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CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
Instrumentation (BMS 2234)
Batch 08
2nd year 2nd Semester
End Semester SEQ Examination

Date: 23rd February 2026
Time: From 9.00 AM to 11.00 AM

INSTRUCTIONS TO CANDIDATES

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

QUESTION 01 **(100 marks)**

1.1. Explain the operating principle of Flame Photometer. (20 marks)

1.2. Describe the two (02) types of centrifuge machines based on their analytical applications. (20 marks)

1.3. Differentiate the three (03) types of microscopes according to their working principles. (30 marks)

1.4. Classify and explain the main instruments used at different stages of tissue processing in a histopathology laboratory. (30 marks)

QUESTION 02 **(100 marks)**

2.1. Compare and contrast borosilicate glass and soft glass with respect to thermal and chemical resistance. (10 marks)

2.2. Outline the standard procedure for cleaning and drying laboratory glassware, highlighting its importance for experimental accuracy. (20 marks)

2.3. Evaluate the impact of improper cuvette on the accuracy of spectrophotometric measurements with examples. (30 marks)

2.4. For each of the following, justify the most appropriate sterilization technique used in laboratory practice:

2.4.1. Petri Plates (10 marks)

2.4.2. Antibodies (10 marks)

2.4.3. Used culture media (10 marks)

2.4.4. Biosafety cabinet (10 marks)

QUESTION 03 **(100 marks)**

3.1. Differentiate the terms of "Sensitivity" and "Specificity". (30 marks)

3.2. The performance of a screening test for Disease Y was evaluated in a community-based study. The outcomes of the test are summarized in the contingency table below.

	Disease Present	Disease Absent	Total
Test +	360	A	450
Test -	B	950	1050
Total	C	D	

3.2.1. Calculate the values for A, B,C and D. (4 X 10 marks)

3.2.2. Evaluate the diagnostic performance of the screening test by interpreting Sensitivity and Specificity. (30 marks)

QUESTION 04 **(100 marks)**

4.1. Describe the principles of any two types of Enzyme-Linked Immunosorbent Assay (ELISA). (25 marks)

4.2. Discuss why ELISA is regarded as a highly specific technique for disease detection. (25 marks)

4.3. Describe the use of the following instruments in ELISA:

4.3.1. ELISA reader (10 marks)

4.3.2. ELISA washer (10 marks)

4.4. Compare and contrast immunoturbidimetry and nephelometry based on their principles, and instrumentation. (30 marks)

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CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
Instrumentation (BMS 2234)
Batch 08
2nd year 2nd Semester
Mid Semester Assignment

Date: 23rd February 2026
Time: From 11:30 AM to 12:30 PM

INSTRUCTIONS TO CANDIDATES

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

QUESTION 01 **(100 marks)**

A hospital laboratory handles pathogenic microorganisms for research and diagnostic purposes. The lab manager is evaluating biosafety cabinets (BSCs) to ensure proper containment, protection of personnel, and sample.

1.1. Assess how the design features of Class I, II, and III biosafety cabinets affect on the laboratory safety. (50 marks)

1.2. Recommend and justify best laboratory practices for staff working with biosafety cabinets to minimize contamination and ensure safe operation. (50 marks)

QUESTION 02 **(100 marks)**

A modern clinical laboratory is implementing automated instruments to increase accuracy and throughput while reducing human error. The lab manager must choose instruments based on function and application.

2.1. Compare the four (04) main types of automated laboratory instruments, focusing on their function, advantages, and limitations. (50 marks)

2.2. Explain application of automated instruments in laboratories, using two (02) examples. (50 marks)

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CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
BMS 2225 – Biochemistry II
2nd Year 2nd Semester
Batch 08
End Semester SEQ Examination

Date : **19th of February 2026**
Time : **9.00 a.m. to 12.00 p.m.**

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 used a scientific calculator for the examination.

QUESTION 01 **(100 marks)**

A biochemist investigated the effect of inhibitor Z on the activity of enzyme B. The enzyme activity was measured at different substrate concentrations in the absence and presence of inhibitor Z as given in the following chart.

Substrate Concentration (mM) (So)	Enzyme Activity (Vo) µmol/min	Enzyme Activity in the presence of inhibitor Z (Vz) µmol/min
0.5	0.15	0.08
1.0	0.28	0.14
2.0	0.50	0.25
3.0	0.65	0.35
4.0	0.78	0.45

1.1. Calculate 1/So, 1/Vo, and 1/Vz for all substrate concentrations. (15 marks)
1.2. Using graph paper, plot two Lineweaver-Burk plot for enzyme B in the presence and absence of inhibitor Z. (40 marks)
1.3. Determine Km and Vmax for enzyme B in the presence of inhibitor Z. (25 marks)
1.4. Describe the effect of inhibitor Z on the kinetic parameters and activity of enzyme B. (20 marks)

QUESTION 02 **(100 marks)**

A 62-year-old female patient presented to the clinic with muscle cramps, numbness in the fingers, and occasional tingling around the mouth. She has a history of low dietary calcium intake and postmenopausal status. Laboratory tests revealed low serum calcium and slightly elevated parathyroid hormone (PTH) levels.

2.1.Explain the biochemical consequences of calcium deficiency observed in this patient based on the symptoms and laboratory test results. (20 marks)
2.2. Describe the role of Vitamin D in calcium metabolism, including its effect on intestinal absorption and bone resorption. (30 marks)
2.3. List the dietary and physiological factors that coud be inhibiting calcium absorption in this patient. (20 marks)
2.4. Write a short note on the regulation of calcium homeostasis. (30 marks)

QUESTION 03 **(100 marks)**

3.A 28-year-old male marathon runner was admitted to hospital after collapsing during an ultramarathon event conducted under extreme environmental conditions. He had inadequate caloric intake for several days, severe dehydration, and continued intense physical exertion.

3.1. Identify the major metabolic pathways responsible for maintaining blood glucose levels in this individual during prolonged energy deficit. (15 marks)
3.2. Describe the changes in substrate utilization by skeletal muscle during prolonged fasting combined with endurance exercise. (25 marks)
3.3. Illustrate, using a flow chart, the metabolic adaptations of the liver and adipose tissue under conditions of prolonged fasting and sustained physical activity. (30 marks)
3.4. Explain the hormonal regulation of metabolism during prolonged fasting, focusing on insulin and glucagon. (30 marks)

QUESTION 04 **(100 marks)**

4.1. Distinguish between essential and non-essential amino acids with respect to their dietary requirement, synthesis, and metabolic significance. (20 marks)
4.2. Classify proteins based on their biological function and provide one suitable example for each category. (25 marks)
4.3. Justify the following statement: "Deficiency of tyrosinase activity results in albinism." Include relevant biochemical pathways and molecular mechanisms in your answer. (25 marks)
4.4. Describe the role of the glucose–alanine cycle in amino acid and nitrogen metabolism. (30 marks)

QUESTION 05 **(100 marks)**

5.1 Analyze the structural organization of DNA. (25 marks)
5.2 Evaluate the role of hydrogen bonding in maintaining the structural integrity of DNA. (25 marks)
5.3 Compare and contrast the structural features of DNA and RNA. (25 marks)
5.4 Analyze how structural variations of RNA contribute to its functional diversity. (25 marks)

QUESTION 06 **(100 marks)**

6.1 Assess the biological relevance through comparing the melting behavior of AT-rich and GC-rich DNA regions. (25 marks)
6.2 Differentiate de novo synthesis and salvage pathways of DNA nucleotide production. (25 marks)
6.3 Critically evaluate the role of *de novo* DNA synthesis in cancer therapy. (25 marks)
6.4 Analyze the biochemical basis of gout. (25 marks)

