



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 I

Document Control & Approving Authority	Senior Director – Quality Management & Administration
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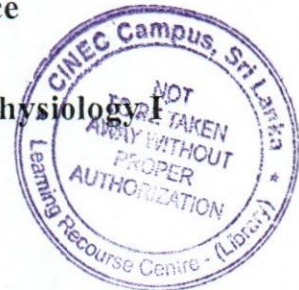
Faculty of Health Sciences

Bachelor of Science Honours in Biomedical Science/
Bachelor of Science Honours in Industrial Pharmaceutical Science/ Bachelor
of Science Honours in Cosmetic Science

BMS 2113/ IPS 2113/ BCS 2113 Anatomy and Physiology I
2nd Year 1st Semester

Mid Semester MCQ Examination

6^h Batch



Date : 1st December 2023
Time : 11.00 a.m. – 12.00 p.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

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1. **Which component in the conducting system involve for ventricle contraction?**
 1. SA node
 2. AV node
 3. Internodal pathway
 4. AV bundle
 5. Purkinje fibers

2. **A cardiac valve with two flaps,**
 1. Mitral valve
 2. Tricuspid valve
 3. Aortic valve
 4. Semilunar valve
 5. Pulmonary valve

3. **In which mitosis phase chromosomes line up across center of the cells?**
 1. Interphase
 2. Prophase
 3. Metaphase
 4. Anaphase
 5. Telophase

4. **Cell organelle contains oxidase enzymes,**
 1. Peroxisomes.
 2. Lysosomes.
 3. Ribosomes.
 4. Secretory vesicles of Golgi apparatus.
 5. Vacuoles.

5. **What is the thickest layer of heart wall?**
 1. Fibrous pericardium
 2. Parietal layer of the serous pericardium
 3. Visceral layer of the serous pericardium
 4. Myocardium
 5. Endocardium

6. **Which of the following cell organelles does the 'autolysis?**
 1. Nucleus
 2. Lysosomes
 3. Peroxisome
 4. Mitochondria
 5. Centrioles

7. **Which is the most suitable name for body fluid compartment that contains cerebrospinal fluid?**
 1. Intracellular fluids
 2. Extracellular fluids
 3. Interstitial fluids
 4. Transcellular fluids
 5. Plasma

8. Which vertebrae is having a heart shaped vertebral body?
1. Cervical
 2. Lumbar
 3. Thoracic
 4. Atlas
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9. In the cell cycle,
1. Chromosomes travel to opposite ends of cells in anaphase.
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 4. G₂ phase is the shortest part of the interphase.
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1. Necrosis is a process of programmed cell death.
 2. Apoptosis is an essential event in development.
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 4. Blebbing of cell membrane can be seen in apoptosis.
 5. Apoptosis is important for cellular homeostasis.
11. Compare to the plasma serum,
1. has less volume.
 2. is acquired from the process of spinning before clotting.
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1. there are seven thoracic vertebrae.
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1. it directs the cardiac impulse from the atria to the ventricles.
 2. it serves as the pacemaker for the heart.
 3. it delays the transmission of the cardiac impulse.
 4. from the AV node, the action potential enters the bundle of his.
 5. AV node can directly contract the ventricles in the heart.



15. True or false?

1. Pectoralis major is the most superficial muscle in the pectoral region.
2. Eighth rib is a false rib.
3. Anterior mediastinum is the largest subdivision of the mediastinum.
4. Arch of aorta presents in the superior mediastinum.
5. Middle mediastinum contains pericardium.

16. Regarding human cell,

1. all plasma proteins are presented at peripherally.
2. tight junctions allow ions to pass for intercellular communication.
3. cristae are infoldings of inner membrane of mitochondria.
4. ribosomes are sites of protein synthesis.
5. microtubules are made of tubulin proteins.

17. Regarding heart anatomy,

1. anterior surface is mainly formed by left ventricle.
2. fibrous pericardium is elastic structure.
3. epicardium is a part of myocardium.
4. endocardium consists of simple cuboidal epithelium.
5. coronary sulcus separates right ventricle from left ventricle.

18. Regarding the nucleus,

1. nuclear envelop is a single layered membrane.
2. it is important in regulating the actions of the cells.
3. euchromatin are less condensed DNA.
4. heterochromatin are mostly located adjacent to the nuclear membrane.
5. outer layer is connected to the smooth endoplasmic reticulum.

19. Regarding the transport systems through the cell membrane,

1. facilitated diffusion follows a concentration gradient.
2. active transport follows a concentration gradient.
3. facilitated diffusion is an active process.
4. oxygen can be transported by simple diffusion.
5. osmosis is the passive movement of water across a semipermeable membrane.

20. True or False?

1. Polycythemia shows increasement in red blood cell.
2. There is a reduction of hemoglobin in anaemia.
3. Red cell indices only give detaols on cell number.
4. Red blood cells produce in bone marrows.
5. Life span of red blood cells in 120 days.



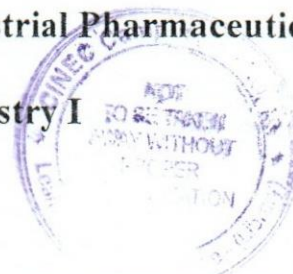
Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences/ Industrial Pharmaceutical
Science/ Cosmetic Science

BMS 2123 / IPS 2123/ BCS 2123– Biochemistry I

Batch – 06

2nd Year 1st Semester

Mid semester MCQ/BRQ Examination



Date : 01st of December 2023
Time : 9.00 a.m. – 10.00 p.m. (One Hour)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **Twenty** MCQ questions.
- Answer **ALL** questions.
- Select the **single best response** for the questions from 01 to 05.
- Mark **True 'T'** or **False 'F'** for each response from question number 06 to 20.
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Select the best response for the questions from 01 to 05.

1. A monosaccharide which contains a ketose functional group is,
 - a) ribose
 - b) ribulose
 - c) xylose
 - d) erythrose
 - e) glucoheptose
2. What is the metabolite which is responsible for the coordinated regulation of glucose and glycogen metabolism ?
 - a) NADH
 - b) Acetyl CoA
 - c) NAD⁺
 - d) Fructose 1,6-bisphosphate
 - e) Fructose 2,6-bisphosphate
3. Select the peripheral protein from the following membrane proteins.
 - a) helical bundle
 - b) α - helix
 - c) carrier protein
 - d) β barrel
 - e) channel protein
4. What is the metabolic process which occurs when the insulin concentration is high?
 - a) stimulates glycogenolysis
 - b) stimulates gluconeogenesis
 - c) inhibits glycogenesis
 - d) stimulates glycolysis
 - e) inhibits kreb's cycle

5. Which of the following enzymes have a high affinity for glucose in liver.
- hexokinase
 - glucose-6-phosphatase
 - glucokinase
 - aldolase
 - phosphofructokinase

Mark 'True' or 'False' for each response from question number 06 to 20.

