Manjaree Guha 2/8/19

FOR GOD AND COUNTRY

ST. LAWRENCE HIGH SCHOOL

IHS

A JESUIT CHRISTIAN MINORITY INSTITUTION

PRE-TEST EXAMINATION– 2019

Sub: Life Science **Class: X** **F. M.-75**

Duration: 2hrs 30mins **Date:1.08.2019**

SOLUTION

Group A

(Multiple Choice Questions-13 marks)
(Answer to all questions is compulsory)

1. Write the answer in complete sentence by choosing the correct answer for each question with respective serial number. Mark for each question is 1. (1x13=13)

1.1 Cleistogamous Flower is found in _____ .
a.Ginger **b.*Commelina*** c.*Musa* d.Onion
1.2 Multiple fission cannot be observed in _____ .
a.Bacteria b.*Amoeba* *c.Plasmodium* **d.Algae**
1.3 Avena Coleoptile Test is for _____ .
a.Auxin b.Gibberellin c.Cytokinin d.Ethylene
1.4 Oxytocin hormone is secreted from _____ .
a.Hypothalamus b.Anterior pituitary **c.Posterior pituitary** d.None of these
1.5 _____ involves differentiation of cells,growth & increase in complexity of an organism.
a.Embryogenesis b.Development c.Cell division d.Metabolism
1.6 The chromosome region distal to the secondary constriction is called_____ .
a.Satellite b.Primary constriction c.telomere d. None of these.
1.7Each chromatid contains _____ DNA molecule(s)
a.Many b.Two **c.One** d.Four
1.8 Which of the following hormone is not an amine hormone?
a. Melatonin b.Epinephrine **c.Calcitonin** d.Thyroxine
1.9 The portion which is the exact centre of the retina of eye is called _____ .
a.Macula **b.Fovea** c.Blind spot d.None of these
1.10Which of the following is an example of unconditioned reflex?
a.Jumping at the sound of a loud noise b.Salivation on smellingfavourite food
c.applying brake while driving when red light appears d.feeling sick at a location where a person was attacked in the past.
1.11 The location of a gene is called_____.
a.Allele b.niche **c.Locus** d.Chromosome
1.12 A _____ is the alternative form of a Character
a.Allele **b.Trait** c.Both a & b d.none of these
1.13 Which one is Homozygous?
a.BB b.Bb c.Both a & b d.None of these

GROUP B

(Very Short Answer Type Questions-16 marks)

2.Answer the questions given below.The mark for each question is 1.

Fill in the blanks with proper word in the following sentences : (1x4=4)

2.1 Chromosome number gets reduced during **meiosis**.

2.2 **Mendel** is called the father of genetics.

2.3 The swollen base of the petiole is called **pulvinus.**

2.4 The other name of Luteotropic Hormone is **prolactin**.

Decide whether the following statements are True or False (1x4=4)

2.5 In human two copies of brown eye alleles are necessarily required for a person to have brown eyes. **FALSE**

2.6 T_4 is more active than T_3 . **FALSE**

2.7 Rod & Cone cells are present in blind spot of eyes. **FALSE**

2.8 The Deoxyribose sugar in DNA is a hexose sugar. **FALSE**

Match the words in column A with those which are most appropriate in column B and rewrite the correct pairing mentioning the serial number of both columns. (1x5=5)

Column A	Column B
2.9 Type -1 Diabetes mellitus	a. moving parts of body towards midline**(2.11)**
2.10 Abduction	b. Adult onset diabetes**(2.13)**
2.11 Adduction	c.Form myelin sheath**(2.12)**
2.12 Glial cells	d. Juvenile onset diabetes**(2.9)**
2.13 Type -2 Diabetes mellitus	e.moving parts of bodyaway from midline **(2.10)**

Answer in a single word or in a single sentence (1x4=4)

2.14 What is Dysphagia?

Difficulty swallowing foods or liquids caused as a result of Goitre.

