

**SECOND YEAR HIGHER SECONDARY EXAMINATION-
SECOND TERMINAL EXAMINATION, DECEMBER - 2023**

SY - 26

PART - III

BIOLOGY (BOTANY & ZOOLOGY)

SCORING KEY (UNOFFICIAL)

| PART - A BOTANY | | |
|--|--|----------------------------|
| Qn. No. | Scoring indicators | Marks |
| PART - I | | |
| Answer any 3 questions from 1 – 5. Each carry 1 score | | |
| 1. | (a) / Microinjection. | 1 |
| 2. | (c) / toxin is inactive. | 1 |
| 3. | Ammensalism | 1 |
| 4. | Parthenocarpy | 1 |
| 5. | (i) Plant cell – Cellulase | 1 |
| PART - II | | |
| Answer any 9 questions from 6 – 16. Each carry 2 scores | | |
| 6. | (a) Enzyme Linked Immuno-Sorbent Assay (b) Antigen-antibody interaction | 1 + 1 = 2 |
| 7. | (a) Natality - The number of births during a given period or birth rate during a given period. (b) Emmigration – The number of individuals of the same species that have come out or left from the habitat or population. | 1 + 1 = 2 |
| 8. | A – Epidermis B – Endothecium C – Middle layer D – Tapetum | $\frac{1}{2} \times 4 = 2$ |

| Qn. No. | Scoring indicators | Marks |
|---------|--|----------------------------|
| 9. | (a) – <i>Meloidogyne incognita</i> (b) – Silencing or inhibition of translation of specific mRNA by complimentary double stranded RNA (dsRNA) is called RNAi technology. | 1 + 1 = 2 |
| 10. | (a) – The age distribution or per cent individuals of a given age or age group is plotted for the population it is called age pyramid. (b) – A - Expanding / Growing B - Declining | 1 + 1 = 2 |
| 11. | Taq polymerase It is a heat stable or thermostable DNA polymerase enzyme isolated from thermophilic bacterium (<i>Thermus aquaticus</i>). It help in extension of primer in PCR. | 1 + 1 = 2 |
| 12. | (a) – Mutualism (b) – Commensalism (c) – Parasitism / Brood parasitism (d) – Competition | $\frac{1}{2} \times 4 = 2$ |
| 13. | Pollen grains are long, ribbon like and carried passively inside the water Pollen grains are protected from wetting by mucilaginous covering. In Vallisneria pollen grains released into the surface of water and carried to the stigma by air current. In sea grass the flowers remains submerged. | $\frac{1}{2} \times 4 = 2$ |
| 14. | Eli Lilly Company prepared DNA sequences corresponding to A and B chain of insulin. A and B Chain DNA were introduced in plasmid of E.coli to produce the A and B chains. Chain A and B were produced separately. Chain A and B were extracted and combined by creating disulphide bonds. | 2 |
| 15. | Explant - Tissue or plant part used for tissue culture is called explant. Totipotency - The capacity to generate a whole plant from a single plant cell or explant is called totipotency. | 1 + 1 = 2 |

| Qn. No. | Scoring indicators | Marks |
|---------|---|-----------|
| 16. | (a) – (a) - Exponential growth / J shaped curve (b) - Logistic growth / Verhulst-Pearl Logistic Growth / Sigmoid Growth / S shaped curve (b) – K – Carrying capacity r – Intrinsic rate of natural increase. | 1 + 1 = 2 |

PART – III

Answer any 3 questions from 17 – 20. Each carry 3 scores

| | | |
|-----|---|-----------|
| 17. | (a) Escherichia coli (b) <ul style="list-style-type: none"> * Ist letter (E) - First letter in the genus of the bacteria from which the enzyme is derived. * IInd & IIIrd letters (co) - First two letters from the species of the organism. * IVth letter (R) - First letter of the strain of bacteria. * Roman number (I) - Order of isolation. <p style="text-align: center;">OR</p> <p style="text-align: center;">E - Escherichia co - coli R - RY 13 strain I - First order of isolation</p> | 1 + 2 = 3 |
| 18. | They keep prey populations under control. Predators help in maintaining species diversity in an ecosystem Predators reduce the intensity of competition among competing prey species. Used in biological control / Pest control methods. | 1+1+1= 3 |
| 19. | (a) - Animals whose DNA is manipulated to possess and express a foreign gene are called transgenic animals. (b) - Used to study the normal physiology and development (effect) of a gene. Used to understand the role of a gene in the development of a disease. Transgenic animals (mice) are used in testing the safety of vaccines They are used for toxicity or safety testing of chemicals. Transgenic animals are used for the production of biological products. (Any two uses) | 1 + 2 = 3 |
| 20. | (a) – Simple stirred tank bioreactor (b) – A – motor B – Sterile air (c) – Bioreactors are commonly used for continuous culture / Cell culture. Bioreactor provide optimal condition for large scale production of products. | 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. | <i>Ramapithecus.</i> | 1 |
| 2. | Henking | 1 |
| 3. | 22A + XXY | 1 |
| 4. | Euchromatin | 1 |
| 5. | (i) / AUG is a start codon. | 1 |

