



ST. LAWRENCE HIGH SCHOOL



A JESUIT CHRISTIAN MINORITY INSTITUTION SECOND TERM EXAMINATION

Sub: LIFE SCIENCE

Class: X

F.M:75

Duration: 2 hours 30 Minutes

Date: 30.07.2018

Group-A

A. Choose the correct option :-

1x12=12

- i) Moving away from the midline is
 - (1) Abduction
 - (2) Adduction
 - (3) Flexion
 - (4) Rotation
- ii) Pseudopodia is the locomotory structure in
 - (1) Paramecium
 - (2) Amoeba
 - (3) Protozoa
 - (4) Euglena
- iii) Multiple fission may be observed in
 - (1) Algae
 - (2) Bacteria
 - (3) Fungi
 - (4) Plasmodium
- iv) Cytoplasmic division is called
 - (1) Cytokinesis
 - (2) Mitosis
 - (3) Karyokinesis
 - (4) Meiosis
- v) Avena coleoptile test is for
 - (1) Auxin
 - (2) Gibberellin
 - (3) Cytokinin
 - (4) Ethylene
- vi) Stress is reduced by
 - (1) ADH
 - (2) Adrenaline
 - (3) Renin

- (4) STH
- vii) Milk releasing hormone is
- (1) Oxytocin
 - (2) Vasopressin
 - (3) TnRH
 - (4) TSH
- viii) The sugar in DNA is
- (1) Pentose
 - (2) Hexose
 - (3) Triose
 - (4) Heptose
- ix) The irregular flower is also called
- (1) Zygomorphic
 - (2) Actinomorphic
 - (3) Didynamous
 - (4) Tetradynamous
- x) The following flower is wind pollinated
- (1) Paddy
 - (2) Hydrilla
 - (3) Shimul
 - (4) Mango
- xi) Adolescence is between
- (1) 0-10 years
 - (2) 10-15 years
 - (3) 15-20 years
 - (4) 20-30 years
- xii) The full form of CDK is
- (1) Cyclin Dependent Kinase
 - (2) Cyclin Dominated Kinase
 - (3) Cyclic Dominated Kinase
 - (4) Cyclic Dependent Kinase

Group-B

A. Fill in the blanks (any four):-

1x4=4

- i) Each cell of human body contain _____ pair of chromosomes.
- ii) The process of necessary adjustment of focal length of the lens in human eye is called _____
- iii) Guanine is a _____ type of nitrogenous base.
- iv) Retrises in birds are located in _____
- v) Ribosomes help in _____ synthesis.

B. State True or False (any four) :-

1x4=4

- i) Uracil is present in RNA.
- ii) There are three sex chromosomes in human body
- iii) Pituitary is also called hypophysis.
- iv) Hypermetropia is corrected using concave lens
- v) Arthrology is the study of nerves.

C. Match the following (any four) :-

1x4=4

- | | |
|------------------------|----------------------|
| i) Cilia | a) Pituitary |
| ii) Sclera | b) white part of eye |
| iii) Growth hormone | c) stamen |
| iv) Androecium | d) Mitosis |
| v) Equational division | e) Paramoecium |

D. Give one word for the following :-

1x4=4

- i) Resting phase of cell cycle
- ii) Portion of chromosomes that are highly stained
- iii) Swelling of thyroid gland
- iv) Antagonistic muscles in fishes
- v) Mode of reproduction in yeast

Group- C

A. Answer the following questions (any eleven) :-

2x11=22

1. Write two differences between DNA and RNA
2. What is binary fission? Give an example of an organism having this mode of reproduction
3. What are synthetic hormones? Give one example.
4. Differentiate between mitosis and meiosis (two points).
5. What is the function of LH? Where is it released from?
6. What is senescence?
7. Define amitosis with one example.
8. What are synovial joints?
9. What is the importance of G1 and S phase of cell division?
10. What is bipedalism?
11. What are secondary constrictions? How are they different from primary constrictions?
12. What are the functions of 'rods' and 'cones' of the retina?
13. Write the characteristics of the mitotic metaphase .
14. What is the role of centrosomes in cell division?
15. What is telomere?
16. Write two importance of the cell cycle.

