LIBRARY

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Higher Diploma in Biomedical Sciences
HD 1223 Physiology
1st Year 2nd Semester
HD BMS Batch – 03
Special Repeat SEQ Examination

Date: 23rd of April 2026
Time: 09.00 am – 12.00 noon – 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 Identify **two (02)** major functions of cardiovascular system. **(20 Marks)**

1.2 A person has a stroke volume (SV) of 70 mL/beat and a heart rate (HR) of 75 beats per minute. **(30 Marks)**
Calculate the cardiac output (CO) in liters per minute.

1.3 Identify **three (03)** factors that can increase cardiac output. **(20 Marks)**

1.4 Explain the difference between systolic and diastolic blood pressure. **(30 Marks)**

Question 02 **(100 Marks)**

2.1 List **two (02)** hormones which are secreted by thyroid gland. **(20 Marks)**

2.2 State the functions of the hormones stated in question number 2.1 **(20 Marks)**

2.3 Identify **three (03)** functions of testosterone hormone. **(30 Marks)**

2.4 Describe how insulin and glucagon work together to maintain blood glucose levels. **(30 Marks)**

Question 03 **(100 Marks)**

3.1 List **three (03)** main constituents of gastric juice. **(30 Marks)**

3.2 State the functions of following organs/structures **(30 Marks)**
3.2.1 Teeth
3.2.2 Stomach
3.2.3 Small intestine

3.3 Summarize the major roles of the digestive system. **(40 Marks)**

Question 04 **(100 Marks)**

4.1 List **three (03)** phases of urine production. **(30 Marks)**

4.2 Write a short note on "Glomerular filtration rate". **(20 Marks)**

4.3 Identify **two (02)** waste products excreted in urine. **(20 Marks)**

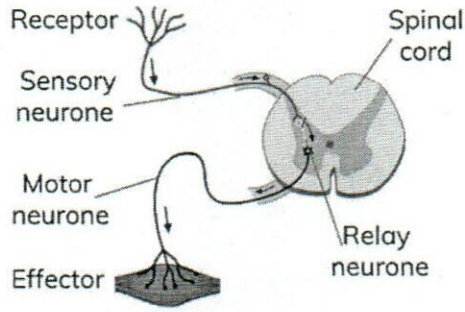
4.4 Explain the relationship between urine volume and water intake. **(30 Marks)**

Question 05 **(100 Marks)**

5.1 Categorize the **two (02)** main divisions of the nervous system. **(20 Marks)**

5.2 Name **three (03)** main parts of a neuron. **(30 Marks)**

5.3 Identify the difference between a sensory neuron and motor neuron using the diagram given. **(20 Marks)**



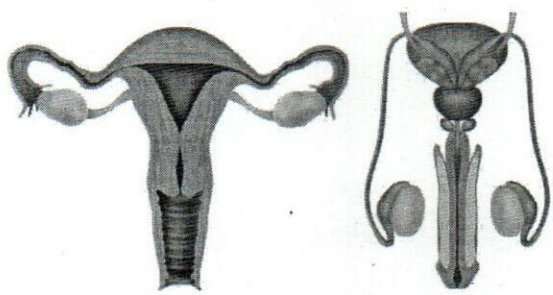
5.4 Apply your knowledge to fill in the blanks given in the table regarding action of autonomic nervous system. **(30 Marks)**

Organ / Function	Sympathetic Effect	Parasympathetic Effect
Heart		
Lungs		
Eyes		

Question 06 **(100 Marks)**

6.1 **(50 Marks)**

6.1.1 Identify **three (03)** internal organs of female reproductive system and male reproductive system in the following diagram.



A-Female reproductive system *B- Male reproductive system*

6.1.2. What functions does the uterus perform in the reproductive process? **(20 Marks)**

6.2 Briefly describe the **two (02)** phases of respiration. **(30 Marks)**

Examination Department
20 JAN 2025
CINEC Campus, Sri Lanka
Library

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Higher Diploma in Biomedical Sciences
HD 1233 – Biochemistry

Batch – 03
1st Year 2nd Semester
End semester SEQ Examination

Date : **20th of January 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.
- You are allowed to use a scientific calculator for the examination.

QUESTION 01 **(100 marks)**

1.1 List five main characteristic features of DNA double helix. (25 marks)

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

1.2 If Cytosine presents in 25% in a particular double stranded DNA molecule, what are the percentages of Adenine, Thymine and Gunanine? (25 marks)

.....
.....
.....
.....
.....
.....

.....
.....

1.3 Write three (03) differences between DNA and RNA structures. (25 marks)

.....
.....
.....
.....
.....
.....
.....
.....

1.4 How does base composition affects on melting temperature of DNA ? (25 marks)

.....
.....
.....
.....
.....
.....
.....
.....

QUESTION 02 **(100 marks)**

2.1 Illustrate the structure of triglyceride made by following fatty acid. (25 marks)

$CH_3(CH_2)_{16}$-COOH

2.2 List four (04) main functions of lipids. (25 marks)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

2.3 Compare simple lipids and compound lipids (25 marks)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

2.4 Calculate the total energy (ATP) yield from the beta oxidation of lauric acid. (25 marks)

QUESTION 03 **(100 marks)**

3.1. State the type of bonds involved in stabilizing the tertiary structure of proteins. (30 marks)

.....
.....
.....
.....
.....
.....

3.2. Draw a flow chart to denote the digestion of proteins. (35 marks)

3.3. Write a short note on β pleated structure of proteins. (35 marks)

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

QUESTION 04 **(100 marks)**

4.1. State three (03) enzymes involved in glycolysis. (15 marks)

.....
.....
.....

4.2. Differentiate between glycogenesis and glycogenolysis. (30 marks)

.....
.....
.....
.....
.....
.....
.....
.....

4.3. Mention five (05) metabolic pathways that are activated during the well fed state. (30 marks)

.....
.....
.....
.....
.....
.....
.....
.....

4.4. Draw a diagram to denote the reactions of citric acid cycle. (25 marks)

QUESTION 05 **(100 marks)**

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

.....
.....
.....
.....

5.2. State 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)**

6.1. Mention three (03) primary active transport systems. (15 marks)

.....
.....
.....
.....
.....
.....

6.2. State five (05) factors which aid to maintain the fluidity of the plasma membrane. (30 marks)

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

6.3. Differentiate between hydrophilic and hydrophobic messengers. (25 marks)

.....
.....
.....
.....
.....
.....
.....
.....

6.4.Mention the main steps involved in the signal transduction pathway of glucagon hormone. (30 marks)

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

libsmy

00002

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Sciences

HD 1223 Physiology

1st Year 2nd Semester

HD BMS Batch – 02

End Semester Special Repeat SEQ Examination

Date: 15th of September 2024
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 List **three** types of muscle tissue in the human body. **(15 Marks)**

.....
.....
.....

1.2 List the **four** major components of conduction system of the heart. **(15 Marks)**

.....
.....
.....
.....

1.3 Briefly describe the phases of action potentials of cardiac muscle. **(30 Marks)**

.....
.....
.....
.....
.....
.....
.....

1.4 State the phases of cardiac cycle. **(40 Marks)**

.....

.....

.....

.....

.....

.....

.....

.....

Question 02 **(100 Marks)**

2.1 List two hormones which are secreted by pancreatic gland. **(15 Marks)**

.....

.....

2.2 State the functions of the hormones stated in question number 2.1 **(15 Marks)**

.....

.....

.....

.....

2.3 List the functions of estrogen hormone. **(30 Marks)**

.....

.....

.....

.....

.....

2.4 State the phases of menstrual cycle. **(40 Marks)**

.....

.....

.....

.....

.....

.....

.....

.....

Question 03 **(100 Marks)**

3.1 List **four** constituents of bile. **(20 Marks)**

.....

.....

.....

.....

3.2 State the functions of following organs **(30 Marks)**

3.2.1 Esophagus

3.2.2 Stomach

3.2.3 Small intestine

.....

.....

.....

.....

.....

3.3 State the roles of the digestive enzymes secreted by the pancreas. **(50 Marks)**

.....

.....

.....

.....

.....

Question 04 **(100 Marks)**

4.1 List **three** functions of urinary system. **(30 Marks)**

.....

.....

.....

4.2 Write short notes on the following. **(20 Marks)**

4.3.1 Nephron

4.3.2 Glomerular filtration rate

.....

.....

.....

.....

4.3 List the **four** constituents in urine. **(20 Marks)**

.....

.....

.....

.....

4.4 State the three phases of urine production. **(30 Marks)**

.....

.....

.....

.....

.....

.....

.....

library

00002

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Sciences

HD 1223 Physiology

1st Year 2nd Semester

HD BMS Batch – 02

End Semester Special Repeat MCQ Examination

INDEX NUMBER:

.....

Date : **15th of September 2024**
Time : **11.00 am - 12.00 noon (One hour)**

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:

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.

Mark true or false regarding the statements in following questions.

1. **Regarding the function of the spinal cord**

    1. The spinal cord transmits signals between the brain and the rest of the body.
    2. Reflexes are processed by the spinal cord without input from the brain.
    3. It is involved in both sensory and motor function.
    4. Spinal cord is part CNS.
    5. Spinal cord only transmits sensory information.

2. **True or false regarding function of the respiratory system**

    1. Primary function of the respiratory system is gas exchange.
    2. The system includes the lungs, trachea & diaphragm.
    3. Gas exchange occurs in the alveoli.
    4. System only functions when person is awake.
    5. System maintains the pH balance of the blood.

3. **True or false regarding conductive system of the heart.**

    1. SA node is known as natural pacemaker.
    2. Electrical impulse transports from SA node to AV node
    3. Bundle of His transports impulses from the atria to ventricles.
    4. Purkinje fibers initiate the heartbeat.
    5. Conductive system generates and coordinate the electrical impulses.

4. **True or false regarding functions of smooth muscles**

    1. Smooth muscles are under involuntary control
    2. Responsible for the movement of bones and joints.
    3. Help to regulate BP by contraction & relaxation of vessels.
    4. Can sustain contractions for longer period than skeletal muscles.
    5. Striated like skeletal muscle.