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CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
BSc (Hons) in Biomedical Sciences
HD 2213 Fundamentals of Laboratory Management
Batch – 03
2nd Year- 2nd Semester Examination - SEQ

Date : **21.11.2025**
Time : **9.00 am. – 11.00 am. (Two Hours)**

INSTRUCTIONS TO CANDIDATES

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

QUESTION 01 **(100 marks)**

1.1 What are the different classifications of laboratories? (20 marks)

1.2 What are the external factors that could negatively impact the overall operations of a laboratory? (20 marks)

1.3 Write four responsibilities of laboratory personnel that ensure accuracy, safety, and compliance in laboratory operations. (20 marks)

1.4 Explain the importance of laboratory safety features and emergency provisions when designing a laboratory to ensure safety and efficiency. (40 marks)

QUESTION 02 **(100 marks)**

2.1 State three types of physical resources in a laboratory. (15 marks)

2.2 Write three ways in which poor management of physical resources can lead to errors. (15 marks)

2.3 A laboratory technician is preparing a calibration series for UV–Visible analysis of a dye solution.

2.3.1 Calculate the volume of stock required to prepare 100 mL of a 200 mg/L intermediate solution from the 1000 mg/L stock dye solution. (20 marks)

2.3.2 Calculate the volume of stock required to prepare 50 mL of a 40 mg/L intermediate solution from the 200 mg/L solution. (20 marks)

2.3.3 What is the final concentration if the technician performs 1:200 serial dilution from the 40 mg/L working solution. (15 marks)

2.3.4 Calculate the absorbance value for the diluted concentration prepared in question 2.3.3. (Given that the molar absorption coefficient is 8.0 $mol^{-1}dm^3\ cm^{-1}$ and the path length of the cuvette is 1 cm) (15 marks)

QUESTION 03 **(100 marks)**

3.1 What is meant by pre-analytical phase? (10 marks)

3.2 Mention **five (05)** common laboratory errors that occur in the pre-analytical phase. (20 marks)

3.3 Briefly explain how the clinical laboratories assure the accuracy and precision of tests performed in the analytical phase. (30 marks)

3.4 Describe the methods of test result validation in the post analytical phase with examples. (40 marks)

QUESTION 04 **(100 marks)**

4.1 What are the four basic principles of management? (10 marks)

4.2 List down the steps on how the organizations attract quality workforce. (20 marks)

4.3 Mention formal channels of communication in an organization. (10 marks)

4.4 Briefly describe with examples how the above communication channels could be effectively used in an organization. (30 marks)

4.5 Describe the role of a quality manager in laboratory auditing. (30 marks)

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Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
Instrumentation (BMS 2234)
Batch 07
2nd year 2nd Semester
End Semester SEQ Examination

Date: 18th August 2025
Time: From 9.00 AM to 11.00 AM

INSTRUCTIONS TO CANDIDATES

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

QUESTION 01 **(100 marks)**

1.1. Identify the main instruments used for tissue processing in a histopathology laboratory. (20 marks)

1.2. Mention the various types of spectrophotometers applied in advanced research laboratories. (20 marks)

1.3. Mention the operating principle of the gas chromatography. (30 marks)

1.4. Compare the different types of protein analyzers according to their working principles. (30 marks)

QUESTION 02 **(100 marks)**

2.1. List the key benefits of using borosilicate glass in scientific laboratories. (10 marks)

2.2. Mention the appropriate sterilization technique for each of the following items.

2.2.1. Vitamins (10 marks)

2.2.2. Liquid broth media (10 marks)

2.2.3. Reusable glass culture tubes (10 marks)

2.2.4. Surgical instruments (10 marks)

2.3. Compare borosilicate glass and soft glass in terms of heat and chemical resistance. (20 marks)

2.4. Outline the cleaning and drying process of the laboratory glassware. (30 marks)

QUESTION 03 **(100 marks)**

3.1. Differentiate the terms of "Accuracy" and "Precision". (30 marks)

3.2. The results of the diagnostic test for disease condition Z are presented in the table below.

	Disease +	Disease -	Total
Test +	480	M	520
Test -	N	1100	1380
Total	P	Q	

3.2.1. Calculate the values for M, N, P, and Q. (4 X 10 marks)

3.2.2. Determine the sensitivity and specificity of the diagnostic test using the data provided. (30 marks)

QUESTION 04 **(100 marks)**

4.1. Write short notes for the following instruments.

4.1.1. Class III Biosafety cabinet (25 marks)

4.1.2. DNA sequencer (25 marks)

4.1.3. Prozone effect (25 marks)

4.1.4. Gel electrophoresis system (25 marks)

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Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
BMS 2225 – Biochemistry II
2nd Year 2nd Semester
Batch 07
End Semester SEQ Examination

Date	:	**13th of August 2025**
Time	:	**9.00 a.m. to 12.00 p.m.**

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 used a scientific calculator for the examination.

QUESTION 01 **(100 marks)**

1.1. State the biochemical consequences of thiamine (Vitamin B1) deficiency. (15 marks)
1.2. Describe the biochemical role of Vitamin K in blood coagulation. (30 marks)
1.3. List the factors that inhibit phosphorus absorption in the intestine. (20 marks)
1.4. Write a short note on the regulation of calcium homeostasis. (35 marks)

QUESTION 02 **(100 marks)**

A biochemist carried out an experiment to detect the effect on enzyme A in the presence and absence of compound Y. Answer the following questions to

2.1. Considering the below given values calculate 1/So, 1/Vo and 1/Vy. (15 marks)

Substrate Concentration (mM) (So)	1/So	Enzyme Activity (Vo) µmol/min	1/Vo	Enzyme activity in the presence of compound Y (Vy) µmol/min	1/Vy
0.5	.....	0.10	.....	0.06	.....
1.0	.....	0.20	.....	0.12	.....
2.0	.....	0.40	.....	0.25	.....
3.0	.....	0.60	.....	0.38	.....
4.0	.....	0.80	.....	0.50	

2.2. Using a graph paper plot the Lineweaver-Burk plot in the absence of compound Y. (20 marks)
2.3. In the same graph paper, plot the Lineweaver-Burk plot in the presence of compound Y. (20 marks)
2.4. Calculate Km and Vmax for the enzyme A in the presence of compound Y. (25 marks)
2.5. Indicate the effect of compound Y on the activity of enzyme A. (20 marks)

QUESTION 03 **(100 marks)**

3.1. Differentiate between ketogenic and glucogenic amino acids. (20 marks)
3.2. Classify proteins based on their solubility and provide an example for each class. (25 marks)
3.3. Justify the following statement:"Untreated Phenylketonuria (PKU) leads to hypopigmentation." Include relevant biochemical pathways and mechanisms in your explanation. (25 marks)
3.4. Compare and contrast the roles of transamination and deamination in amino acid metabolism. (30 marks)

QUESTION 04 **(100 marks)**

4. A 30-year-old female was recently rescued after being isolated in a rural mountainous region following a natural disaster. She had minimal food access for approximately 07 days, surviving on small amounts of water and occasional wild fruits.

4.1. Mention the major metabolic pathways activated in this individual during the prolonged starving period. (15 marks)
4.2. Shortly describe the hormonal changes expected in this individual during this situation. (25 marks)
4.3. Draw a flow chart to denote the metabolic adaptations of the liver during prolonged staving. (30 marks)
4.4. Disccuss briefly the physiological consequences of prolonged starvation on muscle tissue. (30 marks)

QUESTION 05 **(100 marks)**

5.1. Write short notes on followings.
5.1.1 Pyrimidine bases (25 marks)
5.1.2. Melting temperature of DNA. (25 marks)
5.2. List characteristic features of DNA molecule. (25 marks)
5.3.Define following terms.
5.3.1 DNA replication (12.5 marks)
5.3.2 Annealing (12.5 marks)

QUESTION 06 **(100 marks)**

6.1 Compare and contrast "De Novo synthesis pathway" and "Salvage pathway" of purine nucleotides synthesis. (25 marks)
6.2 Briefly describe how does 5-fluorouracil act as suicide inhibitor/ irreversible inhibitor in a cancer chemotherapy. (25 marks)
6.3 What is the biochemical basis of gout? (25 marks)
6.4 Compare and contrast messenger RNA (m.RNA) and transfer RNA (t.RNA). (25 marks)

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Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
BMS 2225 – Biochemistry II
2nd Year 2nd Semester
Batch 04
End Semester Special Repeat SEQ Examination

Date	**:**	**24th of June 2025**
Time	**:**	**9.00 a.m. to 12.00 p.m.**

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 used a scientific calculator for the examination.