Group- D

1. Draw a neat diagram of the section of human eye and label 5
- i. Sclera
 - ii. Iris
 - iii. Pupil
- Or
- Write three merits and two demerits of self and cross pollination. 3+2=5
2. What are the post fertilization events in plants? Describe the structure of gynoecium. 2+3=5
- Or
- Explain 'alternations of generations in plants. 5
3. Describe the structure of DNA 5
- Or
- Write the cause , problems, and correction of Myopia. 2+2+1=5
4. Explain 'synapse' in neuron. Write one of its functions. 4+1=5
- Or
- Write the types of transport of phytohormones. 5
5. What is accommodation? Write the mechanism of the eye to see distant and nearby objects. 1+4=5
- Or
- Write two differences between plant and animal mitosis. Why are prophase and telophase considered opposite to each other? 2+3=5
-



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PRE-TEST EXAMINATION

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Answer key

Group-A

A. Choose the correct option :-

1x12=12

i) Moving away from the midline is

Abduction

ii) Pseudopodia is the locomotory structure in

Amoeba

iii) Multiple fission may be observed in

Plasmodium

iv) Cytoplasmic division is called

Cytokinesis

v) Avena coleoptile test is for

Auxin

vi) Stress is reduced by

Adrenaline

vii) Milk releasing hormone is

Oxytocin

viii) The sugar in DNA is

Pentose

ix) The irregular flower is also called

Zygomorphic

- x) Adolescence is between
 (1) 0-10 years
 (2) 10-15 years
 (3) 15-20 years
 (4) 20-30 years
- xi) The full form of CDK is
 Cyclin Dependent Kinase

Group-B

- A. Fill in the blanks (any four):- 1x4=4
- i) Each cell of human body contain 23 pair of chromosomes.
 - ii) The process of necessary adjustment of focal length of the lens in human eye is called accomodation.
 - iii) Guanine is a Purine type of nitrogenous base.
 - iv) Retrices in birds are located in tail
 - v) Ribosomes help in protein synthesis.
- B. State True or False (any four) :- 1x4=4
- i) Uracil is present in RNA. (TRUE)
 - ii) There are three sex chromosomes in human body (FALSE)
 - iii) Pituitary is also called hypophysis (TRUE)
 - iv) Hypermetropia is corrected using concave lens (FALSE)
 - v) Arthrology is the study of nerves. (FALSE)
- C. Match the following (any four) :- 1x4=4
- i) Cilia- e)Paramoecium
 - ii) Sclera - b) white part of eye
 - iii) Growth hormone- a) Pituitary
 - iv) Androecium- c) stamen
 - v) Equational division- d)Mitosis
- D. Give one word for the following :- 1x4=4
- i) Resting phase of cell cycle – G0
 - ii) Portion of chromosomes that are highly stained- HETEROCHROMATIN
 - iii) Swelling of thyroid gland- GOITRE
 - iv) Antagonistic muscles in fishes -MYOTOME
 - v) Mode of reproduction in yeast- BUDDING

Group- C

- A. Answer the following questions(any eleven) :- 2x11=22
1. Differences between DNA and RNA are:

DNA	RNA
1. Presence of deoxyribose sugar	1. Presence of ribose sugar
2. Thymine is present instead of Uracil	2. Uracil is present instead of Thymine
3. Double stranded	3. Single stranded

2. Binary fission- When a cell divided by mitosis to produce two identical daughter cells.

An example of an organism having this mode of reproduction is Amoeba.

3. Synthetic hormones-The chemical compounds which act as plant growth regulators and can be synthesised in the laboratory .

Example – NAA, 2,4-D, IPA, etc.