6. Membrane carrier proteins differ from membrane channel proteins by,
- carrier proteins are transport proteins while channel proteins are not.
 - channel proteins form aqueous pores across the bilayer while carrier proteins cannot.
 - channel proteins can mediate active transport, but carrier proteins cannot.
 - channel proteins can mediate passive transport, but channel proteins cannot.
 - carrier proteins undergoes conformational changes but channel proteins does not.
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- the process cannot start de novo and requires the primer glucose.
 - glycosyl-4,6- transferase enzyme is involved for the cleavage of α 1,6 branches.
 - UDP glucose is the immediate donor of glucose to produce glycogen.
 - starting molecule of the process is glucose-1-phosphate.
 - UDP glucose phosphatase is important for the formation of the UDP glucose.
8. True or false regarding G protein linked membrane receptors,
- G protein is inactive when ATP is bound to it.
 - is important for the hydrophilic signal transduction pathway.
 - consists of an area to bind to the substrate.
 - oestrogen hormone is able to bind to G-protein linked receptor.
 - usually peptide hormones bind to G-protein linked receptors.
9. Which of the following is/are correct regarding Sodium pump?
- exchange extracellular Na^+ for intracellular K^+ .
 - is an ion channel.
 - is important for maintaining a constant cell volume.
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- requires inactivation of phosphorylase kinase.
 - uses ATP to produce glucose-1-phosphate.
 - requires activation of glycogen synthase.
 - it involves enzymes cleaving β -1-4 glycosidic linkage.
 - requires a dual action enzyme α -1-6 glycosidase and transferase.
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- fructose is a reducing sugar as it has a free aldehyde group.
 - all polysaccharides are non-reducing sugars.
 - maltose and sucrose are non-reducing disaccharides.
 - the branches of glycogen consists of α 1-4 glycosidic linkages.
 - hyaluronic acid is an example for heteropolysaccharide.

12. Carrier protein can

- a) transport only one substance.
- b) transport more than one substance.
- c) exchange one substance to another.
- d) only by diffusion and active transport.
- e) undergo conformational changes during solute transport.

13. Which of the following is/are correct regarding Krebs's cycle?

- a) α -ketoglutarate synthetase is involved in forming α -ketoglutarate.
- b) occurs in the matrix of mitochondria.
- c) CO_2 is generated in the conversion of isocitrate to α -ketoglutarate.
- d) FADH_2 is generated in the conversion of malate to oxaloacetate.
- e) it is also known as Citric acid cycle.

14. Pyruvate dehydrogenase enzyme complex,

- a) interconnects glycolysis and citric acid cycle.
- b) involved in oxidative carboxylation of pyruvate to Acetyl CoA.
- c) consists of a multienzyme complex including ten coenzymes.
- d) increased rates of Acetyl CoA produces a negative feedback on the complex.
- e) pyruvate dehydrogenase is independent on c-AMP.

15. The ability of the cell membrane to act as a selective barrier depends upon

- a) the lipid composition of the membrane.
- b) the pores which allows small molecules.
- c) the special mediated transport system.
- d) the protein composition of the membrane.
- e) the concentration gradient.

16. True or false regarding disorders of carbohydrate metabolism?

- a) type III glycogen storage disease affects only liver.
- b) glucose-6-phosphate dehydrogenase deficiency lead to Cori's disease.
- c) deficiency of the debranching enzyme leads to abnormal structure of glycogen.
- d) deficiency of glycogen phosphorylase leads to abnormal structure of glycogen.
- e) deficiency of acid maltase leads to lactic acidosis.

17. True or False regarding the signal transduction pathway,

- a) glucagon hormone binds with intracellular receptors for signal transduction pathway.
- b) epinephrine involves cyclic AMP for the signal transduction.
- c) pituitary hormone binds with extracellular receptors for signal transduction.
- d) Adenylyl cyclase converts G protein to cycle AMP during the transduction pathway.
- e) Thyroid hormone conducts the signal transduction as per the hydrophobic pathway.

18. Which of the following is/are correct regarding membrane transport?

- a) ATP is hydrolyzed in secondary active transport.
- b) Cells shrinks in a hypertonic solution.
- c) One ATP molecule is used to pump 3 Na^+ into the cell.
- d) Na^+ - co transport system involves in transport of macromolecules.
- e) Voltage gated ion channels are responsible for resting membrane potential.

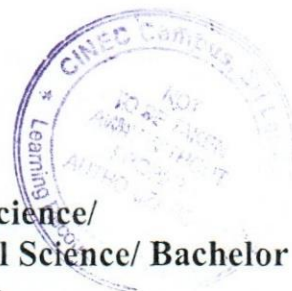
19. Which of the following is/are True or False regarding transport systems ?

- a) glucose transporter in erythrocytes is a antiporter, powered by ATP.
- b) pinocytosis does not require energy from ATP.
- c) transport of sodium and glucose in intestine is an example for symport systems.
- d) valinomycin selectively translocate small molecules across biological membranes.
- e) antiporters involve movement of two different solutes in the same direction.

20. True or False regarding the common differences observed in glycolysis and gluconeogenesis,

- a) oxaloacetate is the starting molecule of gluconeogenesis.
- b) glycolysis happens during fed state.
- c) phosphofructokinase-1 is involved in both processes.
- d) gluconeogenesis happens during fasting state.
- e) there are 4 bypass reactions in gluconeogenesis compared to glycolysis.

Library



Faculty of Health Sciences

Bachelor of Science Honours in Biomedical Science/
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of Science Honours in Cosmetic Science

BMS 2113/ IPS 2113/ BCS 2113 Anatomy and Physiology I

2nd Year 1st Semester

Mid Semester MCQ Examination

6^h Batch

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Bachelor of Science Honours in Industrial Pharmaceutical Science/ Bachelor of Science Honours in Biomedical Science/ Bachelor of Science Honours in Cosmetic Science

IPS 2113/ BMS 2113/ BCS 2113 Anatomy and Physiology I
2nd year 1st semester

End Semester MCQ Examination

6th Batch

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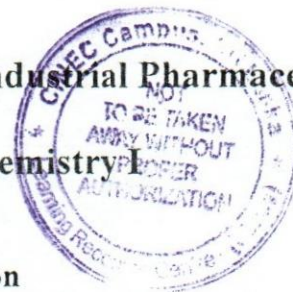
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Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences/ Industrial Pharmaceutical
Science/ Cosmetic Science
BMS 2123 / IPS 2123/ BCS 2123– Biochemistry I
Batch – 06
2nd Year 1st Semester
Mid semester MCQ/BRQ Examination



Date : 01st of December 2023
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Select the best response for the questions from 01 to 05.

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 - CO_2 is generated in the conversion of isocitrate to α -ketoglutarate.
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- c) transport of sodium and glucose in intestine is an example for symport systems.
- d) valinomycin selectively translocate small molecules across biological membranes.
- e) antiporters involve movement of two different solutes in the same direction.

20. True or False regarding the common differences observed in glycolysis and gluconeogenesis,

- a) oxaloacetate is the starting molecule of gluconeogenesis.
- b) glycolysis happens during fed state.
- c) phosphofructokinase-1 is involved in both processes.
- d) gluconeogenesis happens during fasting state.
- e) there are 4 bypass reactions in gluconeogenesis compared to glycolysis.



Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences/ Industrial
Pharmaceutical Science/ Cosmetic Science
BMS 2123 / IPS 2123/ BCS 2123– Biochemistry I
Batch – 06
2nd Year 1st Semester
Mid semester MCQ/BRQ Examination

Date : 01st of December 2023
Time : 9.00 a.m. – 10.00 p.m. (One Hour)

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **Twenty MCQ** questions.
- Answer **ALL** questions.
- Select the single best response for the questions from 01 to 05.

Ex:

a	b	<input checked="" type="checkbox"/>	d	e
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- Mark True '**T**' or False '**F**' for each response from question number 06 to 20.

Ex:

T	<input checked="" type="checkbox"/>	T	T	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	F	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	F

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

Select the best response for the questions from 01 to 05.

1.

a	b	c	d	e
---	---	---	---	---

2.

a	b	c	d	e
---	---	---	---	---

3.

a	b	c	d	e
---	---	---	---	---

4.

a	b	c	d	e
---	---	---	---	---

5.

a	b	c	d	e
---	---	---	---	---

Mark True 'T' or False 'F' for each response from question number 06 to 20.

6.

T	T	T	T	T
F	F	F	F	F

7.

T	T	T	T	T
F	F	F	F	F

8.

T	T	T	T	T
F	F	F	F	F

9.

T	T	T	T	T
F	F	F	F	F

10.

T	T	T	T	T
F	F	F	F	F

11.

T	T	T	T	T
F	F	F	F	F

12.

T	T	T	T	T
F	F	F	F	F

13.

T	T	T	T	T
F	F	F	F	F

14.

T	T	T	T	T
F	F	F	F	F

15.

T	T	T	T	T
F	F	F	F	F

16.

T	T	T	T	T
F	F	F	F	F

17.

T	T	T	T	T
F	F	F	F	F

18.

T	T	T	T	T
F	F	F	F	F

19.

T	T	T	T	T
F	F	F	F	F

20.

T	T	T	T	T
F	F	F	F	F



Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Science
Bachelor of Science Honours in Industrial Pharmaceutical Science
Bachelor of Science Honours in Cosmetic Science

BMS 2153 - General Microbiology
IPS 2153 - Pharmaceutical Microbiology
BCS 2153- Cosmeceutical Microbiology

2nd year 1st semester – Batch 5
End Semester Examination - SEQ

INDEX NUMBER:

Date : 9th September 2022
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 answers in lined papers legibly in black or blue ink.
- You are not allowed to take out the examination papers.

Question 01

(100 marks)

Describe the bacterial morphology, pathogenesis and laboratory identification characteristics of following microorganisms.

- 1.1. *Mycobacterium tuberculosis* (25 marks)
- 1.2. *Chlostridium botulinum* (25 marks)
- 1.3. *Neisseria gonorrhoeae* (25 marks)
- 1.4. *Neisseria meningitidis* (25 marks)

Question 02

(100 marks)

2.1. A scientist wanted to identify the microorganisms present in a water sample taken from a pond. Therefore he spread 0.1 mL of the water sample on Nutrient Agar medium. For doing this he used many laboratory instruments.

State whether he had followed “sterilization” or “disinfection” for each of item mentioned below.

And mention the most **appropriate method** that he can use to achieve sterilization /disinfection of each item accordingly.

- 2.1.1. Nutrient Agar medium
- 2.1.2. Petri dishes
- 2.1.3. Working bench
- 2.1.4. Inoculation loop
- 2.1.5. Glass spreader (50 marks)

2.2. Mention 2 key differences between sterilization and disinfection in microbiology. (20 marks)

2.3. Compare and contrast between simple staining and differential staining with examples. (30 marks)

Question 03

(100 marks)

34 year female patient with white/yellowish color patches on tongue came for treatments. Patient mentioned that she encounters a cotton-like sensation in her mouth with a bad taste and difficulty of swallowing, suspecting an oral thrush. A scraped biopsy sample from the affected area was subjected for direct microscopy after treating with KOH and **staining**. The medical laboratory technician suspected the causative agent as *Candida albicans*.

- 3.1. State the name of the test that he could perform for confirmation the presence of *Candida albicans* in patient sample. (20 marks)
- 3.2. What is the observation that he could get once he performed the test that you mentioned in 3.1. (20 marks)
- 3.3. State a drug which can be used for a fungal infection. (20 marks)
- 3.4. State two stains that you could use for staining fungal elements? (20 marks)
- 3.5. What is meant by “dimorphic fungi” ? (20 marks)

Question 04**(100 marks)**

4.1. Mention the disease caused by each organism

4.1.1. *Corynebacterium diphtheriae*

4.1.2. *Escherichia coli*

4.1.3. *Bacillus anthracis*

4.1.4. *Mycoplasma pneumoniae*

4.1.5. *Chlostridium perfringens*

4.1.6. *Treponima pallidum*

(60 marks)

4.2. Describe the steps of "Generalized transduction" process in which DNA is transferred from one bacterium to another by a virus. (40 marks)

Question 05**(100 marks)**

5.1. What are the advantages of dark field microscopy over the light microscope?(20 marks)

5.2. Mention the stains used for following bacterial staining methods.

5.2.1. Endospore staining

5.2.2. Flagella staining

5.2.3. Spirochete staining

(30 marks)

5.3. What are the morphological features of a spirochete ?

(10 marks)

5.4. State two special characteristic features of mycoplasma.

(10 marks)

5.5. Describe the procedure of performing antibiotic sensitivity test (ABST) in microbiology.

(30 marks)

Question 06**(100 marks)**

6.1. Describe the bacterial morphology of the *Chlostridium tetani* (20 marks)

6.2. Mention the neurotoxin produced by the bacteria mentioned in 6.1. (20 marks)

6.3. Describe the action of neurotoxin mentioned in 6.2 and clinical symptoms of a patient which are arising due to that. (30 marks)

6.4. Classify the culture methods based on ingredients and give example for each type.

(30 marks)



Faculty of Health Sciences
**Bachelor of Science Honours in Industrial Pharmaceutical Science/
Bachelor of Science Honours in Biomedical Science/ Bachelor of Science
Honours in Cosmetic Science**

**IPS 2113/ BMS 2113/ BCS 2113 Anatomy and Physiology I
2nd year 1st semester**

End Semester SEQ Examination

5th Batch

INDEX NUMBER:

Date : 05th September 2022
Time : 9.00 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.
- You are not allowed to take out the examination papers.

