

**FIRST YEAR HIGHER SECONDARY EXAMINATION – JANUARY - 2022**

**FY – 426**

**PART – III**

**BIOLOGY (BOTANY & ZOOLOGY)**

**SCORING KEY (UNOFFICIAL)**

**PART -A**

**BOTANY**

Qn. No.	Scoring indicators	Marks
	<b>PART - I</b>	
1.	Eukaryote	1
2.	Racemose	1
3.	Metaphase	1
4.	Ethylene / Ethephon	1
5.	(ii) / Saprophytes : absorb organic matter from dead substrates	1
6.	Ammonification	1

**PART - II**

7. Male sex organ - Antheridium  
Female sex organ – Archegonium  
(Correct response without specifying male/female give full score) 1+1 = 2

8.	A	B	
	(i) Chloroplast	Contains chlorophyll	
	(ii) Amyloplast	Store carbohydrates	
	(iii) Elaioplast	Store oils and fats	
	(iv) Chromoplast	Contains carotenoids	$\frac{1}{2} \times 4 = 2$

9. Contain only one types of cells  
Parenchyma / Collenchyma / Sclerenchyma ( Any two examples) 1 + 1 = 2

10. (a) Palisade and spongy parenchyma. 1 + 1 = 2  
(b) Photosynthesis.

11. The number of chromosomes in the parent and progeny cells is the same so it is called as equational division. / Chromosome number does not change. 2

Qn. No.	Scoring indicators		Marks				
12.	<table border="1"> <thead> <tr> <th>Dicot root</th> <th>Dicot stem</th> </tr> </thead> <tbody> <tr> <td>(a) Presence of casparian strips (c) Two or four xylem and phloem patches</td> <td>(b) Vascular bundle arranged in the form of ring. (d) Conjoint, open vascular bundle with endarch protoxylem.</td> </tr> </tbody> </table>	Dicot root	Dicot stem	(a) Presence of casparian strips (c) Two or four xylem and phloem patches	(b) Vascular bundle arranged in the form of ring. (d) Conjoint, open vascular bundle with endarch protoxylem.		$\frac{1}{2} \times 4 = 2$
Dicot root	Dicot stem						
(a) Presence of casparian strips (c) Two or four xylem and phloem patches	(b) Vascular bundle arranged in the form of ring. (d) Conjoint, open vascular bundle with endarch protoxylem.						
13.	Apoplast pathway & Symplast pathway		1 + 1 = 2				
14.	<p>Help in cell wall formation, DNA replication and distribution to daughter cells. They also help in respiration, secretion process, to increase surface area of the plasma membrane and enzymatic content.</p> <p style="text-align: right;">( Any two points)</p>		1 + 1 = 2				
15.	<p>(i) Minerals are present in the soil as charged particles / ions which cannot move across cell membranes</p> <p>(ii) The concentration of minerals in the soil is usually lower than the concentration of minerals in the root</p>		1 + 1 = 2				
16.	<p>Alternate - Single leaf in each node in alternate manner. Eg :- China Rose, Mustard</p> <p>Opposite - Two leaves in each node arranged in opposite manner.</p> <p style="text-align: center;">Eg:- Calotropis &amp; Guava</p> <p style="text-align: right;">( Example for each type give 1 Score)</p>		1 + 1 = 2				
17.	<p>Metacentric chromosome - has middle centromere forming two equal arms</p> <p>Sub-metacentric chromosome – has centromere slightly away from the middle of the chromosome</p> <p>Acrocentric chromosome - has centromere situated close to its end.</p> <p>Telocentric chromosome - has a terminal centromere</p> <p style="text-align: right;">(Any one type of chromosome give full score)</p>		1 + 1 = 2				
18.	<p>(a) Rhodophyceae</p> <p>(b) Green algae</p> <p>(c) Brown algae</p> <p>(d) Starch</p>		$\frac{1}{2} \times 4 = 2$				
19.	<p>Impermeable and hard seed coat / presence of chemical inhibitors such as abscissic acids, phenolic acids, para-ascorbic acid / Immature embryos are some of the reasons which causes seed dormancy.</p> <p style="text-align: right;">( Any two points)</p>		1 + 1 = 2				