4. Differences between mitosis and meiosis are :

MITOSIS	MEIOSIS
<ul style="list-style-type: none"> • Takes place in somatic cells • Equational division takes place and two diploid daughter cells of identical characters are produced • Chromosomes and nucleus divide only once • No crossing over and chiasma takes place. 	<ul style="list-style-type: none"> • Takes place in germ mother cells after maturity • Reductional division takes place as four haploid cells are produced from the mother cells • Chromosomes divides only once and nucleus divides twice. • Crossing over and chiasma takes place

5. Function of LH-

- Stimulates the gonads to produce sex hormones – estrogens in females and testosterone in males.

Released from Pituitary gland.

6. Senescence – It is a period of considerable adjustment to changes in one's life and self-perceptions . Certain aspects of sensory and perceptual skills, muscular strength, and certain kinds of memory tend to diminish with age . This phase is from sixty five years and above.

7. Amitosis – It is a direct division . Amitosis occurs in prokaryotes and protozoans. The nucleus and cell body undergo a simple mass division into two parts, each of which can grow into new complete organism.

8. Synovial joints- The only joints that have a space between the adjoining bones. These are freely movable joints mostly present between limb bones. At synovial joints the adjacent bones are so shaped that an enlargement of one bone fits into a depression of the other. Example- knees, elbows, shoulders.

9. Importance of G1 and S phase of cell division:

- G1 phase- cells increase in size, produce RNA, and synthesize proteins. G1 checkpoint ensures that everything is ready for DNA synthesis.
 - S phase- DNA replication occurs which requires to produce two daughter cells.
10. Bipedalism- a major type of locomotion involving movement on two feet. It occurs in human beings.
11. Secondary constrictions- The constricted region of the chromosome other than primary constriction containing nuclear organizer . They are useful in identifying a particular chromosome in a set.

Difference between primary constrictions and secondary constrictions:

PRIMARY CONSTRICTION	SECONDARY CONSTRICTION
<ul style="list-style-type: none"> • Chromosomes bend only at the primary constriction or centromere • Not associated with nucleolus 	<ul style="list-style-type: none"> • Chromosomes do not bend at secondary constrictions. • Associated with nucleolus . so, they are also called Nucleolar Organiser Region.(NOR)

12. Functions of 'rods' and 'cones' of the retina:

- Rods – have high light sensitivity allow seeing in poor light , they are also responsible for peripheral vision.
- Cones - need plenty of light for functioning , allow distinguishing small details and ensuring colour appreciation.

13. Characteristics of the mitotic metaphase :-

- The chromosomes migrate towards the equator of the spindle.
- Each chromosome becomes more compact and short and its two chromatids separate except at the centromere which has not divided so far.
- Kinetochore microtubules align the chromosomes in one plane to form the metaphase plate .
- Centromeres lie on the equatorial plane while the chromosome arms are directed away from the equator called auto- orientation.

14. Role of centrosomes in cell division:

- Contains two centrioles oriented at right angles to each other.
- Microtubules grow out from each centrosome with their ends growing towards the metaphase plate. The microtubule spokes radiate from a central site occupied by the centrosome, which is the primary microtubule organizing centre.(MTOC)
- Help in the movement of chromosomes in the anaphase.

15. Telomere-It is the end of chromatid. Repetitive DNA are situated at the ends of the chromosomes. Telomeres protect the ends of the chromosomes from damage and stop them from becoming attached to each other.

