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**Faculty of Health Sciences**  
**Higher Diploma in Biomedical Sciences**  
**Instrumentation (HD 1253)**  
**Batch 02**  
**1<sup>st</sup> year 2<sup>nd</sup> Semester**  
**End Semester SEQ Examination**

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**Date: 10<sup>th</sup> November 2023**  
**Time: From 9.00 am to 12.00 pm**

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**INSTRUCTIONS TO CANDIDATES**

- This question paper consists of **SIX** questions.
  - Answer **all** questions.
  - You should write legibly in black or blue ink.
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- Question 01** (100 marks)
- 1.1. What does it mean by “Good Laboratory Practice (GLP)”? (10 marks)
- 1.2. Mention the two objectives of Good Laboratory Practice. (15 marks)
- 1.3. List the three instruments that are commonly used in the Microbiology laboratory. (15 marks)
- 1.4. Describe the basic steps of cleaning glassware. (30 marks)
- 1.5. List four (04) volumetric glassware which are used for heating liquids. (30 marks)

- Question 02** (100 marks)
- Write short notes for the following instruments.
- 2.1. Autoclave machine (25 marks)
- 2.2. Incubator (25 marks)
- 2.3. Compound light microscope (25 marks)
- 2.4. Water bath (25 marks)

**Question 03****(100 marks)**

- 3.1. What are the instruments seen in the molecular biology laboratory? (20 marks)
- 3.2. List the main components of a light microscope. (20 marks)
- 3.3. Briefly describe the applications of the spectrophotometer in laboratory settings. (20 marks)
- 3.4. Describe the automated instruments and their application in the pathology laboratory. (40 marks)

**Question 04****(100 marks)**

- 4.1 State five principles of Good Microbiological practices. (15 marks)
- 4.2 Differentiate the Class I biological safety cabinet and Class II biological safety cabinet. (15 marks)
- 4.3 Briefly describe the common disinfecting methods used in microbiology laboratory. (30 marks)
- 4.4 State the instruments used in immunology laboratory and their applications. (40 marks)

**Question 05****(100 marks)**

- 5.1 Define the term of "precision". (30 marks)
- 5.2 List the instruments and glassware used in advanced chemistry laboratory. (30 marks)
- 5.3 Mention the applications of ELISA instrument. (40 marks)

**Question 06****(100 marks)**

- 6.1 What are the Good Laboratory Practices used in chemistry laboratory? (15 marks)
- 6.2 What is the use of pH meter? (15 marks)
- 6.3 List the types of centrifuge machine used in all the laboratories. (30 marks)
- 6.4 Describe the common chromatography techniques and their application. (40 marks)



Faculty of Health Sciences  
Higher Diploma in Biomedical Sciences

HD 1243 – Fundamentals of Genetics

Batch – 02

1<sup>st</sup> Year 2<sup>nd</sup> Semester

End semester SEQ Examination

Date : 09<sup>th</sup> of November 2023  
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)

1.1. State the chromosomal aberrations present in the following conditions. (15 marks)

- 1.1.1. Down's Syndrome
- 1.1.2. Cri-du Chat Syndrome
- 1.1.3. Myeloid leukemia

1.2. Compare and contrast between metacentric and submetacentric chromosomes. (30 marks)

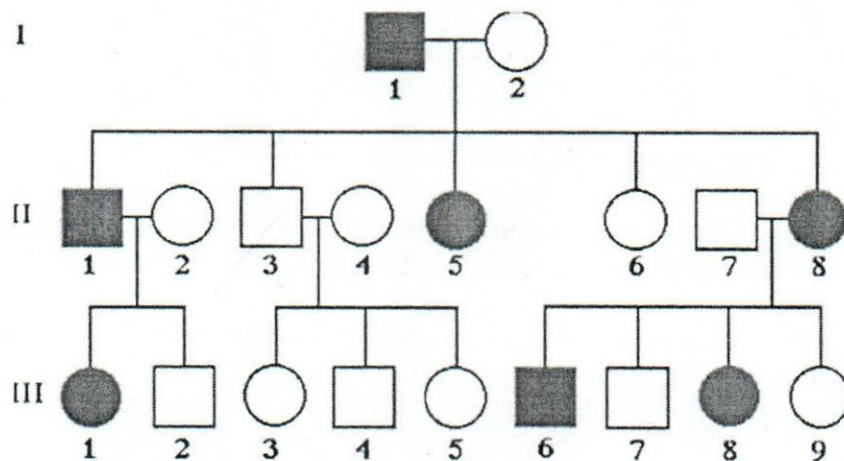
1.3. Discuss the importance of using *Drosophila melanogaster* for genetic studies. (25 marks)

1.4. Write a short note on applications of genetics. (30 marks)

**QUESTION 02**

(100 marks)