QUESTION 01 **(100 marks)**

1.1.Outline the reactions involved in denovo synthesis of purine nucleotides. (35 marks)

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1.2.Compare and contrast between nucleotides and nucleosides. (30 marks)

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1.3. Write a short note on metabolic defects associated with purine metabolism. (35 marks)

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QUESTION 02 **(100 marks)**

2.1. State the types of bonds involved in stabilizing the tertiary structure of proteins. (15 marks)

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2.2. . Classify proteins based on their solubility and provide an example. (25 marks)

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2.3. State the structure and significance of beta sheet in proteins. (30 marks)

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2.4. Differentiate between protein motifs and protein domains. (30 marks)

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QUESTION 03 **(100 marks)**

3.1. Draw flow chart to denote the digestion of proteins. (30 marks)

3.2. Discuss the metabolic fate of amino acids during prolonged fasting. (35 marks)

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3.3. Differentiate the roles of transamination and deamination of protein metabolism. (35 marks)

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QUESTION 04 **(100 marks)**

4.1. Mention three non-essential amino acids. (15 marks)

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4.2. Draw a flow chart to denote the basic reactions of the urea cycle. (30 marks)

4.3. Compare the biochemical basis of alkaptonuria and cystinuria. (30 marks)

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4.4. Justify the following statement. "Untreated Phenylketonuria (PKU) leads to hypopigmentation". (25 marks)

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QUESTION 05 **(100 marks)**

5.1. State the metabolic defects that could arise due to deficiency of vitamin A. (15 marks)

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5.2. Describe the biochemical roles of vitamin D in calcium homeostasis. (30 marks)

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5.3. Mention the factors which aid for the absorption of iron. (20 marks)

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5.4. Write a short note on the role of calcium in metabolic processes. (35 marks)

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QUESTION 06 **(100 marks)**

6.1. State what is meant by km? (10 marks)

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6.2. Mention the Michaleis menton Kinetics equation. (20 marks)

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6.3. Differentiate between competitive, non-competitive and uncompetitive inhibitions. (35 marks)

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6.4. Describe the allosteric regulation of enzymes. (35 marks)

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Beyond A Graduate

Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
BMS 3153 – Molecular Biology
3rd Year 1st Semester
Batch 06
End Semester SEQ Examination

Date : 23rd of May 2025
Time : 09.00 am – 11.00 am (Two Hours)

INSTRUCTIONS TO CANDIDATES

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

QUESTION 01 **(100 marks)**

1.1. You are provided with the following segment of a normal DNA sequence and a mutated version of the same sequence. Answer the following questions referring to them.

Normal DNA sequence (5' → 3'):
ATG TGC CAA GGA TTA CGC TGA

Mutated DNA sequence (5' → 3'):
ATG TGC CAA GGA TTA TGC TGA

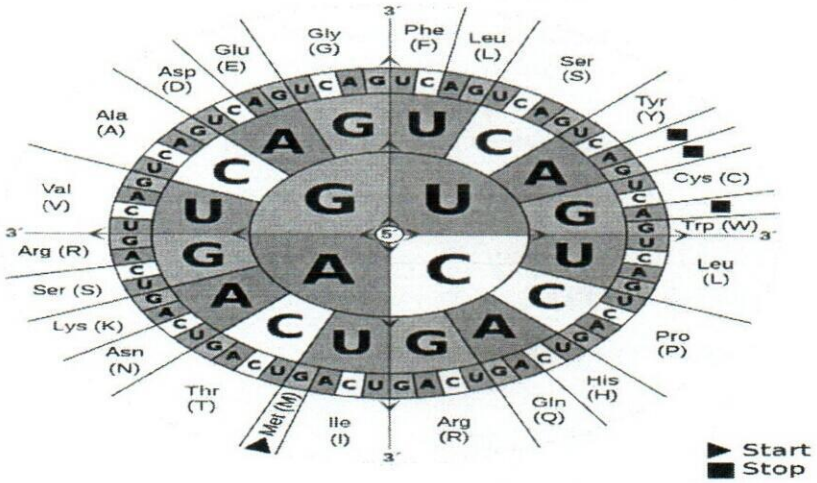
1.1.1. Identify the type of mutation that has occurred in the mutated DNA sequence. (10 marks)

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1.1.2. Write the corresponding mRNA sequences transcribed from both the normal and mutated DNA. (20 marks)

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1.1.3. Translate both mRNA sequences into amino acid sequences using the provided chart.
(20 marks)



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1.1.4. Briefly describe the possible impact of this mutation on the resulting protein structure and function. (35 marks)

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1.1.5. Draw a flow chart of the procedure of the type of DNA repair mechanism that should have been activated to correct this mutation. (15 marks)

QUESTION 02 **(100 marks)**

2.1. State five (05) standard precautions that should be followed when preparing molecular molecular biology reagents in the laboratory. (25 marks)

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2.2. Design a workflow for RNA extraction and quality assessment in a molecular biology laboratory. Include key steps, reagents, and equipment used. Illustrate your answer with a flow diagram. (40 marks)

2.3. Write a short note on the applications of proteomics in biomedical research. (35 marks)

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QUESTION 03 **(100 marks)**

3.1. Define the term of "Gene Expression". (20 marks)

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3.2 List three **(3)** post transcriptional modifications commonly observed in eukaryotic cells. (15 marks)

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3.3 Compare and contrast the mechanisms of translation in eukaryotic and prokaryotic organisms. (25 marks)

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3.4. Outline the sequential molecular events involved in prokaryotic transcription, using *Escherichia coli* as a model organism. (40 marks)

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QUESTION 04 **(100 marks)**

4.1 List the major steps involved in the process of molecular cloning. (20 marks)

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4.2. Mention three **(3)** basic characteristics of an ideal cloning vector used in recombinant DNA technology. (20 marks)

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4.3. State three **(03)** methods used to transform recombinant DNA constructs into host cells. (30 marks)

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4.4. Outline the process of *blue-white screening* used to distinguish recombinants from non-recombinant colonies. (30 marks)

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Beyond A Graduate

Faculty of Health Sciences

B.Sc. (HONS) BIOMEDICAL SCIENCES

BMS 3143 – EPIDEMIOLOGY

3rd Year 1st Semester

END-SEMESTER EXAMINATION – Assignment

Date: 21st May 2025
Time: 01.30 p.m. – 02.30 p.m. – One Hour

INSTRUCTIONS TO CANDIDATES

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

Question 01 **(100 marks)**

1.1 Describe the types of systematic errors in epidemiological studies. (40 marks)

1.2 Discuss the impact of above errors and strategies can be employed to minimize these errors in epidemiological studies. (60 marks)

Question 02 **(100 marks)**

2.1 Describe "necessary causes" and "sufficient causes" by giving examples. (20 marks)

2.2 Describe the factors influencing quality of laboratory. (80 marks)

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FACULTY OF HEALTH SCIENCES
BSC. (HONS) BIOMEDICAL SCIENCES
BMS 3143 – EPIDEMIOLOGY
3rd year 1st semester
END-SEMESTER EXAMINATION – SEQ
6th BATCH

Date: 21st May 2025
Time: 09.00 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 mar**

A district health department reported an unusual increase in cases of acute gastroenteritis over a two-week period. A total of 140 cases were reported from five different hospitals. Laboratory surveillance identified the presence of *Salmonella spp.* in 85 stool samples. The population of the district is 100,000. An epidemiological investigation was launched to determine the magnitude and source of the outbreak.