- Question 1** (100 marks)
- 1.1 Define following terms.
- 1.1.1 True Ribs (10 marks)
 - 1.1.2 False Ribs (10 marks)
 - 1.1.3 Floating Ribs (10 marks)
- 1.2 Name the bones in upper limb. (20 marks)
- 1.3 Describe the conduction system of the heart. (30 marks)
- 1.4 Outline the functions of the following blood cells.
- 1.4.1 Red blood cells (10 marks)
 - 1.4.2 White blood cells (10 marks)
- Question 2** (100 marks)
- 2.1 Describe the general characters of epithelial tissues. (25 marks)
- 2.2 Describe structural diversity of animal cells, based on their functions, by giving 3 examples. (25 marks)
- 2.3 List the functions of the following cell organelles. (20 marks)
- 2.3.1 Smooth endoplasmic reticulum
 - 2.3.2 Ribosome
 - 2.3.3 Golgi apparatus
 - 2.3.4 Lysosome
- 2.4 Write short notes on following fluid compartments in the body
- 2.4.1 Intra cellular fluid compartment (15 marks)
 - 2.4.2 Extracellular fluid compartment (15 marks)
- Question 3** (100 marks)
- 3.1 Write short notes on followings.
- 3.1.1 Paranasal sinuses (15 marks)
 - 3.1.2 Respiratory epithelium (15 marks)
- 3.2 List four differences between right and left bronchi. (20 marks)
- 3.3 Define the lung volumes given below. (15 marks)
- 3.3.1 Tidal volume
 - 3.3.2 Inspiratory reserve volume
 - 3.3.3 Expiratory reserve volume
- 3.4 Describe the process of pulmonary ventilation. (35 marks)
- Question 4** (100 marks)
- 4.1 Describe the microscopic structure of human liver. (25 marks)
- 4.2 Write a short note on pericardium. (25 marks)
- 4.3 List the functions of saliva. (10 marks)
- 4.4 List the constituents in gastric juice. (10 marks)
- 4.5 Outline the functions of liver. (15 marks)
- 4.6 Outline the process of fat absorption. (15 marks)



Faculty of Health Sciences
**Bachelor of Science Honours in Biomedical Sciences/
Bachelor of Science Honours in Industrial Pharmaceutical Sciences/
Bachelor of Science Honours in Cosmetic Science**

BMS 2123/ IPS 2123/ BCS 2123 – Biochemistry I

2nd Year 1st Semester

Batch 05

End Semester SEQ Examination

INDEX NUMBER:

Date : 07th of September 2022
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 not allowed to take out the examination papers.

QUESTION 01**(100 marks)**

- 1.1. State the methods of cell communications. (15 marks)
- 1.2. Compare and contrast symporter and antiporter systems. (20 marks)
- 1.3. Illustrate the signaling cascade mediated by IP₃ and DAG through G protein coupled receptor to increase cytosolic Calcium ion concentration. (40 marks)
- 1.4. Discuss the role of sodium driven transporters in regulating cytosolic pH. (25 marks)

QUESTION 02**(100 marks)**

- 2.1. Draw the structures of the following molecules. (20 marks)
- 2.1.1 Cellulose
- 2.1.2 Sucrose
- 2.1.3 β -D glucose
- 2.2.4 Amylose
- 2.2. Discuss the biological significance of carbohydrates. (30 marks)
- 2.3. Draw a diagram to illustrate the reactions of the TCA cycle. (25 marks)
- 2.4. Describe the role of pentose phosphate pathway in regulating oxidative stress. (25 marks)

QUESTION 03**(100 marks)**

- 3.1. Mention the enzymes involved in glycogenolysis. (15 marks)
- 3.2. Discuss the fate of glucose-6-phosphate released by glycogenolysis. (20 marks)
- 3.3. Discuss the significance of gluconeogenesis. (25 marks)
- 3.4. Write short notes on following.
- 3.4.1 Pompe's disease (20 marks)
- 3.4.2 Lactic acidosis (20 marks)

QUESTION 04**(100 marks)**

- 4.1 List 03 biological and 03 clinical significance of lipids. (20 marks)
- 4.2 Define the following terms. (15 marks)
- 4.2.1 Ketogenesis
- 4.2.2 Ketonemia
- 4.2.3 Ketonuria
- 4.3 Write a short note on Utilization of Ketone bodies with a suitable diagram. (35 marks)
- 4.4 What is mean by "Ketoacidosis" ? (15 marks)
- 4.5 List 03 early symptoms of ketoacidosis and 03 other symptoms of ketoacidosis. (15 marks)

QUESTION 05**(100 marks)**

- 5.1 Define the term " β Oxidation". (15 marks)
- 5.2 Why this process called " β Oxidation". (20 marks)
- 5.3 What are the 03 phases of β Oxidation. (20 marks)
- 5.4 Describe any of the above mentioned phases by using a suitable diagram. (45 marks)

QUESTION 06**(100 marks)**

- 6.1 What is meant by "Electron Transport Chain" (20 marks)
- 6.2 Briefly describe an overview of "Electron Transport Chain" (35 marks)
- 6.3 Describe the de-novo synthesis of cholesterol by using an appropriate diagram. (45 marks)



Faculty of Health Sciences
Bachelor of Science (Hons) in Biomedical Sciences
BMS 2143 – Clinical Biochemistry
2nd Year 1st Semester
Batch 04
End Semester SEQ Examination

INDEX NUMBER:

Date : 25.04.2022
Time : 9.00 am – 11.00 am

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **FOUR** questions.
- Answer **ALL** questions.
- The paper will be for two hours (9.00 am – 11.00 am).
- You should write **answers in lined papers** legibly in black or blue ink.

Question 01**(100 Marks)**

- 1.1 State the structure of the haemoglobin and its function. (15 marks)
- 1.2 What are the normal ranges for haemoglobin level for men and for women? (10 marks)
- 1.3 List most common 3 types of haemoglobin and describe their structure. (15 marks)
- 1.4 Which types of haemoglobin are present in sickle cell disease and what is the technique used to check the different types of haemoglobin in the blood? (20 marks)
- 1.5 Discuss the mechanism of inheritance of sickle cell disease. (40 marks)

Question 02**(100 Marks)**

- 2.1 Define a serum enzyme and what is the importance of measuring them? (15 marks)
- 2.2 Differentiate functional and non-functional plasma enzymes. (20 marks)
- 2.3 What is acute myocardial infarction (AMI) and name two serum cardiac markers used for diagnosing an AMI? (20 marks)
- 2.4 Mention the main cause of cholestasis and list serum tests in diagnosis. (20 marks)
- 2.5 Describe the reason why serum preferred over plasma. (25 marks)

Question 03**(100 Marks)**

- 3.1 Where does urea formed in our body? (10 marks)
- 3.2 What is the clinical significance of testing for blood urea nitrogen (BUN)? (20 marks)
- 3.3 State the normal ranges of BUN and the threshold for higher level. (20 marks)
- 3.4 What are the differences between creatine and creatinine and mention the clinical significance of measuring serum creatinine? (25 marks)
- 3.5 Discuss the urea cycle using diagram along with ammonia conversion into urea. (25 marks)

Question 04**(100 Marks)**

- 4.1 List 2 reasons for carrying out lipid profile test. (20 marks)
- 4.2 What are the pre-preparation steps of lipid profile test? (15 marks)
- 4.3 State the parameters in lipid profile. (15 marks)
- 4.4 Describe the production process of bilirubin within human body. (35 marks)
- 4.5 Mention the tests based on excretory function of liver. (15 marks)



Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Science
BMS 2123 – Biochemistry I
2nd year 1st semester – Batch 04
End Semester SEQ Examination

INDEX NUMBER:

Date : 20th April 2022
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 not allowed to take out the examination papers.