2.1. Answer the following questions referring to the given pedigree chart.



2.1.1. Identify the pedigree type by providing reasons. (35 marks)

2.1.2. Mention the genotypes of the affected individuals. (25 marks)

2.1.3. State two diseases having the above inheritance pattern. (10 marks)

2.1.3. Discuss the probability of the 5<sup>th</sup> and 6<sup>th</sup> individuals of generation III having a child with the trait. (30 marks)

**QUESTION 03** (100 marks)

- 3.1. List two invasive and non-invasive pre-natal diagnostic tests. (20 marks)
- 3.2. Describe the importance of pre-natal testing. (30 marks)
- 3.3. State two types of Genetic counseling. (10 marks)
- 3.4. Briefly state the code of ethics in genetic counseling. (15 marks)
- 3.5. Write a short note on the importance of genetic counseling. (25 marks)

**QUESTION 04** (100 marks)

- 4.1. What is CYP enzyme system ? (10 marks)
- 4.2. Warfarin metabolism vary from person to person and can change the therapeutic efficacy drug. Describe your answer taking CYP2C9 and warfarin as examples. (30 marks)
- 4.3. Briefly describe ADRB1 genetic variation. (20 marks)
- 4.4. Describe how pharmacogenetic testing is helpful in practicing personalized medicine. (40 marks)

**QUESTION 05** (100 marks)

In humans, the alleles responsible for the blood type are designated as  $I^A$  (A-type blood),  $I^B$  (B-type blood) and  $i$  (O type blood).

- 5.1. What are the expected frequencies of phenotypes in the following matings?

A%    B%    O%    AB%

- 5.1.1.  $I^A I^A \times I^B i$  (20 marks)
- 5.1.2.  $I^A I^B \times I^A i$  (20 marks)
- 5.1.3.  $ii \times I^A i$  (20 marks)
- 5.2. Briefly describe three genetic inheritance patterns. (40 marks)

**QUESTION 06** (100 marks)

- 6.1. Describe the Hardy-Weinberg law and its assumptions. (40 marks)

6.2. Cystic fibrosis is a recessive condition that affects about 1 in 2,500 babies in the Caucasian population of the United States. Calculate the following.

- 6.2.1. The frequency of the recessive allele in the population. (20 marks)
- 6.2.2. The frequency of the dominant allele in the population. (20 marks)
- 6.2.3. The percentage of heterozygous individuals (carriers) in the population. (20 marks)

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**Faculty of Health Sciences**  
**Higher Diploma in Biomedical Sciences**  
**HD1223 Physiology**  
**Batch – 02**  
**1<sup>st</sup> Year 2<sup>nd</sup> Semester**  
**End semester MCQ Examination**

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Date : 07<sup>th</sup> November 2023  
Time : 11.00 am – 12.00 pm (One hour)

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**INSTRUCTIONS TO CANDIDATES**

- This question paper consists of **TWENTY MCQ** questions
- Answer **ALL** questions
- **Each question consists of five statements** and you need to select and mark either **True (T)** or **False (F)** in each statement.

Ex:

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

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

Mark true or false regarding the statements in following questions.

1. **True or false regarding cardiac functions?**
  1. AV node generates electrical impulses
  2. Electrical impulse transports from AV node to SA node
  3. Bundle of his transports impulse to the perkinje system
  4. Perkinje system transports impulse to cardiac muscle
  5. Radial arteries supply the blood to heart muscle
2. **Regarding the function of the brain,**
  1. Cerebellum is responsible for thinking
  2. Cerebrum helps to keep the equilibrium
  3. Hypothalamus balances the body temperature
  4. Corpus callosum controls the breathing
  5. Midbrain involves in reasoning

**3. True or false regarding respiratory organs?**

1. Nasal cavity humidifies the inhaled air
2. Larynx involves in voice production
3. Lungs are involving in excretion function
4. Alveoli are involving in internal respiration
5. Bronchi make a passage way for air

**4. Regarding endocrine system,**

1. Posterior pituitary secretes growth hormone
2. Anterior pituitary secretes prolactin
3. TRH secreted by the hypothalamus
4. Thyroid gland secretes TSH
5. Insulin is secreted by pancreas

**5. True or false regarding functions of skeletal muscles?**

1. Skeletal muscles are under in-voluntary control
2. Actin and myosin are involve in muscle contractions
3.  $\text{Ca}^+$  ions are involved in muscle contraction
4. Skeletal muscles in involve in body movements
5. Acetylcholine releases by the skeletal muscles when relaxation

**6. Regarding female reproductive system,**

1. Fertilization of ovum occurs inside the fallopian tubes
2. Cervix transport the ovum to uterus
3. Vagina stretches in child birth
4. Ovaries secretes HCG hormone
5. Fimbriae catches the ovum which expelled by the ovaries

**7. True or false regarding respiration?**

1. Expiration is an active process
2. Diaphragm moves upward when inspiration
3. Inspiratory muscles relax at the end of inspiration
4. Size of chest cavity decreases when inspiration
5. Inspiration needs energy