5. **Regarding hormones secreted by hypothalamus**

    1. Regulate the release of hormones from pituitary.
    2. Oxytocin hormone is produced by the hypothalamus.
    3. TRH is secreted by the hypothalamus
    4. Vasopressin hormone is stored in hypothalamus.
    5. Produces insulin to regulate blood sugar levels.

6. True or false regarding digestion.

1. Begins in the mouth.
2. Chewing is the mechanical breakdown.
3. Stomach is the primary site for nutrient absorption.
4. Bile produced by the liver and stored in gallbladder.
5. Small intestine absorbs water and electrolytes.

7. Regarding male reproductive system

1. Testes are responsible for producing sperms.
2. Prostate gland produces a fluid that nourishes sperms.
3. Vase deferens carries sperms from the testes to urethra.
4. Sperm production occurs in the epididymis.
5. Male urethra serves a passageway for both urine & semen.

8. True or false regarding central nervous system

1. CNS consists of the brain and the spinal cord.
2. CNS does not play a role in motor function.
3. The brain stem is part of the CNS.
4. CNS responsible for processing and interpreting sensory information.
5. CNS can regenerate damaged neurons easily.

9. Regarding urinary system

1. Only includes the kidneys and bladder.
2. Kidneys are involved in erythropoietin production
3. Primary function is to filter waste products.
4. The bladder can stores urine until to be excreted.
5. Ureters transport urine from the kidney to the bladder.

10. True or false regarding endocrine system

1. Uses hormones to regulate various bodily functions.
2. The thyroid gland produces TSH.
3. The adrenal glands are located on top of the kidneys.
4. The pancreas is both an endocrine & exocrine gland.
5. Hormones in the endocrine system are released into the bloodstream.

11. True or false regarding functions of GIT

1. Primary function is to digest food and absorb nutrients.
2. The stomach secretes hydrochloric acid.
3. Small intestine is responsible for the majority of nutrient absorption.
4. The large intestine stores fat.
5. Enzymes produced by the pancreas are essential for digestion.

12. True or false regarding skeletal muscle contraction

1. Initiated by action potential.
2. Actin and myosin filaments are involved in contraction.
3. ATP is not required for muscle contraction.
4. Calcium ions are released from the sarcoplasmic reticulum.
5. Contraction means the shortening the muscle fiber.

13. Regarding female sex hormones

1. Estrogen is responsible for the development of the female reproductive system.
2. Progesterone is secreted by uterus.
3. FSH stimulates the growth of follicles.
4. LH triggers ovulation.
5. Female sex hormones have no role in bone density regulation.

14. Regarding the cardiac muscles

1. Found only in the heart.
2. Cells are striated.
3. Muscle contractions are involuntary.
4. Contractions are controlled by the autonomic nervous system.
5. Can regenerate quickly after injury.

15. True or false regarding the blood pressure

1. It is the force exerted by blood against the wall of arteries.
2. High blood pressure also known as hypertension.
3. Diastolic blood pressure is the highest arterial blood pressure
4. Diastolic blood pressure occurs when the ventricles are at rest
5. Systolic blood pressure is about 120 mmHg in healthy adults

16. Regarding lung volumes and capacities

1. Tidal volume is 500 mL
2. Tidal volume is the amount of air inhaled or exhaled in breathing.
3. Residual volume is the amount of air left in lungs after full exhalation.
4. Residual volume is 1200 mL
5. Inspiratory reserve volume is 3100 mL

17. True or false regarding functions of female reproductive system

1. The ovaries produce eggs.
2. The fallopian tubes transport eggs from ovary to uterus.
3. The implantation usually occurs in the fallopian tubes.
4. Uterus serves as the birth canal.
5. Menstrual cycle typically lasts 21 to 35 days.

18. True or false regarding vision tests

1. Snellen chart is used to measure visual acuity.
2. The Ishihara test is used to diagnose color blindness.
3. The pupil dilation can be checked by using a pen torch.
4. The Ishihara plates include colored dot patterns or numbers.
5. Distance between the Snellen chart and the patient is 20 m

19. Regarding the joints

1. Synovial joints are the most common type.
2. Cartilaginous joints are connected by cartilage.
3. Fibrous joints can be found in the skull.
4. Ball and socket joints allow movements in multiple directions.
5. Knee joint is example for the synovial joint.

20. True or false regarding the reflexes

1. Reflexes are automatic.
2. Reflexes are involuntary responses to specific stimuli.
3. Cremaster reflex indicates the contraction of scrotum
4. Checking triceps-reflex is to find the function of C6 - C7 nerves
5. Checking achilles tendon reflex is to find the function of S1- S2 nerves

Library

00002

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Higher Diploma in Biomedical Science
HD 1213
Anatomy
1st year 2nd Semester
End Semester MCQ Special Repeat Examination
2nd Batch

Date : **14th September 2024**
Time : **11.00 a.m. – 12.00 p.m. (One Hour)**

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:
~~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. True or false regarding human kidneys?

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

2. True or false regarding human lungs?

1. Right lung contains only oblique fissure.
2. Inferior lobe of the right lung contains lingula.
3. Apex rises into the root of the neck.
4. Medial surface contains a hilum.
5. Right lung is larger than the left lung.

3. True or false regarding bones?

1. Radius 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.

4. 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 pelvic cavity.
4. Descending colon lies in right side of the abdominal cavity.
5. It terminates at the rectum.

5. The thyroid gland,

1. covers by a fibrous capsule.
2. is butterfly in shape.
3. always contains pyramidal lobe.
4. is a highly vascular organ.
5. consists thyroid follicles as their functional units.

6. The trachea,

1. contains elastic cartilages.
2. lies anterior to the oesophagus.
3. covers by trachealis muscle anteriorly.
4. consists of stratified ciliated columnar epithelium.
5. lies posterior to the thyroid gland.

7. True or false regarding the bronchial tree?

1. Left bronchus is shorter than the right bronchus.
2. Right bronchus is narrower than the left bronchus.
3. Right bronchus divides into three branches.
4. Alveoli are blind ends of the bronchial tree.
5. Primary bronchi are formed at the 5^{th} thoracic vertebral level.

8. True or false regarding heart anatomy?

1. Anterior surface is mainly formed by right atrium.
2. Serous pericardium is inelastic.
3. Myocardium is the thickest layer of the heart.
4. Endocardium consists of simple cuboidal epithelium.
5. Coronary sulcus separates two ventricles.

9. True or false regarding muscle?

1. Cardiac muscles found only in the heart wall.
2. Smooth muscles are non-striated muscles.
3. Smooth muscles are multinucleated.
4. Skeletal muscles are involuntary muscles.
5. Muscle fiber is a muscle cell.

10. In nasal cavity,

1. nasal septum is usually smooth.
2. there are four meatus.
3. olfactory mucosa contains receptors for smell.
4. goblet cells secrete mucus.
5. septum locates in the middle.

11. True or false regarding female reproductive system?

1. The ovaries are inactive before puberty.
2. Primordial follicle stage is the mature stage.
3. Fimbriae is the free edge of infundibulum.
4. Right ovarian vein drains in to right renal vein.
5. Vestibular glands secrete mucus.

12. 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. Pia matter is the outer most one.
5. Subdural space contains cerebrospinal fluid.

13. True or false regarding the liver?

1. Greater part presents in right lumbar region.
2. Liver lobules are hexagonal in shape.
3. Hepatic duct directly joins with pancreatic duct.
4. Liver lobules contain central vein.
5. It has three lobes.

14. True or false regarding cranial nerves?

1. Olfactory nerve is a mixed nerve.
2. Oculomotor nerve is the fourth cranial nerve.
3. Facial nerve contains both sensory and motor fibres.
4. Vestibulocochlear nerve is a motor nerve.
5. Vagus is the 12^{th} cranial nerve.

15. True or false regarding the thoracic vertebrae?

1. There are twelve thoracic vertebrae.
2. Body is kidney shape.
3. Seven thoracic vertebra is one of the atypical thoracic vertebrae.
4. There are facets for ribs.
5. They are larger than lumbar vertebrae.

16. True or false regarding the stomach?

1. Its' wall contains an oblique muscle layer.
2. It contains greater and lesser curvatures.
3. Its' distal end contains pyloric sphincter.
4. It is "J" shaped.
5. Ruge are present.

17. True or false regarding nervous system?

1. Ganglions are collection of neuron axons.
2. Thalamus is a part of brain stem.
3. Gyri are fold in cerebral cortex.
4. There are 10 pairs of cranial nerves.
5. A bundle of axons is known as tracts.

18. True or false regarding male reproductive system?

1. Left testis is slightly higher than the right testis.
2. Each testis consists seminiferous tubules.
3. Spermatic cord contains penile urethra.
4. Epididymis contain primary spermatocytes.
5. Cowper glands are largest accessory glands.

19. True or false regarding urinary system?

1. Ureters line with transitional epithelium.
2. Ureters open to the posterior wall of the urinary bladder.
3. Empty urinary bladder consists rugae.
4. Trigone is a rough folded area in the urinary bladder.
5. Detrusor muscle presents in the wall of urinary bladder.

20. True or false regarding vagina?

1. Surface is kept moist by cervical secretions.
2. It has no secretary glands.
3. It lines with simple squamous epithelium.
4. Middle layer of the wall consists of smooth muscle.
5. Outer lining forms rugae.

Library.

00006

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Higher Diploma in Biomedical Sciences
HD 1243 – Fundamentals of Genetics
Batch – 02
1st Year 2nd Semester
End semester SEQ Examination- Special Repeat

Date : **13th of September 2024**
Time : **9.00 am. – 12.00 pm (Three Hours)**

INSTRUCTIONS TO CANDIDATES

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

QUESTION 01 **(100 marks)**

1.1. State the chromosomal aberrations present in the following conditions. (20 marks)

1.1.1. Down's Syndrome

.....
.....

1.1.2. Klinefelter Syndrome

.....
.....

1.2. Draw and label the parts of a chromosome. (30 marks)

1.3. State the importance of using model organisms for genetic studies. (25 marks)

.....
.....
.....
.....
.....
.....
.....