2.15 What does midbrain, pons & medulla together refer to as?

Brain stem

2.16 Give an example of a medial rotator muscle.

Gluteus medius

2.17 What is Nucleosome?

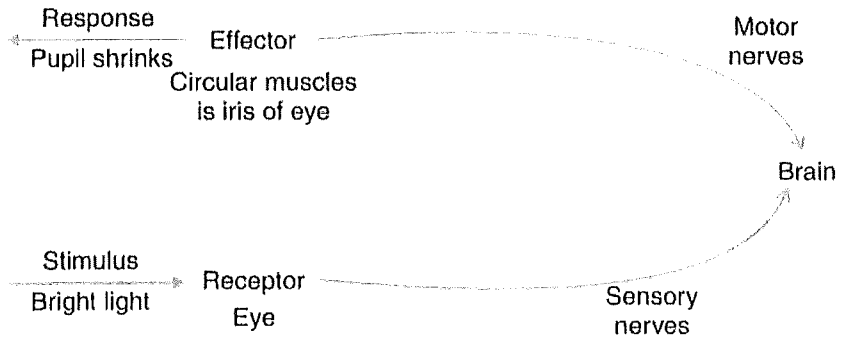
DNA wrapped around the histone core of eight protein subunit forms nucleosome.

GROUP C

Short Answer Type Question: (2x10=20) 3.

Answer in 2-3 sentences.The marks for each question are 2.

3.1 Write the sequence of events in a simple reflex action with the help of flowchart.



3.2 Define Chemonastic movement with a suitable example.

The nastic movement occuring in response to some chemical stimulus ,e.g. strong chemonasty is exhibited by long peripheral tentacles of sundew leaves(Drosera) which respond to the presence of organic nitrogenous compounds by bending towards the middle of leaf .

3.3 State two important characteristics of Animal Hormones .

- ***Most of the animal hormones are water soluble & are derived from amino acids,peptides or proteins ,Hydrophilic in nature & interact with receptor molecules on the surface of the membrane.***
- ***Hormones are directly secreted in to the blood stream, and effect different target tissues.***

3.4 How are steroid hormones circulated in the human body?

Steroid hormones are least soluble or insoluble in aqueous solution & OVER 90% circulate in blood as complexes bound to specific plasma globulins or albumin.

3.5What is Kinetochore?

Trilamellar protein disc shaped structure present at the centromere of chromosomes to which the spindle fibres get attached durinf cell division.

3.6 Write two points of difference between Euchromatin & Heterochromatin.

Euchromatin	*Heterochromatin*
1.Portions of chromosomes that stain lightly are only partially condensed. ***2.Genetically active chromatin containing region having structural genes.***	***1.Dark staining regions which remain in the condensed state.*** ***2.Contain repetitive DNA sequence & not transcribed .***

3.7 Differentiate between Prometaphase & Metaphase.

ProMetaphase- The chromosome tends to get attached with the spindle & Align themselves on the equatorial plate.
Metaphase- The chromosomes have already got attached with the spindle & have already aligned themselves on the metaphasic plate.

3.8 Define Regeneration process of Reproduction with an example.

Regeneration is the type of asexual reproduction in animals where the part of the animal is cut off into fragments which grow & produce an entire organism.,e.g,Planaria sp.

3.9 What is tissue culture?

The process in which small pieces of plant body are propagated in semi-solid or liquid media containing essential nutrients & phytohormones in aseptic condition ,whwn the pieces grow into an undifferentiated mass of tissue called callus followed by differentiation into an entire organism.

3.10 Differentiate between Homozygous & Heterozygous organism.

Homozygous organism-It means that it has two copies of the same allele for a particular gene.It can be homozygous dominant if it carries two copies of the same dominant allele or recessive if carries two recessive alleles of the same gene.

Hetyrezygous organism-The organism carries two different alleles of the same gene for example-pea plants can have red flowers & either be homozygous dominant (red-red) or heterozygous (red-white).If they have white flowers then they are homozygous rece4ssive (white-white).

GROUP D

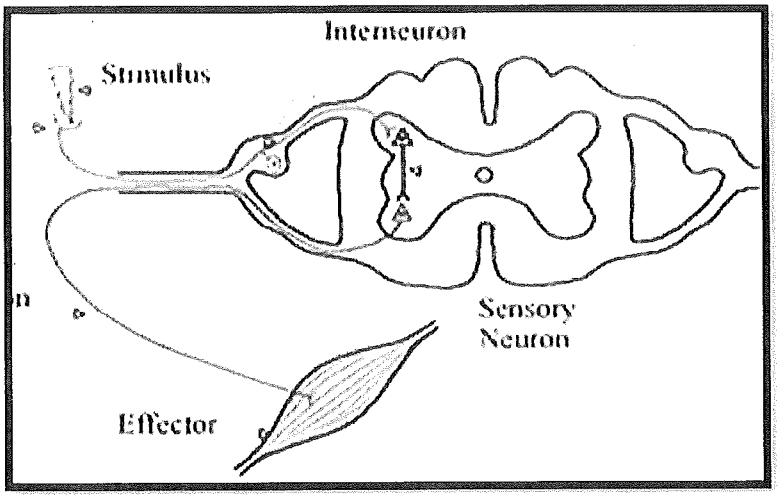
Long Answer Type Questions (5x5=25)