**8. True or false regarding nervous system?**

1. Motor nerves convey signals to effector cells
2. Autonomic nervous system relaxes the body after an emergency
3. Neurons transmit impulses
4. Sensory nerves conduct signals from sensory receptors to brain
5. Parasympathetic nervous system prepares the body for an emergency

**9. True or false regarding GI system?**

1. Tongue is involving in mechanical digestion
2. Stomach is involving in chemical digestion
3. Liver emulsifies the lipids in small intestine
4. Gallbladder produces bile
5. Pancreas secretes enzymes to duodenum

**10. Regarding urinary system,**

1. Kidneys are involved in removal of nitrogenous waste
2. Renal cortex protects the kidney from injuries
3. Urinary bladder stores the urine until it passes
4. Reabsorption starts from the bowman's capsule
5. Glucose presents in glomerular filtrate

**11. True or false regarding peristalsis?**

1. It is a voluntary movements in GI system
2. Smooth muscle cells are involving in peristalsis
3. Peristalsis can be seen only in esophagus
4. By the peristalsis, the food bolus passes to stomach
5. Contraction and relaxation smooth muscles occur in peristalsis

**12. Regarding female sex hormones,**

1. Estrogen is secreted by the uterus
2. Mainly secreted estrogens is estradiol
3. Estrogen regulates the growth & development of bones
4. Estrogen influences on fat deposition on breasts
5. Estrogen helps to maintain body fluid balance

**13. Regarding the functions of smooth muscles,**

1. Smooth muscles are under conscious control
2. Smooth muscles are covering the hollow organs
3. These regulate diameter of blood vessels
4. These have the ability to initiate their own contractions
5. Action is regulated by sympathetic nervous system

**14. Regarding lung volumes and capacities,**

1. Tidal volume is 800 ml
2. Dead spaces involve in gas exchange
3. Residual Volume of a male is 1200ml
4. Expiratory Reserve Volume of a male is 1200ml
5. Inspiratory Reserve Volume of a male is 3100ml

**15. True or false regarding functions of male reproductive system?**

1. Epididymis stores sperm cells
2. Vas deferens transports matured sperms to epididymis
3. Bulbourethral glands neutralize the acidity in urethra
4. Seminal vesicles produce semen
5. Prostate gland nourishes the sperms

**16. True or false regarding the blood pressure?**

1. Sphygmomanometer is used to measure the blood pressure
2. Heart muscles are relaxed when the systole
3. Diastolic blood pressure is the highest arterial blood pressure
4. Systolic blood pressure occurs when the ventricles are at rest
5. Diastolic blood pressure is about 120mmHg in healthy adults

**17. True or false regarding sensory tests?**

1. Snellen chart is using to test color blindness
2. Sour taste can be identified by the lateral borders of tongue
3. Holmgren's test is performing as a visual acuity test
4. The frequency of the tuning fork that use for rinne test is 512Hz
5. Distance between the snellen chart and the patient is 6m

**18. Regarding the functions of the skeletal system,**

1. Provide attachment sites for the skeletal muscles
2. Produces red blood cells
3. Involves in mineral homeostasis
4. Stores proteins
5. On demand bones release minerals to blood

**19. True or false regarding the reflexes?**

1. Patella reflex is a skin reflex
2. Plantar flexion is the response of Achilles tendon reflex
3. Cremaster reflex indicate the lifting the scrotum
4. Triceps-reflex is a tendon reflex
5. As a response to triceps-reflex, elbow joint extends

**20. Which of the following is correct regarding hormones?**

1. Adrenaline is secreted by adrenal cortex
2. Cortisol is secreted by adrenal medulla
3. Type 02 diabetes mellitus caused by insulin resistance
4. Releasing T3 and T4 is stimulated by TSH
5. Testosterone synthesized in testes



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Faculty of Health Sciences  
Higher Diploma in Biomedical Science  
HD 1213  
Anatomy  
1<sup>st</sup> year 2<sup>nd</sup> Semester  
End Semester SEQ Examination  
2<sup>nd</sup> Batch

Date : 6<sup>th</sup> November 2023  
Time : 9.00 a.m. – 11.00 a.m. (Two hours)

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**INSTRUCTIONS TO CANDIDATES**

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

- Question 1** (100 marks)
- 1.1 Write three (03) differences between artery and vein. (15 marks)
- 1.2 Write a short note on heart valves. (25 marks)
- 1.3 Describe respiratory epithelium (30 marks)
- 1.4 Describe differences between right and left bronchi. (30 marks)
- Question 2** (100 marks)
- 2.1 Describe anatomy of human stomach. (35 marks)
- 2.2 Describe the difference between exocrine and endocrine pancreas. (35 marks)
- 2.3 Describe structure of human teeth. (30 marks)
- Question 3** (100 marks)
- 3.1 Draw a label diagram of a nephron. (25 marks)
- 3.2 Write the differences between male and female urethra. (25 marks)
- 3.3 Write the differences between cortical and juxta medullary nephron. (25 marks)
- 3.4 Compared three muscle types in human body. (25 marks)
- Question 4** (100 marks)
- 4.1 Draw a labeled diagram for the microscopic view of cortex of human ovary. (25 marks)
- 4.2 Write a short note on neuron structure (25 marks)
- 4.3 Names all bones in upper limbs. (20 marks)
- 4.4 Define following terms.
- 4.4.1 True Ribs (10 marks)
- 4.4.2 False Ribs (10 marks)
- 4.4.3 Floating Ribs (10 marks)

