

Exam  
30 AUG 2024  
CINEC Campus, Sri Lanka

**Faculty of Health Sciences**  
**Bachelor of Science Honours in Biomedical Sciences**  
**BMS 4233 Applied Biochemistry**  
**Batch - 04**  
**4<sup>th</sup> Year 2<sup>nd</sup> Semester**  
**End semester SEQ Examination**

**Date** : 30<sup>th</sup> of August 2024  
**Time** : 9.00 am. – 12.00 pm (Three Hours)

**INSTRUCTIONS TO CANDIDATES**

- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.
- You are allowed to use a scientific calculator for the examination.

**QUESTION 01** **(100 marks)**

1.1 Write **three (03)** indications of oral glucose tolerance test (OGTT). (15 marks)

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1.2 List main steps in OFTT. (30 marks)

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1.3 Show an electrophoresis pattern for serum of healthy adult individual by a labeled diagram. (25 marks)

1.4 List **five (05)** components of renal function test.

(15 marks)

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1.5 List **five (05)** components in clinical examination of a stool sample.

(15 marks)

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**QUESTION 02**

**(100 marks)**

2.1 List **five (05)** criteria you have to consider when collect stool samples to diagnose parasitic infections. (20 marks)

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2.2 What are the diagnostic importance of following serum markers?

(20 marks)

2.2.1 Albumin

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2.2.2 Alanine aminotransferase

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(20 marks)

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2.3 What are the diagnosis condition when lab report contains following details?

2.3.1 Normal plasma level of gamma- Glutamyl Transferase (GGTP) with elevated Alkaline phosphatase (ALP level) (20 marks)

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2.3.2 Elevated plasma level of GGTP and elevated ALP (20 marks)

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**QUESTION 03 (100 marks)**

3.1. State three (03) individuals who are at a higher risk to suffer from thyroid diseases. (15 marks)

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3.2. Differentiate between the symptoms observed in hypothyroidism and hyperthyroidism. (25 marks)

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3.3. Mention five (05) factors for the occurrence of thyroid disease during pregnancy. (30 marks)

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3.4. Write a short note on the importance of thyroid function tests in the laboratory. (30 marks)

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**QUESTION 04 (100 marks)**

4.1. State five types of cardiac investigations. (15 marks)

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4.2. Write a short note on the importance of cardiac markers. (30 marks)

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4.3. Differentiate between normal aging and disease conditions. (25 marks)

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Examination Department  
 28 AUG 2024  
 CINEC Campus, Sri Lanka



**Faculty of Health Sciences**  
**Bachelor of Science Honours in Biomedical Sciences**  
**BMS 4213 Immunobiology**  
 Batch – 04  
 4<sup>th</sup> Year 2<sup>nd</sup> Semester  
 End Semester SEQ Examination

Date : 28.08.2024  
 Time : 9.00 am. – 12.00 pm. (Three Hours)

**INSTRUCTIONS TO CANDIDATES**

- This question paper consists of SIX questions.
- Answer ALL questions.
- You should write legibly in black or blue ink.

**Question 01**

**(100 marks)**  
**(25 marks)**

1.1 Define the innate immunity of the immune system.

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1.2 State the components of second line defense under innate immunity. **(25 marks)**

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1.3 Briefly state two components comes under the second line of defense mechanism of innate immunity. **(25 marks)**

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1.4 Outline the process of inflammation under the innate immune system. (25 marks)

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**Question 02** **(100 marks)**

2.1 Define the term humoral immunity under the adaptive immunity. (25 marks)

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2.2 Classify the adaptive immunity based on the mode of development. (25 marks)

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2.3 State the steps of immune response initiation under the adaptive immunity. (25 marks)

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2.4 State the clonal selection theory of B lymphocytes. (25 marks)

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**Question 03 (100 marks)**

3.1 Define the term of immunoglobulin. (25 marks)

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**Question 04**

**(100 marks)**

4.1 Define the term of immunogenicity.

(25 marks)

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4.2 State the characteristics of complete antigen and incomplete antigen.

(25 marks)

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4.3 Outline the factors that influence the antigenicity.

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4.4 Compare and contrast the linear epitope and conformational epitope.

(25 marks)

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**Question 05**

**(100 marks)**

5.1 Define the term of complement proteins.

(25 marks)

5.2 State the types of complement pathways.

(25 marks)

5.3 State the steps of activation of alternative complement pathway.

(25 marks)

5.4 Compare and contrast the classical pathway and alternative pathways in complement system.

(25 marks)



**Question 06**

**(100 marks)**

6.1 Define the term of transplantation.

(25 marks)

6.2 State the types of transplantation based on graft type.

(25 marks)

6.3 Outline the transplantation rejection take place via indirect presentation by T cells.

(25 marks)

6.4. State the steps of a laboratory method that can be quantify the antibodies produced during primary response a host.

(25 marks)

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~~ANSWER SCRIPTS~~

LIBRARY

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**Faculty of Health Sciences**  
**Bachelor of Science Honours in Biomedical Sciences**  
**BMS 4223 – Laboratory Management**  
**4<sup>th</sup> Year 2<sup>nd</sup> Semester**  
**Batch 04**  
**End Semester SEQ Examination**

**Date : 26<sup>th</sup> of August 2024**  
**Time : 09.00 am – 12.00 p.m (Three Hours)**

**INSTRUCTIONS TO CANDIDATES**

- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.
- You are not allowed to take out the examination papers.

