http://www.allenandunwin.com/food/correct.html)
5. [none of the above](http://www.allenandunwin.com/food/tryagain.html)

7. The log phase of the bacterial growth cycle is characterized by:

1. [No apparent growth](http://www.allenandunwin.com/food/tryagain.html)
2. [Rapid growth](http://www.allenandunwin.com/food/correct.html)
3. [A balance between cell growth and death](http://www.allenandunwin.com/food/tryagain.html)
4. [Cell death and a decline in population](http://www.allenandunwin.com/food/tryagain.html)
5. [None of the above](http://www.allenandunwin.com/food/tryagain.html)

8. Pregnant women should be advised to avoid \_\_\_\_\_\_\_\_\_\_ to reduce the risk of miscarriage or stillbirth arising from Listeria monocytogenes.

1. [fresh salads](http://www.allenandunwin.com/food/tryagain.html)
2. [yoghurt](http://www.allenandunwin.com/food/tryagain.html)
3. [bread](http://www.allenandunwin.com/food/tryagain.html)
4. [soft cheeses](http://www.allenandunwin.com/food/correct.html)
5. [cooked fish](http://www.allenandunwin.com/food/tryagain.html)

9. Which person is most likely to have the highest BMR?

1. [male jockey on a starvation diet](http://www.allenandunwin.com/food/tryagain.html)
2. [overweight grandmother with an under-active thyroid](http://www.allenandunwin.com/food/tryagain.html)
3. [stocky adolescent football player with a broken leg](http://www.allenandunwin.com/food/correct.html)
4. [over-worked housewife addicted to coffee](http://www.allenandunwin.com/food/tryagain.html)
5. [adolescent female who is a chronic smoker](http://www.allenandunwin.com/food/tryagain.html)

10. The hormone thought to be most responsible for long-term control of body energy reserves stored as triglyceride is:

1. [cholecystokinin](http://www.allenandunwin.com/food/tryagain.html)
2. [leptin](http://www.allenandunwin.com/food/correct.html)
3. [serotonin](http://www.allenandunwin.com/food/tryagain.html)
4. [growth hormone](http://www.allenandunwin.com/food/tryagain.html)
5. [aldosterone](http://www.allenandunwin.com/food/tryagain.html)

11. Which of the following factors has the least impact on BMR?

1. [high protein intake](http://www.allenandunwin.com/food/correct.html)
2. [body size](http://www.allenandunwin.com/food/tryagain.html)
3. [fasting](http://www.allenandunwin.com/food/tryagain.html)
4. [infection](http://www.allenandunwin.com/food/tryagain.html)
5. [body fat](http://www.allenandunwin.com/food/tryagain.html)

12. Wernicke-Korsakoff Syndrome is common in alcoholics and results from which vitamin deficiency?

1. [folate](http://www.allenandunwin.com/food/tryagain.html)
2. [riboflavin](http://www.allenandunwin.com/food/tryagain.html)
3. [thiamin](http://www.allenandunwin.com/food/correct.html)
4. [vitamin B12](http://www.allenandunwin.com/food/tryagain.html)
5. [vitamin K](http://www.allenandunwin.com/food/tryagain.html)

13. Which of the following food preparation methods is most likely to cause large losses of vitamins?

1. [Cooking fruits and vegetables whole and unpeeled](http://www.allenandunwin.com/food/tryagain.html)
2. [Cooking in small amounts of water](http://www.allenandunwin.com/food/tryagain.html)
3. [Cooking in the shortest time possible](http://www.allenandunwin.com/food/tryagain.html)
4. [Cutting just before serving time](http://www.allenandunwin.com/food/tryagain.html)
5. [Dicing fruits and vegetables into small pieces before cooking](http://www.allenandunwin.com/food/correct.html)

