Biology Sample Paper

Marking Scheme

(Marking scheme and Hints to solution)

Note: (Any other relevant answer not given here in but given by the candidate be also suitably awarded)

Q.No.	Value Points	Marks allotted to each value point/key point	Total marks
	SECTION A		
1	(c) Related orders form the category class	1	1
2	(d) dominant sporophyte	1	1
3	(d) Vasopressin- diuretic	1	1
4	(c) endothelium of glomerular blood vessels →basement membranes →epithelium of Bowman's capsule	1	1
5	(c) A-2, B-1, C-3	1	1
6	(d) presence of milk producing glands	1	1
7	(a) 104→ 95→40	1	1
8	(b) A-iv, B-iii, C-ii, D-i	1	1
9	(b) E, C, B, A,D	1	1
10	(c) 1-C, 2-A, 3-D, 4-B	1	1
11	(b) Triglyceride: - 1 Glycerol, 2 unsaturated fatty acids, 1 saturated fatty acid	1	1
12	(c) Epigynous	1	1
13	(a) Both A and R are true and R is the correct explanation of A.	1	1
14	(a) Both A and R are true and R is the correct explanation of A.	1	1
15	(c) A is true but R is false.	1	1
16	(b) Both A and R are true and R is not the correct explanation of A.	1	1

	SECTION B		
17	Athlete B -More myoglobin/ mitochondria; -aerobic muscles **OR** -Hypothalamus stimulated by activated osmoreceptors; -ADH/ vasopressin released from neurohypophysis; -Water reabsorption from latter parts of tubule; -Increase in body fluid volume/blood pressure leading to increase in GFR	1 ½ ½ ½ ½ ½ ½	2
18	(i) The walls are embedded with silica and are indestructible. (ii) Spores have true walls.	1 1	2
19	(a) 2,4-D (2,4 dichlorophenoxy acetic acid) (b) NAA (Naphthalene Acetic Acid) -help initiate rooting in stem cuttings/promote flowering e.g. in pineapples. (any other correct answer)	1 ½ ½	2
20	ii- Heteropolymer i, iii, iv- Homopolymer	½ ½ x3	2
21	(a) A- Pseudocoelom, B- Acoelomate condition *Fasciola* (Platyhelminthes)- Acoelomate condition (b) *Cucumaria* (Echinodermata) are coelomates/ body cavity is lined by mesoderm.	½ + ½ ½ ½	2

SECTION C			
22.	a) A- vital capacity;maximum volume of air a person can breathe in after a forced expiration/ maximum volume of air a person can breathe out after a forced inspiration. b) B- Inspiratory reserve volume-the additional volume of air that can be inspired after a forcible inspiration. C – Expiratory reserve volume- the additional amount of air that can be expired by a forcible expiration. **OR** a) Oxygen Dissosciation curve. b) (i) Maximum pCO_2 at point 1 (ii) Minimum H^+ at point 3	½+½ ½+ ½ ½+ ½ 1 1 1	3
23.	a) Plant A; It's a C4 plant showing more productivity at higher temperatures. b) Plant B; It's a C3 plant where RuBisCO acts as oxygenase to show photorespiration.	½ + 1 ½ + 1	3
24.	a) -A is competitive inhibitorstructurally similar to substrate -competes with substrate for active site -substrate cannot bind with active site -enzyme action declines. b) Activation energy- The difference in average energy content of substrate from that of transition state.	½x4 1	3
25	NCERT book, Pg No. 137, Fig 8.10 **Or** NCERT book, Pg no. 131, Fig 8.4 (Correct depiction of diagram; any four labels	1+ ½ x4 1+ ½ x4	3
A 26	(a) (i) Fucoxanthin (ii) Floridean starch (iii) Algin (iv) Absent (b) The cellulosic cell walls are covered with gelatinous coating algin being hydrocolloid (water holding substance) it helps the algae survive in marine conditions	½ X 4 ½ ½	3
A 27	**Asexual spores** Ascomycetes- conidia (produced exogenously on conidiophore) Basidiomycetes- absent **Sexual spores** Ascomycetes- ascospores/ produced endogenously in ascus Basidiomycetes- Basidiospores/ produced exogenously on basidium	 ½ ½ ½+½ ½+½	3
A28	a) i. small median chamber; used to pass faecal matter, urine and sperms to exterior. ii. triangular structure that joins right atrium; receives blood through the major veins. b) Males have: -Sound producing vocal sacs;	 ½+½ ½+½	3

