Virudhunagar District

STD XI Quarterly Exam September 2024

BIOLOGY Marks : 70

Time: 3 Hrs

Part – I Bio – Botany Marks: 35

Section – A

Answer All the Questions: **8 x 1 = 8**

1. d. I-D, II-C, III-B, IV-A
2. c. 18
3. b. multicarpellary, Apocarpous ovary
4. a. In Pisum sativum leaflets are modified into tendrils
5. d. serotaxonomy
6. b. i,ii, iii
7. b. movement of chromosomes towards pole
8. a. Zero

Section – B

Answer any Four of the following: **4 x 2 = 8**

9. Plectostele: Xylem plates alternates with phloem plates. ---------- 1 Mark
Example: Lycopodium clavatum ---------- 1 Mark

11. Photosynthetic roots :Roots of some climbing or epiphytic plants develop chlorophyll and turn green which helpin photosynthesis.
Example: Tinospora, Trapa natans, Taeniophyllum ---------- 2 Marks

12.Uses of molecular taxonomy ---------- 2 Marks

1. Molecular taxonomy helps in establishing the relationship of different plant groups at DNA level
2. It unlocks the treasure chest of information on evolutionary history of organisms

13. It is used for studying detailed structrue of viruses, mycoplasma, cellular organelles, etc

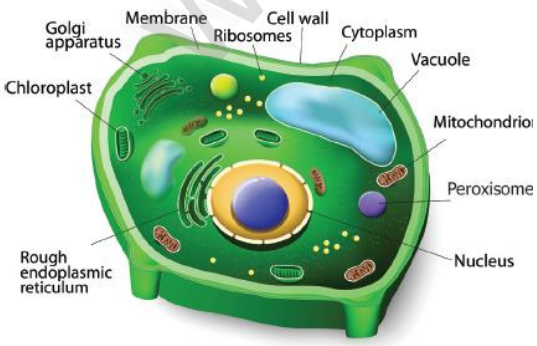
14. Nucleoside : It is a combination of base and sugar.
Example:denosine = Adenine + Ribose
Nucleotide:It is a combination of nucleoside and phosphoric acid.
Example: Adenylic acid =Adenosine + Phosphoric acid ---------- 2 Marks

Section – C

Answer Any Three of the following : Q. No: 19 is compulsory 3 x 3 = 9

15. The cells are arrested in G1 phase due to
- Nutrient deprivation
- Lack of growth factors or density dependant inhibition
- Undergo metabolic changes and enter into G 0 state.

16.



17. Lianas (woody stem climber) : Woody perennial climbers found in tropical forests are lianas. They twine themselves around tall trees to get light.
Example: Hiptage benghalensis, Bauhinia vahlii.

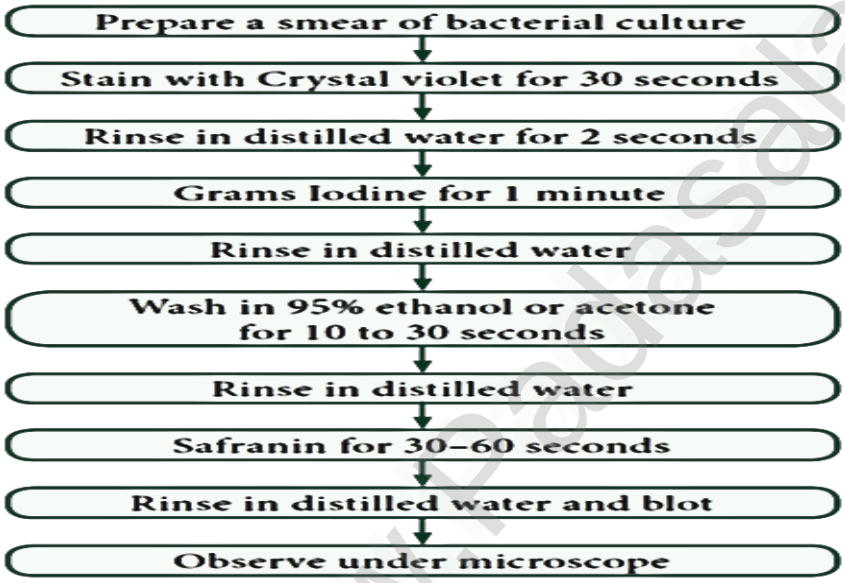
18. Living Characters
• Presence of nucleic acid and protein.
• Capable of mutation
• Ability to multiply within living cells.
• Able to infect and cause diseases in living beings.
• Show irritability.
• Host –specific

19. Yes the shape of the chloroplast is unique to algae.Variation among the shape of the chloroplast is found in members of algae. It is cup shaped (Chlamydomonas), discoid (Chara), girdle shaped, (Ulothrix), spiral (Spirogyra), reticulate (Oedogonium), stellate (Zygnema) and plate like (Mougeoutia).