1.4. Write a short note on applications of genetics. (25 marks)

.....

.....

.....

.....

.....

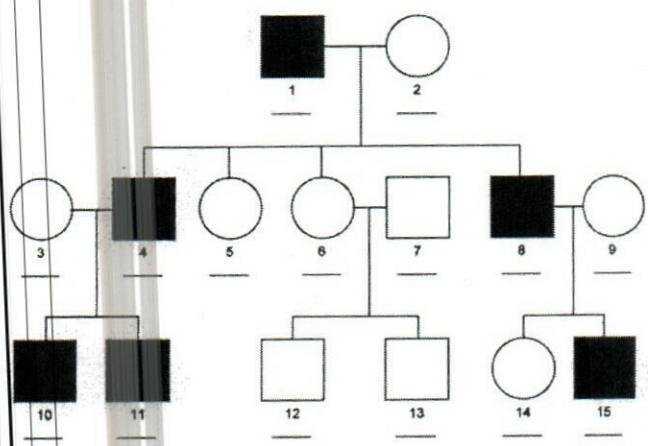
.....

.....

.....

QUESTION 02 **(100 marks)**

Answer the following questions referring to the given pedigree chart.



2.1. Identify the above pedigree type. (30 marks)

.....

.....

2.2. State the genotypes of the affected individuals. (30 marks)

.....

.....

.....

.....

2.3. What is the probability of the 13th and 14th individuals of generation III having a child with the trait ? (40 marks)

.....

.....

.....
.....
.....
.....

QUESTION 03 **(100 marks)**

3.1. List invasive and non-invasive pre-natal diagnostic tests. (20 marks)

.....
.....
.....
.....

3.2. Mention the importance of pre-natal testing. (30 marks)

.....
.....
.....
.....
.....
.....

3.3. State two types of Genetic counseling. (20 marks)

.....
.....
.....
.....

3.4. State the importance of genetic counseling. (30 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. State ADRB1 genetic variation. (20 marks)

.....

.....

.....

.....

.....

.....

4.4. How does 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. ii X I^Bi (20 marks)

5.1.2. I^AI^B X I^Ai (20 marks)

5.1.3. ii X I^Ai (20 marks)

5.2. State three genetic inheritance patterns. (40 marks)

.....
.....
.....
.....
.....
.....
.....
.....
.....

QUESTION 06 **(100 marks)**

6.1. What is the Hardy-Weinberg law and its assumptions? (40 marks)

.....
.....
.....
.....
.....

6.2. Sickle cell anemia is a recessive genetic disorder that affects approximately 1 in 3,600 African American newborns. Using Hardy-Weinberg principles, 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)

.....
.....

Library

00002

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Higher Diploma in Biomedical Sciences
Instrumentation (HD 1253)
Batch 02
1st year 2nd Semester

End Semester SEQ Examination-Special Repeat

Date: 12th September 2024
Time: From 9.00 am to 12.00 pm

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. Define the term "Good Laboratory Practice (GLP)". (20 marks)

.....
.....
.....
.....

1.2. Mention the two objectives of Good Laboratory Practice. (25 marks)

.....
.....
.....
.....

1.3. State the three Glassware that are commonly used in the Microbiology laboratory. (25 marks)

.....
.....
.....
.....

1.4. 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. Analytical Balance (25 marks)

2.4. Water bath (25 marks)

Question 03 **(100 marks)**

3.1. State 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. List 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 Mention the disinfecting methods used in microbiology laboratory.

(30 marks)

4.4 List the instruments used in immunology laboratory and their applications. (40 marks)

Question 05 **(100 marks)**

5.1 Define the term "Accuracy". (30 marks)

5.2 Differentiate the terms of "accuracy" and "precision". (30 marks)

5.3 Mention the applications of ELISA instrument. (40 marks)

Question 06 **(100 marks)**

6.1 List the Good Laboratory Practices used in chemistry laboratory. (15 marks)

.....
.....
.....
.....
.....
.....
.....

6.2 State the use of pH meter. (15 marks)

.....
.....
.....
.....
.....
.....
.....

6.3 List the types of centrifuge machine used in all the laboratories. (30 marks)

.....
.....
.....
.....
.....
.....
.....

6.4 Mention the common chromatography techniques and their application. (40 marks)

.....
.....
.....
.....
.....
.....
.....

Library

Examination Department
11 SEP 2024
CINEC Campus, Sri Lanka

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Higher Diploma in Biomedical Sciences
HD 1233 – Biochemistry

Batch – 02
1st Year 2nd Semester
End semester Special Repeat SEQ Examination

Date : **11th of September 2024**
Time : **9.00 am. – 12.00 pm (Three Hours)**

INSTRUCTIONS TO CANDIDATES

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

QUESTION 01 **(100 marks)**

1.1 List main functions of lipids. (40 marks)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

1.2 Write short notes on following.

1.2.1 Delta nomenclature (30 marks)

.....

.....

.....

.....

.....

.....

.....

.....

.....

1.2.2 Beta oxidation (30 marks)

.....

.....

.....

.....

.....

.....

.....

QUESTION 02 **(100 marks)**

2.1 Illustrate a basic structure of a building block of DNA. (40 marks)

2.2. List main characteristic features of DNA double helix. (60 marks)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

QUESTION 0 3 **(100 marks)**

3.1. Mention five (05) main functions of proteins. (30 marks)

.....

.....

.....

.....

.....

.....

3.2. Draw a flow chart to denote the digestion of proteins. (35 marks)

3.3. Describe the regulation of urea cycle. (35 marks)

.....

.....

.....

.....

.....

.....

.....

.....

QUESTION 04 **(100 marks)**

4.1. Classify the following carbohydrates based on the functional group. (45 marks)

4.1.1. Fructose

.....

4.1.2. Sedoheptulose

.....

4.1.3. Erythrose

.....

4.2. Define reducing and non-reducing sugars. (25 marks)

.....

.....

.....

.....

.....

4.3. Briefly describe the importance of gluconeogenesis. (30 marks)

.....

.....

.....

.....

.....

.....

.....

QUESTION 05 **(100 marks)**

5.1. State three (03) enzymes involved in glycogenesis. (30 marks)

.....

.....

.....

.....

.....

5.2. Differentiate between glycogenesis and glycogenolysis. (40 marks)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

5.3. Mention five (05) metabolic pathways that are activated during the well fed state. (30 marks)

.....

.....

.....

.....

.....

.....

.....

.....

QUESTION 06 **(100 marks)**

6.1. Mention three (03) primary active transport systems. (30 marks)

.....

.....

.....

.....

.....

.....

6.2. State five (05) factors which aid to maintain the fluidity of the plasma membrane. (50 marks)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

6.3. Differentiate between endocytosis and exocytosis. (20 marks)

.....

.....

.....

.....

.....

.....

.....

Library

00017

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Sciences

Instrumentation (HD 1253)

Batch 02

1st year 2nd Semester

End Semester SEQ Examination

Date: 10th November 2023
Time: From 9.00 am to 12.00 pm

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. 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)

Library

00017

CINEC Campus, Sri La... NOT TO BE...

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Higher Diploma in Biomedical Sciences
HD 1243 – Fundamentals of Genetics
Batch – 02
1st Year 2nd Semester
End semester SEQ Examination

Date : 09th of November 2023
Time : 9.00 am. – 12.00 pm (Three Hours)

INSTRUCTIONS TO CANDIDATES

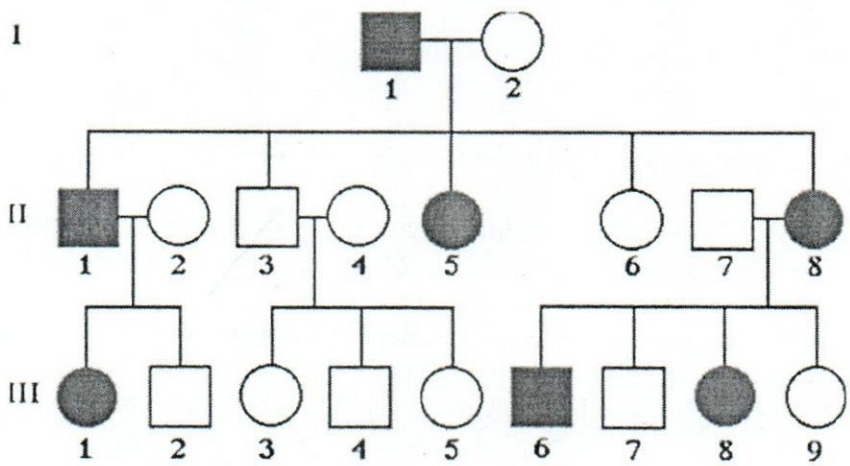
- This question paper consists of **SIX** questions.
- Answer **ALL** questions.
- You should write legibly in black or blue ink.

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 5th and 6th 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-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^AI^A X I^Bi (20 marks)

5.1.2. I^AI^B X I^Ai (20 marks)

5.1.3. ii X I^Ai (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)

Library
00009

CINEC CAMPUS
Beyond A Graduate

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

Date : **07th November 2023**
Time : **11.00 am – 12.00 pm (One hour)**

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:

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.

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. 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

libomy

00018

CINEC CAMPUS
Beyond A Graduate

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

Date : 6th November 2023
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.

Question 1 **(100 marks)**

1.1 Write three (o3) 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.
4.4.1True Ribs (10 marks)
4.4.2 False Ribs (10 marks)
4.4.3Floating Ribs (10 marks)

library

00004

CINEC CAMPUS
Beyond A Graduate

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 -model 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
06 NOV 2023
CINEC

library

00017

CINEC Campus, Sri Lanka
Learning Resource

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Science

HD 1213
Anatomy
1st year 2nd Semester

End Semester MCQ Examination

2nd Batch

Date	:	**6th 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.
- **Each question, consists 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.

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. Ii 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.

EXAMINATION
06 NOV 2023
CINEC

00017

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Science

HD 1213
Anatomy
1st year 2nd Semester

End Semester MCQ Examination

2nd Batch

Date	:	**6th 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:
~~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.

