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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)

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1.2 List the **four** major components of conduction system of the heart.

(15 Marks)

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1.3 Briefly describe the phases of action potentials of cardiac muscle.

(30 Marks)

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1.4 State the phases of cardiac cycle.

(40 Marks)

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Question 02

(100 Marks)

2.1 List two hormones which are secreted by pancreatic gland.

(15 Marks)

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2.2 State the functions of the hormones stated in question number 2.1

(15 Marks)

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2.3 List the functions of estrogen hormone.

(30 Marks)

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2.4 State the phases of menstrual cycle.

(40 Marks)

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Question 03

(100 Marks)

3.1 List four constituents of bile.

(20 Marks)

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3.2 State the functions of following organs

(30 Marks)

- 3.2.1 Esophagus
- 3.2.2 Stomach
- 3.2.3 Small intestine

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3.3 State the roles of the digestive enzymes secreted by the pancreas.

(50 Marks)

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Question 04

(100 Marks)

4.1 List **three** functions of urinary system.

(30 Marks)

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4.2 Write short notes on the following.

(20 Marks)

- 4.3.1 Nephron
- 4.3.2 Glomerular filtration rate

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4.3 List the **four** constituents in urine.

(20 Marks)

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4.4 State the three phases of urine production.

(30 Marks)

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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:

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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



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 5th 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 12th 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 secretory glands.
3. It lines with simple squamous epithelium.
4. Middle layer of the wall consists of smooth muscle.
5. Outer lining forms rugae.

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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

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1.1.2. Klinefelter Syndrome

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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)

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1.4. Write a short note on applications of genetics.

(25 marks)

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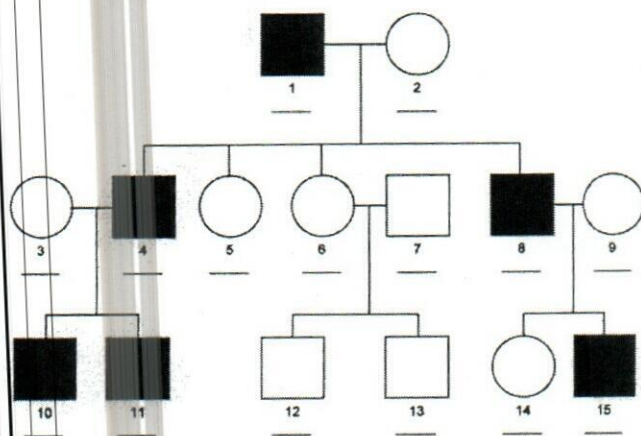
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QUESTION 02

(100 marks)

Answer the following questions referring to the given pedigree chart.



2.1. Identify the above pedigree type.

(30 marks)

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2.2. State the genotypes of the affected individuals.

(30 marks)

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

(40 marks)

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QUESTION 03

(100 marks)

3.1. List invasive and non-invasive pre-natal diagnostic tests.

(20 marks)

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3.2. Mention the importance of pre-natal testing.

(30 marks)

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3.3. State two types of Genetic counseling.

(20 marks)

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3.4. State the importance of genetic counseling.

(30 marks)

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QUESTION 04

(100 marks)

4.1. What is CYP enzyme system ?

(10 marks)

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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)

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4.3. State ADRB1 genetic variation. (20 marks)

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4.4. How does pharmacogenetic testing is helpful in practicing personalized medicine? (40 marks)

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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. $ii \times I^B i$ (20 marks)

5.1.2. $I^A I^B \times I^A i$ (20 marks)

5.1.3. $ii \times I^A i$ (20 marks)

5.2. State three genetic inheritance patterns.

(40 marks)

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QUESTION 06

(100 marks)

6.1. What is the Hardy-Weinberg law and its assumptions?

(40 marks)

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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)

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6.2.2. The frequency of the dominant allele in the population.

(20 marks)

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6.2.3. The percentage of heterozygous individuals (carriers) in the population.

(20 marks)

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

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1.2. Mention the two objectives of Good Laboratory Practice.

(25 marks)

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1.3. State the three Glassware that are commonly used in the Microbiology laboratory.

(25 marks)

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1.4. List four (04) volumetric glassware which are used for heating liquids.

(30 marks)

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Question 02

(100 marks)

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Write short notes for the following instruments.

2.1. Autoclave machine

(25 marks)

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2.2. Incubator

(25 marks)

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2.3. Analytical Balance

(25 marks)

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2.4. Water bath

(25 marks)

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Question 03

(100 marks)

3.1 State the instruments seen in the molecular biology laboratory.

(20 marks)

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3.2. List the main components of a light microscope. (20 marks)

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3.3. Briefly describe the applications of the spectrophotometer in laboratory settings. (20 marks)

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3.4. List the automated instruments and their application in the pathology laboratory. (40 marks)

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Question 04 (100 marks)

4.1 State five principles of Good Microbiological practices. (15 marks)

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4.2 Differentiate the Class I biological safety cabinet and Class II biological safety cabinet. (15 marks)

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4.3 Mention the disinfecting methods used in microbiology laboratory. (30 marks)

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

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Question 05 (100 marks)

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

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

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

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Question 06**(100 marks)**

6.1 List the Good Laboratory Practices used in chemistry laboratory.

(15 marks)

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6.2 State the use of pH meter.

(15 marks)

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6.3 List the types of centrifuge machine used in all the laboratories.

(30 marks)

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6.4 Mention the common chromatography techniques and their application.

(40 marks)

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1.2 Write short notes on following.

1.2.1 Delta nomenclature

(30 marks)

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1.2.2 Beta oxidation

(30 marks)

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QUESTION 02

(100 marks)

2.1 Illustrate a basic structure of a building block of DNA.

(40 marks)