4. Write any 5 questions or their alternatives given below:

4.1 Draw a neat diagram of Reflex Arc. Label the following: (3+2)

a)Afferent neuron b) Efferent neuron

c)Interneuron d)Receptor organ



4.2 Differentiate between Exocrine & Endocrine Glands. Name the lobe of cerebral cortex which helps in hearing. (4+1)

Differences between exocrine and endocrine glands

Endocrine glands	Exocrine glands
Without ducts	With ducts
Secretions are poured directly into the blood	Secretions are poured directly into cavity through duct
Secrete hormones	Produce juice containing enzymes biological catalysts
Secretions are in minute quantity/ small change in secretion leads to disorders	Secretions are in large quantity. small changes no problem
Eg.Hypothalamus	
Pituitary	Eg. Salivary glands
Thyroid & parathyroid	Gastric glands
Suprarenal	Pancreatic acini
Islets of Langerhans	
Ovary Testes	

4.3Differentiate between Movement & Locomotion.What are Myotomes? (3+2)

MOVEMENT	*LOCOMOTION*
• ***Movement can happen with or without moving away from the organism's original position.*** • ***Movement can be either voluntary or involuntary.*** • ***Movement, on the other hand, implies the following basic mechanisms:*** • ***Amoeboid (in amoeba and certain cells in other organisms, such as the movement of leucocytes in the blood of humans)*** • ***Ciliary (in ciliated protozoans)*** • ***Muscular (in most vertebrates, which includes the types of locomotion cited above)***	• ***Locomotion involves moving away from the original position of the organism.*** • ***Locomotion is typically a voluntary movement.*** • ***Locomotion in animals can fall under the following broad types:*** • ***Aerial (flying)*** • ***Arboreal (living in and moving through trees)*** • ***Aquatic (moving on water)*** • ***Cursorial (running)*** • ***Fossorial (digging and living underground)*** • ***Saltatorial (jumping or hopping)***

Undulatory swimming in fish is powered by the segmental body musculature of the myotomes ('V' shaped muscles). Power generated by this muscle and the interactions between the fish and the water generate a

backward-travelling wave of lateral displacement of the body and caudal fin. The body and tail push against the water, generating forward thrust. The muscle activation and strain patterns that underlie body bending and thrust generation have been described for a number of species and show considerable variation.

4.4 Give a brief description of the different parts of a chromosome with a suitable diagram.(5)

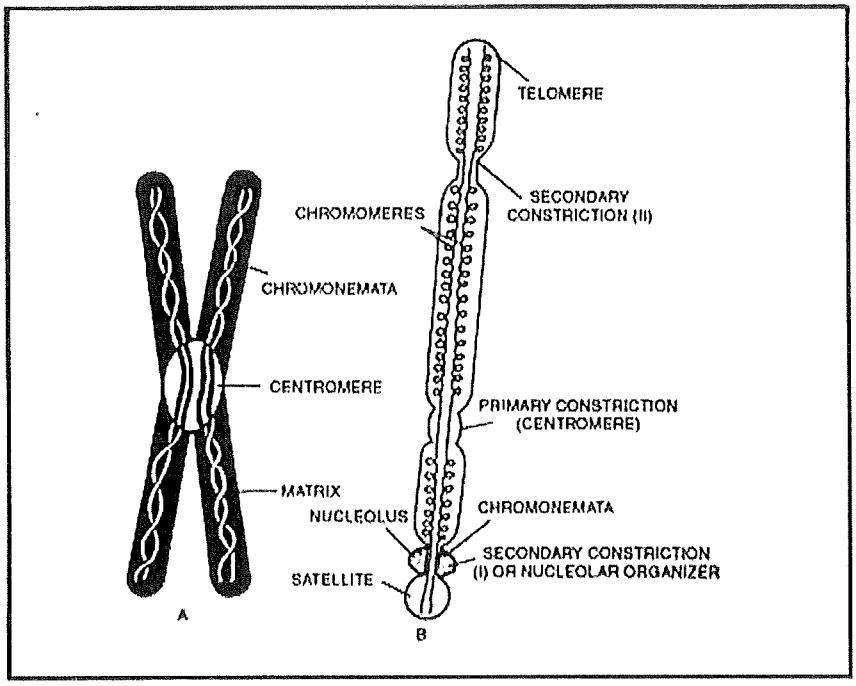


Fig. 49. Structure of chromosome (in metaphase stage)