1.1 Calculate the incidence rate of gastroenteritis during the outbreak period. (20 mark

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1.2 If a follow-up survey revealed that 300 individuals had ever experienced gastroenteritis symptoms in the past year, calculate the prevalence of gastroenteritis in the district. (20 mark

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1.3 Write **one (01)** key importance of laboratory surveillance in the early detection and control of this outbreak. (20 mark

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1.4 Write **one (01)** key importance of how laboratory findings contribute to identifying the pathogen and guiding public health action. (10 marks

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1.5 As a bio medical scientist, outline **three (03)** key interventions you would take based on this data. (30 marks

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Question 02 **(100 mark**

2.1 Define meta-analysis. (10 marks

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2.2 Write **one (01)** key differences between a meta-analysis and a systematic review. (10 marks

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2.3 List **one (01)** key advantage and **one (01)** limitation of using meta-analysis in evidence-based healthcare (20 marks

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2.4 Outline the main steps involved in conducting a meta-analysis (40 marks

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2.5 Write **one (01)** method of detecting publication bias in a meta-analysis. (20 mark

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Question 03

3.1 Define the term "validity" and "reliability" (20 mark

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3.2 List **four (04)** factors influencing causation. (20 marks

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3.3 List **two (02)** factors that influence statistical power of a study. (10 marks

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3.4 List **three (03)** strategies that can be employed during the research design and data collection phases to minimize systematic errors. (30 marks

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3.5 Outline **four (04)** the Bradford Hill criteria for establishing causality in epidemiology. (20 marks

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Question 04 **(100 marks)**

4.1 Write **one (01)** importance of effective communication during an outbreak investigation. (10 marks)

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4.2 What are the steps used in planning an epidemiological investigation? (20 marks)

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4.3 Define the terms "sensitivity" and "specificity" in the context of diagnostic tests. (20 marks)

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4.4 List **three (03)** layers in the Triple Packaging System used in the transport of infectious samples. (30 marks)

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4.5 List **two (02)** general rules to be followed in the safe collection and transport of clinical and environmental samples in epidemiological investigations. (20 marks)

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Question 05 **(100 Marks)**

5.1 Multiple individuals across a city present to hospitals with severe diarrhea. Investigation reveals that *Vibrio cholerae* was deliberately introduced into the water supply. What category does this bioterrorism agent fall into? (20 Marks)

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5.2 You are setting up a new microbiology teaching lab. You plan to work only with non-pathogenic E. coli. What biosafety level is appropriate, and write **03 (three)** minimum safety features needed? (25 Marks)

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5.3 While working in a BSL-2 laboratory with *Staphylococcus aureus*, a student accidentally spills a culture on the bench. Write **03 (three)** steps should they take immediately**.** (25 Marks)

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5.4 You are a lab technician assigned to work with *Mycobacterium tuberculosis*. A new colleague suggests performing the experiment on an open bench in the general microbiology lab. What is wrong with this suggestion, and briefly describe which biosafety level precautions should be followed instead? (30 Marks)

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Question 06 **(100 marks)**

6.1 Name **two (02)** data sources for measuring population health. (20 marks)

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6.2 List social factors that determine health of a population. (10 marks)

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6.3 Write **two (02)** examples for religious influence on health and illness. (20 marks)

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6.4 Briefly explain the five (05) stages of natural history of disease. (50 marks)

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CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
BSc (Hons) in Biomedical Sciences
BMS 3134- Industrial Microbiology

Batch – 06
3rd Year 1st Semester
End Semester SEQ Examination

Date : **19.05.2025**
Time : **9.00 am. – 12.00 pm. (Three Hours)**

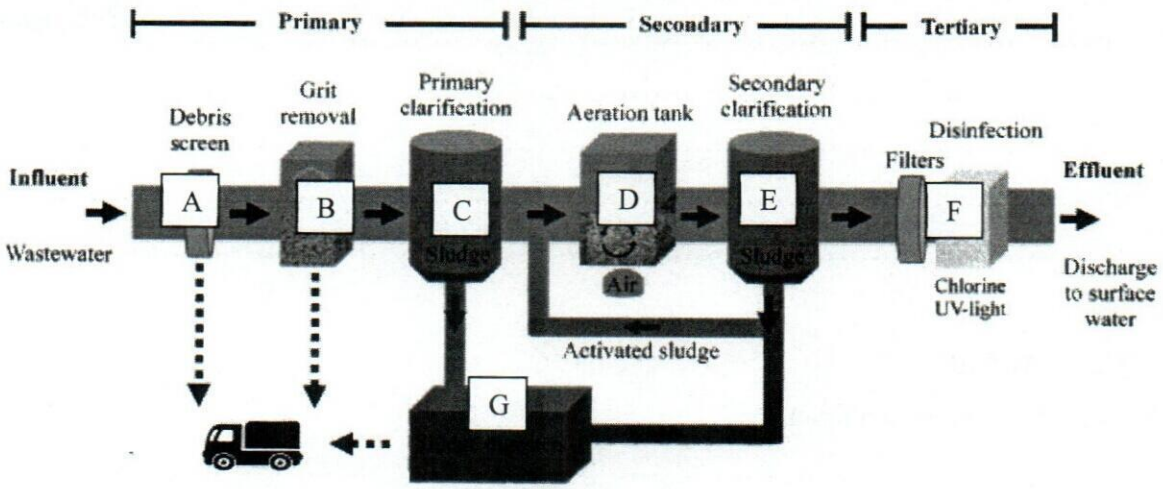
INSTRUCTIONS TO CANDIDATES

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

QUESTION 01

(100 Marks)

Given below is a schematic diagram of a wastewater treatment plant.



1.1. Identify the steps where microbial digestion is used in this treatment plant. (20 Marks)

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1.2. State different types of secondary treatment methods used when designing a wastewater treatment plant. (20 Marks)

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1.3. Mention the importance of using indicator organisms over pathogenic organisms when assessing microbiological safety of water. (25 Marks)

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1.4. Imagine you are a manager in the above treatment plant. As a manager, mention how you would optimally use the biproducts of the plant in an eco-friendly aspect. (35 Marks)

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QUESTION 02 **(100 Marks)**

2.1. Define food preservation. (10 Marks)

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2.2. Mention **Four (04)** different food preservation methods and state the technique of preventing microbial growth in each method. (20 Marks)

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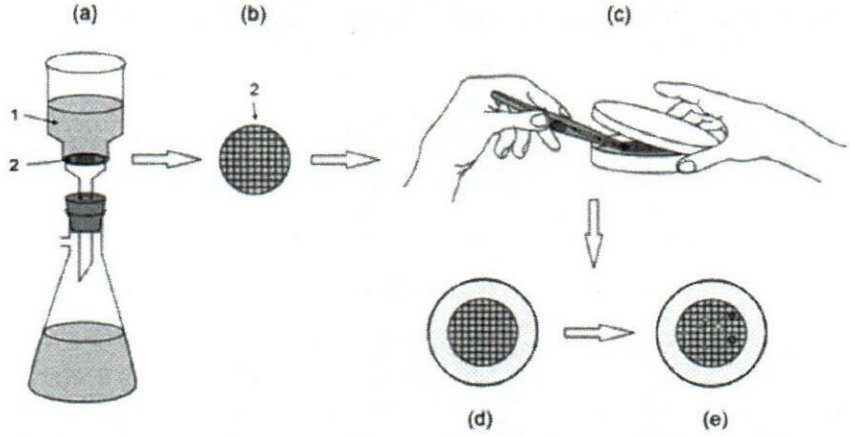
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2.3. Identify the given enumeration technique used in the food and beverage industry. (10 Marks)



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2.4. List down other microbial enumeration techniques. (20 Marks)

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2.5. Outline the significance of the illustrated method in 2.3, over the other methods you mentioned in 2.4. (40 Marks)

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QUESTION 03 **(100 Marks)**

3.1. What is a foodborne outbreak? (20 Marks)

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3.2. Who are the responsible authorities in the outbreak control team (OCT)? (30 Marks)

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3.3. Outline the role of a public health laboratory during an outbreak investigation. (50 Marks)

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QUESTION 04 **(100 Marks)**

4.1. State the principle of industrial fermentation technology. (20 Marks)

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4.2. List **Two (02)** commonly used microorganisms in citric acid and acetic acid production.