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.

T	T	T	T	T
F	F	F	F	F

20.

T	T	T	T	T
F	F	F	F	F

Library

00017

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Sciences

HD1223 Physiology

Batch – 02

1st Year 2nd Semester

End Semester SEQ Examination

CINEC Campus, Malabe
Learning Resource Centre

INDEX NUMBER: .....

Date : 07th of November 2023

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 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)

Library

00017

Learning Recourse Centre - (Library)
AUTHORIZATION

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences
Higher Diploma in Biomedical Sciences
HD 1233 – Biochemistry

Batch – 02
1st Year 2nd Semester
End semester SEQ Examination

Date : 08th 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.
- You are allowed to use a scientific calculator for the examination.

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 (So) (mM)	Enzyme Activity (Vo) µmol/min
2	0.25
3	0.33
4	0.37
5	0.45
6	0.49

4.1.1. Calculate (1/So) substrate concentration and (1/Vo) enzyme Activity values. (10 marks)
4.1.2. Plot the Lineweaver-Burk plot for the above data. (20 marks)
4.1.3. Calculate Km and Vmax 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)

library

00018

CINEC Campus, Sri Lanka
NOT TO BE TAKEN AWAY WITHOUT PROPER AUTHORIZATION
Learning Recourse Centre - (Library)

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

HIGHER DIPLOMA IN BIOMEDICAL SCIENCES

HD 1133 FOUNDATION OF CHEMISTRY

HIGHER DIPLOMA SEMESTER-END SEMESTER SEQ EXAMINATION

Date: 25th 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 → C is given by 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 mol^{-2} dm^6 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 N_2O_5

2.1.2 H_2O_2

2.1.3 PCl_5

2.1.4 SF_6

2.2 Figure out the shape and the geometry of the following molecules. (40 marks)

2.2.1 NH_3

2.2.2 XeF_5

2.2.3 CCl_4

2.2.4 SF_6

2.3 Explain why H_2O has different bond angle comparing with NH_3. (20 marks)

Question 03 **(100 marks)**

3.1 In an acidic solution, a solution of potassium permanganate ($KMnO_4$) is added to a solution containing iron (II) sulfate ($FeSO_4$). The reaction between $KMnO_4$ and $FeSO_4$ 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 $KMnO_4$ solution is required to react completely with 25.0 mL of FeSO4 solution, what is the molarity of the $FeSO_4$ solution? (20 marks)

3.1.3 A student performed the reaction between $KMnO_4$ and $FeSO_4$ and obtained 7.20 g of $Fe_2(SO_4)_3$. Calculate the theoretical yield of $Fe_2(SO_4)_3$ and the percentage yield of the reaction. (30 marks)

3.2.

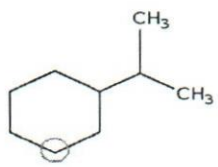
3.2.1 Draw the molecular orbital diagram of O_2. (30 marks)

3.2.2 Determine the bond order of O_2 Molecule. (10 marks)

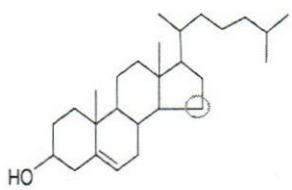
Question 04

4.1 Write the hybridization of the circled atom in each in each molecule. (15 marks)

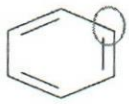
4.1.1



4.1.2



4.1.3



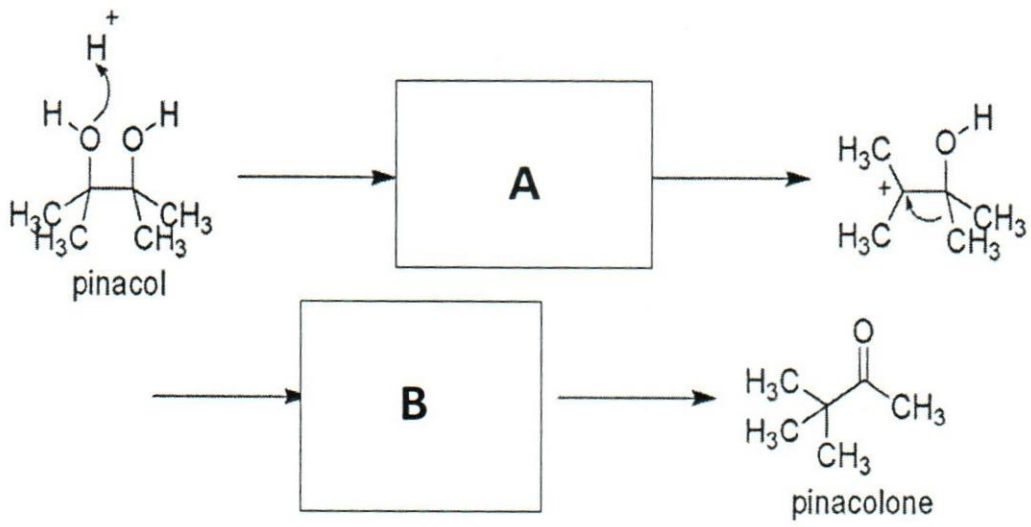
4.2 Draw the structures for the following IUPAC names. (35 marks)

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) MnO_4^{-2} 2) Cr_2O7^{-2} 3) BaO 4) CrO_3 5) $TiCl_4$

5.2 Write the balance reactions of Na, K and Ca with water. (15 marks)

5.3 Explain why 3rd ionization energy is large compare to the 1st and 2nd 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)

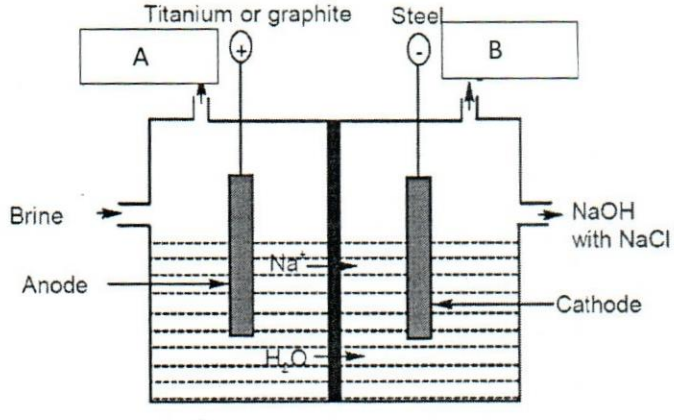
5.6 Metal (Y) shows common oxidation states such as +2 and +7. When reacts with Oxalic acid it forms gas which can react with lime water to produce milky appearance. Metal Y forms oxoanion which is purple in colour.

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)

CINEC CAMPUS
Beyond A Graduate

PAST PAPERS

Faculty	Department / Section/Division
Not Applicable	Learning Resource Centre

Past Papers

Faculty of Health Sciences

Higher diploma in Biomedical Sciences

(Year 1 – Semester II)

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

1st Issue Date: 2017.011.30	Revision No.00	Revision Date: 19.04.2023	Validated by: Librarian

library

00003

CINEC Campus, Sri Lanka
Learning Recourse Centre - (Library)

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Sciences

HD 1223 Physiology

Batch – 01

1st Year 2nd Semester

End Semester SEQ Repeat Examination

Date : 27th of January 2023

Time : 9.00 am. – 11.00 am (2 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 List the hormones which are secreted by the ovaries (10 marks)

1.2 State the **two functions from each** of the hormones stated in question number 1.1 (20 marks)

1.3 List the functions of testosterone hormone (15 marks)

1.4 State the functions of each structure of the male reproductive system (25 marks)

1.5 List the steps of spermatogenesis process (30 marks)

Question 02 **(100 marks)**

2.1 List **five** constituents in the glomerular filtrate (15 marks)

2.2 List **five** components absent in glomerular filtrate (15 marks)

2.3 Briefly describe **five** main functions of the kidneys (30 marks)

2.4 Briefly describe the process of urine formation (40 marks)

Question 03 **(100 marks)**

3.1 List **five** functions of respiratory system (10 marks)

3.2 Briefly describe on followings

3.3.1 Inspiration (20 marks)

3.3.2 Expiration (20 marks)

3.3 Name the factors affecting for Lung compliance (10 marks)

3.4 List the **four** major components of conduction system of the heart (10 marks)

3.5 Briley describe the process of blood circulation through the heart (30 marks)

Question 04 **(100 marks)**

4.1 List **four** constituents of saliva (10 marks)

4.2 Briefly describe the main functions of following organs

4.2.1 Stomach (20 marks)

4.2.2 Small intestine (20 marks)

4.2.3 Large intestine (20 marks)

4.3 Describe **three** phases of gastric juice secretion (30 marks)

***

Library

00004

CINEC Campus, Sri Lanka
NOT TO BE TAKEN AWAY WITHOUT PROPER AUTHORIZATION
Learning Recourse Centre - (Library)

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Sciences

Instrumentation (HD 1253)

Batch 01

1st year 2nd Semester

End Semester SEQ Examination-Repeat

Date: 25th January 2023
Time: From 9.00 am to 12.00 pm

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. 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)

Library.

CINEC Campus, Sri La... NOT TO BE TAKEN ... WITHOUT PROPER AUTHORIZATIO... Learning Recourse Cen...

00004

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Sciences

HD 1223 Physiology

Batch – 01

1st Year 2nd Semester

End Semester MCQ Repeat Examination

Date : **27th of January 2023**
Time : **11.00 am - 12.00 noon (1 hour)**

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:

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.

Mark true or false regarding the statements in following questions.