Part # 1. Pellicle and Matrix:
A membrane, which surrounds each chromosome, is said as pellicle. A jelly substance present inside the membrane is called as matrix. Presumably the matrix and sheath are considered as non-genetic material.
Part # 2. Chromatids, Chromonema and Chromomeres:
The most important and constant constituent of the cell nucleus is chromatin. The chromosomes are made up of chromatin. The structure of the chromosome is best studied in late prophase, metaphase and anaphase. During early prophase a chromosome appears to consist spirally coiled thin or filamentous long continuous structure called as chromonema (plural—chromonemata).
Part # 3. Centromeres (= Primary constriction):
The constricted non-stained portion of chromosome is known as centromere. It is the specific part of the chromosome where spindle fibres are attached. The position of centromere is constant for a particular chromosome.
The structure and function of the centromere is different from that of the rest of chromosome. During division, the centromere is functional while the rest part of the chromosome is genetically inactive.
In mitosis, metaphasic chromosomes which consist of two chromatids, four granules may be seen within the centromere. These granules are called centromeric chromomeres, and are about 0.5 micron in size. They are arranged in square.
During anaphase, when the two chromatids separate, each chromatid (chromosome) show two granules. At the same time duplication of the centromere occurs during mitosis and meiosis. The centromere is considered to be an extended region of the chromonema.
Part # 5. Satellite:
This is another structure exhibited by some chromosomes. These are terminal portion of the chromosome beyond the secondary constriction. Satellites are elongated, round shaped, variable in size. The chromosome with a satellite is referred to as 'SAT-chromosome'. There are at-least two SAT-chromosomes in each diploid nucleus. Many polyploid species, however, have only two SAT-chromosomes. For example, hexaploids wheat.
Part # 6. Telomere:
The tips or the terminal ends of chromosomes are called telomeres. The telomere differs in structure and composition from the rest of the chromosome. It has a unique property that it prevents the ends of the chromosomes from sticking to each or one another.

If the chromosomes ends are broken by X-ray radiation, the newly formed broken ends undergo fusion. A telomere will not, however, unite with a broken end, nor will two telomeres unite. Telomeres are specially modified portion of the chromosomes for attachment to the nuclear membrane.

4.5 Differentiate between Mitosis & Meiosis. What is Crossing Over? (3+2)
Differences between mitosis and meiosis:

	Meiosis	Mitosis
1.	It is carried out in germ cells or gametic cells.	It is carried out in somatic cells.
2.	It involves crossing over.	It does not involve crossing over.
3.	It involves two division, first meiotic division and second meiotic division.	It involves one division.
4.	Synapsis occurs leading to tetrad formation.	No synapsis occurs.
5.	Number of daughter cells formed is four.	Number of daughter cells formed is two.
6.	Interphase occurs only before first meiotic division and no interphase is seen before second meiotic division.	Each mitotic division is followed by interphase.

During prophase I of meiosis, non-sister chromatids of the homologous chromosomes may exchange their segments reciprocally known as crossing over. So there may be mixture of paternal and maternal genes that will result into a genotype, which is partly paternal and partly maternal. However crossing over is a matter of chance that may occur or may not. Crossing over of non-sister chromatids results into an X-shaped structure called chiasma. Hence crossing over is the cause and chiasma is the effect.

4.6 Give one important point of difference between the cytokinesis of Animal & Plant cell.Diffrentiate between Self-pollination & Cross-pollination.

CYTOKINESIS IN PLANTS	*CYTOKINESIS IN ANIMALS*
• *There is cell plate formation at the cytokinesis phase* • *Cell plate formation begins from the center to the periphery.*	• *No cell plate formation and cytokinesis takes place but furrowing.* • *Cell plate formation begins from the periphery to the center.*

SELF AND CROSS POLLINATION :-

SELF POLLINATION	*CROSS POLLINATION*
• *Takes place easily and rate of success is very high* • *Daughter plants show repetition of characters* • *Need not depend on agents for pollination* • *Seed collection becomes easy* • *Seeds produced are of low quality* • *No scope of formation of new species or variety*	• *Chance of pollination and fertilization is uncertain* • *Pollinating agents are required* • *Probability of high quality plants* • *Many pollens are lost* • *Daughter plants are stong and adapt to any environment*