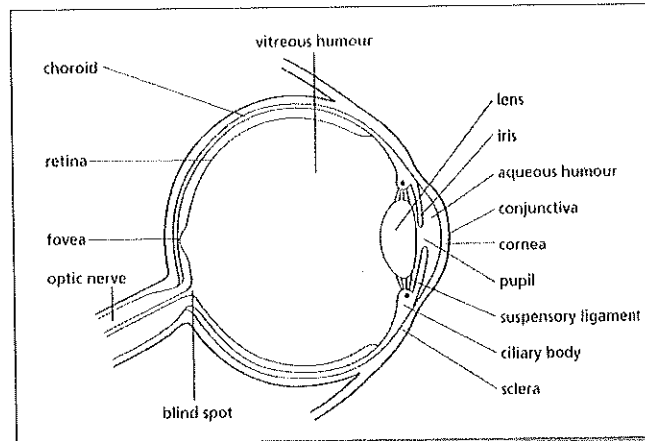
16. Importance of the cell cycle:

- Coordination between the interphase and dividing phase is maintained

- All the events occur in their appropriate time failing of which may result into withdrawal of cell division or uncontrolled cell division.

Group- D

1. SECTION OF HUMAN EYE :



Or

MERITS AND DEMERITS OF SELF AND CROSS POLLINATION :-

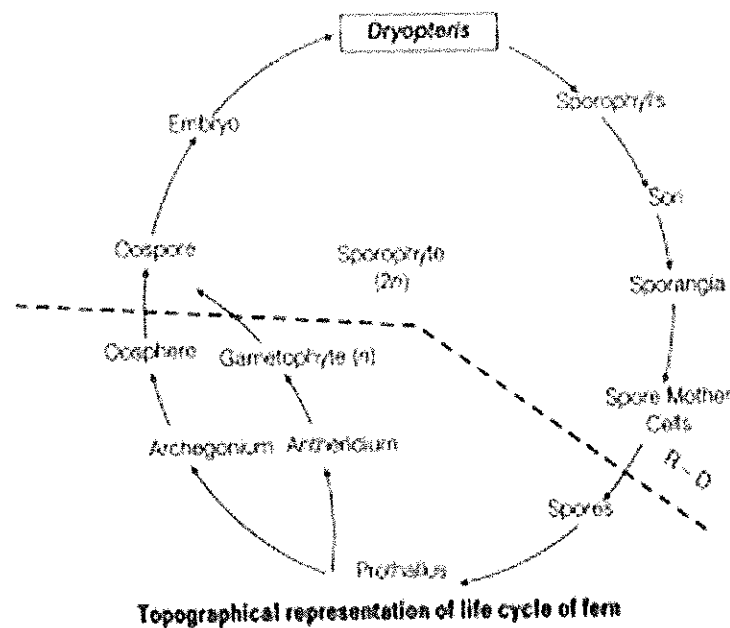
SELF POLLINATION MERITS	SELF POLLINATION DEMERITS
<ul style="list-style-type: none"> • Takes place easily and rate of success is very high • Daughter plants show repetition of characters • Need not depend on agents for pollination • Seed collection becomes easy 	<ul style="list-style-type: none"> • Seeds produced are of low quality • No scope of formation of new species or variety
CROSS POLLINATION MERITS	CROSS POLLINATION DE MERITS
<ul style="list-style-type: none"> • Probability of high quality plants • Daughter plants are strong and adapt to any environment 	<ul style="list-style-type: none"> • Pollinating agents are required • Chance of pollination and fertilization is uncertain • Many pollens are lost

2. POST FERTILIZATION EVENTS IN PLANTS:-

- Ovary gets transformed to fruits
- Ovule to seed
- Other floral parts dry and fall off

Or

'ALTERNATIONS OF GENERATIONS IN PLANTS.'



The progressive sequence of changes through which an organism goes from the moment of fertilization to death intervened with simple or diversified somatic growth, development and differentiation constitutes the life cycle. In course of life cycle the organism produces a new generation of individuals by asexual or sexual reproduction involving mitosis and meiosis and repeat the process. This sequence of events occur both in sexually reproducing plants and animals involving the cyclic alternation of two generations- diploid and haploid or vice versa in succession to complete the life cycle. This diploid phase is intervened between syngamy and meiosis. Two phases have different structure and function.