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Faculty of Management and Social Sciences  
Department of Logistics & Transport  
BSc in International Transportation Management and Logistics  
Course CODE: COM550



Year 4 Semester I

REPEAT EXAMINATION

Foreign Trade Insurance – FTIN0335

- This paper consists of EIGHT questions on THREE (03) pages.
- Answer FIVE Questions including Question 01.
- Only non-programmable calculators are allowed.
- You may use appropriate graphs, diagrams, equation/s to prove or justify the answers.
- If you have any doubt as to the interpretation of the wording of a question, make your own decision, but clearly state it on the script.
- Write Legibly.

Date: 2023.11.06

Pass mark: 50%

Time: 03 Hours

### Question 01 (Compulsory)

- (a) Explain what is meant by, 'Underwriting', in insurance? (05 Marks)
- (b) Explain five (5) factors that an insurer will take into consideration when underwriting cargo risks. (10 Marks)
- (c) Discuss why "packaging", is an important factor (05 Marks)

**Question 02**

(a) Explain the purpose of INCO terms and their relevance to insurance policies that cover multi-modal transport . (08 Marks)

(b) Explain the following INCO terms and state the party responsible to arrange insurance cover: ( 03 Marks each)

\* EXW

\* CIF

\* FOB

\* FCA

**Question 03**

Explain susceptibility of following cargo to loss or damage during sea voyage and suggest ways to mitigate them; - (04 Marks each)

(a) Vehicle spare parts

(b) Tea

(c) Fresh fruits

(d) Coal

(e) News print

**Question 04**

Explain briefly, related to cargo insurance :- (04 Marks each)

(a) Particular Average Loss

(b) Salvage Charges

(c) Bill of Lading

(d) Constructive Total Loss

(e) Open Policy

**Question 05**

- (a) Discuss the scope of cover under the Products Liability Insurance (10 Marks)
- (b) Explain the Commercial and Non- Commercial risks covered under Export Credit Insurance. (10 Marks)

**Question 06**

Containerization is a system of standardized transportation that uses a common sized steel container to transport goods.

- (a) Explain the advantages in using containers in transportation of goods from one country to another. (08 Marks)
- (b) Identify the hazards involved in containerized transits and discuss the insurance covers available to cover containerized cargo (12 Marks)

**Question 07**

- (a) Explain why insurance policies have exclusions (08 Marks)
- (b) Describe the common Exclusion Clauses appearing in modern cargo insurance policies (12 Marks)

**Question 08**

- (a) Describe eight (8) perils which may cause losses / damages to cargo during a sea voyage. (08 Marks)
- (c) Give examples of five dangerous cargoes (05 Marks)
- (c) Discuss the effect of natural phenomena on global trade? (07 Marks)

-----END OF THE QUESTION PAPER-----

EXAMINATION

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**Faculty of Health Sciences**  
**Higher Diploma in Biomedical Science**

**HD 1213**

**Anatomy**

**1<sup>st</sup> year 2<sup>nd</sup> Semester**

**End Semester MCQ Examination**

**2<sup>nd</sup> Batch**

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Date : 6<sup>th</sup> November 2023  
Time : 11.00 a.m. – 12.00 p.m. (One Hour)

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**INSTRUCTIONS TO CANDIDATES**

- This question paper consists of **Twenty** questions.
- Answer **ALL** questions.
- **Each question, consists of Five statements** and you need to select and mark either **True (T)** or **False (F)** in each statement.

Ex:

- |              |              |              |              |              |
|--------------|--------------|--------------|--------------|--------------|
| <del>T</del> | T            | <del>T</del> | <del>T</del> | T            |
| F            | <del>F</del> | F            | F            | <del>F</del> |

- You should write legibly in black or blue ink.

**1. Regarding heart,**

1. It is located in the middle mediastinum.
2. Endocardium is the thickest layer of the heart.
3. Heart lies in the mediastinum.
4. Bicuspid valve is located between right atrium and right ventricle.
5. Myocardium consists cardiac muscle.

**2. Regarding lung,**

1. Right lung is smaller than the left lung.
2. Left lung contains two fissures.
3. Base is semilunar in shape.
4. Alveoli contains pneumocytes.
5. Medial surface contains hilum.

3. **Regarding human small intestine,**
  1. Jejunum is the distal part of the small intestine.
  2. Ileocecal valve controls the flow of materials from caecum to ileum.
  3. Lacteals absorb fat.
  4. Goblet cells are dispersed between the enterocytes.
  5. Duodenum curves around the head of the spleen.
  