14. Which vitamin is present only in foods of animal origin?

1. [Biotin](http://www.allenandunwin.com/food/tryagain.html)
2. [Vitamin B12](http://www.allenandunwin.com/food/correct.html)
3. [Vitamin D](http://www.allenandunwin.com/food/tryagain.html)
4. [Vitamin K](http://www.allenandunwin.com/food/tryagain.html)
5. [Thiamin](http://www.allenandunwin.com/food/tryagain.html)

15. Which of the following statements regarding calcium is not correct?

1. [is mostly stored in bones and teeth](http://www.allenandunwin.com/food/tryagain.html)
2. [aids blood clotting](http://www.allenandunwin.com/food/tryagain.html)
3. [can cause kidney stones if taken in excessive quantities](http://www.allenandunwin.com/food/tryagain.html)
4. [is released from bones when blood calcium is low](http://www.allenandunwin.com/food/tryagain.html)
5. [prevents tooth decay if taken as a supplement](http://www.allenandunwin.com/food/correct.html)

16. Which minerals are mostly involved with maintaining the body’s fluid and acid base balance?

1. [Chlorine, sodium, potassium](http://www.allenandunwin.com/food/correct.html)
2. [Sodium, potassium, zinc](http://www.allenandunwin.com/food/tryagain.html)
3. [Potassium, magnesium, selenium](http://www.allenandunwin.com/food/tryagain.html)
4. [Chlorine, phosphorous, magnesium](http://www.allenandunwin.com/food/tryagain.html)
5. [Selenium, phosphorous, zinc](http://www.allenandunwin.com/food/tryagain.html)

17. The mineral content of food is dependent on the mineral content of the soil in which plants are grown or stocks are grazed. This statement is particularly true for which of the following?

1. [Iodine and selenium](http://www.allenandunwin.com/food/correct.html)
2. [Sodium and copper](http://www.allenandunwin.com/food/tryagain.html)
3. [Copper and selenium](http://www.allenandunwin.com/food/tryagain.html)
4. [Magnesium and iodine](http://www.allenandunwin.com/food/tryagain.html)
5. [Magnesium and copper](http://www.allenandunwin.com/food/tryagain.html)

18. Infants fed an infant formula that has been made up to greater than the recommended strength are at increased risk of:

1. [Dehydration](http://www.allenandunwin.com/food/correct.html)
2. [Anaemia](http://www.allenandunwin.com/food/tryagain.html)
3. [Asthma](http://www.allenandunwin.com/food/tryagain.html)
4. [Coeliac disease](http://www.allenandunwin.com/food/tryagain.html)
5. G[alactosaemia](http://www.allenandunwin.com/food/tryagain.html)

19. Most breast-fed infants will have additional needs for \_\_\_\_\_\_, \_\_\_\_\_\_ and \_\_\_\_\_\_\_\_ after \_\_\_\_\_\_ months of age.

1. [iron, protein and vitamin C, 10](http://www.allenandunwin.com/food/tryagain.html)
2. [iron, calcium and B vitamins, 8](http://www.allenandunwin.com/food/tryagain.html)
3. [energy, iron and protein, 6](http://www.allenandunwin.com/food/correct.html)
4. [protein, fat and carbohydrate, 7](http://www.allenandunwin.com/food/tryagain.html)
5. [none of the above](http://www.allenandunwin.com/food/tryagain.html)

20. You are employed as a public health nutritionist to develop a program with a goal to increase the number of women breast feeding their babies. Your principal target population would include:

1. [Young women of low socioeconomic status](http://www.allenandunwin.com/food/correct.html)
2. [Older women of low socioeconomic status](http://www.allenandunwin.com/food/tryagain.html)
3. [Young, well-educated women](http://www.allenandunwin.com/food/tryagain.html)
4. [Older, poorly educated women](http://www.allenandunwin.com/food/tryagain.html)
5. [Older women of high socioeconomic status](http://www.allenandunwin.com/food/tryagain.html)