1. **True or false regarding respiratory organs,**
   1. Nasal cavity humidifies the inhaled air
   2. Pharynx involves in voice production
   3. Lungs are involving in excretion function
   4. Alveoli are involving in internal respiration
   5. Bronchioles make a passageway for air

2. **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

3. **Regarding lung volumes and capacities,**
    1. Tidal volume is 500 ml
    2. Dead spaces involve in gas exchange
    3. Residual Volume is 1200ml
    4. Expiratory Reserve Volume is 1200ml
    5. Inspiratory Reserve Volume is 3100ml

4. **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

5. **True or false regarding functions of skeletal muscles,**
    1. Skeletal muscles are under voluntary control
    2. Actin and myosin are involve in muscle contractions
    3. Ca^{+} ions are involved in muscle contraction
    4. Muscle twitch starts after the start of muscle depolarization
    5. Acetylcholine releases by the skeletal muscles when relaxation

6. **Regarding endocrine system,**
    1. Hypothalamus secretes growth hormone
    2. Anterior pituitary secretes prolactin
    3. TRH secreted by the hypothalamus
    4. Adrenal gland secretes epinephrine
    5. Glucagon is secreted by pancreas

7. **Regarding the functions of smooth muscles,**
    1. Smooth muscles are under conscious control
    2. Smooth muscles are covering the cavities
    3. These regulate diameter of tracts
    4. These have the ability to initiate their own contractions
    5. Action is regulated by autonomic nervous system

8. **Regarding the function of the brain,**
    1. Cerebral cortex is responsible for thinking
    2. Cerebellum helps to keep the equilibrium
    3. Hypothalamus balances the body temperature
    4. Pons involves in memory
    5. Midbrain involves in reasoning

9. True or false regarding cardiac functions,

1. SA node generates electrical impulses
2. Electrical impulse transports from SA node to AV node
3. Bundle of his transports impulse to the Perkinje system
4. Perkinje system transports impulse to cardiac muscle
5. Coronary arteries supply the blood to heart muscle

10. Regarding female reproductive system,

1. Fertilization of ovum occurs inside the uterus
2. Fallopian tubes transport the ovum to uterus
3. Cervix involves in transport semen to the uterus
4. Ovaries secretes HCG hormone
5. Fimbriae catches the ovum which expelled by the ovaries

11. Regarding urinary system,

1. Kidneys are involved in erythropoietin production
2. Fibrous capsule protects the kidney from injuries
3. Urinary bladder stores the urine until it passes
4. Reabsorption starts from the bowman's capsule
5. Leucocytes are present in glomerular filtrate

12. True or false regarding skeletal muscle functions,

1. Skeletal muscle have voluntary control over it
2. Actin-myosin cross-bridges are formed, when muscle contraction
3. Action potential is transmitted along the muscle fiber
4. Na+ ions are involved in skeletal muscle relaxation
5. Skeletal muscles involve in locomotion

13. True or false regarding GI system,

1. Tongue is involving in deglutition
2. Stomach is involving in HCL secretion
3. Liver emulsifies the lipids in small intestine
4. Gallbladder produces bile
5. Pancreas secretes enzymes to jejunum

14. Regarding female sex hormones,

1. Estrogen is secreted by the uterus
2. Mainly secreted estrogen is estradiol
3. Estrogen regulates the growth & development of human body
4. Estrogen influences on skeletal system
5. Estrogen helps to maintain body fluid balance

15. True or false regarding the blood pressure,

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

16. True or false regarding peristalsis,

1. It is a voluntary process 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

17. Regarding the functions of the skeletal system,

1. Provide support for soft tissues
2. Produces white blood cells
3. Involves in balancing mineral levels
4. Stores triglycerides
5. Produces calcium which needs for bones

18. True or false regarding the reflexes,

1. Checking patella reflex to find 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. Checking triceps-reflex is to find the function of C6 - C7 nerves
5. Checking Achilles tendon reflex is to find the function of S1- S2 nerves

19. True or false regarding functions of male reproductive system,

1. Epididymis carries stores sperm cells
2. Vas deferens transports matured sperms to epididymis
3. Ejaculatory ducts transport sperms to the urethra
4. Seminal vesicles produce semen
5. Prostate gland nourishes the sperms

20. 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's test is 522Hz
5. Distance between the Snellen's chart and the patient is 20m

library

00009

CINEC Campus, Sri Lanka
NOT TO BE TAKEN AWAY WITHOUT PROPER AUTHORIZATION
Learning Recourse Centre - (Library)

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Sciences

HD 1243 – Fundamentals of Genetics

Batch – 01

1st Year 2nd Semester

End semester Repeat SEQ Examination

Date : **23rd of January 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.
- You are not allowed to take out the examination papers.

QUESTION 01 **(100 marks)**

1.1. Write a short notes on following.

i. Importance of using model organisms for genetic studies. (40 marks)
ii. Applications of genetics. (30 marks)
iii. Classification of chromosomes. (30 marks)

QUESTION 02 **(100 marks)**

2.1. Define what is known as polygenic inheritance. (15 marks)

2.2. Mention three types of genetic polymorphism seen in pharmacogenetic studies. (15 marks)

2.3. Describe how pharmacogenetic testing is helpful in practicing personalized medicine. (35 marks)

2.4. Write a short note on consequences of polymorphisms. (35 marks)

QUESTION 03 **(100 marks)**

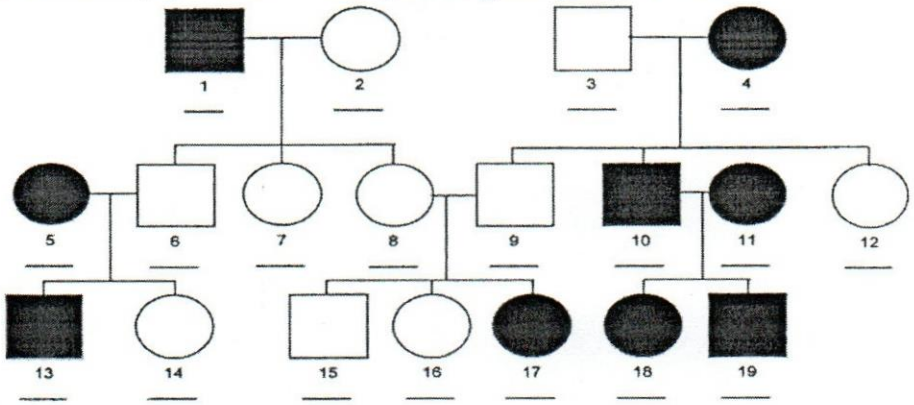
3.1. Draw a diagram to denote the coupling and repulsion hypothesis of genetic linkage. (25 marks)

3.2. State five factors responsible for phenotypic variation. (25 marks)

3.3. Compare and contrast between founder effect and bottle neck effect. (50 marks)

QUESTION 04 **(100 marks)**

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



4.1.1. Identify the above pedigree type. (25 marks)
4.1.2. Provide reasons for your answer in 3.1.1. (25 marks)
4.1.3. Mention the genotypes of the affected individuals. (25 marks)
4.1.4. Discuss the probability of 17^{th} & 18^{th} individuals of generation III having a child with the trait. (25 marks)

QUESTION 05 **(100 marks)**

5.1. List the steps that are followed in engaging a couple in a genetic counseling. (20 marks)

5.2. State the main indications for prenatal diagnosis. (20 marks)

5.3. Discuss on the importance of prenatal diagnostic tests. (30 marks)

5.4. Describe the importance of genetic counselling. (30 marks)

QUESTION 06 **(100 marks)**

6.1. A sick cell anaemic male (H^SH^S) and a carrier female (H^AH^S) marries and have children,
6.1.1. Draw a punnett square to denote the genotypes of their offspring. (30 marks)
6.1.2. Calculate the percentages of the offspring with different genotypes. (30 marks)

6.2. A man with blood group A marries a woman with blood group B.

6.2.1. Discuss the possible phenotypes of their offspring. (40 marks)

library

00011

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Sciences

HD 1233 – Biochemistry

Batch – 01

1st Year 2nd Semester

End semester Repeat SEQ Examination

Date : 19th of January 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.
- You are allowed to use a scientific calculator for the examination.
- You are not allowed to take out the examination papers.

QUESTION 01 **(100 marks)**

1.1. Define reducing and non-reducing sugars. (10 marks)

1.2. Differentiate Phosphofructokinase-1 and Fructose 1,6-bisphosphatase. (30 marks)

1.3. Draw a flow chart to denote the basic steps involved in the citric acid cycle. (30 marks)

1.4. Describe the role of fructose 2,6-bisphosphate in glycolysis. (30 marks)

QUESTION 02 **(100 marks)**

2.1 Write short notes on following.

i. Double helix structure of DNA. (30 marks)
ii. Structure of messenger RNA. (30 marks)

2.2. Outline the reactions involved in de novo synthesis of purine nucleotides. (40 marks)

QUESTION 03 **(100 marks)**

3.1. Describe the digestion and absorption of dietary lipids. (25 marks)

3.2. Write a short note on biological functions of lipids. (25 marks)

3.3. Draw a diagram to denote fatty acid synthase complex. (25 marks)

3.4. Describe the regulation of hormone sensitive lipase (HSL). (25 marks)

QUESTION 04 **(100 marks)**

4.1. Write a short note on sodium- potassium pump. (30 marks)

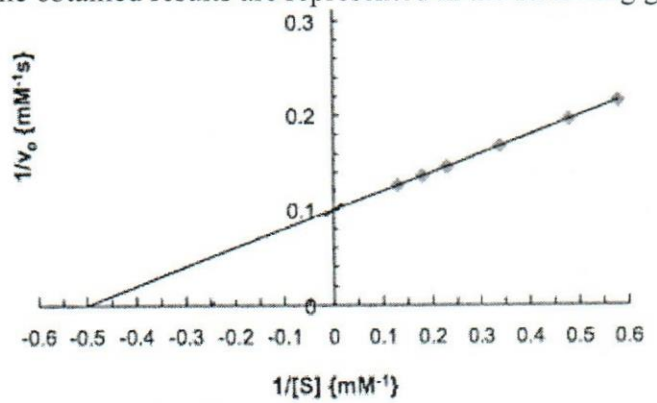
4.2. Differentiate between uniport and symport systems. (20 marks)

4.3. Compare and contrast between the types of ATP driven pumps. (20 marks)

4.4. Explain the role of ubiquinone in electron transport chain. (30 marks)

QUESTION 05 **(100 marks)**

5.1.A researcher carried out an experiment to detect the effect on enzyme A using different substrate concentrations. The obtained results are represented in the following graph.



