

30.4 BIOLOGY (231)

30.4.1 Biology Paper 1 (231/1)

1. (a) Xylem.
(b) Phloem.
(c) Apical meristem. **(3 marks)**

2. (a) **Ultrafiltration**:- to remove toxic/ harmful substances/urea/nitrogenous waste from the blood stream.
(b) **Selective reabsorption**:- to return useful substances/glucose and amino acids back into the blood stream. **(2 marks)**

3. (a) Hepatitis B.
(b) (i) *Vibrio cholera*.
(ii) *Candida vaginalis/albicans/vaginitis*. **(3 marks)**

4. (a) The red blood cell was placed in a hypertonic solution; it lost water by osmosis; and became crenated. **(2 marks)**

5. (a)
 - Temperature; pH; co-factors; co-enzyme; substrate concentration
 - Cell wall inhibitors; enzyme concentration; product concentration. **(2 marks)**

6. (a) Failure of homologous/sister chromatids to segregate during meiosis.
(b) Height; weight/mass; length of toe/finger. **(3 marks)**

7. (a) Preserved remains of dead organisms that lived in ancient times.
(b) Convergent evolution occurs when two dissimilar species/structures/organisms of different embryonic origin change in response to similar environmental conditions and develop similar characteristics/modified to perform similar functions. **(4 marks)**

8. (a) Anaphase.
(b) (i) Chromatid pairs move towards opposite pole/ends of the cell/sister chromatids separate.
(ii) The spindle apparatus have disappeared/spindle fibres have disappeared.
(iii) Root tip/shoot tip/young leaves. **(4 marks)**

9.
 - Basal metabolic rate (B.M.R); sex.
 - Occupation/activity; age; body size. **(3 marks)**

10. (a) Antigens A; and B/rhesus factors/rhesus antigens/antigen D.
(b) Pliable/flexible/able to change its shape. **(3 marks)**

11. (a) The ability of organisms to maintain a stable/constant internal environment.

(b)
 - Breathing mechanism/gaseous exchange.
 - Thermoregulation/temperature regulation.
 - Osmoregulation/regulation of water and ions/excretions.
 - Regulation of blood sugar level/glucose; regulation of pH value . **(4 marks)**

12.
 - Transport of protein.

- Transport/synthesis of lipids/steroids.
 - Provision of sites of attachment of ribosomes.
 - Stores calcium in skeletal muscles.
 - Storage of proteins/enzymes/hormones.
 - Detoxification of organic materials. (2 marks)
13. (a) Fovea/yellow spot/fovea centralis.
 (b) Image is
 - upside down/inverted.
 - back to front/reversed.
 - smaller than object/diminished.
 - real. (3 marks)
14.
 - **Growth**:- increase in numbers/decrease in numbers/change in numbers/growth rate.
 - **Dispersion**:- spread or distribution of organisms in a habitat.
 - **Density**:- the number of individuals per unit area. (3 marks)
15. Muscles are subjected to respire anaerobically resulting in accumulation of lactic acid in the tissue; causing fatigue/muscle cramps. (2 marks)
16. (a) Photosynthesis.
 (b)
 - Carbon IV oxide (concentration).
 - Temperature.
 - (Amount) of chlorophyll. (2 marks)
17. (a) **Lag phase**:- the number of cells dividing are few/the cells have not yet adjusted to the surrounding environmental factors.
 (b) **Plateau phase**:- most cells fully differentiated/few cells are still dividing. Rate of cells dividing is equal to rate of cells dying. (2 marks)
18.
 - Transparent to allow light to penetrate the photosynthetic tissue;
 - Single layer of cells/thin to reduce distance over which light penetrates;
 - Photosynthetic tissue;
 - Presence of stomata for gaseous exchange;
 - Closely fitting cells to protect inner tissue. (2 marks)
19. (a) Cardiac muscle/tissue.
 (b) Contraction of the heart. (2 marks)
20. (a) Circulatory system in which blood passes through two capillary systems before flowing back to the heart/blood passes only once through the heart to complete the circuit.
 (b) Earthworm/Leech/Ragworm/fish.
 (c) Ostium. (3 marks)
21. (a) A state during which a seed cannot germinate/resting before seed germination.
 (b) Abscisic acid. (2 marks)
22.
 - Large air spaces.
 - Thin cell walls. (2 marks)
23. (a) Canine.
 (b) pointed/sharp for piercing/tearing/cutting food.
 (c) (i) **C**:- maintenance of healthy cells promotes absorption of iron/prevents scurvy/quick healing of wounds/prevents bleeding of gum/boosts immunity.

- (ii) **K**:- Participates in clotting of blood. (4 marks)
24.
 ▪ **Light reaction**:- Grana.
 ▪ **Dark reaction**:- Stroma. (2 marks)
25.
 ▪ **Bean plant**:- Dicotyledonae; leaves are net-veined/leaves with petiole/star-shaped xylem with Phloem in between arm of xylem/tap root system.
 ▪ **Bat**:- Mammalia; presence of fur/hair/mammary glands. (4 marks)
26. (a) **Colchicine**:- Used in inducing polyploidy.
 (b) **Papain**:-Used as meet tenderizer. (2 marks)
27. (Anaerobic) micro organism/break down harmful substances in sewage. (1 mark)
28. (a) Budding.
 (b) (i) **Protandry**:- stamens/anthers/male parts mature before the carpels/pistil/female parts/Stigma of a flower.
 (ii) **Protogyny** :- carpels mature before the stamens of a flower. (3 marks)
29. Cushions foetus against shock/provide a suitable medium for embryo to grow. (1 mark)
30. (a) Pelvic girdle.
 (b) Femur.
 (c) Obturator foramen. (3 marks)

30.4.2 Biology Paper 2 (231/2)

1. (a)
 ▪ **F**:- Oestrogen.
 ▪ **G**:- Progesterone. (2 marks)
- (c)
 ▪ **F** :- Promotes healing and repair of the uterus.
 ▪ **G** :- Causes thickening of the uterine lining. (2 marks)
- (c) (i) Leutinizing hormones.
 (ii)
 ▪ Causes ovulation.
 ▪ Induces graafian follicle to become corpus luteum. (3 mark)
- (d) 12th to 16th day (1 mark)
2. (a) Parental genotypes
 ▪ Round seed plants – Rr.
 ▪ Wrinkled seed plants – rr. (2 marks)
- (c) Gametes from
 P1 i Rr → R and r
 P2 ii rr → r and r (2 marks)