Section – IV

Answer All the Questions 2 x 5 = 10

20. Bacteria – Gram staining steps



b.Aestivation: Arrangement of Sepals and Petals in the flower bud

A . Valvate: Margins of sepals or petals do not overlap but just touch each other.
Example: Calyx in members of Malvaceae, Calotropis, Annona.

B. Twisted or Convolute or Contorted: One margin of each petal or sepal overlapping on the other petal. Example: Petals of Chinarose.

C. Imbricate: Sepals and petals irregularly overlap on each other; one member of the whorl is exterior,one interior and rest of the three having one margin exterior and other interior.
Example: Cassia, Delonix

There are 3 types: 1. Ascendingly imbricate; 2. Quincuncial; 3. Vexillary.
D. Quincuncial: It is a type of imbricate aestivation in which two petals are external and two internal and one petal with one margin internal and the other margin external. Example: Guava, Calyx of Ipomoea, Catharanthus. Essential Parts of Flower
E Vexillary: Large posterior petals both margins overlap lateral petals. Lateral petals other margin overlaps anterior petals. Example: Pea, Bean.

21. a **Botanical description of *Datura metel*** ---------- 5 Marks

Habit: Large, erect and stout herb.
Root: Branched tap root system.
Stem: Stem is hollow, green and herbaceous with strong odour.
Leaf: Simple, alternate, petiolate, entire or deeply lobed, unicostate reticulate venation.
Inflorescence: Solitary and axillary cyme.
Flower: Flowers are large, greenish white, bracteate, ebracteolate, pedicellate, complete, pentamerous, regular, actinomorphic, bisexual and hypogynous.
Calyx: Sepals 5, green synsepalous showing valvate aestivation. Calyx is mostly persistent,
Corolla: petals 5, greenish white, sympetalous, plicate (folded like a fan) showing twisted aestivation.
Androecium: Stamens 5, free from one another, epipetalous,. Anthers are basifixed, dithecous, with long filament
Gynoecium: Ovary bicarpellary, syncarpous superior ovary, basically bilocular but tetralocular due to the formation of false septum. Carpels are obliquely placed and ovules on swollen axile placentation. Style simple long and filiform, stigma two lobed.
Fruit: Spinescent capsule opening by four apical valves with persistent calyx.
Seed: Endospermous.

b. Difference Between Mitosis and Meiosis

Mitosis	Meiosis
One division	Two divisions
Number of chromosome remain the same	Number of chromosomes is halved
Homologous chromosomes line up separately on the metaphase plate	Homologous chromosomes line up in pairs at the metaphase plate
Homologous chromosome do not pair up	Homologous chromosome pairup to form bivalent
Chiasmata do not form and crossing over never occurs	Chiasmata form and crossingover occurs
Daughter cells are genetically identical	Daughter cells are genetically different from parent cell
Two daughter cells are formed	Four daughter cells are formed

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Part – II Bio- Zoology

Section – A

Answer All the Questions: **8 x 1 = 8**

1. b. Taxon
2. a. Ichyophis
3. c. Coelenterata
4. d. VC = ERV+TV+IRV
5. a. collagen
6. c. Mesonephric.
7. a. Production of insulin
8. c. Bring interstitial fluid in blood

Section – B

Answer any Four of the following: **4 x 2 = 8**

9. In 1859 Charles Darwin in his book **Origin of species** explains the evolutionary connection of species by the process of natural selection. --------- 1 Mark
10. The trochophore larva is found in Phylum Annelida. ---------- 2 Marks
11. The triangular muscles that are responsible for blood circulation in the cockroach are called **alary muscles** (13 pairs). ---------- 2 Marks
12. The fluid inside the lymphatics is called **lymph.** ---------- 1 Mark
    Functions: Lymphocytes collected in the lymphatic fluid are carried via the arterial blood and are recycled back to the lymph. Fats are absorbed through lymph in the lacteals present in the villi of the intestinal wall. ---------- 1 Mark
13. A person whose diet has less iron is suffering from Anaemia. Symptoms: Fatigue, Tiredness. Weakness. Shortness of breath. Irregular heartbeat. Dizziness Chest pain.
14. There are are of four different types (**heterodont**), namely, Incisors (I) chisel like cutting teeth, Canines (C) dagger shaped tearing teeth, Pre molars (PM) for grinding, and Molars (M) for grinding and crushing. Arrangement of teeth in each half of the upper and lower jaw, in the order of I, C, PM and M can be represented by a dental formula, in human the dental formula is 2123 / 2123 x 2 ---------- 2 Marks

Section – C

Answer Any Three of the following: Q. No 19 is compulsory 3 x 3 = 9

15. **Elastic Fibers** : In Dense irregular connective tissues, some elastic fibres are also present. It is found in the skin as the leathery dermis and forms fibrous capsules of organs such as kidneys, bones, cartilages, muscles, nerves and joints. ----------1 ½ Mark
    Elastic connective tissue contains high proportion of elastic fibres. It allows recoil of tissues following stretching. It maintains the pulsatile flow of blood through the arteries and the passive recoil of lungs following inspiration. ---------- 1 ½ Mark
16. In stomach the food is mixed with gastric juice and make it into a creamy liquid called **chyme.** In intestine food is made simple substances and absorbed by villi ------- 3 Marks
17. **Pneumonia**– Inflammation of the lungs due to infection caused by bacteria or virus is called pneumonia. The common symptoms are sputum production, nasal congestion, shortness of breath, sore throat etc.
    Pneumonia whether caused by virus or bacteria the symptoms very dangerous or even to fatal , so pneumonia is considered as a dangerous disease.