Question 01**(100 marks)**

- 1.1 State two anaplerotic reactions of TCA cycle. (20 marks)
- 1.2 Discuss the importance of HMP shunt. (40 marks)
- 1.3 State the steps in glycolysis that indicate substrate level phosphorylation. (10 marks)
- 1.4 Explain the regulation of glycogenesis by glycogen synthase in response to the hormone glucagon. (30 marks)

Question 02**(100 marks)**

- 2.1 State 3 types of ion channels. (15 marks)
- 2.2 Describe the working mechanism of sodium potassium pump. (35 marks)
- 2.3 Assume that there are thirty sodium ions outside the cell and twenty potassium ions inside the cell. Calculate the number of sodium and potassium ions after one cycle of the sodium-potassium pump. Mention the location of the ions. (30 marks)
- 2.4 Differentiate symporter and antiporter systems. Provide one example for each. (20 marks)

Question 03**(100 marks)**

- 3.1 Discuss the energetics of β oxidation of palmitic acid (16C). (40 marks)
- 3.2 State five enzymes present in the fatty acid synthase complex. (20 marks)
- 3.3 Draw the following structures. (20 marks)
- 3.3.1 Glycerol trilaurate (lauric acid – 12:0)
 - 3.3.2 18:2;9,12
 - 3.3.3 β -D glucose
 - 3.3.4 Amylose
- 3.4 Briefly describe the mode of transport of fatty acids from cytosol to mitochondria. (20 marks)

Question 04**(100 marks)**

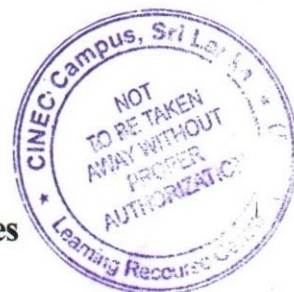
- 4.1 State two types of cell receptors. (08 marks)
- 4.2 State methods of cell communications. (12 marks)
- 4.3 Differentiate first and second messengers with examples. (40 marks)
- 4.4 Illustrate the signaling cascade mediated by IP₃ and DAG through G protein coupled receptor to increase cytosolic Calcium ion concentration. (40 marks)

Question 05**(100 marks)**

- 5.1 State the defective enzyme/s of following metabolic disorders. (20 marks)
- 5.1.1 Tay-Sachs disease
 - 5.1.2 Gaucher disease
 - 5.1.3 Von Gierke disease
 - 5.1.4 Wernicke Korsakoff syndrome
- 5.2 Compare glycolysis and gluconeogenesis. (30 marks)
- 5.3 Explain the role of glucose-6-phosphate dehydrogenase in elimination of reactive oxygen species in red blood cells. (30 marks)
- 5.4 What are lipid storage disorders? (20 marks)

Question 06**(100 marks)**

- 6.1 State the order of electron flow through electron transport chain. (30 marks)
- 6.1.1. When NADH is the substrate
 - 6.1.2. When FADH₂ is the substrate
- 6.2 FADH₂ produces less ATP than NADH through electron transport chain. Justify this statement. (40 marks)
- 6.3 Discuss the fates of glucose-6-phosphate. (30 marks)



Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
BMS 2133 – Laboratory Safety
2nd Year 1st Semester
Batch 04
End Semester SEQ Examination

INDEX NUMBER:

Date : 22nd of April 2022

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

QUESTION 01**(100 marks)**

- 1.1. Mention five universal precautions that should be practiced in the laboratory. (15 marks)
- 1.2. Discuss the standard laboratory practices that should be followed by an undergraduate student to maintain laboratory safety. (35 marks)
- 1.3. Mention the laboratory personal responsible to maintain safety in the laboratory. (15 marks)
- 1.4. Discuss the importance of immunizing the laboratory staff. (35 marks)

QUESTION 02**(100 marks)**

- 2.1. What is a Personal protective equipment? (10 marks)
- 2.2. Discuss the factors which influence the selection of personal protective equipments. (20 marks)
- 2.3. Complete the following chart to represent the personal protective equipments that you should use when performing the following experiments. (20 marks)

	Experiment	Personal protective equipments that should be used
i	When handling a hazardous chemical	
ii	When handling a combustible chemical	
iii	When dealing with a nasal swab	
iv	When drawing blood from a patient	

- 2.4. Compare and contrast surgical mask and N95 masks. (30 marks)
- 2.5. Draw a flow chart to denote the proper method of removing gloves after handling a hazardous chemical. (20 marks)

QUESTION 03**(100 marks)**

- 3.1. State 3 types of hazards in the laboratory. (15 marks)
- 3.2. Define Biohazard. (15 marks)
- 3.3. State the precautions that should be taken when handling chemical hazards. (30 marks)
- 3.4. Mention the precautions that should be taken when handling each of the following chemicals. (40 marks)

Name of the laboratory items	Precautions that should be taken
Flammable chemical	
Carcinogen	
Corrosive chemical	
Oxidizing chemical	

QUESTION 04**(100 marks)**

- 4.1. State the main types of radiation. (10 marks)
- 4.2. Draw a caution symbol used to represent a radioactive material (15 marks)
- 4.3. Discuss the standard practices followed in laboratories to safeguard the laboratory staff from hazardous effects of radiation. (25 marks)
- 4.4. Write short notes on following.
- 4.4.1. Biological effects of radiation exposure. (25 marks)
- 4.4.2. Radioactivity (25 marks)

QUESTION 05**(100 marks)**

- 5.1. Imagine that you are conducting a research involving influenza virus. Mention the biosafety level that should be maintained in the laboratory. (10 marks)
- 5.2. Discuss the standard laboratory practices followed in the biosafety level mentioned in 5.1 above. (35 marks)
- 5.3. Describe the importance of maintaining biosafety in the laboratory. (25 marks)
- 5.4. Compare and contrast biosafety cabinet class I, II and III. (30 marks)

QUESTION 06**(100 marks)**

- 6.1. Mention 3 safety precautions that should be followed when discarding microbiology laboratory waste. (15 marks)
- 6.2. State the method of disposal of the following laboratory waste. (40 marks)

Name of the laboratory waste	Method of disposal
Lancets	
Contaminated cotton	
Sputum samples	
Syringes	

- 6.3. Describe the standard laboratory practice that should be followed when transporting laboratory waste. (20 marks)
- 6.4. Discuss the importance of waste management for the biomedical science laboratory. (25 marks)



Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences
BMS 2123 – Molecular Biology
2nd year 1st semester
Higher Diploma
End Semester SEQ Examination

INDEX NUMBER:

Date : 07th of August 2022
Time : 9.00 a.m. to 12.00 p.m.