The haploid phase represents the gamete producing plants, the gametophyte and the spore producing plants, the sporophyte, represents the diploid phase. The two generations may be independent, dependent or partially dependent.

3. THE STRUCTURE OF DNA

- Double helical chain
- Consists of a pentose sugar – deoxyribose sugar
- Nitrogenous bases – Purines – Adenine, Guanine ; Pyrimidines- Cytosine and Thymine
- Nucleotides, nucleosides
- Presence of hydrogen bonds- two bonds between A and T; 3 bonds between C and G
- The nitrogenous bases form the steps of the ladder
- Phosphoric acid are also present.

Or

CAUSE , PROBLEMS, AND CORRECTION OF MYOPIA.

Cause : This problem arises if the power of the eye is too great due to the decrease in focal length of the lens . this may be due to -

- i)excessive curvature of the cornea
- ii)elongation of the eyeball

Problems :

- i) Focus of the object does not fall on the retina but in front of the retina.
- ii)Problem in seeing objects which are far away.

Correction :

By using Concave lens
(May provide diagram)

4. 'SYNAPSE' IN NEURON.

- A synapse is a structure that permits to pass an electrical or chemical signal to another neuron. Information from one neuron flows to another neuron across a synapse. It contains a small gap separating neurons .
- It consists of –a) A pre synaptic knob-containing neurotransmitters, mitochondria and other cell organelles b) A post synaptic knob – contains receptors for neurotransmitters and c) a synaptic cleft- space between pre and post –synaptic knob.

Function-

- At the synaptic terminal, an electric impulse will trigger the migration of the vesicles towards the pre-synaptic membrane . The vesicle membrane will fuse with the presynaptic membrane releasing the neurotransmitters into the

synaptic cleft. The neurotransmitter molecules then diffuse across the synaptic cleft where they bind with the receptor sites on the post synaptic ending .

- (provide a suitable diagram)

Or

TYPES OF TRANSPORT OF PHYTOHORMONES. (elaborate each point)

- Within the cell they follow cyclosis around the large central vacuole or smaller vacuoles.
- In between two adjacent cells, they follow the cytoplasmic streaming movement through the plasmodesmatal connections .
- It follows upward translocation through xylem vessels .
- It can also follow the transcellular strands across the sieve plate , passing through the sieve plate regions.

5. ACCOMMODATION.

The process in which by the movement of ciliary muscles the curvature of the lens is so adjusted that the focus falls on the yellow spot of the lens so that a bright image of the object is seen. It is a reflex action of the eye in response to focusing on a near object, then looking at a distant object (and vice versa).

Looking at distant objects:

Ciliary muscles relaxed---- lens becomes thin ----- focal length of the lens increases.

Looking at objects closer to the eye:

Ciliary muscles contract ---- increases curvature of the lens ----- lens becomes thick---- focal length of the lens decreases.

Or

DIFFERENCES BETWEEN PLANT AND ANIMAL MITOSIS.

MITOSIS IN PLANTS	MITOSIS IN ANIMALS
<ul style="list-style-type: none"> • No centriole is present and aster formation in plant cell • There is cellplate formation at the cytokinesis phase 	<ul style="list-style-type: none"> • A pair of centrioles move apart to elongate the astral rays. • No cell plate formation and cytokinesis takes place bt furrowing.

Prophase and Telophase are considered opposite to each other because:

- IN PROPHASE:-

- ✓ Nucleus become spherical and cytoplasm becomes more viscous.
- ✓ The chromatin slowly condenses to form well defined chromosome
- ✓ Chromatin threads coil and become shorter to form chromosomes
- ✓ Each chromosome is already doubled due to the doubling of DNA contents in interphase
- ✓ The spindle begins to form

- IN TELOPHASE :-

- ✓ Chromosomes reach the pole of the spindles and spindle fibres retract.
- ✓ Chromosomes uncoil and form chromatin net
- ✓ Kinetochore microtubules disappear
- ✓ The nuclear wall and nucleolus reappear.