4. **Regarding the liver,**
  1. Greater part presents in right hypochondriac region.
  2. It has four lobes.
  3. Liver lobules are hexagonal in shape.
  4. Hepatic duct directly joins with pancreatic duct.
  5. Liver lobules contain central vein.
  
5. **True or false?**
  1. Kidneys are intraperitoneal organs.
  2. Kidneys lateral to T12- L3vertebrae.
  3. Renal medulla contains pyramids.
  4. Apex of pyramids open directly to the renal pelvis.
  5. Loop of Henle present in renal cortex
  
6. **Regarding the stomach,**
  1. Its' wall contains an oblique muscle layer.
  2. It contains greater and lesser curvatures.
  3. Its' proximal end contains pyloric sphincter.
  4. It is "J" shaped.
  5. Ruge are flattened in empty stomach.
  
7. **The thyroid gland,**
  1. covers by a fibrous capsule.
  2. consists thyroid follicles as their functional units.
  3. is a less vascular organ.
  4. sometimes contains pyramidal lobe.
  5. has butterfly shape.
  
8. **Regarding skeletal muscles,**
  1. Individual muscle fibers are surrounded by endomysium.
  2. Myosin filaments are thick filaments.
  3. Actin filaments are thin filaments.
  4. Sarcomere extend from one M line to the next.
  5. Sarcoplasmic reticulum store calcium.
  
9. **True or false?**
  1. Humerus is a long bone.
  2. There are four carpal bones.
  3. There are thirty bones in each upper limb.
  4. The size of the axilla region varies with arm movements.
  5. There are seven metatarsal bones.

- 10. Regarding the human uterus,**
  1. It is a pear-shaped organ.
  2. It lies in the pelvic cavity.
  3. Myometrium is the thickest layer.
  4. Fundus is below to the openings of the uterine tubes.
  5. Endometrium consists columnar epithelium.
  
- 11. Regarding the meninges,**
  1. The dura and arachnoid maters are separated by a subdural space.
  2. Dura matter adheres to the brain.
  3. The superior sagittal sinus is formed by the falx cerebri.
  4. Dura matter is the outer most one.
  5. Subarachnoid space contains cerebrospinal fluid.
  
- 12. Regarding male reproductive system,**
  1. Left testis is slightly lower than the right testis.
  2. Each testis consists seminiferous tubules.
  3. Spermatic cord contains vas deferens.
  4. Epididymis contain primary spermatocytes.
  5. Cowper glands are largest accessory glands.
  
- 13. Regarding human ovaries,**
  1. The ovaries are female gonads.
  2. The ovaries are inactive before puberty.
  3. Ovaries have cortex and medulla.
  4. Graafian follicle stage is the mature stage.
  5. Cortex contains ovarian follicles.
  
- 14. True or false regarding urinary system?**
  1. Ureters line with columnar epithelium.
  2. Ureters open to the anterio wall of the urinary bladder.
  3. Empty urinary bladder consists rugae.
  4. Trigone is a smooth folded area in the urinary bladder.
  5. Urinary bladder contains three orifices.
  
- 15. Regarding human brain,**
  1. Cerebrum is the largest part.
  2. Each hemisphere contains three main lobes.
  3. It lies within the cranial cavity.
  4. Venous blood drains into the dural venous sinuses.
  5. The surface contains folds.
  
- 16. True or false nervous system?**
  1. Ganglions are collection of neuron cell bodies.
  2. Thalamus is a part of brain stem.
  3. Gyri are fold in cerebral cortex.
  4. There are 11 pairs of cranial nerves.
  5. A bundle of axons is known as tracts.

- 17. True or false regarding large intestine?**
1. Its' end part is the caecum.
  2. Caecum has a blind end.
  3. Sigmoid colon is in the abdominal cavity.
  4. Descending colon lies in left side of the abdominal cavity.
  5. It terminates at the rectum.
- 18. True or false regarding endocrine organ?**
1. There are four pairs of parathyroid glands.
  2. Thymus grows to its largest size during puberty.
  3. Thymus contains Hassals' corpuscles.
  4. Pancreas is a pure endocrine organ.
  5. Pancreatic islets only contain beta cells.
- 19. The trachea,**
1. contains hyaline cartilages.
  2. lies posterior to the oesophagus.
  3. lies posterior to the thyroid gland.
  4. consists of stratified ciliated columnar epithelium.
  5. anterior part, covered by Trachealis.
- 20. Regarding muscle,**
1. Cardiac muscles found only in the heart wall.
  2. Smooth muscles are striated muscles.
  3. Skeletal muscles are multinucleated.
  4. Smooth muscles are involuntary muscles.
  5. Muscle fiber contains number of muscle cells.



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**Faculty of Health Sciences**  
**Higher Diploma in Biomedical Science**

**HD 1213**

**Anatomy**

**1<sup>st</sup> year 2<sup>nd</sup> Semester**

**End Semester MCQ Examination**

**2<sup>nd</sup> Batch**

Date : 6<sup>th</sup> November 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.
- **All questions, consist of Five statements** and you need to select and mark either **True (T)** or **False (F)** in each statement.

