SECOND YEAR HIGHER SECONDARY EXAMINATION– MARCH - 2024

SY - 526

PART – III

BIOLOGY (BOTANY & ZOOLOGY)

SCORING KEY (UNOFFICIAL)

	PART -A BOTANY	
Qn. No.	**Scoring indicators**	**Marks**
	PART - I	
	Answer any 3 questions from 1 – 4. Each carry 1 score	
1.	Scutellum.	1
2.	Spooling. Mis-leading question As per NCERT text spooling - DNA that separates out can be removed by spooling. (Using chilled ethanol / Gel electrophoresis / Elution can be considered)	1
3.	b / Probe.	1
4.	Deep sea hydro-thermal ecosystem / Deep Sea.	1
	PART – II	
	Answer any 9 questions from 5 – 15. Each carry 2 scores	
5.	(a) – A - Vegetative cell B – Generative cell (b) – Vegetative cell is bigger / has abundant food reserve / has large irregularly shaped nucleus. (Any two features)	½ x 4 = 2
6.	Filiform apparatus. It plays an important role in guiding the entry of pollen tube into the synergids.	1 + 1 = 2
7.	Genetic engineering. Bioprocess engineering / Chemical engineering processes.	1 + 1 = 2
8.	**Microinjection** - Direct injection of recombinant DNA (rDNA) into the nucleus of an animal cell is called microinjection / It is the rDNA transfer method for animal cell. **Biolistics** - Bombardment of plant cell with high velocity micro particle of gold or tungsten coated with DNA is called biolistics / It is the rDNA transfer method for plant cell.	1 + 1 = 2

<table>
<tr><th>Qn. No.</th><th>Scoring indicators</th><th>Marks</th></tr>
<tr><td>9.</td><td>Rosie.
alpha-lactalbumin / Human protein.</td><td>1 + 1 = 2</td></tr>
<tr><td>10.</td><td>
<table>
<tr><th></th><th>A</th><th></th><th>B</th></tr>
<tr><td>1.</td><td>Biopiracy</td><td>B.</td><td>Basmathi rice</td></tr>
<tr><td>2.</td><td>Gene Therapy</td><td>A.</td><td>ADA deficiency</td></tr>
<tr><td>3.</td><td>RNA interference</td><td>D.</td><td>Meloidogyne incognita</td></tr>
<tr><td>4.</td><td>Bacillus thuringiensis</td><td>C.</td><td>Cry gene</td></tr>
</table>
</td><td>½ x 4 = 2</td></tr>
<tr><td>11.</td><td>(1) a – Exponential growth / J shaped curve / Geometric growth model.
b – Logistic growth / Verhulst-Pearl Logistic Growth / Sigmoid Growth / S-shaped curve
(2) K – Carrying capacity.</td><td>1 + 1 = 2</td></tr>
<tr><td>12.</td><td>The loss of unnecessary sense organs / presence of adhesive organs or suckers to cling on to the host / loss of digestive system / high reproductive capacity / presence of intermediate host or vectors.
(Any four points)</td><td>½ x 4 = 2</td></tr>
<tr><td>13.</td><td>(a) When energy flow from a particular trophic level to the next level some energy is lost as heat at each step.
Only 10% of the energy is transferred to each trophic level from the lower trophic level / According to law of 10%.
(b) Pyramid of numbers, Pyramid of biomass.</td><td>1 + 1 = 2</td></tr>
<tr><td>14.</td><td>1st Trophic level – Phytoplankton
2nd Trophic level – Zooplankton
3rd Trophic level – Fish
4th Trophic level – Man
OR
Phytoplankton → Zooplankton → Fish → Man</td><td>½ x 4 = 2</td></tr>
<tr><td>15.</td><td>(a) GPP – Gross Primary Productivity
NPP – Net Primary Productivity
(b) GPP - R = NPP.</td><td>1 + 1 = 2</td></tr>
</table>

PART – III		
Answer any 3 questions from 16 – 19. Each carry 3 scores		
Qn. No.	**Scoring indicators**	**Marks**
16.	(1) a – Antipodals b – polar nuclei c – Synergids d – Egg / Female gamete (2) Central cell.	2 + 1 = 3
17.	Made crops tolerant to abiotic stress (cold, drought, salt & temperature) / Develop pest resistance / Helped to reduce post-harvest losses / Enhanced nutritional value of food / Increased efficiency of mineral usage by plants. (Any three merits)	1 + 2 = 3
18.	(1) a. Denaturation b. Annealing c. Extension. (Fill in the blank and അടയാളപ്പെടുത്തുക in English and Malayalam version of question is confusing) (2) Polymerase Chain Reaction (3) Taq Polymerase.	1 +1+1 = 3
19.	(a) Commensalism – It is +, 0 interaction / In this interaction one species is benefitted and the other is neither benefitted nor harmed. (b) Mutualism – It is +, + interaction / In this interaction both the species are benefitted. (c) Parasitism – It is +, - interaction / In this interaction only one species benefit and the interaction is detrimental to the other species / Interaction between host and parasite.	1 +1 +1 = 3

PART -B
ZOOLOGY

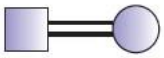
Qn. No.	Scoring indicators	Marks
	PART - I	
	Answer any 3 questions from 1 – 6. Each carry 1 score	
1.	Alleles.	1
2.	Transcription.	1
3.	Saheli.	1
4.	Foreskin.	1
5.	Edward Wilson.	1
	PART – II	
	Answer any 9 questions from 6 – 16. Each carry 2 scores	
6.	See table below	1 + 1 = 2
7.	A – Vas deferens B – Urethra C – Epididymis D – Rete testis	½ x 4 = 2

Homologous organ	**Analogous organ**
➢ Organs that have similar structure but having different function. ➢ Homology indicates common ancestry. ➢ Homologous organ represents the divergent evolution.	➢ The organs that are having similar function but differ in structure and origins are called analogous organs. ➢ Analogous organ represents the convergent evolution.
Examples • Fore limbs of whale, bat, human and cheetah. • Hearts of Vertebrates • Brain of Vertebrates • Tendril in Cucurbits & Thorn in Bougainvillea	Examples • Wings of Butterfly and Birds. • Eye of Octopus and Mammals. • Flippers of Penguins and Dolphins • Tuber of Potato and Sweet Potato.