21. Which of the following types of fatty acids can increase LDL-cholesterol?

1. [Saturated fatty acids](http://www.allenandunwin.com/food/tryagain.html)
2. [Trans fatty acids](http://www.allenandunwin.com/food/tryagain.html)
3. [Omega 6 fatty acids](http://www.allenandunwin.com/food/tryagain.html)
4. [(a) and (b)](http://www.allenandunwin.com/food/correct.html)
5. [(a), (b) and (c)](http://www.allenandunwin.com/food/tryagain.html)

22. Assessment of nutritional status involves consideration of which of the following data?

1. [Clinical and laboratory](http://www.allenandunwin.com/food/tryagain.html)
2. [Psychosocial and socio demographic](http://www.allenandunwin.com/food/tryagain.html)
3. [Dietary intake and anthropometry](http://www.allenandunwin.com/food/tryagain.html)
4. [(a) and (b)](http://www.allenandunwin.com/food/tryagain.html)
5. [(a), (b) and (c)](http://www.allenandunwin.com/food/correct.html)

23. The Healthy Eating Pyramid:

1. [is essentially a quantitative food guide](http://www.allenandunwin.com/food/tryagain.html)
2. [recommends dietary balance through use of the terms: ‘Eat more/ moderately/ less’](http://www.allenandunwin.com/food/correct.html)
3. [recommends intake of phyto-chemicals as a separate group](http://www.allenandunwin.com/food/tryagain.html)
4. [is culturally sensitive](http://www.allenandunwin.com/food/tryagain.html)
5. [includes recommendations regarding snack indulgences](http://www.allenandunwin.com/food/tryagain.html)

24. Which of the following is not true in relation to food-based dietary guidelines?

1. [they are scientifically based](http://www.allenandunwin.com/food/tryagain.html)
2. [they focus on daily recommended intakes](http://www.allenandunwin.com/food/correct.html)
3. [they are culturally relevant and sensitive](http://www.allenandunwin.com/food/tryagain.html)
4. [they allow innovation, for example healthier traditional dishes](http://www.allenandunwin.com/food/tryagain.html)
5. [they can promote enjoyment and taste](http://www.allenandunwin.com/food/tryagain.html)

25. Which of the following statements regarding prebiotics is correct?

1. [they are the same as probiotics](http://www.allenandunwin.com/food/tryagain.html)
2. [they stimulate the body to produce antibiotics thus reducing infection](http://www.allenandunwin.com/food/tryagain.html)
3. [they stimulate growth of beneficial gut bacteria](http://www.allenandunwin.com/food/correct.html)
4. [they are viable micro-organisms which improve the balance of gut flora](http://www.allenandunwin.com/food/tryagain.html)
5. [none of the above](http://www.allenandunwin.com/food/tryagain.html)

26. The most distinguishing features of Type I versus Type II diabetes are usually:

1. [rate of onset, degree of insulin secretion](http://www.allenandunwin.com/food/correct.html)
2. [levels of desirable blood glucose, dietary treatment](http://www.allenandunwin.com/food/tryagain.html)
3. [types of insulin required, risk of complications](http://www.allenandunwin.com/food/tryagain.html)
4. [(a) and (b)](http://www.allenandunwin.com/food/tryagain.html)
5. [(a), (b) and (c)](http://www.allenandunwin.com/food/tryagain.html)

27. One of the main functions of the stomach is:

1. [secretion of enzymes to digest carbohydrate](http://www.allenandunwin.com/food/tryagain.html)
2. [production of an acidic liquid chyme by mixing food and digestive secretions](http://www.allenandunwin.com/food/correct.html)
3. [provision of a storage space of up to 500 ml for an average adult](http://www.allenandunwin.com/food/tryagain.html)
4. [initial mixing of bile with fat to facilitate fat’s digestion and absorption](http://www.allenandunwin.com/food/tryagain.html)
5. [absorption of excess water](http://www.allenandunwin.com/food/tryagain.html)