Ex:

<del>T</del>	T	<del>T</del>	<del>T</del>	T
F	<del>F</del>	F	F	<del>F</del>

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

1.

T	T	T	T	T
F	F	F	F	F

2.

T	T	T	T	T
F	F	F	F	F

3.

T	T	T	T	T
F	F	F	F	F

4.

T	T	T	T	T
F	F	F	F	F

5.

T	T	T	T	T
F	F	F	F	F

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.

<b>T</b>	<b>T</b>	<b>T</b>	<b>T</b>	<b>T</b>
<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>

20.

<b>T</b>	<b>T</b>	<b>T</b>	<b>T</b>	<b>T</b>
<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>



**Faculty of Health Sciences**  
**Higher Diploma in Biomedical Sciences**  
**HD1223 Physiology**  
**Batch – 02**  
**1<sup>st</sup> Year 2<sup>nd</sup> Semester**  
**End Semester SEQ Examination**



**INDEX NUMBER:** .....

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**Date** : 07<sup>th</sup> of November 2023  
**Time** : 9.00 am – 11.00 am (Two Hours)

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**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 'tidal volume' of the lung (10 marks)
- 1.2 Outline the functions of pharynx (15marks)
- 1.3 Describe the process of breathing (25 marks)
- 1.4 Briefly describe the electrical conduction of the heart (25 marks)
- 1.5 Outline **05 functions** of the blood (25 marks)

**Question 02** (100 marks)

- 2.1 List the hormones which are secreted by the anterior pituitary gland (10 marks)
- 2.2 Briefly describe the negative feedback mechanism of thyroxine hormone secretion (30 marks)
- 2.3 List the functions of testosterone hormone (10 marks)
- 2.4 List the **functions** of following structures of the male reproductive system
- 2.4.1 Vas deference (10 marks)
- 2.4.2 Prostate gland (10 marks)
- 2.5 Describe the ovarian cycle in females (30 marks)

**Question 03** (100 marks)

- 3.1 Define peristalsis (10 marks)
- 3.2 Write short notes on followings,
- 3.2.1 Mechanical digestion in oral cavity (30 marks)
- 3.2.2 Functions of small intestine (30 marks)
- 3.3 List **four** functions of the skeletal system (10 marks)
- 3.4 Outline the steps of a skeletal muscle contraction (20 marks)

**Question 04** (100 marks)

- 4.1 List 05 functions of cerebrum (20 marks)
- 4.2 State the importance of blood brain barrier (20 marks)
- 4.3 List 02 ions reabsorb in the proximal convoluted tubule (10 marks)
- 4.4 List 05 components glomerular filtrate (20 marks)
- 4.5 Describe the process of urine formation (30 marks)



**Faculty of Health Sciences**  
**Higher Diploma in Biomedical Sciences**  
**HD 1233 – Biochemistry**  
 Batch – 02  
 1<sup>st</sup> Year 2<sup>nd</sup> Semester  
 End semester SEQ Examination




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**Date** : 08<sup>th</sup> of November 2023  
**Time** : 9.00 am. – 12.00 pm (Three Hours)

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**INSTRUCTIONS TO CANDIDATES**

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

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

- 1.1. Define Ionophores. (10 marks)
- 1.2. Compare and contrast between the types of ATP driven pumps. (30 marks)
- 1.3. Write a short note on secondary active transport systems. (30 marks)
- 1.4. Draw a flow chart to denote the signal transduction pathway of steroids. (30 marks)

**QUESTION 02** **(100 marks)**

- 2.1. State the enzymes involved in glycogenesis. (10 marks)
- 2.2. Differentiate between glycogenesis and glycogenolysis. (30 marks)
- 2.3. Write a short note on the importance of gluconeogenesis. (30 marks)
- 2.4. Discuss the metabolic fates of glucose-6-phosphate. (30 marks)

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

- 3.1. State three glucogenic amino acids. (25 marks)
- 3.2. Denote the sequence of reactions involved in glucose alanine cycle. (25 marks)
- 3.3. Describe the regulation of urea cycle. (25 marks)
- 3.4. Write a short note on metabolic defects associated with protein metabolism. (25 marks)

**QUESTION 04****(100 marks)**

4.1. A researcher carried out an experiment to detect the effect on enzyme A and obtained the results as follows.

Substrate Concentration ( $S_0$ ) (mM)	Enzyme Activity ( $V_0$ ) $\mu\text{mol}/\text{min}$
2	0.25
3	0.33
4	0.37
5	0.45
6	0.49

- 4.1.1. Calculate ( $1/S_0$ ) substrate concentration and ( $1/V_0$ ) enzyme Activity values. (10 marks)  
 4.1.2. Plot the Lineweaver-Burk plot for the above data. (20 marks)  
 4.1.3. Calculate  $K_m$  and  $V_{max}$  for the enzyme A. (20 marks)