(Any one example in each)

<table>
<tr><th>Qn. No.</th><th>Scoring indicators</th><th>Marks</th></tr>
<tr><td>8.</td><td>(a) – Gonorrhoea / syphilis / genital herpes / chlamydiasis / genital warts / Trichomoniasis / hepatitis-B / AIDS / HIV infection.
(Any two examples)
(b) – Avoid sex with unknown partners/multiple partners / Always use condoms during coitus / In case of doubt, one should go to a qualified doctor for early detection and get complete treatment. (Any two methods)</td><td>½ x 4 = 2</td></tr>
<tr><td>9.</td><td>A – Down's Syndrome B – Klinefelter's Syndrome
C – 47 with XXY / 44A + XXY
D – Sterile female / Ovaries are rudimentary / Secondary sexual characters absent.</td><td>½ x 4 = 2</td></tr>
<tr><td>10.</td><td>Physical Barriers – It includes the anatomical barriers like skin / mucous coating of the gastro intestinal tract, genital tract and respiratory tract.
Physiological Barrier – It include body temperature / PH / acid in stomach / Saliva in the mouth / secretions with lytic enzyme like lysozymes.
Cellular Barriers –Phagocytic cells in our body such as Polymorpho-nuclear leucocytes (PMNL-neutrophils) / Monocytes / natural killer type lymphocytes in blood / macrophages in tissue.
Cytokine Barriers – interferons.
(Any one example in each)</td><td>½ x 4 =2</td></tr>
<tr><td>11.</td><td>A – Ramapithecus B – Homo habilis
C – Homo erectus D – Homo sapiens.</td><td>½ x 4 =2</td></tr>
<tr><td>12.</td><td>(a) – Male - Vasectomy.
Female - Tubectomy.
(b) – CuT, Cu7 & Multiload 375 (Any two examples)</td><td>½ x 4 =2</td></tr>
<tr><td>13.</td><td>(a) – Incomplete dominance
(b) – Phenotypic ratio = 1 : 2 : 1 Genotypic ratio = 1 : 2 : 1
(c) – Dog flower plant / Snapdragon / Antirrhinum</td><td>½+1+ ½=2</td></tr>
<tr><td>14.</td><td>A – Transcription B – Translation</td><td>1 +1 = 2</td></tr>
<tr><td>15.</td><td><table><tr><th>A</th><th>B</th></tr><tr><td>Clostridium butylicum</td><td>Butyric acid</td></tr><tr><td>Aspergillus niger</td><td>Citric acid</td></tr><tr><td>Acetobacter aceti</td><td>Acetic acid</td></tr><tr><td>Lactobacillus</td><td>Lactic acid</td></tr></table></td><td>½ x 4 = 2</td></tr>
</table>

Qn. No.	Scoring indicators	Marks
16.	(a) – No. (b) – ELISA / Enzyme Linked Immuno-Sorbent Assay. (c) – • HIV enters body and infect into Macrophages • RNA genome replicates to form viral DNA by Reverse transcriptase. • Viral DNA incorporates into host cell's DNA. • Infected cells produce more and more viral particles. • Enters Helper T Lymphocytes (TH). • Replicates and produce progeny virus. • Attack other T cells so that T cells count decreases. • Immunity weakens.	½+½+1=2
	PART – III	
	Answer any 3 questions from 17 – 20. Each carry 3 scores	
17.	(a) A – Estrogen B – Progesterone. (b) C – Corpus luteum Corpus luteum secretes a large amount of progesterone, which maintain the endometrium of uterus / Maintain pregnancy. (c) – LH / Luteinising hormone.	½+1½+½ = 3
18.	1. Isolation of DNA 2. Digestion of DNA by restriction endonuclease enzyme 3. Separation of DNA fragments by electrophoresis 4. Blotting of separated DNA fragment into synthetic nylon or nitrocellulose membrane. 5. Hybridisation using labelled VNTR (Variable Number of Tandem Repeats) probe. 6. Detection of hybridised DNA fragment by autoradiography.	½ x 6 = 3
19.	a) Habitat loss and fragmentation, Over-exploitation, Alien species invasions, Co-extinctions (b) In Situ Conservation / On site Conservation Ex Situ Conservation / Off site Conservation (c) Speciation is generally a function of time / tropical latitudes have remained relatively undisturbed for millions of years and thus had a long evolutionary time for species diversification / Tropical environments, unlike temperate ones, are less seasonal, relatively more constant and predictable / There is more solar energy available in the tropics, which contributes to higher productivity (Any two points)	1+1+1 =3

20.	(a) A – Autosomal dominant trait / Myotonic dystrophy B – Autosomal recessive trait / Sickle-cell anaemia (b)  (c) Analysis of a genetic trait in a several generations of a family is called pedigree analysis.	1+ 1 + 1 =3