Qn. No.	Scoring indicators	Marks
20.	(a) Carboxylation, Reduction and regeneration (b) RuBP / Ribulose -1,5-bisphosphate	1½+½ = 2
21.	(a) Partial breakdown of glucose into two molecules of pyruvic acids / equation Glucose $\longrightarrow$ 2 mol. Pyruvicacid (b) Cytoplasm	1 + 1 = 2
22.	PEP is the primary CO <sub>2</sub> acceptor / Oxaloacetic acid is the first stable compound / PEP case is the Carboxylation enzyme / Kranz anatomy present / C <sub>3</sub> cycle occur inside bundle sheath cell / Productivity high / Photorespiration absent / CO <sub>2</sub> fixation occur at low CO <sub>2</sub> concentration  ( Any two points)	1 + 1 = 2
23.	(a) NADPH and ATP formed (c) Splitting of water occur (d) Both photosystem involved (f) Oxygen is evolved	½ x 4 = 2
24.	(a) Chlorophyll b / Xanthophylls / Carotenoid (b) absorb light and transfer the energy to reaction Centre / chlorophyll a	1 + 1 = 2

### PART – III

25.	Aerobic respiration	Anaerobic respiration
	<ul style="list-style-type: none"> <li>• Respiration occur in the presence of oxygen.</li> <li>• Complete oxidation of substrate occur.</li> <li>• CO<sub>2</sub>, H<sub>2</sub>O and ATP are produced.</li> <li>• Occur in cytoplasm and mitochondria</li> <li>• High energy output</li> </ul>	<ul style="list-style-type: none"> <li>• Respiration occur in the absence of oxygen.</li> <li>• Partial oxidation of substrate occur.</li> <li>• Ethanol / Lactic acid and less amount of ATP is produced.</li> <li>• Occur in cytoplasm</li> <li>• Low energy output</li> </ul>

( Any two differences)

Ethanol & CO<sub>2</sub>

26.	(a) Abscisic acid. (b) Gibberellins / GA. (c) Auxins	2 + 1 = 3
27.	(a) Leptotene , Zygotene , Pachytene , Diplotene , Diakinesis (b) Pachytene	1+1+1 = 3 2 + 1 = 3

Qn. No.	Scoring indicators	Marks
28.	(a) The compounds that are oxidized during cell respiration / Compound undergo respiration. (b) carbohydrates / proteins / fats / organic acids	1+2= 3
	( Any two)	
29.	Symbiotic nitrogen fixing bacteria contact the root hairs. The root hair secrete some chemicals into the soil. Root hair curl around the nitrogen fixing bacteria Bacteria enter inside the root hairs. An infection thread is formed carrying the bacteria into the cortex of root. Bacteria cause uncontrolled growth of cortical cell. This uncontrolled growth produce root nodule.	$\frac{1}{2} \times 6 = 2$
	( Any six points)	
30.	(a) A – Valvate B – Twisted C – Vexillary (b) 5 petals – 1 large standard petal, 2 lateral wing petals and 2 united keel petals / Papilionaceous corolla	$1\frac{1}{2} + 1\frac{1}{2} = 3$

**PART – B**  
**ZOOLOGY**

Qn. No.	Scoring indicators	Marks
<b>PART – I</b>		
1.	Cerebrum	1
2.	Vital capacity / VC	1
3.	GLUT – 4 / GLUT	1
4.	Tricuspid valve	1
5.	Ichthyophis	1
6.	Tapeworm	1
<b>PART – II</b>		
7.	(a) Parapodia / Metamerism* (*If students consider comb plate as general character) (b) Malpighian tubules	1 + 1 = 2
8.	(a) Hemichordata (b) Worm like animals / organ system level of organization / bilateral symmetry Triploblastic / coelomate / body is divided into proboscis, collar and a long trunk / Collar region contain a rudimentary stomochord / open type of circulation / Gills are the respiratory organ / Proboscis gland are the excretory organ. ( Any two characters)	1 + 1 = 2
9.	SA Node → AV Node → Bundle of His → Purkinje fibers → Ventricle	2
10.	(a) Manual provide information for identification of name of species found in an area	2
11.	(a) Parietal cells secrete HCl (c) Gastric juice does not contains nucleases / Gastric juice contains Pepsinogen / HCl.  (Identifying (a) & (c) half score)	1 + 1 = 2
12.	A – Crop - Used for storing of food. B – Gizzard / Proventriculus – Helps in grinding of food. Hepatic caeca or Gastric caeca – Secrete digestive juice	½ x 4 = 2
13.	(a) Hinge joint (b) Pivot joint (c) Gliding joint (d) Saddle Joint  (Ball and Socket Joint ½ Score)	½ x 4 = 2

