

BIOLOGY PART A - **BOTANY**

ANSWER KEY

I Answer any three from 1 to 5 (1 x 3 = 3)

1. a. comma shaped bacteria : Vibrio
b. paramecium : Ciliated protozoan
2. c. Singer and Nicolson
3. a. Phellem (cork) b. Phelloderm (sec. cortex)
4. b. the cells are living
5. A - S phase (Synthesis Phase) B – G₂ phase (Gap 2)

II Answer any nine from 6 to 16 (9 x 2 = 18)

6.

Root modification	Example
a. Stilt root	Sugar cane
b. Storage root	Carrot
c. Pneumatophore	Rhizophora
d. Prop root	Banyan tree

7. The two ways used to synthesize amino acids are reductive amination and transamination. In reductive amination, ammonia react with α -keto glutaric acid to form glutamic acid./ its equation. (any one)

In transamination, the amino group from an amino acid (glutamate) is transferred to the keto group of a keto acid to form other amino acids. / its equation / from glutamate, NH₂ group is transferred to keto acids(OAA) to form other amino acids like aspartic acid. (any one)

8. A – Radial vascular bundle B – Conjoint open vascular bundle

In radial VB, xylem and phloem are arranged in an alternate manner along different radius or as separate groups. In conjoint open VB, xylem and phloem are situated along the same radius and cambium is present between them.

9. a. Gracilaria, Gelidium
b. used for culturing microbes / preparation of ice creams and jellies (any one)

10. a. Vesicles, Tubules, Lamellae
- b. cell wall formation / DNA replication and distribution to daughter cells / respiration / secretion / increase the surface area of plasma membrane (any one)
11. Apoplast pathway – movement of water through the cell wall and intercellular spaces / movement of water through the outer space of the cells / it does not cross the plasma membrane / water can freely move / movement of water is through mass flow. (any two)
- Symplast pathway – movement of water through protoplast and plasmodesmata / movement of water through the inner space of the cells / it cross the plasma membrane / movement is slower (any two)
12. a. Lysosome, Vacuole, ER, Golgi complex
- b. it is a group of membranes and organelles in eukaryotic cell that functions in a coordinated manner.
13. a. chamber B
- b. Chamber B
- c. A to B
- d. diffusion of water molecules through a semi permeable membrane / movement of water molecules from higher con. to lower con. / Movement of water molecules from higher water potential to lower water potential / movement of water molecules from lower solute potential to higher solute potential (any one)
14. Mitochondria.
- A – inner membrane, B- matrix, C – inter membrane space, D – crista
15. creates transpiration pull for absorption and transport / supplies water for photosynthesis / transport minerals from soil to all parts of the plant / cools leaf surface by evaporative cooling / make cells turgid thereby maintains shape and structure of cells (any two)

16.

Leptotene	Zygotene	Pachytene	Diplojene
Chromosomes become gradually visible	Formation of synaptonemal complex	Appearance of recombination nodule	X shaped chiasmata are formed

III Answer any three from 17 to 20 (3 x 3 = 9)

17. i. the element must be absolutely necessary for the normal growth and reproduction.
ii. the requirement of an element is specific and cannot be replaced by another element.
iii. the element must be directly involved in the metabolism of the plant.

18. a. A – metaphase, B - Anaphase

b. Metaphase – spindle fibres get attached with the centromere of each chromosome / chromosomes are arranged at the equator of the cell / maximum condensation of chromosomes takes place / nuclear membrane completely disappeared (any two)

Anaphase - centromere of each chromosome split and chromatids separate / chromatids move to opposite poles

19. a. Monocot root and Dicot stem

b.

Monocot root	Dicot stem
More than six radial VB	Large no. of VB arranged in the form of a ring
Xylem round in shape	Cambium present b/w xylem and phloem
Xylem is exarch	Xylem is endarch

20. a. Fabaceae

b. corolla – petals five, polypetalous, papilionaceous, have a large petal called standard petal, two lateral petals called wing petals, two anterior petals called keel petals, vexillary aestivation. (any two)

androecium – stamens ten, diadelphous with (9) + 1 arrangement, anther dithecous

c. any pulses like gram, sem, moong, soyabean etc, ground nut, indigofera, sunhemp, sesbania, lupin, sweet pea etc.(any one)