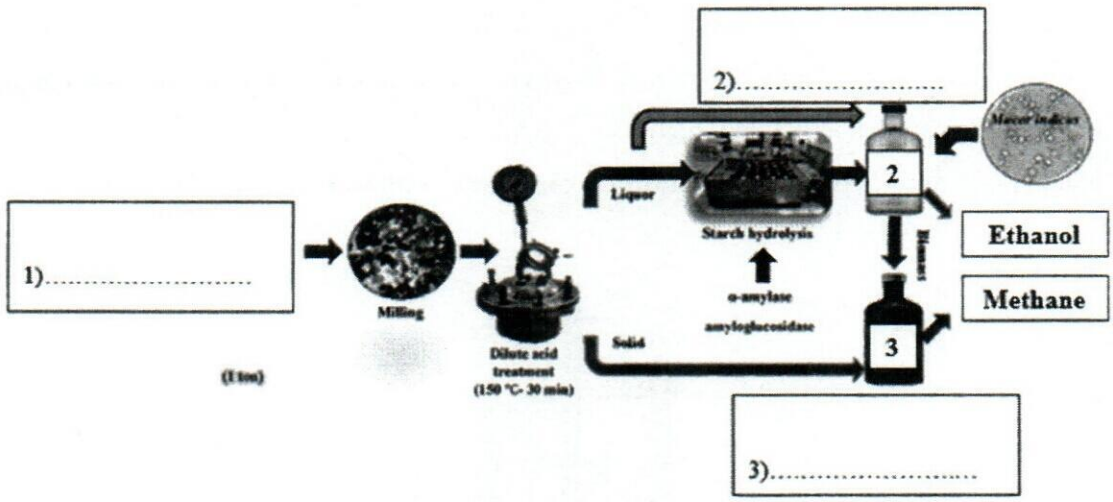
(20 Marks)

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4.3. Complete the following process of ethanol and methane biogas production. (30 Marks)



4.4. List down **Four (04)** properties of microorganisms make them suitable to be used in industrial production of various products. (30 Marks)

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QUESTION 05 **(100 Marks)**

5.1. Differentiate upstream and downstream process in fermentation (20 Marks)

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5.2. State the role of anti-foaming agents in industrial fermentation with the consequences of foam formation. (20 Marks)

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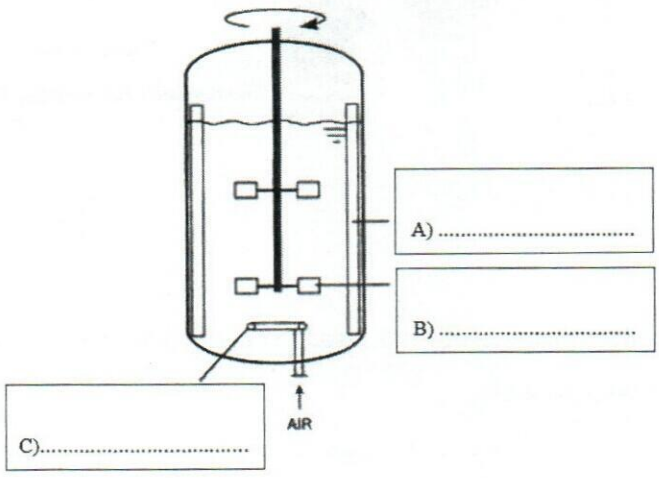
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5.3. Name A, B, and C parts of the following diagram of continuous stirred tank fermenter.

(30 Marks)



5.4. State the function of above (5.3) A, B, and C in continuous stirred tank fermenter. (30 Marks)

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QUESTION 06 **(100 Marks)**

Assume you are a Quality Manager in a UHT milk production factory. You are responsible in designing sampling plans for assessing microbial quality in different stages in the production process.

6.1. Name different sampling plans used to collect samples when testing microbiological quality in the food production industry. (20 Marks)

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6.2. Mention the occasions where each of the above sampling plans are selected. (30 Marks)

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6.3. As a Quality Manager describe how you would implement the HACCP (Hazard Analysis Critical Control Point) system to assure the quality in the production process of this factory.

(50 Marks)

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CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
BSc (Hons) in Biomedical Sciences
BMS 3134- Industrial Microbiology

Batch – 06
3rd Year 1st Semester
Mid Assignment

Date : **19.05.2025**
Time : **1.30 pm. – 2.30 pm. (One Hour)**

INSTRUCTIONS TO CANDIDATES

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

1. Define indicator organisms and outline the importance of using them in assuring microbiological quality in food and water. (100 marks)

2. Write an overview of different microbiological enumeration techniques. (100 marks)

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CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Bachelor of Science in Biomedical Sciences
Pathology BMS 3124
3rd Year 1st Semester
6th Batch
End Semester SEQ Examination

Date: 30th April 2025
Time: 09.00 am – 11.00 am – Two Hours

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **FOUR** 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 Compare and contrast

1.1.1 Dystrophic calcification and Metastatic calcification **(25 marks)**

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1.1.2 Acute inflammation and Chronic inflammation **(25 marks)**

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1.2 List **three (03)** main types of intracellular accumulations **(15 marks)**

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1.3 List **three (03)** results of macrophage activation **(15 marks)**

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1.4 List **four (04)** differences between tissue regeneration and tissue repair. **(20 marks)**

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Question 02 **(100 marks)**

2.1 List **three (03)** preservatives which can be added to urine and write the main importance of them. **(15 marks)**

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2.2 List the main steps in tissue preparation **(15 marks)**

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2.3 Compare and contrast excisional and incisional surgical biopsies. **(20 marks)**

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2.4 2.4.1. What are carcinogens? **(10 marks)**

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2.4.2. List **two (02)** examples for carcinogens **(10 marks)**

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2.5 Compare benign tumors and malignant tumors **(30 marks)**

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Question 03 **(100 marks)**

3.1 Name the causative agent for the following diseases **(10 marks)**

a) Tuberculosis - .....
b) Leprosy - .....

3.2 What is an autoimmune disease? **(20 marks)**

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3.3 List the clinical features of acute glomerulonephritis **(30 marks)**

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3.4 Write a short note on acute respiratory distress syndrome **(40 marks)**

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Question 04 **(100 marks)**

4.1 List four (04) haemodynamic disorders **(20 marks)**

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4.2 Name four (04) types of shock **(20 marks)**

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4.3 What are the signs and symptoms of acute mastitis? **(20 marks)**

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4.4 Write a short note on Breast Cancer **(40 marks)**

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28 OCT 2024
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CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
BMS 2225 – Biochemistry II
2nd Year 2nd Semester
Batch 06
End Semester SEQ Examination

Date : **28th of October 2024**
Time : **9.00 a.m. to 12.00 p.m.**

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 used a scientific calculator for the examination.