- 4.2. Differentiate competitive and uncompetitive enzyme inhibitions using Lineweaver burk plots. (25 marks)  
 4.3. Discuss the importance of enzyme regulation providing examples. (25 marks)

**QUESTION 05****(100 marks)**

- 5.1 List three lipolytic hormone. (15 marks)  
 5.2 What causes fatty acid oxidation? (20 marks)  
 5.3 Describe beta oxidation. (35 marks)  
 5.4 Describe the role of liver in maintaining a blood glucose level during fed, fasting and starvation stages. (30 marks)

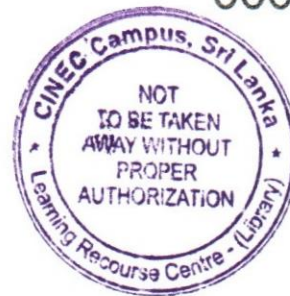
**QUESTION 06****(100 marks)**

- 6.1 Describe main characteristic features of DNA double helix. (40 marks)  
 6.2 If Guanine presents in 20% in a particular double stranded DNA molecule , what are the percentages of Adenine, Thymine and Cytosine? (20 marks)  
 6.3 Explain how following factors affect on melting temperature of DNA.  
     6.3.1 Base composition (20 marks)  
     6.3.2 Length of the chain (20 marks)



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**Faculty of Health Sciences**  
**HIGHER DIPLOMA IN BIOMEDICAL SCIENCES**  
**HD 1133 FOUNDATION OF CHEMISTRY**

**HIGHER DIPLOMA SEMESTER-END SEMESTER SEQ EXAMINATION**

Date: 25<sup>th</sup> of May 2023

Time: 09.00 am – 12.00 pm - Three Hours

**INSTRUCTIONS TO CANDIDATES Page**

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

**Question 01**

**(100 marks)**

1. The rate law for the reaction  $A + B \rightarrow C$  is given by  $\text{rate} = k[A][B]^2$ . The initial concentrations of A and B are both 0.1 M, and the rate constant k is  $0.05 \text{ mol}^{-2} \text{ dm}^6 \text{ s}^{-1}$ .
- 1.1 Calculate the initial rate of the reaction. (20 marks)
- 1.2 Apart from the concentration, name two other factors that affect the rate of the reaction. Explain how each factor changes the rate of the reaction. (25 marks)
- 1.3 What is the meaning of half-life in a chemical reaction? (10 marks)
- 1.4 Find the half-life of A and B. (25 marks)
- 1.5 Find the concentration of A after 10 seconds. (20 marks)

**Question 02**

**(100 marks)**

- 2.1 Draw the Lewis structures of following molecules. (40 marks)
- 2.1.1  $\text{N}_2\text{O}_5$
- 2.1.2  $\text{H}_2\text{O}_2$
- 2.1.3  $\text{PCl}_5$
- 2.1.4  $\text{SF}_6$
- 2.2 Figure out the shape and the geometry of the following molecules. (40 marks)
- 2.2.1  $\text{NH}_3$

2.2.2 XeF<sub>5</sub>2.2.3 CCl<sub>4</sub>2.2.4 SF<sub>6</sub>2.3 Explain why H<sub>2</sub>O has different bond angle comparing with NH<sub>3</sub>.

(20 marks)

**Question 03****(100 marks)**

3.1 In an acidic solution, a solution of potassium permanganate (KMnO<sub>4</sub>) is added to a solution containing iron (II) sulfate (FeSO<sub>4</sub>). The reaction between KMnO<sub>4</sub> and FeSO<sub>4</sub> is a redox reaction.

3.1.1 Write the balanced redox equation for this reaction. Identify the oxidizing and reducing agents in the reaction.

(10 marks)

3.1.2 If 35.0 mL of 0.200 M KMnO<sub>4</sub> solution is required to react completely with 25.0 mL of FeSO<sub>4</sub> solution, what is the molarity of the FeSO<sub>4</sub> solution?

(20 marks)

3.1.3 A student performed the reaction between KMnO<sub>4</sub> and FeSO<sub>4</sub> and obtained 7.20 g of Fe<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>. Calculate the theoretical yield of Fe<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub> and the percentage yield of the reaction.

(30 marks)

3.2.

3.2.1 Draw the molecular orbital diagram of O<sub>2</sub>.

(30 marks)

3.2.2 Determine the bond order of O<sub>2</sub> Molecule.

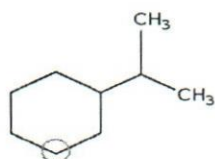
(10 marks)

**Question 04**

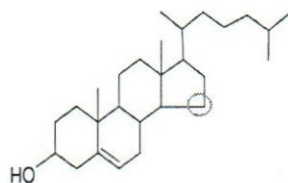
4.1 Write the hybridization of the circled atom in each in each molecule.