	-copulatory pad on the first digit of forelimbs These are absent in females.	½+½	
	SECTION-D		
29	(a) Hypothyroidism	½	
	(b) T3,T4- Thyroid	½+½	
	TSH- Anterior pituitary/Adenohypophysis	½	
	(c) stunted growth (cretinism)/mental retardation/low intelligence quotient/abnormal skin/ deaf-mutism,etc. (any four)	½ X 4	4
	Or		
	Iodine; It is essential for the normal rate of hormone synthesis in thyroid gland.	1+1	
30	(a) Succinate dehydrogenase	1	
	(b) Outer surface of inner mitochondrial membrane	1	4
	(c) Citric acid cycle/ TCA/ Krebs cycle		
	Succinic acid + FAD ⟶ Malic acid + $FADH_2$	1+1	
	OR		
	Passing of electrons from one carrier to another via complex I to complex IV in ETS/ and its final coupling to ATP synthase (complex V) is affected.	1+1	
	SECTION E		
31	(a) Na+ and K+	½ +½	
	(b) K+	1	
	In the resting membrane of neuron, the axonal membrane is comparatively more permeable to K+ ions/ nearly impermeable to Na+ ions.	½ +½	
	The membrane is impermeable to negatively charged proteins present in the axoplasm.		
	(c) Nerve impulse conduction velocity will decrease as the nerve impulse sequence will be repeated all along the length of the axon.	1 1	
	OR		
	(a) Medulla oblongata	1	5
	(b) Sympathetic nervous system	1	
	- increased rate of heart beat	½	
	- increased strength of ventricular contraction and thereby increase in cardiac output.	½	
	(c) Adrenal gland	1	
	(d) -Cardiac output= Volume of blood pumped out by each ventricle per minute	½	
	-5000 m L or 5 litres.	½	
32	a) A- Metaphase I; Bivalent chromosomes align on equatorial plate	½ +½	
	B-Anaphase I; Homologous chromosomes separate while sister chromatids remain associated at centromere.	½ +½	
	C-Telophase I; Nuclear membrane and nucleolus reappear/cytokinesis leads to formation of dyad of haploid cells(any one)	½ +½	
	b) Zygotene: -pairing together of homologous chromosomes/synapsis. -formation of synaptonemal complex; bivalent formation	½ +½	

	(any two) Pachytene: -Four chromatids of bivalent separate(tetrad) -appearance of recombination nodules -crossing over between non sister chromatids of homologous chromosomes (any two)	½ +½	5
	OR		
	(a) B Synthesis phase or S phase No of chromosomes 2n= 24 (no of chromosomes remains same)	½ ½ ½	
	(b) E Metaphase Chromosomes are arranged along the equator/ equatorial plate or metaphase plate	½ ½ ½	
	(c) G_0 phase Quiescent phase	½ ½	
	(d) Growth/ cell repair/ restoring nucleo-cytoplasmic ratio (any one)	1	
33.	(a) The monocot stem has a sclerenchymatous hypodermis/ a large number of scattered vascular bundles/ each surrounded by a sclerenchymatous bundle sheath/large, conspicuous parenchymatous ground tissue /Vascular bundles are conjoint and closed/ Peripheral vascular bundles are generally smaller than the centrally located ones/ The phloem parenchyma is absent/ water-containing cavities are present within the vascular bundles.	½ X 6	
	Or		
	NCERT book Pg no 92 Fig 6.7 b	1 (diagram) ½X 4 (labelling)	
	(b) In an **isobilateral** leaf, -the stomata are present almost in equal numbers on both the surfaces of the epidermis; -the mesophyll is not differentiated into palisade and spongy parenchyma - nearly similar size of vascular bundles except main vein In a **dorsiventral** leaf, -The abaxial epidermis generally bears more stomata than the adaxial epidermis. - mesophyll has two types of cells – the palisade parenchyma and the spongy parenchyma - The size of the vascular bundles are dependent on the size of the veins. (any two contrasting points)	1+1	5
	OR		
	(a) (i) Androecium: stamens five, epipetalous (ii) Gynoecium:bicarpellary obligately placed/syncarpous/ ovary superior/ bilocular/placenta swollen with many ovules, axile placentation(any two) (iii) NCERT pg 80 Fig 5.22 f Correct depiction of Calyx/corolla/ androecium/ gynoecium/ aestivation/ placentation/ epipetalous/ mother axis (any six)	½ +½ ½ +½ ½ X 6	