QUESTION 01 **(100 marks)**

1.1. Compare and contrast between nucleotides and nucleosides. (30 marks)

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1.2. Outline the reactions involved in denovo synthesis of purine nucleotides. (35 marks)

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1.3. Write a short note on metabolic defects associated with pyrimidine metabolism. (35 marks)

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QUESTION 02 **(100 marks)**

2.1. State the types of bonds involved in stabilizing the quaternary structure of proteins. (15 marks)

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2.2. . Classify proteins based on their solubility and provide an example. (25 marks)

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2.3. State the structure and significance of an alpha helix in proteins. (30 marks)

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2.4. Compare and contrast protein motifs and protein domains. (30 marks)

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QUESTION 03 **(100 marks)**

3.1. Outline the process of protein synthesis. (25 marks)

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3.2. Outline the catabolism of amino acids, including key pathways and end products. (35 marks)

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3.3. Compare and contrast the roles of transamination and deamination in amino acid metabolism. (40 marks)

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QUESTION 04 **(100 marks)**

4.1. Mention three essential amino acids. (15 marks)

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4.2. Draw a flow chart to denote the basic reactions of the urea cycle. (30 marks)

4.3. Compare the biochemical basis of Alkaptonuria and Cystinuria. (30 marks)

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4.4. Justify the following statement. "Untreated Phenylketonuria (PKU) leads to hypopigmentation". (25 marks)

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QUESTION 05 **(100 marks)**

5.1. State the metabolic defects that could arise due to deficiency of Vitamin C. (15 marks)

5.2. Describe the biochemical roles of Vitamin D in calcium homeostasis. (30 marks)

5.3. Mention the factors which aid for the absorption of iron. (20 marks)

5.4. Write a short note on the role of phosphorous in metabolic processes. (35 marks)

QUESTION 06 **(100 marks)** 00035

A biochemist carried out an experiment to detect the effect on enzyme A in the presence and absence of compound Y. Answer the following questions to

6.1. Considering the below given values calculate 1/So, 1/Vo and 1/Vy. (15 marks)

Substrate Concentration (mM) (So)	1/So	Enzyme Activity (Vo) µmol/min	1/Vo	Enzyme activity in the presence of compound Y (Vy) µmol/min	1/Vy
1	.....	0.15	.....	0.12	.....
2	.....	0.30	.....	0.25	.....
3	.....	0.45	.....	0.40	.....
4	.....	0.60	.....	0.55	.....
5	.....	0.75	.....	0.70	.....

6.2. Using a graph paper plot the Lineweaver-Burk plot in the absence of compound Y. (20 marks)

.....*Answer should be in Graph paper*.....

6.3. In the same graph paper, plot the Lineweaver-Burk plot in the presence of compound Y. (20 marks)

.....*Answer should be in Graph paper*.....

6.4. Calculate Km and Vmax for the enzyme A in the presence of compound Y. (25 marks)

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6.5. Indicate the effect of compound Y on the activity of enzyme A. (20 marks)

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EXAMINATION
23 OCT 2024
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Library JOURNAL

00018

Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
Instrumentation (BMS 2234)
Batch 06
2nd year 2nd Semester
End Semester SEQ Examination

Date: 23rd October 2024
Time: From 9.00 am to 11.00 pm

INSTRUCTIONS TO CANDIDATES

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

QUESTION 01 **(100 marks)**

1.1. State five common properties of borosilicate glasses. (10 marks)

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1.2. List the glassware that is used to measure a certain volume. (20 marks)

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1.3. Mention the sterilization method of the following components.

1.3.1. Plasticware (10 marks)

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1.3.2. Petri plates (10 marks)

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1.3.3. Antibiotics (10 marks)

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1.3.4. Culture media (10 marks)

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1.4. Outline the cleaning process of the glassware stained from organic matters. (30 marks)

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QUESTION 02 **(100 marks)**

2.1. Write short notes for the following instruments.

2.1.1. Freeze dryers (25 marks)

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2.1.2. Thermal cycler (25 marks)

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2.1.3. Hematology auto analyzer (25 marks)

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2.1.4. Microtome (25 marks)

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QUESTION 03 **(100 marks)**

3.1. State the function of each optical part of a light microscope. (20 marks)



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3.2. List the main components of UV-Visible spectrophotometer. (20 marks)

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3.3. Mention the operating principle of the flame photometer. (30 marks)

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3.4. Differentiate the types of protein analyzers based on the working principles. (30 marks)

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QUESTION 04 **(100 marks)**

4.1. Differentiate the terms of "Specificity" and "Sensitivity". (20 marks)

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4.2. ELISA test results of disease condition X is mentioned in the table given below.

	Disease +	Disease -	Total
Test +	545	A	600
Test -	B	1345	1500
Total	C	D	

4.2.1. Find the counts stated as A, B, C and D. (20 marks)

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4.2.2. Calculate sensitivity and specificity for the above data. (30 marks)

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4.3. Compare and contrast immunoturbidimetry and nephelometry. (30 marks)

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CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
Instrumentation (BMS 2234)
Batch 06
2nd year 2nd Semester
Mid Semester Assignment

Date: 23rd October 2024
Time: From 11:15 am to 12.15 noon

INSTRUCTIONS TO CANDIDATES

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

QUESTION 01 **(100 marks)**

1.1. Define the term "Standard Operational Procedure-SOP". (20 marks)

1.2. Differentiate the three types of bio safety cabinets based on the components and the uses of the instrument. (30 marks)

1.3. Discuss the application of different types of microscopes in clinical settings. (50 marks)

QUESTION 02 **(100 marks)**

2.1. State the importance of sterilization in the microbiology laboratory. (10 marks)

2.2. List different sterilization techniques that are been used in clinical laboratories. (30 marks)

2.3. Mention the instruments and consumables used in histopathology laboratory with its function. (60 marks)

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Examination Department

21 OCT 2024

CINEC Campus, Sri Lanka

00059

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
BMS 2243 – Haematology
2nd Year 2nd Semester
Batch 06
End Semester SEQ Examination

Date : 21st of October 2024
Time : 09.00 a.m. – 11.00 a.m. (Two Hours)

INSTRUCTIONS TO CANDIDATES

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

QUESTION 01 **(100 marks)**

1.1 Define "self-renewal" in the context of stem cells. (10 marks)

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1.2 List six (06) characteristics of myeloid and lymphoid growth factors. (30 marks)

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1.3 State six (06) characteristics that would expect from an ideal anticoagulant. (30 marks)

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1.4. A patient suffering from multiple myeloma revealed elevated gamma globulin levels. Using your knowledge of erythrocyte sedimentation rate (ESR), explain how this condition affects the ESR level, providing a detailed explanation. (30 marks)

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QUESTION 02 **(100 marks)**

2.1. List the five (05) components of "Hemostasis Response". (10 marks)

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2.2. State four (04) main functions of Haemostatic mechanism. (20 marks)

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2.3. Briefly outline the structure of platelets highlighting the function of each structure. (30 marks)

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2.4 Discuss the physiological limitations for blood coagulation. (40 marks)

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QUESTION 03 **(100 marks)**

A 35-year-old female patient presenting fatigue, pallor, soreness of breath on exertion, and occasional dizziness was admitted to the medical ward of the hospital. No significant medical history was found for the illness.

Her full blood count report is given to you.