(15 marks)

4.1.1



4.1.2



4.1.3



4.2 Draw the structures for the following IUPAC names.

(35 marks)

- i) Propan -2-ol
- ii) 1,3- hexanediol
- iii) 2- butylcyclohexanol
- iv) 2-butanone
- v) 2,4,6-tribromophenol
- vi) 2-butylethanoate

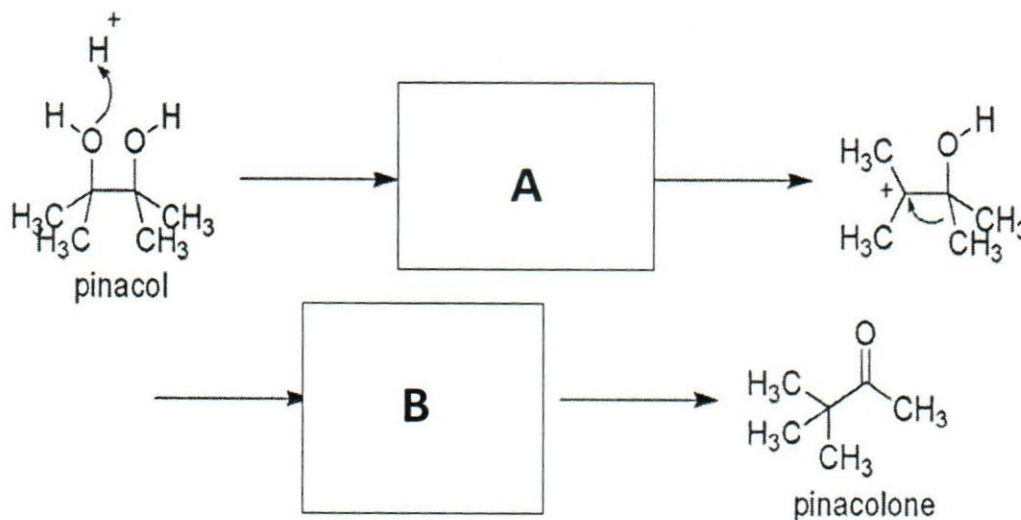
4.3 Arrange the following molecules based on increasing solubilities and briefly explain the reasons for your choice.

(30 marks)

Hexane, Methylamine, Butanal

4.4 Complete the products, A and B according to the arrow pushing mechanism.

(20 marks)



## Question 05

(100 marks)

5.1 Find the oxidation number for the metals in the following compounds.

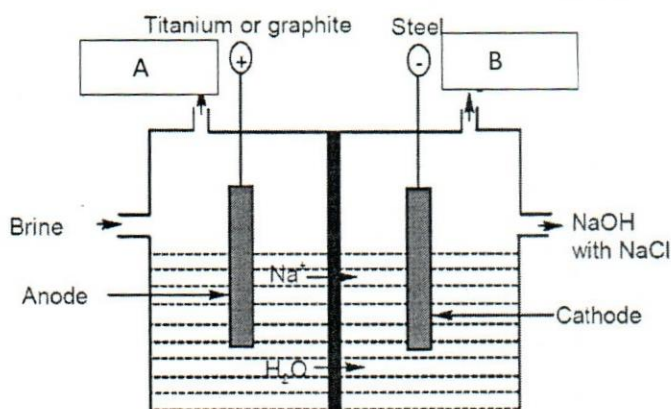
(25 marks)

- 1)  $\text{MnO}_4^{2-}$
- 2)  $\text{Cr}_2\text{O}_7^{2-}$
- 3) BaO
- 4)  $\text{CrO}_3$
- 5)  $\text{TiCl}_4$

- 5.2 Write the balance reactions of Na, K and Ca with water. (15 marks)
- 5.3 Explain why 3<sup>rd</sup> ionization energy is large compare to the 1<sup>st</sup> and 2<sup>nd</sup> ionization energy of Calcium (Ca) (15 marks)
- 5.4 Briefly explain the increase in size of the atoms down the group and state how the density change (15 marks)
- 5.5 Given that melting point of Ca is larger than the melting point of Ba .Explain the reason for the difference in melting points. (10 marks)
- 5.6 Metal (Y) shows common oxidation states such as +2 and +7. When reacts with Oxalic acid it forms gas which can react with lime water to produce milky appearance. Metal Y forms oxoanion which is purple in colour.
- 5.6.1 Find the metal Y and write the compounds which is responsible to +2 and +7 oxidation state. (10 marks)
- 5.6.2 Write the balance reaction for gas with lime water to produce milky appearance. (10 marks)

**Question 06****(100 marks)**

- 6.1 The following questions are based on the diaphragm cell method.



- 6.1.1 Mention the gases (A and B) which release in anodic and cathodic compartments (10 marks)
- 6.1.2 Write balanced reactions of anodic and cathodic compartments (15 marks)
- 6.1.3 State the use of having a diaphragm to separate the anode and the cathode compartments. (15 marks)
- 6.1.4 Write one side reaction which can occur in this method. (10 marks)

- 6.2 Describe five requirements to be considered when establishing chemical industries.

(50 marks)