5.1.1 Mention the name given for this graph. (15 marks)

5.1.2. Calculate Km value for the enzyme A. (25 marks)

5.1.3. Calculate Vmax for the enzyme A. (25 marks)

5.2. Discuss the effect of pH on the activity of enzymes. (35 marks)

QUESTION 06 **(100 marks)**

6.1. Write a short note on secondary and tertiary structure of proteins. (25 marks)

6.2. Denote the sequence of reactions involved in glucose alanine cycle. (25 marks)

6.3. Describe the regulation of urea cycle. (25 marks)

6.4. Write a short note on metabolic defects associated with protein metabolism. (25 marks)

Library

00001

CINEC Campus, Sri Lanka
NOT TO BE TAKEN AWAY WITHOUT PROPER AUTHORIZATION
Learning Recourse Centre - (Library)

CINEC CAMPUS
Beyond A Graduate

CINE Campus (Pvt) Ltd

Approved for Quality Management System

Faculty of Health Sciences

Higher Diploma in Biomedical Sciences

IPS 2143 Organic Chemistry
Batch 01
Special Examination

INDEX NUMBER: .....

Date: 18th of January 2023

Time: 09.00 am – 12.00 pm - Three Hours

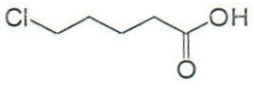
INSTRUCTIONS TO CANDIDATES

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

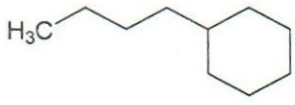
Question 1 **(100 marks)**

1.1 Name the following structures in IUPAC nomenclature. (20 marks)

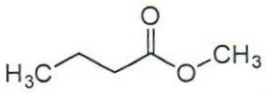
(a)



(b)



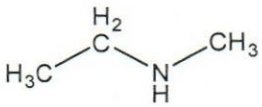
(c)



(d)



(e)



1.2 Draw the structures corresponding to the following IUPAC names. (20 marks)

(a) 2-propyl-1-pentene

(b) 3-methylhexane

(c) 2,4,6-Trinitrophenol

(d) 3- aminobenzoic acid

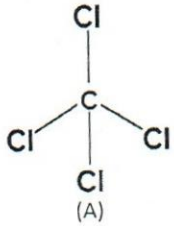
(e) 2-methylheptan-3-one

1.3 Identify the alkene obtained on dehydration of following alcohols. (You may draw the structure of the product in your answer sheet) (20 marks)

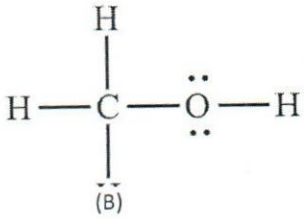
a. 2-ethyl-3-pentanol

b. 2-hexanol

1.3 Comment on the polarity of the molecules given below and briefly indicate the reason for your answer for each molecule. (40 marks)



(A)

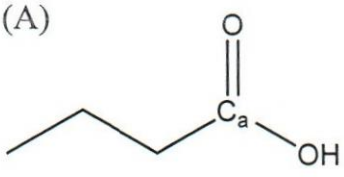


(B)

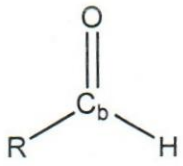
Question 02 **(100 marks)**

2.1. Determine the oxidation states on the carbon atoms (C_a, C_b, C_c, C_d) of following organic molecules. (20 marks)

(A)



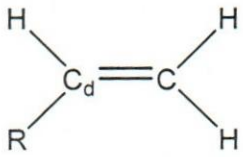
(B)



(C)



(D)



2.2. Classify each of the following reactions as an electrophilic/nucleophilic addition, elimination, substitution, or rearrangement. (30 marks)

(a) $C_6H_6 + CH_3Cl \longrightarrow C_6H_5CH_3 + HCl$

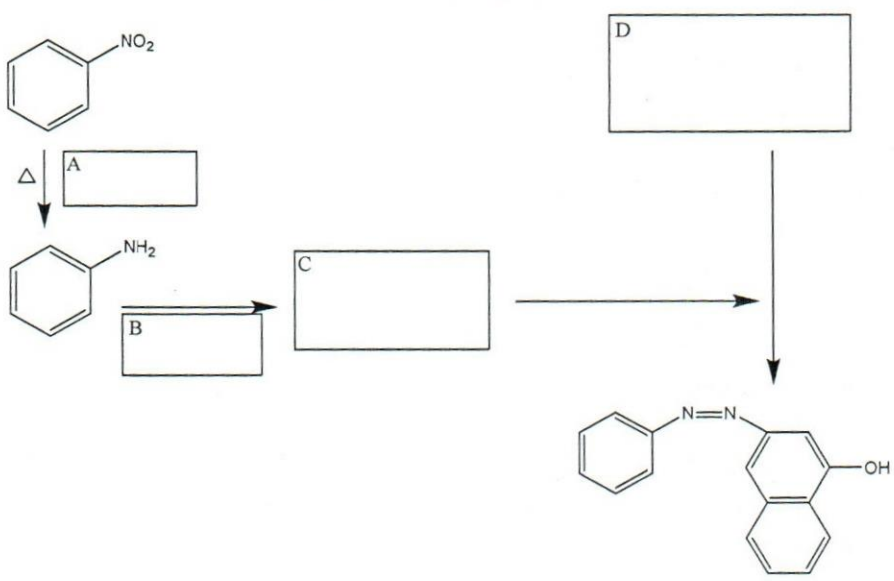
(b) $CH_3CH_2OH \longrightarrow H_2C{=}CH_2 + H_2O$

(c) $C_6H_6 + Br_2 + FeBr_3 \longrightarrow C_6H_5Br + HBr + FeBr_3$

(a) $C_2H_6 + Cl_2 \longrightarrow C_2H_5Cl + HCl$

(b) $CH_3CH_2OH + HCl \longrightarrow CH_3CH_2Cl + H_2O$

2.3. Predict the structures of (A), (B), (C), (D) and (E) (50 marks)



Question 03 **(100 marks)**

3.1 Write the products (A to F) of the following reactions. (40 marks)

(a)

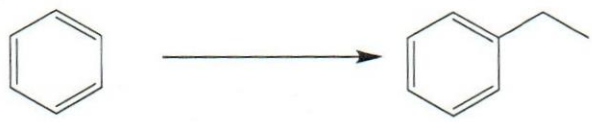


(b)



3.2 How would you synthesis the following organic compounds using any other reagents? (40 marks)

(a)



(b)



3.3 Compare and contrast the water solubility of following organic molecules by giving reasons. (20 marks)

(a) CH_3CH_2OH and CH_3CHO

(b) $CH_3CH_2CH_2CH_2CH_3$ and CH3CH2CH(CH3)2

Question 04. **(100 marks)**

4.1 Draw the Newman projection of staggered and eclipsed conformations of the following molecules. (20 marks)

a. $Cl\text{-}CH_2\text{-}CH_2\text{-}Cl$

b. $OH\text{-}CH_2\text{-}CH_2\text{-}CH_3$

4.2 Consider the molecule CH_3-CH_3 (ethane). Sketch the graph of the rotational barrier in ethane as a function of dihedral angle. (30 marks)

4.3 Draw compounds that contain the following. (20 marks)

a. A primary alcohol
b. A tertiary amine
c. Both primary and secondary alcohol
d. Quaternary carbon

4.4 Describe the following by giving examples. (30 marks)

a. Constitutional isomers
b. Stereoisomers

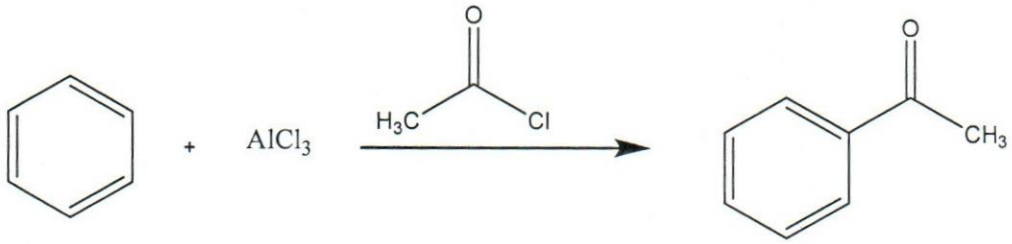
Question 05. **(100 marks)**

5.1. Briefly explain the reason for the following observations. (20 marks)

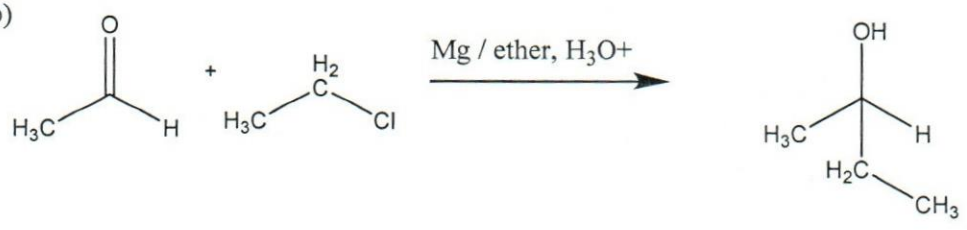
a. Isomeric alcohols boiling points follow the order:
Primary alcohol > Secondary alcohol >tertiary alcohol.
b. Solubility of ethers in water decreases from lower members to higher members.