Qn. No.	Scoring indicators	Marks
14.	(a) Photopic vision – Daylight vision / with the help of cone cells Scotopic vision – Twilight vision / with the help of rod cells	
	(b) Olfactory receptors – Sense of smell Gustatory receptors – Sense of taste	1 + 1 = 2
15.	Calcium / Ca <sup>2+</sup> Ca <sup>2+</sup> bind with troponin subunit of actin filaments and thereby expose the active sites for myosin.	1 + 1 = 2
16.	(a) A – Hormone receptor complex B – Genome / DNA / mRNA (b) Estrogen / Progesterone / Estradiol / Testosterone / Cortisol (Any two correct response)	1 + 1 = 2
17.	(a) Melatonin. (b) Thymus gland (c) Immunity / Differentiation of T-lymphocytes / Provide cell mediated immunity Production of antibody / Involved in humoral immunity. ( Any correct response) (d) Testis	½ x 4 = 2
18.	No. Body plan of Coelenterates, Ctenophora and Echinodermata are different. ( If it is body symmetry it can be substantiated using radial symmetry ) ( Types of body plan not explained in SCERT text)	2
19.	(a) Sea horse / Hippocampus (b) Osteichthyes / Bony fishes (c) They include both marine and freshwater fishes / They have bony endoskeleton / Mouth is terminal / Gills are covered by operculum / Cycloid, Ctenoid scales present / Air bladder present ( Any two correct responses)	1 + 1 = 2
20.	(a) Disaccharidases / Maltase / Lactase / Sucrase / Dipeptidases / Lipases / Nucleosidases (b) Di and Monoglycerides $\xrightarrow{\text{Lipases}}$ Fattyacids + Glycerol	1 + 1 = 2

**Qn. No.** **Scoring indicators** **Marks**

21. (a) A – Bone B - Cartilage  
(b)

Bone	Cartilage
<ul style="list-style-type: none"> <li>• Intercellular material is hard and non-pliable</li> <li>• Hard in nature</li> <li>• Cells are called osteocytes</li> </ul>	<ul style="list-style-type: none"> <li>• Intercellular material is solid and pliable</li> <li>• Soft in nature</li> <li>• Cells are called chondrocytes</li> </ul>

( Any two correct responses)

1 + 1 = 2

22. (a) Tetany.  
(b) Arthritis.  
(c) Osteoporosis  
(d) Gout

½ x4 = 2

23. (a) A – Adenine / Purine B – Uracil / Pyrimidine  
(b) Adenosine  
Uridine

½ x4 = 2

24. ANF can cause vasodilation / dilation of blood vessels and thereby decrease the blood pressure. ANF mechanism acts against the renin-angiotensin mechanism.

2

### PART – III

25. Tight junction – help to prevent leakage of material across tissues.  
Adhering junction – Keep neighboring cell together.  
Gap junction – Provide connection between cytoplasm & help in transfer of materials.

1+1+1=3

26.

Porifera	Arthropoda	Mollusca
Spicules Spongocoel	Compound eye Antenna ?	Mantle Foot

(Name of Phylum not needed since it was not mentioned in question)

1+1+1=3

27. During inspiration  
The diaphragm contract  
External intercostal muscle contract and lift the ribs and sternum  
During expiration  
The diaphragm relax  
Intercostal muscle relax that return the diaphragm and sternum to normal position  
(Any two correct response/muscle name give full score)

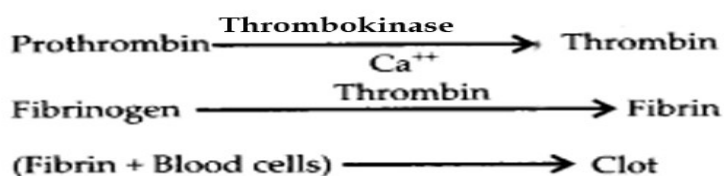
1½ +1½=3

<b>Qn. No.</b>	<b>Scoring indicators</b>	<b>Marks</b>
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28. The formation of clot or coagulum on the wound prevent excessive loss of blood.
- Clot is formed mainly of a network of threads called fibrins in which dead and damaged formed elements of blood are trapped.
  - Fibrins are formed by the conversion of inactive fibrinogens in the plasma by the enzyme thrombin.
  - Thrombins in turn are formed from another inactive substance present in the plasma called prothrombin.
  - An enzyme complex, thrombokinase, is required for the above reaction.

OR

The formation of clot or coagulum on the wound prevent excessive loss of blood.



1+1+1=3

29. Receptor → Afferent neuron → Inter neuron in spinal cord → Motor neuron → Effector organ

3

30. (a) Non- protein part of an enzyme is called Co-factor

(b)

1. Prosthetic group

Tightly bound organic molecules

Eg:- Haem in peroxidase

2. Co-enzyme

Transiently bound organic molecules

Eg:- NAD or NADP

3. Metallic ion

Inorganic ions

Eg:-  $\text{Zn}^{2+}$ ,  $\text{Cu}^{2+}$

( Any 2 types of co-factor example or explanation give 2 score)

1+2 = 3