18. **open type circulatory system** : in which the blood remains filled in tissue spaces due to the absence of blood capillaries ---------- 1 ½ Marks
closed type circulatory system : in which the blood is circulated through blood vessels of varying diameters (arteries, veins and capillaries) ---------- 1 ½ Marks

19.

Blood group	Agglutinogens (antigens) on the RBC	Agglutinin (antibodies) in the plasma
A	A	Anti B
B	B	Anti A
AB	AB	No antibodies
O	No antigens	Anti A and Anti B

Section – IV

Answer All the Questions: 2 x 5 =10

20. a. **Rules of Nomenclature** ---------- **5 Marks**

- The scientific name should be italicized in printed form and if handwritten, it should be underlined separately.
- The generic name's (*Genus*) first alphabet should be in uppercase.
- The specific name (*species*) should be in lowercase.
- The scientific names of any two organisms are not similar.
- The name or abbreviated name of the scientist who first publishes the scientific name may be written after the species name along with the year of publication. For example Lion-*Felis leo* Linn., 1758 or *Felis leo* L., 1758.
- If the species name is framed after any person's name the name of the species shall end with i, ii or ae.

For example, a new species of a ground dwelling lizard (Cyrtodactylus) has been discovered and named after Scientist Varad Giri, *Cyrtodactylus varadgirii*.

Or

b. Epithelial tissue is a sheet of cells that covers the body surface or lines the body cavity. --- 1 Mark
Simple epithelium is composed of a single layer of cells. They are found in the organs of absorption, secretion and filtration. Simple epithelial tissue is further classified
The **squamous epithelium** is made of a single thin layer of flattened cells with irregular boundaries.
The **cuboidal epithelium** is made of a single layer of cube like cells.
The **columnar epithelium** is composed of single layer of tall cells with round to oval nuclei at the base. The two modifications of this lining are the presence of **microvilli** on the apical surface of the absorptive cells and **Goblet cell** which secretes the protective lubricating mucus.
If the columnar cells bear cilia on their free surfaces they are called **ciliated epithelium**.

Pseudo-stratified epithelial cells are columnar, but unequal in size. Although the epithelium is single layered yet it appears to be multi-layered because the nuclei lie at different levels in different cells. Hence, it is also called pseudostratified epithelium.

Glandular epithelium Some of the cuboidal or columnar cells get specialized for secretion and are called **glandular epithelium.**

They are mainly of two types: unicellular, consisting of isolated glandular cells (goblet cells of the **alimentary canal**), and multicellular, consisting of cluster of cells (**salivary gland**).

Any four ------- 4 Marks

21. a. ---------- 5 Marks

Events in inspiration and expiration

Inspiration	Expiration
Respiratory centre initiates the stimuli during inspiration.	Respiratory centre terminates the stimuli during expiration.
The diaphragm and exspiratory muscles contract.	The diaphragm relax but internal intercostal muscles contract.
The thoracic volume increases as the chest wall expands.	The thoracic volume decreases as the chest wall contracts.
The intra pulmonary pressure is reduced.	The intra pulmonary pressure is increased.
The alveolar pressure decreases than the atmospheric pressure	The alveolar pressure increases than the atmospheric pressure.
Air is taken inside due to expansion of alveoli.	Air is sent out due to the contraction of alveoli.
Air flows into the alveoli until the alveolar pressure equalizes the atmospheric pressure and the alveoli get inflated.	Air flows out of the alveoli until the alveolar pressure equalizes the atmospheric pressure and the alveoli get deflated.

b. **Origin and conduction of heart beat** ---------- 5 Marks

The heart in human is myogenic (cardiomyocytes can produce spontaneous rhythmic depolarisation that initiates contractions).

The cardiac cells with fastest rhythm are called the **Pacemaker cells**, since they determine the contraction rate of the entire heart. These cells are located in the right **sinuatrial (SA) node/ Pacemaker**.

On the left side of the right atrium is a node called a**uriculo ventricular node** (AV node). Two special cardiac muscle fibres originate from the auriculo ventricular node and are called the **bundle of His** which runs down into the interventricular septum and the fibres spread into the ventricles. These fibres are called the **Purkinje fibres**.

Pacemaker cells produce excitation through depolarisation of their cell membrane. Early depolarisation is slow and takes place by sodium influx and reduction in potassium efflux. Minimum potential is required to activate voltage gated calcium (Ca+) channels that causes rapid depolarisation which results in action potential. The pace maker cells repolarise slowly via K+ efflux.

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