INSTRUCTIONS TO CANDIDATES

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

QUESTION 01**(100 marks)**

- 1.1. What is DNA? (15 marks)
- 1.2. Define the following terms. (20 marks)
- 1.2.1 Chromosome
- 1.2.2 Genome
- 1.2.3 Gene
- 1.2.4 Karyotype
- 1.3 Draw the structure of chromosome and label the parts. (30 marks)
- 1.4 Mention 04 differences between RNA and DNA. (20 marks)
- 1.5 List 02 functions of tRNA. (15 marks)

QUESTION 02**(100 marks)**

- 2.1. What are the significance of DNA replication? (15 marks)
- 2.2 List 05 bacterial DNA replication proteins and their functions. (25 marks)
- 2.3 Briefly describe the 03 stages of RNA transcription. (30 marks)
- 2.4 Compare the translation in Bacteria and Eukaryotes. (30 marks)

QUESTION 03**(100 marks)**

- 3.1. Mention 02 types of spontaneous DNA damage and briefly describe them. (30 marks)
- 3.2 Define the term "Gel Electrophoresis". (15 marks)
- 3.3 Briefly describe the principle of "Gel Electrophoresis". (20 marks)
- 3.4 What is needed for "Gel Electrophoresis"? (15 marks)
- 3.5 Briefly describe process of "Gel Electrophoresis". (20 marks)

QUESTION 04**(100 marks)**

- 4.1. What is Blotting Technique? (15 marks)
- 4.2 Write 05 applications on Southern Blotting. (25 marks)
- 4.3 What are the steps in gene cloning? (15 marks)
- 4.4 What are the uses of PCR in recombinant DNA? (25 marks)
- 4.5 List down the uses of restriction fragments? (20 marks)



Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Science
BMS 2113 Anatomy and Physiology I
2nd year 1st semester
End Semester SEQ Examination
4th Batch

INDEX NUMBER:

Date : 18th April 2022
Time : 9.00 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.
- You are not allowed to take out the examination papers.

Question 1 (100 marks)

- 1.1 Draw a labeled diagram of typical animal cell. (15 marks)
- 1.2 Describe structural diversity of animal cells, based on their functions, by giving 3 examples. (25 marks)
- 1.3 Write a one function of each of following organ.
- (a) Ribosome (5marks)
 - (b) Mitochondria (5marks)
 - (c) Rough Endoplasmic Reticulum (RER) (5marks)
 - (d) Nucleus (5marks)
 - (e) Plasma membrane (5marks)
- 1.4 Describe the interphase of human cell cycle. (35 marks)

Question 2 (100 marks)

- 2.1 Define following terms.
- 2.1.1 True Ribs (15 marks)
 - 2.1.2 False Ribs (15 marks)
 - 2.1.3 Floating Ribs (15 marks)
- 2.2 Describe the blood supply to the anterior intercostal space. (25 marks)
- 2.3 Describe the mechanisms of oedema formation in following situations.
- 2.3.1 Increased capillary hydrostatic pressure (15 marks)
 - 2.3.2 low albumin synthesis in liver damage (15 marks)

Question 3 (100 marks)

- 3.1 Write short notes on followings.
- 3.1.1 Paranasal sinuses (20 marks)
 - 3.1.2 Respiratory epithelium (20 marks)
- 3.2 List four differences between right and left bronchi. (20 marks)
- 3.3 How hypoxic hypoxia gives rise to tissue hypoxia? (20 marks)
- 3.4 List two differences between central and peripheral cyanosis. (20 marks)

Question 4 (100 marks)

- 4.1 Describe the five major activities of the human digestive system. (30 marks)
- 4.2 Write the function of followings.
- 4.2.1 Intrinsic factor (10 marks)
 - 4.2.2 Pepsin enzyme (10 marks)
 - 4.2.3 Trypsin enzyme (10 marks)
- 4.3 Describe the structure of biliary duct system. (25 marks)
- 4.4 What is peristalsis movements. (15 marks)



Faculty of Health Sciences

Bachelor of Science Honours in Biomedical Science

BMS 2133 Laboratory Safety
2nd Year 1st Semester

End Semester SEQ Examination
2nd & 3rd Batch

INDEX NUMBER:

Date : 16th August 2021
Time : 09.00 a.m. – 12.00 p.m. (Three hours) - To answer the questions
12.00 p.m. – 12.30 p.m. (30 minutes) - To upload & email the
compiled answer script

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- The paper will be for three hours (9.00 a.m. – 12.00 p.m.). You will be given an extra 30 minutes for submission. Any submission after 12.30 p.m. will not be accepted.
- You should write the answers in **lined sheets** legibly in black or blue ink.
- You **MUST** write **examination name, module name, your name and index number** of each answer script **according to the previously circulated format via email**.
- **Answer script** should be numbered (right bottom) clearly.
- Photograph of your answer scripts must be taken by keeping them on a clear platform (e.g. table).
- Arrange the photographs of your answer script in a word document in an orderly manner, then convert the word document to a **PDF**.
- **Label the PDF: Your Index No –Laboratory Safety SEQ**
- **Upload** the labelled **PDF to LMS AND** also **email** the PDF to **Fohs.exams@cinec.edu**

- Question 1** (100 marks)
- 1.1 Describe the need of biosafety at the biomedical laboratory. (25 marks)
 - 1.2 Describe the class I biological safety cabinet. (35 marks)
 - 1.3 List the steps you have to follow from start up to shut down when using of bio cabinet in your procedures. (40 marks)

- Question 2** (100 marks)
- 2.1 List the general contents in a material safety data sheet. (25 marks)
 - 2.2 Describe the general precautions you have to follow when using chemicals at the laboratory. (35 marks)
 - 2.3 List five health effects of chemical hazards. (20 marks)
 - 2.4 List five important factors that determine the degree of fire hazard liquid. (20 marks)

- Question 3** (100 marks)
- 3.1 Write short notes on followings.
 - 3.1.1 Particle radiation (25 marks)
 - 3.1.2 Electromagnetic radiation (25 marks)
 - 3.2 Discuss the advantages of use of film badges in personal radiation monitoring. (35 marks)
 - 3.3 Draw a caution symbol for radioactive material. (15 marks)

- Question 4** (100 marks)
- 4.1 Define the term radio sensitivity. (15 marks)
 - 4.2 What are the three fundamental principles of radiation protection based on? (15 marks)
 - 4.3 Describe the followings.
 - 4.3.1 Deterministic radiation effect (35 marks)
 - 4.3.2 Stochastic radiation effects (35 marks)

- Question 5** (100 marks)
- 5.1 What is personal protective equipment (PPE)? (15 marks)
 - 5.2 Describe the importance of wearing N95 mask as a safety precaution for COVID-19 pandemic. (35 marks)
 - 5.3 Compare and contrast N-95 mask and surgical mask. (35 marks)
 - 5.4 Is a N95 a respirator? (15 marks)

- Question 6** (100 marks)
- 6.1 Briefly describe the importance of autoclaving. (25 marks)
 - 6.2 Write three key parameters in an incinerator. (15 marks)

6.3 Describe the related factors that should consider with a request of microbiological investigation in a laboratory. (30 marks)

6.4 Describe four factors affect on the reliability of laboratory results. (30 marks)



Faculty of Health Sciences

Bachelor of Science Honours in Biomedical Science

BMS 2143 Clinical Biochemistry
2nd Year 1st Semester

End Semester SEQ Examination

3rd Batch

INDEX NUMBER:

Date : 11th August 2021
Time : 09.00 a.m. – 11.00 a.m. (Two hours) - To answer the questions
11.00 a.m. – 11.30 a.m. (30 minutes) - To upload & email the compiled answer script

INSTRUCTIONS TO CANDIDATES

- This question paper consists of **FOUR** questions.
- Answer **ALL** questions.
- The paper will be for two hours (9.00 a.m. – 11.00 a.m.). You will be given an extra 30 minutes for submission. Any submission after 11.30 a.m. will not be accepted.
- You should write the answers in **lined sheets** legibly in black or blue ink.
- You **MUST** write **examination name, module name, your name and index number** of each answer script **according to the previously circulated format via email**.
- **Answer script** should be numbered (right bottom) clearly.
- Photograph of your answer scripts must be taken by keeping them on a clear platform (e.g. table).
- Arrange the photographs of your answer script in a word document in an orderly manner, then convert the word document to a **PDF**.
- **Label the PDF: Your Index No –Clinical Biochemistry SEQ**
- **Upload** the labelled **PDF to LMS AND** also **email** the PDF to **Fohs.exams@cinec.edu**

Question 1**(100 marks)**

A 50-year-old woman, complained of intractable vomiting suspected of suffering from pyloric stenosis receiving treatment showed following acid base data on day 1 and day 2.