5.2. Propose a reaction mechanism to account for the following reactions. (30 marks)

(a)



(b)

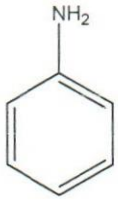


5.3. Identify the following groups and categories in to *o,p*-directors or *m*-directors. (10 marks)

(a) -OH
(b) -NH_2
(c) -COOH
(d) -NO2
(e) -CN

5.4. Draw the possible resonance structure of the following organic molecules. (20 marks)

(a) 

(b) 

5.5. Write the mechanism of dehydration of ethanol which leads to the formation of ethane. (20 marks)

Question 06 **(100 marks)**

6.1 Predict the result of the addition of hydrogen bromide to 2-methylpent-2-ene (25 marks)

6.2 Write the mechanism for the treatment of a but-2-ene with bromine (Br_2) in a chlorinated solvent ($CHCl_3$). (35 marks)

6.3 Suggest a method to differentiate $CH_3(CH)OHCH_3$ and CH_3CH_2OH organic molecule. (10 marks)

6.4 State the reaction conditions for following conversions. (30 marks)

a. $CH_2{=}CH_2 \rightarrow CH_3 - CH_3$
b. $CH{\equiv}CH \rightarrow CH_3 - CH_3$
c. $(CH_3)_2C{=}O \rightarrow (CH_3)_2CH - OH$
d. $CH_3CH_2OH \rightarrow CH_3\text{-}COOH$

Library

00009

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Science

HD 1213
Anatomy
1st year 2nd Semester

End Semester SEQ Repeat Examination

1st Batch

Date : **17th January 2023**
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 List three main types of muscle tissues. (15 marks)
1.2 Compared three muscle types you mentioned in 1.1. (35 marks)
1.3 Names all bones in upper limbs. (15 marks)
1.4 Describe the difference between exocrine and endocrine pancreas. (35 marks)

Question 2 **(100 marks)**

2.1 Name the major cell types in alveolar epithelium and state their function. (20 marks)
2.2 Write short notes on respiratory epithelium (25 marks)
2.3 List four differences between right and left bronchi. (20 marks)
2.4 List the main layers present in heart wall (15 marks)
2.5 "Myocardium in left ventricle is thicker than the wall of right ventricle". What is the reason for that? (20 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 Define following terms.
  3.3.1 True Ribs (10 marks)
  3.3.2 False Ribs (10 marks)
  3.3.3 Floating Ribs (10 marks)
3.4 Show the nine regions in the abdominal region by using a labeled diagram. (20 marks)

Question 4 **(100 marks)**

4.1 Name the three layers of meninges. (15 marks)

4.2 Describe a structure of a nerve trunk. (40 marks)

4.3 List the main layers present in heart wall (20 marks)

4.4 "Myocardium in left ventricle is thicker than the wall of right ventricle". What is the reason for that? (25 marks)

Library.

CINEC-Campus, Sri Lanka
NOT TO BE TAKEN AWAY WITHOUT PROPER AUTHORIZATION
Learning Resource Centre - (Library)

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Science

HD 1213
Anatomy
1st year 2nd Semester

End Semester MCQ Repeat Examination

1st Batch

Date	:	**17th January 2022**
Time	:	**11.00 a.m. – 12.00 p.m. (One Hour)**

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:
~~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. True or false?

1. Humerus is a long bone.
2. There are eight carpal bones.
3. There are thirty-two bones in each upper limb.
4. The size of the axilla region varies with arm movements.
5. There are five metatarsal bones.

2. Regarding heart anatomy,

1. Anterior surface is mainly formed by right ventricle.
2. Fibrous pericardium is inelastic.
3. Pericardium is the thickest layer of the heart.
4. Endocardium consists of simple squamous epithelium.
5. Coronary sulcus separates the atria from the ventricles.

3. **In nasal cavity,**
   1. septum locates in the middle.
   2. there are three meatus.
   3. olfactory mucosa contains receptors for smell.
   4. mucosa contains stratified columnar ciliated epithelium.
   5. nasal septum is usually smooth.

4. **Regarding the meninges,**
   1. The dura and arachnoid maters are separated by a subdural space.
   2. Pia 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. Subarachnoid space contains cerebrospinal fluid.

5. **True or false?**
   1. Renal cortex contains pyramids.
   2. Kidneys are intraperitoneal organs.
   3. Kidneys are bean shaped organs.
   4. Apex of pyramids open directly to the minor calyx.
   5. Loop of Henle present in renal cortex.

6. **Regarding the liver,**
   1. Greater part presents in right hypochondriac region.
   2. It is associated with sub-phrenic recesses.
   3. It is associated with left triangular ligament.
   4. Bare area covered by peritoneal covering.
   5. It has four lobes.

7. **Regarding the thoracic vertebrae,**
   1. There are seven thoracic vertebrae.
   2. First thoracic vertebra is one of the atypical thoracic vertebrae.
   3. There are facets for ribs.
   4. They are smaller than lumbar vertebrae.
   5. Body is heart shape.

8. **The trachea,**
   1. contains hyaline cartilages.
   2. lies anterior to the oesophagus.
   3. lies posterior to the thyroid gland.
   4. consists of pesudostratified ciliated columnar epithelium.
   5. anterior part, covered by Trachealis.

9. **True or false regarding a human skin?**
   1. Ceruminous gland is an apocrine gland.
   2. Arrector pili are bundle of smooth muscles.
   3. Sebaceous glands are abundant in axillae.
   4. Hypodermis is a avascular layer.
   5. Epidermis contains keratinized simple squamous epithelium.

10. Regarding human excretory system,

1. Male urethra is longer than female urethra.
2. Internal urethral sphincter consists voluntary muscles.
3. Blood leaves the nephron via the efferent arteriole.
4. Cortical nephrons are the abundant type.
5. One collecting tubule connects with number of nephrons.

11. Regarding female reproductive system,

1. The ovaries are active before puberty.
2. Graafian follicle stage is the mature stage.
3. Fimbriae is the free edge of infundibulum.
4. Right ovarian vein drains in to inferior vena cava.
5. Vestibular glands secrete mucus.

12. Regarding human lungs,

1. Left lung contains only oblique fissure.
2. Inferior lobe of the left lung contains lingula.
3. Apex rises into the root of the neck.
4. Medial surface contains a hilum.
5. Right lung is smaller than the left lung.

13. The thyroid gland,

1. sometimes contains pyramidal lobe.
2. is a less vascular organ.
3. is butterfly in shape.
4. covers by a fibrous capsule.
5. consists thyroid follicles as their functional units.

14. True or false?

1. Ureters line with transitional epithelium.
2. Ureters open to the lateral wall of the urinary bladder.
3. Empty urinary bladder consists rugae.
4. Trigone is a smooth folded area in the urinary bladder.
5. Detrusor muscle presents in the wall of urinary bladder.

15. Spermatic cord contains,

1. penile urethra.
2. ductus deferens.
3. pampiniform plexus.
4. testicular artery.
5. prostatic urethra.

16. Regarding neuroglial cells,

1. Astrocytes are the largest neuroglia.
2. Astrocytes are analogous to Schwann cells of peripheral nervous system.
3. Microglial cells are the smallest neuroglia.
4. Ependymal cells produce cerebrospinal fluids.
5. Schwann cells produce myelin sheath.

17. **Regarding cranial nerves,**
    1. Olfactory nerve is a sensory nerve.
    2. Oculomotor nerve is the fourthe cranial nerve.
    3. Facial nerve contains both sensory and motor fibres.
    4. Vestibulocochlear nerve is a sensory nerve.
    5. Vagus is the 10^{th} cranial nerve.

18. **True or false?**
    1. The squamous epitheliums are lining epithelia.
    2. Sub mandibular glands are sitiated just below the external acoustic meatus.
    3. Salivary glands are surrounded by a fibrous capsule.
    4. Oesophagus contains only skeletal muscles.
    5. Stomach has two curvatures.

19. **Regarding the bronchial tree,**
    1. Left bronchus is shorter than the right bronchus.
    2. Right bronchus is wider than the left bronchus.
    3. Right bronchus divides into two branches.
    4. Alveoli are blind ends of the bronchial tree.
    5. Primary bronchi are formed at the 7^{th} thoracic vertebral level.

20. **Regarding vagina,**
    1. It has no secretary glands.
    2. It lines with simple squamous epithelium.
    3. Surface is kept moist by cervical secretions.
    4. Middle layer of the wall consists of smooth muscle.
    5. Inner lining forms rugae.

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Science

HD 1213

Anatomy

1st year 2nd Semester

End Semester SEQ Examination

1st Batch

INDEX NUMBER: .....

Date	**: 28th March 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 Write short notes on followings.

1.1.1 Paranasal sinuses (20 marks)

1.1.2 Respiratory epithelium (20 marks)

1.2 List four differences between right and left bronchi. (20 marks)

1.3 List the main layers present in heart wall (15 marks)

1.4 "Myocardium in left ventricle is thicker than the wall of right ventricle". What is the reason for that? (25 marks)

Question 2 **(100 marks)**

2.1 Draw a label diagram of a nephron. (25 marks)

2.2 Write short notes on followings.

2.2.1 Urinary bladder (25 marks)

2.2.2 Prostate gland (25 marks)

2.3 Write the differences between male and female urethra. (25 marks)

Question 3 **(100 marks)**

3.1 Name the three layers of meninges. (15 marks)

3.2 Describe a structure of a nerve trunk. (30 marks)

3.3 What are the structural differences between anterior pituitary and posterior pituitary? (25 marks)

3.4 Describe three histological zones in the adrenal cortex. (30 marks)

Question 4 **(100 marks)**

4.1 Names all bones in upper limbs. (15marks)

4.2 Describe the microscopic structure of human liver. (30 marks)

4.3 Describe the difference between exocrine and endocrine pancreas. (30 marks)

4.4 Describe the differences between skeletal muscles and smooth muscles. (25 marks)

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Sciences

HD 1223 Physiology

Batch – 01

1st Year 2nd Semester

End Semester SEQ Examination

INDEX NUMBER: .....

Date : **30th of March 2022**

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.
- You are not allowed to take out the examination papers.