**QUESTION 01** **(100 marks)**

1.1 List five (05) key events in the post-analytical phase. (10 marks)

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1.2 Briefly outline the impact of pre-analytical errors on Total Testing Process. (30 marks)

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1.3 List five (05) quality indicators that can be used to measure the quality of the pre-analytical phase of the "Fasting Plasma Glucose" test. (20 marks)

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1.4. Laboratory "X" uses Westgard multi-rules to interpret the quality control data of the Clinical Biochemistry section and 2s error was identified. As the responsible officer, explain how you would handle this situation indicating the reasons for the mentioned error. (40 marks)

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**QUESTION 02** (100 marks)

As the laboratory manager, you have been tasked to recruit new employees for a upgrade of the current laboratory.

2.1 List the steps in the manpower planning process for staff recruitment to a laboratory. (20 marks)

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2.2 As a part of the recruitment process, it is essential to develop job descriptions and job specifications.

2.2.1 What is the difference between job description and job specification. (10 marks)

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2.2.2 List the types of details that you would add to job description and job specifications separately. (30 marks)

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2.3 Briefly outline the way of planning a competency evaluation program to the employees and the methods that can be utilized for the competency evaluation. (40 marks)

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**QUESTION 03** **(100 marks)**

As the laboratory manager of "XYZ" laboratory you have been given a task to plan the installation of collection centers.

3.1 Briefly outline the key factors that would be considered during the "Environmental analysis" of the above planning process. (30 marks)

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3.2 What are the pros and cons of the establishment of collection centers. (20 marks)

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3.3 Communication is a key skill that needs to be developed by a good manager.

3.3.1 "Oral communication is considered as a better mode of communication". Briefly explain your idea on this statement. (20 marks)

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3.3.2 State the barriers to an effective communication. (30 marks)

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**QUESTION 04**

**(100 marks)**

4.1 Write **three (03)** types of laboratories.

(15 marks)

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4.2 How do external factors impact on laboratory management ?

(20 marks)

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4.3 State the roles and responsibilities of laboratory director.

(30 marks)

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4.4 State the importance of laboratory policies.

(20 marks)

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4.5 Write **three (03)** factors when designing a laboratory. (15 marks)

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**QUESTION 05** (100 marks)

5.1. State **three (03)** types of physical resources in a laboratory. (15 marks)

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5.2. State the key practices involved in the effective management of equipment in a research laboratory. (40 marks)

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5.3 State the importance of the calibration of laboratory equipment. (30 marks)

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5.4 Compare the accuracy of burette and graduated cylinders used in the laboratories. (15 marks)

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**QUESTION 06** (100 marks)

6.1 You have given concentrated stock solution of  $15 \text{ mol dm}^{-3} \text{ H}_2\text{SO}_4$  in 2.5 L

6.1.1 Calculate the volume required from the stock solution of concentrated  $\text{H}_2\text{SO}_4$  to prepare 1 L of  $3.0 \text{ mol dm}^{-3} \text{ H}_2\text{SO}_4$  solution. (20 marks)

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6.1.2 Calculate the dilution factor.

(20 marks)

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6.2 You need to prepare a series of 1:10 serial dilutions starting with 100 ml of a 1M NaCl solution.  
Calculate how many dilutions are required to reach a final concentration of  $1\mu\text{M}$  NaCl solution.

(30 marks)

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6.3 A biochemical assay requires a final concentration of 1 mM ATP and 2 mM  $\text{MgCl}_2$  in 500  $\mu\text{L}$   
reaction volume. You have 100 mM ATP and 200 mM  $\text{MgCl}_2$  stock solutions in excess. Calculate  
the volumes required from ATP and  $\text{MgCl}_2$  to prepare the assay mixture.

(30 marks)

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**Faculty of Health Sciences**  
**Bachelor of Science Honours in Biomedical Sciences**  
**BMS 4213 Immunobiology**  
 Batch – 02 & 03  
 4<sup>th</sup> Year 2<sup>nd</sup> Semester  
 End Semester SEQ Repeat Examination

**Date** : 2024.06.28  
**Time** : 9.00 am. – 12.00 pm. (Three Hours)

**INSTRUCTIONS TO CANDIDATES**

- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.

**Question 01**

**(100 marks)**  
**(25 marks)**

1.1 What is an adaptive immunity?

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1.2 State the importance of opsonization.

**(25 marks)**

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1.3 State three types of phagocytic cells.

**(25 marks)**

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1.4 What is the process of phagocytosis?

**(25 marks)**

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**Question 02**

**(100 marks)**

2.1 Define the passive immunity.

**(25 marks)**

2.2 Classify the adaptive immunity types.

**(25 marks)**

2.3 Classify the adaptive immunity based on the effector molecules.

**(25 marks)**

2.4 Differentiate the terms of naturally acquired active immunity and artificially acquired active immunity.

**(25 marks)**

**Question 03**

**(100 marks)**

3.1 Define the complement system.

**(40 marks)**



3.2 State the types of complement system. (30 marks)

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3.3 Briefly outline the process of membrane attack complex (MAC). (30 marks)

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**Question 04 (100 marks)**

4.1 Define the terms of antigen and antibody. (25 marks)

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4.2 State the types of immunoglobulins. (25 marks)

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4.3 Differentiate the MHC classes which are involved in antigen presentation. (25 marks)

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4.4 Differentiate the antigenicity and immunogenicity. (25 marks)

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**Question 06**

**(100 marks)**

6.1 Define the term “transplantation”.

(25 marks)

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6.2 What are the two types of transplantation?

(25 marks)

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6.3 Briefly describe the transplantation rejection take place via,

6.3.1 Direct presentation (or direct recognition) of alloantigens by T cells.

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6.3.2 Indirect presentation (or indirect recognition) by T cells.

(25 marks)

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