Laboratory data on Day 1

		Reference
pH	7.6	(7.35-7.45)
pCO ₂	41 mmHg	(35 - 45 mmHg)
HCO ₃ ⁻	35 mmol/L	(22 - 26 mmol/L)

Laboratory data on Day 1

		Reference
pH	7.55	(7.35-7.45)
pCO ₂	45 mmHg	(35 - 45 mmHg)
HCO ₃ ⁻	28 mmol/L	(22 - 26 mmol/L)

- 1.1 Interpret the lab report on Day 01. (15 marks)
- 1.2 Identify the acid-base disorder of this patient in Day 01. (10 marks)
- 1.3 Interpret the lab report on Day 02. (15 marks)
- 1.4 Identify the acid-base disorder of this patient in Day 01. (10 marks)
- 1.5 Describe the process of vomiting induced acid-base disorder? (25 marks)
- 1.6 Justify the role of respiratory center and kidneys in this situation (25 marks)

Question 2**(100 marks)**

A 25-year-old woman, presented with burning sensation during urination, a increased frequency of urination and intense urge to urination, even though little comes out when she does, cloudy, dark, bloody, or strange-smelling urine and feeling pain in lower abdomen.

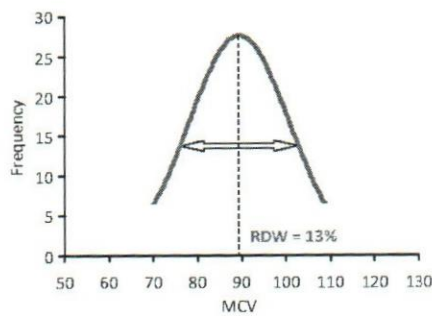
- 2.1 What is the most potential clinical disease? (15marks)
- 2.2 List two most appropriate urine test you would recommend here (15 marks)
- 2.3 What is most appropriate type of the urine sample you would collect? (15marks)
- 2.4 If you are at the sample collection counter, what are the containers and materials you have to supply for the patient to collect the appropriate urine sample? (20 marks)
- 2.5 What are the instructions you should give to this patient regarding the urine sample collection? (35 marks)

Question 3**(100 marks)**

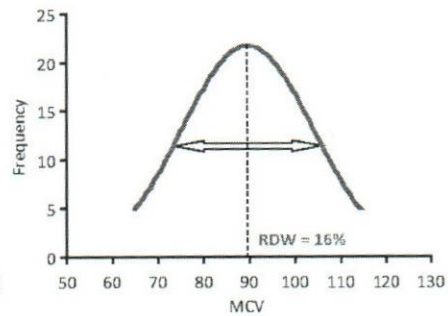
- 3.1 List separately the basic hematological parameters and derived parameters in complete blood count test? (20 marks)
- 3.2 What is the role of cynomethemoglobin in estimation of hemoglobin concentration? (20 marks)

3.3 Supposed you are received a patient blood sample containing in a tube with red top. Describe the next steps you have to follow to prepare the sample for alanine aminotransferase assay. (30 marks)

3.4 Following diagram shows red blood cell distribution of a patient. Interpret the results. (30 marks)



Healthy adults' sample



Patients' sample

Question 4

(100 marks)

4.1 Define following terms.

- 4.1.1. False negative test (15 marks)
- 4.1.2. Accuracy of a test (15 marks)
- 4.1.3. Sensitivity of a test (15 marks)
- 4.1.4 Reference range (15 marks)
- 4.1.5 Relative error (15 marks)

4.2 Why the reference ranges important in a biomedical laboratory? (25 marks)



Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Science/
Bachelor of Science Honours in Industrial Pharmaceutical Science/
Bachelor of Science Honours in Cosmetic Science
BMS 2153 – General Microbiology
IPS 2153 – Pharmaceutical Microbiology
BCS 2153 – Cosmeceutical Microbiology
2nd year 1st semester – BMS/IPS Batch 03, BCS Batch 01
End Semester Online Examination - SEQ

INDEX NUMBER:

Date : 13th August 2021
Time : 9.00 a.m. to 12.00 p.m.

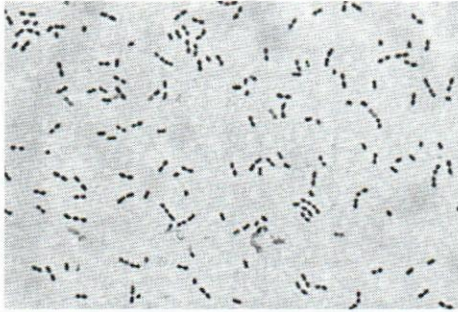
INSTRUCTIONS TO CANDIDATES

- This question paper consists of SIX questions.
- Answer ALL questions.
- You should write answers in lined papers legibly in black or blue ink.
- You MUST write your index number in the top right corner of each answer script.
- Answer script should be numbered (right bottom) clearly.
- Photograph of your answer scripts must be taken by keeping them on a clear platform (e.g. table).
- Arrange the photographs of your answer script in a word document in an orderly manner, then convert the word document to a PDF.
- Label the PDF: Your Index No-Module name.
- Upload the labelled PDF to LMS AND also email the PDF to Fohs.exams@cinec.edu

Question 01

(100 marks)

1.1. 34 year old patient presented with high fever, cough and yellow sputum for 3 days. On examination he was febrile, ill and both lungs shows evidence of pneumonia. He was admitted to the medical casualty ward and following investigation were done. Full blood count, CRP and sputum gram staining was given below.