Question 01 **(100 marks)**

1.1 List **five** constituents in the glomerular filtrate (15 marks)

1.2 List **five** components that cannot be filtered via glomerulus (15 marks)

1.3 Briefly describe **five** main functions of the kidneys (30 marks)

1.4 Describe the process of urine formation (40 marks)

Question 02 **(100 marks)**

2.1 List the hormones which are secreted by the ovaries (10 marks)

2.2 State the functions of the hormones stated in question number 2.1 (20 marks)

2.3 List the functions of testosterone hormone (15 marks)

2.4 State the functions of each structure of the male reproductive system (25 marks)

2.5 Describe the spermatogenesis process (30 marks)

Question 03 **(100 marks)**

3.1 List **four** constituents of saliva (10 marks)

3.2 Write short notes on functions of following organs

3.2.1 Stomach (20 marks)

3.2.2 Small intestine (20 marks)

3.2.3 Large intestine (20 marks)

3.3 Describe 03 phases of gastric juice secretion (30 marks)

Question 04 **(100 marks)**

4.1 List **five** functions of respiratory system (10 marks)

4.2 Write short notes on followings

4.3.1 Inspiration (20 marks)

4.3.2 Expiration (20 marks)

4.3 Outline the factors affecting for Lung compliance (10 marks)

4.4 List the **four** major components of conduction system of the heart (10 marks)

4.5 Describe the process of blood circulation through the heart (30 marks)

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Sciences

HD 1233 – Biochemistry

Batch – 01

1st Year 2nd Semester

End semester SEQ Examination

INDEX NUMBER: .....

Date : **06th of April 2022**
Time : **9.00 am. – 12.00 pm (Three Hours)**

INSTRUCTIONS TO CANDIDATES

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

QUESTION 01 **(100 marks)**

1.1. Write a short note on chemiosmosis mechanism of ATP synthesis. (30 marks)

1.2. Discuss the role of glycerol-3-phosphate shuttle. (40 marks)

1.3. Explain the role of ubiquinone in electron transport chain. (30 marks)

QUESTION 02 **(100 marks)**

2.1. Define reducing and non-reducing sugars. (10 marks)

2.2. Differentiate Phosphofructokinase-1 and Fructose 1,6-bisphosphatase. (30 marks)

2.3. Outline the reaction steps involved in the citric acid cycle. (30 marks)

2.4. Describe the role of glycogen phosphorylase in glycogen metabolism. (30 marks)

QUESTION 03 **(100 marks)**

3.1. Describe the digestion and absorption of dietary lipids. (25 marks)

3.2. Discuss the biological functions of lipids. (25 marks)

3.3. Illustrate fatty acid synthase complex. (25 marks)

3.4. Describe the hormonal regulation of cholesterol biosynthesis. (25 marks)

QUESTION 04 **(100 marks)**

4.1 State 3 major classes of RNA with their functions. (30 marks)

4.2 Outline the sequence of reactions involved in synthesis of purine nucleotides. (40 marks)

4.3 Write a short note on metabolic defects associated with purine metabolism. (30 marks)

QUESTION 05 **(100 marks)**

5.1. Draw a flow chart to denote the digestion of proteins. (25 marks)

5.2. Denote the sequence of reactions involved in glucose alanine cycle. (25 marks)

5.3. Describe the regulation of urea cycle. (25 marks)

5.4. Write a short note on metabolic defects associated with protein metabolism. (25 marks)

QUESTION 06 **(100 marks)**

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

Substrate Concentration (mM) (So)	Enzyme Activity (1/Vo) µmol/min
0.1	40.00
0.2	24.00
0.3	17.00
0.4	15.00
0.5	13.00

6.1.1. Calculate 1/So substrate concentration values. (10 marks)
6.1.2. Plot the Lineweaver-Burk plot for the above data. (20 marks)
6.1.2. Calculate Km and Vmax for the enzyme A. (20 marks)

6.2. Compare and contrast between the three types of enzyme inhibitions using Lineweaver burk plots. (25 marks)
6.3. Discuss the importance of enzyme regulation providing examples. (25 marks)

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Sciences

HD 1243 – Fundamentals of Genetics

Batch – 01

1st Year 2nd Semester

End semester SEQ Examination

INDEX NUMBER: .....

Date : **01st of April 2022**
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 papers.

QUESTION 01 **(100 marks)**

1.1. Metabolism of a drug vary from person to person and can change the therapeutic efficacy of a drug. Explain your answer taking CYP2C9 and warfarin as examples. (40 marks)

1.2. Describe how pharmacogenetic testing is helpful in practicing personalized medicine. (40 marks)

1.3. What is the common genetic polymorphism type seen in pharmacogenetic studies? (10 marks)

1.4. List two drugs which inhibit the hepatic metabolizing enzyme. (10 marks)

QUESTION 02 **(100 marks)**

2.1. Discuss on the importance of using model organisms for genetic studies. (30 marks)

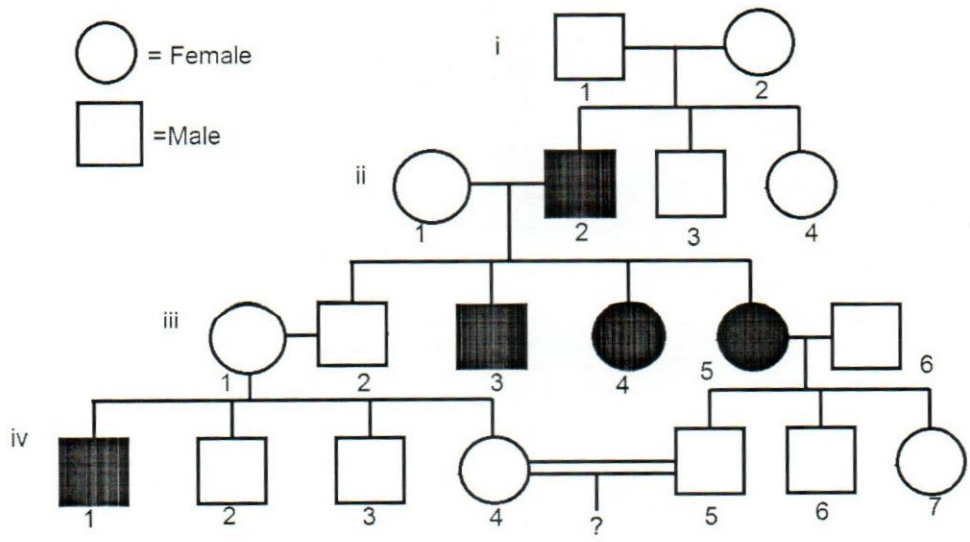
2.2. Write a short note on classification of chromosomes. (30 marks)

2.3. Compare and contrast between lamp brush and giant chromosome types. (20 marks)

2.4. Write an account on applications of genetics. (20 marks)

QUESTION 03 **(100 marks)**

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



3.1.1. Identify the pedigree type by providing reasons. (30 marks)

3.1.2. Mention the genotypes of the affected individuals. (20 marks)

3.1.3. Discuss the probability of the 4th & 5th individuals of generation IV having a child with the trait. (20 marks)

3.2. Write a short note on chromosomal aberrations. (30 marks)

QUESTION 04 **(100 marks)**

4.1. Describe the coupling and repulsion hypothesis of genetic linkage using a diagram. (25 marks)

4.2. Discuss on the significance of genetic linkage. (20 marks)

4.3. State five factors responsible for phenotypic variation. (25 marks)

4.4. Explain the bottle neck effect. (30 marks)

QUESTION 05 **(100 marks)**

5.1 If a mother with sickle cell anemia and a father with sickle cell anemia trait (carrier) have children, calculate the percentages of the offspring with different phenotypes using Punnett square. (35 marks)

5.2 ABO blood type in humans is determined by three alleles: I^A, I^B, i.

5.2.1 What are the possible genotypes for blood group A? (20 marks)

5.2.2 What are the alleles that shows co-dominance? (20 marks)

5.3 A mother of a child with blood type O has blood type A. Discuss the possible genotypes and phenotypes of the father. (25 marks)

QUESTION 06 **(100 marks)**

6.1 Describe the importance of pre-natal testing. (30 marks)

6.2 List two invasive and non-invasive pre-natal diagnostic tests. (20 marks)

6.3 Recently married 40-yearold female and 42-year-old male partners came to the genetic clinic for counseling for planning their pregnancy.

6.3.1 List the steps you would engage with this couple during Genetic counseling session. (20 marks)

6.3.2 State two types of Genetic counseling. (05 marks)

6.3.3 Briefly state the code of ethics in genetic counseling. (15 marks)

6.3.4 List the goals of genetic counseling in this couple. (10 marks)

CINEC CAMPUS
Beyond A Graduate

Faculty of Health Sciences

Higher Diploma in Biomedical Sciences
HD 1253 Instrumentation
Batch 01
1st year 2nd Semester

End Semester SEQ Examination

INDEX NUMBER: .....

Date: 4th April 2022
Time: from 9.00 am to 12.00 pm

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

1.1. Identify two differences between Watch glass and Petri dish. (10 marks)

1.2. Name three (03) instruments used for heating chemical substances in the laboratory. (15 marks)

1.3. Name three (03) pieces of glassware used for heating liquids. (15 marks)

1.4. Write four (04) volumetric glass wares which are used to measure and dispense known volumes of liquids in the laboratory. (20 marks)

1.5. Describe the basic steps of the cleaning of glassware. (40 marks)

Question 02

2.1. Mention two sterilization instruments used in microbiology laboratory. (10 marks)

2.2. When there is an increased concentration of infectious agents in a laboratory, certain biosafety level practices are needed. Therefore, biological safety cabinets (BSCs) are designed to protect the operator, the laboratory environment and work materials from exposure to infectious aerosols and splashes. Mention biosafety cabinet types and their protection types. (40 marks)

2.3. Describe care and maintenance of microscopes. (50 marks)

Question 03

3.1. A modern Chemistry laboratory should be furnished with the different types of equipment. Describe in detail about all equipment and their uses found in this modern molecular biology laboratory. (100 marks)

Question 04

4.1. Define the automated instruments. (20 marks)

4.2. List the fully automated equipment found in Biochemistry Laboratory, Haematology Laboratory and Microbiology Laboratory. (30 marks)

4.3. Describe the applications of above mentioned instrument in Haematology laboratory. (50 marks)

Question 05

5.1. Mention the six laboratory freeze dryers (10 marks)

5.2. Describe applications of Laboratory Freeze Drying (40 marks)

5.3. Describe the applications of Spectrophotometer (50 marks)

Question 06

6.1. Write short note about following instruments

6.1.1. Conventional PCR Machine (25 marks)

6.1.2. Flame Photometry (25 marks)

6.1.3. Liquid Chromatography (25 marks)

6.1.4. Gas Chromatography (25 marks)