28. Which of the following is thought to be protective against colon cancer?

1. [Antioxidant supplements](http://www.allenandunwin.com/food/tryagain.html)
2. [Refined cereal products](http://www.allenandunwin.com/food/tryagain.html)
3. [Animal fat](http://www.allenandunwin.com/food/tryagain.html)
4. [Fruits and vegetables](http://www.allenandunwin.com/food/correct.html)
5. [All of the above](http://www.allenandunwin.com/food/tryagain.html)

29. Most body fluids contain concentrations of electrolytes which maintain an osmolarity of:

1. [200 mOsm/L](http://www.allenandunwin.com/food/tryagain.html)
2. [260 mOsm/L](http://www.allenandunwin.com/food/tryagain.html)
3. [300 mOsm/L](http://www.allenandunwin.com/food/correct.html)
4. [360 mOsm/L](http://www.allenandunwin.com/food/tryagain.html)
5. [400 mOsm/L](http://www.allenandunwin.com/food/tryagain.html)

30. Information on human nutritional requirements is drawn from two major sources:

1. [Anthropology and Psychology](http://www.allenandunwin.com/food/tryagain.html)
2. [Scientific literature and Medicine](http://www.allenandunwin.com/food/tryagain.html)
3. [Laboratory science and Epidemiology](http://www.allenandunwin.com/food/correct.html)
4. [Randomized control studies and Pathology](http://www.allenandunwin.com/food/tryagain.html)
5. [Anatomy and Physiology](http://www.allenandunwin.com/food/tryagain.html)

**PART II : Short Answer Questions (20 marks)**

**Answer all the questions.**

1. Explain the following (2.5x2=5 marks)

a. **EAR** - Estimated Average Requirement

b. DRI: Dietary Reference intake

2. Explain: (2.5x2=5 marks)

a. RDA: Recommended Dietary Allowance

b. Difference between Feed-75 and Feed 100

3. Explain the physical properties of milk (5 marks)

4. Explain five nutritional importance of fats in your daily diet (5 marks)

**SECTION B**

**Case Study**

**Choose either Case 1 or Case 2 from this section. Each case carries 50 marks. Mark for each sub-question is indicated in the bracket.**

**Case 1**

**Question 1:** Aum Dema 68 female who weighs 59 kgs was brought to JDWNRH with complains of fever and nausea. On doing laboratory analysis the creatinine level was found to be 10 mg/dl, Urea 396 mg/dl and hemoglobin level 9 mg/dl. The blood pressure was also recorded to be 76/56 mm of Hg

1. On presenting the case, calculate her Glomeruler Filtration Rate GFR? (5 marks)
2. As a dietician, what kind of diet would you prescribe for the conditions given? (5 marks)
3. How much calorie do you think that the diet prescribed by you would meet?(10 marks)

**Question 2:** Mr. Dorji was diagnosed as stomach Ca patient. He was admitted because of complains like; loss of appetite and weight loss. On the day of admission, the surgeon on duty suggested him to be given Total Parental Nutrition 100 ml/hour for 24 hours.

1. As a dietician calculate the amount of carbohydrate and protein that the patient will be met from TPN which is composed of 25% dextrose and 4% amino acid (20 marks)
2. As a dietician what would you be interested in monitoring during the process of TPN?

 (10 marks)

**Case 2**

**Question 1**

In a community, most of the mothers had a difficult time taking their children to the hospital because of diarrhea and on weighing their child most of them were found stunted (-3 SD)

1. Imagine that you are in that community and design a theoretical web of causation for diarrhea? ( 5 marks)
2. What kind of screening procedure do you think would be in place for admitting the child? (5 marks)
3. Suppose, if many children were admitted after meeting the screening criteria, what kind of therapeutic diet would you start with or recommend? ( 10 marks)

**Question 2**

Imagine that you are working for the Nutrition Program for the Ministry of Health and develop a project proposal to reduce the prevalence of stunting among the under five children of Bhutan from 33.5 percent to 30 percent within the two years (30 marks)