Full Blood Count (FBC) Report

Test	Result	Reference Range
Hemoglobin (Hb)	9.5 g/dL	12.0 - 16.0 g/dL
Hematocrit (Hct)	30%	36% - 46%
Red Blood Cells (RBC)	3.8 x 10^12/L	4.2 - 5.4 x 10^12/L
Mean Corpuscular Volume (MCV)	72 fL	80 - 100 fL
Mean Corpuscular Hemoglobin (MCH)	25 pg	27 - 33 pg
Mean Corpuscular Hemoglobin Concentration (MCHC)	310 g/L	320 - 360 g/L
Red Cell Distribution Width (RDW)	17%	11.5% - 14.5%
White Blood Cells (WBC)	7.0 x 10^9/L	4.0 - 11.0 x 10^9/L
Platelets	450 x 10^9/L	150 - 400 x 10^9/L

3.1. Comment on the results of the full blood count report. (20 marks)

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3.2. State the most probable diagnosis of the above patient. (10 marks)

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3.3. Briefly outline the features that you used for 3.2 mentioned diagnosis. (30 marks)

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3.4 The serum iron studies result of the same patient is given below

Test	**Result**	**Reference Range**
Serum Iron	25 µg/dL	60 - 170 µg/dL
Total Iron Binding Capacity (TIBC)	450 µg/dL	250 - 400 µg/dL
Transferrin Saturation	6%	20% - 50%
Serum Ferritin	10 ng/mL	15 - 150 ng/mL

3.4.1 State the most probable diagnosis of the patient based on the serum iron studies findings. (10 marks)

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3.4.2 Outline the reasons for the diagnosis mentioned in 3.4.1, by highlighting and explaining the key results from the serum iron studies. (30 marks)

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QUESTION 04 **(100 marks)**

4.1. List three inherited vascular disorders. (20 marks)

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4.2. Briefly outline the laboratory diagnosis of **Chronic idiopathic thrombocytopenic purpura (ITP).** (40 marks)

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4.3. An automated analyzer reported a patient's platelet count as 50 x 10^9/L. However, the clinical history does not support this finding. The laboratory technologist suspects this may be a falsely low count and troubleshoots the situation. Explain the steps the technologist should take to handle this situation, including potential causes of a falsely low platelet count and the appropriate corrective actions. (40 marks)

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CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
BMS 2243 – Haematology
2nd Year 2nd Semester
Batch 06
Mid Semester Assignment Examination

Date : 21st of October 2024
Time: 11.15 a.m. – 12.15 p.m. (One Hour)

INSTRUCTIONS TO CANDIDATES

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

QUESTION 01 **(100 marks)**

A 32-year-old female patient presents with symptoms of anemia. The following laboratory results were obtained:

- Hemoglobin (Hb): 8.5 g/dL (Reference range: 12.0 - 16.0 g/dL)
- Hematocrit (Hct): 26% (Reference range: 36% - 46%)
- Reticulocyte percentage: 3.5% (Reference range: 0.5% - 2.5%)
- Reticulocyte maturation time correction factor: 1.5 (for hematocrit of 26%)
- Assume the normal hematocrit is 45%.

1.1. Calculate reticulocyte Index. (15 marks)
1.2. Calculate reticulocyte Production Index. (15 marks)
1.3. Outline the importance of calculating reticulocyte index and reticulocyte production index over reticulocyte count. (35 marks)
1.4. Discuss the importance of Immature Reticulocyte Fraction in diagnosis. (35 marks)

QUESTION 02 **(100 marks)**

Write short notes on each of the topics,

2.1 Intravascular haemolysis (40 marks)
2.2 Electronic resistance principle in automated haematology analyzer (30 marks)
2.3 Erythropoiesis (30 marks)

CINEC CAMPUS
Beyond A Graduate

PAST PAPERS

Faculty	Department / Section/Division
Not Applicable	Learning Resource Centre

Past Papers

Faculty of Health Science

Bachelor of Science honours in Biomedical Sciences

Year 2 – Semester II

Document Control & Approving Authority	Senior Director – Quality Management & Administration

1st Issue Date: 2017.011.30	Revision No.00	Revision Date: 12.01.2023	Validated by: Librarian

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CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
BMS 2243 Haematology
Batch – 02 & 03
2nd Year 2nd Semester
End Semester Assignment Repeat Examination

Date : **2024.06.19**
Time : **11.00 am. – 12.00 pm. (One Hour)**

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **TWO** 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 Discuss the principles of automated haematology analysers. (50 marks)

1.2 Briefly describe the steps of erythrocyte sedimentation rate test method perform in haematology laboratory. (30 marks)

1.3 State the clinical significance of is erythrocyte sedimentation rate test. (20 marks)

Question 02 **(100 marks)**

2.1 Draw a flow chart of the macro-haematocrit method. (50 marks)

2.2 The height of the red blood column obtained during the procedure was at 5th mark of the wintrobe tube. Calculate the pack cell volume of the test. (50 marks)

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CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
BMS 2243- Haematology
Batch – 02 & 03
2nd Year 2nd Semester
End Semester SEQ Repeat Examination

Date : **2024.06.19**
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 not allowed to take out the examination paper.

Question 01 **(100 marks)**

1.1 Define the term of haemopiesis. (25 marks)

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1.2 State the sites of haemopoiesis. (25 marks)

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1.3 Differentiate the pluripotent and unipotent cells. (25 marks)

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1.4 Briefly describe the mechanism of haemopoiesis take place within the bone marrow. (25 marks)

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Question 02 **(100 marks)**

2.1 Define the term of peripheral blood cells. (25 marks)

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2.2 State the components of whole blood. (25 marks)

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2.3 Briefly describe the structure of haemoglobin molecule. (25 marks)

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2.4 Briefly describe the terms of plasmin and anti-thrombin. (25 marks)

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Question 03 **(100 marks)**

3.1 Define the term of anaemia. (25 marks)

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3.2 Briefly describe the classification of anaemia. (25 marks)

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3.3 Briefly describe the laboratory identification method of iron deficiency anaemia. (25 marks)

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3.4 Briefly describe the term of sideroblastic anemia. (25 marks)

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Question 04 **(100 marks)**

4.1 Define the term of haemostasis. (25 marks)

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4.2 State the functions of haemostatic mechanism. (25 marks)

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4.3 State the information which can be obtained from automated hematology counter report. (25 marks)

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4.4 Briefly outline the mechanism of haemostasis. (25 marks)

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Question 05 **(100 marks)**

5.1 Define the term of intrinsic pathway of coagulation. (25 marks)

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5.2 Briefly describe the extrinsic pathway of coagulation. (25 marks)

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5.3 Briefly describe the blood ABO group compatibility patterns. (25 marks)

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5.4 Briefly outline the term of fresh frozen plasma preparation. (25 marks)

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Question 06 **(100 marks)**

6.1 State the purpose of donor selection. (25 marks)

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6.2 State the steps involved in doner selection process. (25 marks)

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6.3 Briefly describe the steps of doner blood collection. (25 marks)

6.4 Briefly explain the fibrinolysis system. (25 marks)

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Beyond A Graduate

Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Science

BMS 2213
Anatomy and Physiology II
2nd Year 2nd Semester
Special Repeat Examination- Assignment
2nd & 3rd Batches

Date	:	**17th June 2024**
Time	:	**2.30 p.m. – 3.30 p.m. (One Hour)**

INSTRUCTIONS TO CANDIDATES

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

Assignment Question 1 **(100 marks)**

1.1 "Female have more chance to get urine infections compare to male" Describe this statement based on anatomical features of female and male urinary systems. (50 marks)

1.2 "Pancreas is both exocrine and endocrine organ". Explain the trueness of this statement. (50 marks)

Assignment Question 2 **(100 marks)**

2.1 Discuss the importance of having ball and socket joint at the shoulder based on its anatomical features. (50 marks)

2..1 Discuss the physiological importance of pituitary gland as an endocrine organ.(50 marks)

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CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Science

BMS 2213
Anatomy and Physiology II

2nd Year 2nd Semester
Special Repeat Examination- BRQ/MCQ
2nd & 3rd Batches

Date	:	**17th June 2024**
Time	:	**9.00 a.m. – 10.00 a.m. (One Hour)**

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **Twenty** questions.
- Answer **ALL** questions.
- **Question No. 01- 08 contains a single answer** and select most appropriate answer among give five statements.