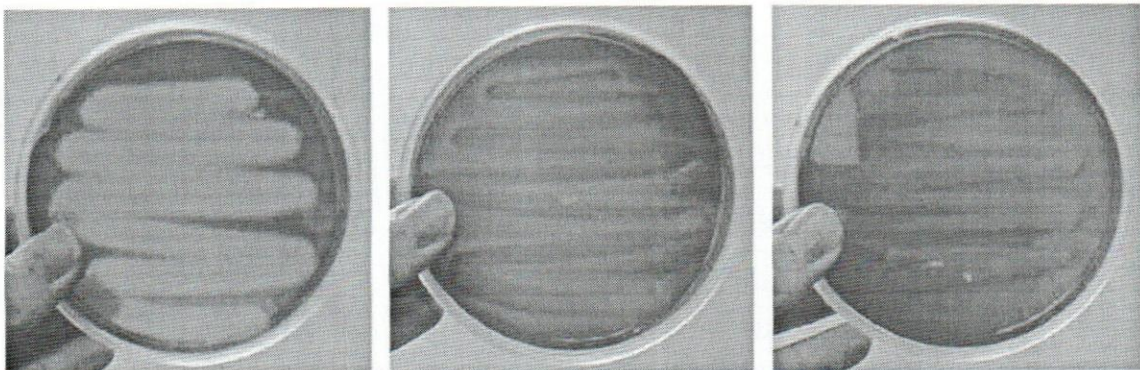
Full blood count shows increased polymorph.

- 1.1.1 What is the possible diagnosis of this patient? (15 marks)
- 1.1.2. What is the organism identified in the direct microscopy (15 marks)
- 1.1.3. Name the virulence factors (10 marks)
- 1.1.4. How do you stain for bacterial identification? (20 marks)

1.2. 12 year boy presented with high fever, tachycardia and evidence of endocarditis. On history, patient has had tonsillitis two weeks before and has not been treated for it. Throat swab was done and gram staining found positive chains of cocci. Culture plate shows gray tiny colonies with clear large zone around colonies in blood agar. Organism was susceptible for bacitracin sensitivity.



- 1.2.1 What is the suspected microorganism? (10 marks)
- 1.2.2. What is the reason for the clear large zone around the colonies in blood agar? (15 marks)
- 1.2.3 Identify the following types of haemolysis in blood agar (15 marks)



Question 02 (100 marks)

- 2.1. Describe the bacterial morphology, identification characteristics and the diseases of
- 2.1.1. *Clostridium perfringens* (25 marks)
 - 2.1.2. *Vibrio cholerae* (25 marks)
 - 2.1.3. *Bacillus anthracis* (25 marks)
 - 2.1.4. *Neisseria gonorrhoeae* (25 marks)

Question 03 (100 marks)

- 3.1. Describe the bacterial morphology of the *Treponima pallidum* (20 marks)
- 3.2. List the diseases caused by the bacteria mentioned in 3.1. (10 marks)
- 3.3. Describe the clinical presentations of leptospirosis. (20 marks)
- 3.4. What is the organism causing leptospirosis? (10 marks)
- 3.5. Describe the bacterial morphology, cultures / colony characteristics of *Staphylococcus aureus*. (30 marks)
- 3.6. List the diseases caused by the organism mentioned in 3.5. (10 marks)

Question 04 (100 marks)

- 4.1. State the types of microscopy techniques. (10 marks)
- 4.2. Compare and contrast the optical microscope and electron microscope. (20 marks)
- 4.3. Differentiate sterilization and disinfection. (20 marks)
- 4.4. Describe the physical methods of sterilization used in the laboratory. (35 marks)
- 4.5. Briefly describe the indirect tests for check the sterility in the laboratory by giving examples. (15 marks)

Question 05 (100 marks)

- 5.1. Classify the culture methods based on ingredients and give example for each type. (15 marks)
- 5.2. Describe the difference and the uses of antibiotic sensitivity test (ABST) and E test. (30 marks)
- 5.3. What is the importance of staining in microbiology? (15 marks)
- 5.4. Describe the principles of Ziehl neelsen acid fast stain. (30 marks)
- 5.5. What are the methods of smear fixation? (10 marks)

Question 06 (100 marks)

- 6.1. Explain how the Trp and Lac operons are arranged and how genes are controlled in bacteria. (30 marks)
- 6.2. Explain the difference between transformation, transduction, and conjugation of bacterial DNA. (45 marks)
- 6.3. Describe the golden era of Microbiology and scientific discoveries during this era. (25 marks)



Faculty of Health Sciences
Bachelor of Science Honours in Biomedical Sciences/
Bachelor of Science Honours in Industrial Pharmaceutical Science
BMS 2123/ IPS 2123 – Biochemistry I
2nd year 1st semester – Batch 02
End Semester SEQ Online Examination

INDEX NUMBER:

Date : 10th August 2021
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 answers in lined papers** legibly in black or blue ink.
- You **MUST** write your **index number in the top right corner** of each answer script.
- **Answer script should be numbered** (right bottom) clearly.
- Photograph of your answer scripts must be taken by keeping them on a clear platform (e.g. table).
- Arrange the photographs of your answer script in a word document in an orderly manner, then convert the word document to a PDF.
- **Label the PDF: Your Index No-Biochemistry II.**
- **Upload the labelled PDF to LMS AND also email** the PDF to Fohs.exams@cinec.edu

Question 01**(100 marks)**

- 1.1 Discuss the role of phospholipase C (PLC) in Angiotensin II mediated vasoconstriction. (30 marks)
- 1.2 Explain how glycogen metabolism is regulated by glucagon signaling pathway. (35 marks)
- 1.3 IGF-1 receptor belongs to tyrosine kinase family. Illustrate the activation of IGF-1 receptor upon binding of IGF-1. (35 marks)

Question 02**(100 marks)**

- 2.1 The sodium/calcium exchanger transports sodium into and calcium out of cardiac muscle cells. Describe why this transporter is classified as secondary active transport. (25 marks)
- 2.2 Explain the role of sodium driven transporters in regulating cytosolic pH. (45 marks)
- 2.3 Proton motive force of mitochondria is generated through an electrochemical gradient. Explain this concept. (30 marks)

Question 03**(100 marks)**

- 3.1 Describe the digestion and absorption of dietary lipids. (40 marks)
- 3.2 Justify the metabolic consequences with intake of high carbohydrate diet when your body is in an excess energy state. (30 marks)
- 3.3 Classify membrane lipids. Draw line structures and give an example for each. (20 marks)
- 3.4 What are omega-3 fats? (10 marks)

Question 04**(100 marks)**

- 4.1 The ketogenic diet is a high-fat, moderate-to-low protein, low carbohydrate diet. It is intended to mimic the metabolic response to fasting and shift the body towards metabolizing lipids rather than glucose. Explain this biochemical concept. (40 marks)
- 4.2 Relate the role of Carnitine acyl transferase- I in lipid metabolism. (40 marks)
- 4.3 Justify how lovastatin regulates the cholesterol synthesis. (20 marks)

Question 05

(100 marks)

- 5.1 Discuss the fate of glucose-6-phosphate released by glycogenolysis. (35 marks)
- 5.2 Explain the role of pentose phosphate pathway in controlling oxidative stress. (40 marks)
- 5.3 Explain the significance of glucose-alanine cycle during starvation. (25 marks)

Question 06

(100 marks)

- 6.1 Explain glycolytic NADH produced in liver cell cytosol is usage in mitochondrial electron transport chain. (30 marks)
- 6.2 Discuss the energetics of glucose oxidation in skeletal muscle cell via glycerol-3-phosphate shuttle. (40 marks)
- 6.3 Explain the role of ubiquinone in electron transport chain. (30 marks)