Ex:

1	2	3	4	5
		X		

- **Question No. 09- 20, consist of Five statements** and you need to select and mark either **True (T)** or **False (F)** in each statement.

Ex:

T	T	T	T	T
F	F	F	F	F

- You should write legibly in black or blue ink.
- You are not allowed to take out the examination papers.

1. Which of the following hormone reacts to the body's stress?

1. Aldosterone
2. Cortisol
3. Melatonin
4. Androgens
5. Calcitonin

2. **Which of the following blood constituent remains inside the glomerular capillaries after glomerular filtration?**
   1. Creatinine
   2. Platelets
   3. Urea
   4. Amino acids
   5. Mineral salts

3. **Part of nephron consists podocytes in the,**
   1. Parietal layer of Bowmans's capsule
   2. Loop of Henle
   3. Visceral layer of Bowman's capsule
   4. Distal convoluted tubule
   5. Proximal convoluted tubule

4. **Which of the following best describes the function of the cerebral cortex?**
   1. Thermoregulation
   2. Sensory perception
   3. Regulation of respiration
   4. Coordination of voluntary movements
   5. Changes in heart rate

5. **What is the Endocrine organ comparatively small in adulthood?**
   1. Thymus
   2. Pancreas
   3. Thyroid gland
   4. Pituitary
   5. Adrenal gland

6. **What is the part of the male reproductive system, act as a reservoir of spermatozoa?**
   1. Seminal vesicles
   2. Cowper gland
   3. Prostate gland
   4. Bulbouretharal gland
   5. Epididymis

7. **Which cranial nerve is the most important to alter the shape of the eye lens?**
   1. Vagus nerve
   2. Facial nerve
   3. Optic nerve
   4. Oculomotor nerve
   5. Olfactory nerve

8. **'Polyuria' is due to,**
   1. acute tubular necrosis.
   2. acute glomerulonephritis.
   3. urinary tract obstruction.
   4. diabetes mellitus.
   5. dehydration.

9. True or false regarding the meninges?

1. The dura and arachnoid maters are separated by a subarachnoid space
2. Dura matter adheres to the brain.
3. The superior sagittal sinus is formed by the falx cerebri.
4. Arachnoid matter is the outer most one.
5. Subdural space contains cerebrospinal fluid.

10. True of false regarding female sex hormones?

1. Ovaries secretes only estrogens.
2. Mainly secreted estrogens is estradiol by ovaries.
3. Estrogen regulates the growth, development of human body.
4. Estrogen influences neuroendocrine and skeletal systems.
5. Estrogen helps to maintain body fluid balance.

11. True or false regarding muscular skeletal system?

1. Tendon attaches bone to bone.
2. Ligament attaches muscle to bone.
3. Pelvic girdle protects the lungs.
4. Haemopoiesis is a function of bones.
   Bones store the minerals

12. Regarding the process of spermatogenesis,

1. begins at an average age of 13 years.
2. it is stimulated by follicular stimulating hormone.
3. it is Inhibited by gonadotrophic hormone.
4. takes place in the seminiferous tubules.
5. continuous throughout of life with same rate.

13. True or false regarding the skin?

1. Skin involves in thermoregulation.
2. Skin acts as a barrier for the pathogens.
3. Skin involves in Na^+ regulation.
4. Skin involves in vitamin D synthesis.
5. Skin plays a major role in homeostasis.

14. True or False regarding human uterus wall?

1. Perimetrium is associated with vesicouterine pouch.
2. Endometrium is the thickest layer.
3. Endometrium consists of squamous epithelium.
4. Endometrium rich with spiral arteries.
5. Functional layer of the endometrium lies next to the myometrium.

15. True or False regarding lymphatic system?

1. Subclavian trunk receives lymph only from upper limbs.
2. Tonsils are secondary lymphatic organ.
3. Lymph nodes contain outer capsule.
4. Afferent lymph vessels leave from lymph node.
5. Lymphoid organs destroy infectious microorganisms.

16. True or false?

1. Kidneys are intraperitoneal organs.
2. Kidneys are located lateral to T12- L3 vertebrae.
3. Renal cortex contains pyramids.
4. Apex of pyramids open to the major calyx.
5. Loop of Henle present in renal medulla.

17. True or false regarding bones and cartilages?

1. Pubic symphysis contains elastic cartilage.
2. Hyoid bone acts as a movable base for tongue.
3. Ball and socket joints act as multiaxial joints.
4. There are seven lumbar vertebrae.
5. Epiglottis contains elastic cartilage.

18. Regarding human eye,

1. Sclera is the outer fibrous layer.
2. Retina consists of nervous tissues.
3. Sclera is white of the eye.
4. Choroid is very rich in blood vessels.
5. Vitreous humor present in the anterior chamber of the eye.

19. True or false regarding sensory tests?

1. Holmgren's test is performed as a visual acuity test.
2. Snellen chart is used to test color blindness.
3. Distance between the snellen chart and the patient should be 20m.
4. Sour taste can be identified by the lateral borders of tongue.
5. The frequency of the tuning fork for rinne test is 522Hz.

20. True or false regarding reflexes?

1. Patella reflex indicates the activity of S1- S2 nerves.
2. Deep plantar reflex reflects the activity of L5-S2 nerves.
3. Cremaster reflex indicates the contraction of scrotum.
4. Conducting triceps-reflex can find the function of C6 - C7 nerves.
5. Conducting achilles tendon reflex will find the function of S1- S2.

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Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Science

BMS 2213
Anatomy and Physiology II
2nd Year 2nd Semester
Special Repeat Examination- SEQ
2nd & 3rd Batches

Date	:	**17th June 2024**
Time	:	**10.00 a.m. – 12.00 p.m. (Two Hour)**

INSTRUCTIONS TO CANDIDATES

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

Question 1 **(100 marks)**

1.1 Draw a label diagram of longitudinal section of a human kidney. (25 marks)

1.2 List **three (03)** major steps in the process of urine formation. (15 marks)

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1.3 Write a short note on microscopic structure nephron. (25 marks)

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1.4 List **three (03)** constituents in the glomerular filtrate. (15 marks)

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1.5 Outline the main functions of following structures of male reproductive system.

1.5.1 Testes (10 marks)

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1.5.2 Epididymis (10 marks)

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Question 2 **(100 marks)**

2.1 Name the **three (03)** layers of meninges. (15 marks)

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2.2 Name the main **three (03)** components of synapse (15 marks)

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2.3 List the **two (02)** hormones which are secreted by adrenal cortex. (20 marks)

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2.4 Write a short note on thyroid follicles (25 marks)

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2.5 Compare skeletal muscles, cardiac muscles and smooth muscles. (25 marks)

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Question 3 **(100 marks)**

3.1 List the main types of joints based on their structural differences giving example for each type. (20 marks)

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3.2 List the organs present in female reproductive system. (20 marks)

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3.3 List main components present in cortex of human ovary. (20 marks)

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3.4 List **four (04)** functions of testosterone hormone. (20 marks)

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3.5 Name primary and secondary immune organs present in human body. (20 marks)

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Question 4 (100 marks)

4.1 Name the main **two (02)** types of phagocytic cells in human body. (20 marks)

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4.2 Write short note on tympanic membrane. (20 marks)

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4.3 Outline **four (04)** functions of bones in human skeletal system. (20 marks)

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4.4 Outline main steps in ovulation process. (20 marks)

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4.5 Write one main function of each of the following hormones.

4.5.1 Prolactin (10 marks)

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4.5.2 Adrenocorticotropic hormone (ACTH) (10 marks)

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