PART - II

Answer any 9 questions from 6 – 16. Each carry 2 scores

| | | |
|----|---|-----------------------|
| 6. | (a) Implantation – The attachment of blastocyst into the endometrium of the uterus is called implantation. (b) Colostrum – The milk produced during the initial few days of lactation is called colostrum (yellow milk). | 1 + 1 = 2 |
| 7. | The signal for parturition originates from the fully developed foetus and the placenta as mild uterine contraction called foetal ejection reflex. Foetal ejection reflex stimulate the secretion of oxytocin from pituitary gland. | 1 + 1 = 2 |
| 8. | (i) CuT. (ii) Non – medicated IUDs. Copper releasing IUDs . Hormone releasing IUDs . | $\frac{1}{2} + 4 = 2$ |

| Qn. No. | Scoring indicators | Marks | | | | | | |
|---------|---|-------------|---|---|---|--------------|-------------|-----------|
| 9. | <p>(i) Sexually Transmitted Infections /Sexually Transmitted Diseases (STD's) OR Diseases or infection which are transmitted through sexual intercourse.</p> <p>(ii) Avoid sex with unknown partners. Always use condoms during coitus. In case of doubts, consult a qualified doctor. Early detection and complete treatment are needed.</p> | 1 + 1 =2 | | | | | | |
| 10. | <p style="text-align: center;">F₁ violet Flowered Pea X White Flowered Pea Ww X ww</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">♂</td> <td style="text-align: center;">W</td> <td style="text-align: center;">w</td> </tr> <tr> <td style="text-align: center;">♀</td> <td style="text-align: center;">Ww Violet</td> <td style="text-align: center;">ww White</td> </tr> </table> <p>In test cross F₁ individual is crossed to its recessive parent. It produce dominant and recessive trait in 1:1 ratio.</p> | ♂ | W | w | ♀ | Ww Violet | ww White | 1 + 1 = 2 |
| ♂ | W | w | | | | | | |
| ♀ | Ww Violet | ww White | | | | | | |
| 11. | <p>DNA has two polynucleotide chains and are coiled like a helix called double helix. Sugar-phosphate forms the backbone of this helix. The bases in two strands are paired -Purines always pair with their corresponding pyrimidines. Adenine pairs with Thymine through two hydrogen bonds. Guanine pairs with Cytosine through three hydrogen bonds. The double helix is right-handed. The pitch of the helix is 3.4 nm. The two chains have anti-parallel polarity i.e. one chain has the polarity 5'→3' and the other has 3'→5'.</p> <p style="text-align: right;">(Any four features)</p> | ½ + 4 = 2 | | | | | | |

| Qn. No. | Scoring indicators | | Marks |
|---|--|---|----------------------------|
| 12. | Convergent Evolution | Divergent Evolution | $\frac{1}{2} \times 4 = 2$ |
| | More than one adaptive radiation appeared to have occurred in an isolated geographical area it is called convergent evolution. | Evolution of different species in a given geographical area starting from a point and literally radiating to other areas of geography or habitats | |
| | Results in the formation of analogous organ | Homologous organ represents the divergent evolution. | |
| 13. | (i) (A) - Transcription. (B) – Translation. (ii) Reverse Transcription / Teminism | | 1 + 1 = 2 |
| 14. | 1. Transcriptional level (formation of primary transcript), 2. Processing level (regulation of splicing), 3. Transport of mRNA from nucleus to the cytoplasm, 4. Translational level. | | $\frac{1}{2} \times 4 = 2$ |
| 15. | (i) ELISA - Enzyme Linked Immuno-Sorbent Assay Used for the testing AIDS or HIV infection. (ii) MALT – Mucosal Associated Lymphoid Tissue. MALT is located within the lining of the major tracts of body such as respiratory, digestive and urogenital tracts It constitutes about 50 per cent of the lymphoid tissue in human body. | | 1 + 1 = 2 |
| 16. | (1) Salmonella typhi | (d) Typhoid | $\frac{1}{2} \times 4 = 2$ |
| | (2) Rhino virus | (c) Common cold | |
| | (3) Pneumococcus | (b) Pneumonia | |
| | (4) Plasmodium | (a) Malaria | |
| PART – III | | | |
| Answer any 3 questions from 17 – 20. Each carry 3 scores | | | |
| 17. | Any suitable answer / points related to side effects / prevention / relieve drug abuse. | | 3 |

| Qn. No. | Scoring indicators | Marks | | | | | | | | | | | | | | |
|------------------------|---|----------|----------|------------|------------------|-------------|-----------------|-----------|----------------------|-------------|-----------------|------------------------|------------------|-----------------------|------------------|-----------|
| 18. | (1) – Cancer cells do not show the property called contact inhibition. Cancer cells show metastasis. Cancer cells show uncontrolled proliferative division. (2) – Physical, chemical or biological agents that cause cancer are called carcinogens. (3) – Benign tumors, Malignant tumors | 1+1+1 =3 | | | | | | | | | | | | | | |
| 19. | (1) Human Genome Project – HGP aimed at the determination of complete DNA sequence of humans. (2) Human genome contains 3164.7 million nucleotide bases. Total number of genes= about 30,000. Largest known human gene is dystrophin contains 2.4 million bases. Very large portion of human genome is made of Repeated (repetitive) sequences. They shed light on chromosome structure, dynamics and evolution. SNPs (Single nucleotide polymorphism or ‘snips’). These are locations of single-base DNA differences | 1+1+1 =3 | | | | | | | | | | | | | | |
| 20. | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th data-bbox="237 1083 786 1136" style="text-align: center;">Period</th> <th data-bbox="786 1083 1333 1136" style="text-align: center;">Organism</th> </tr> </thead> <tbody> <tr> <td data-bbox="237 1136 786 1188">(1) 15 mya</td> <td data-bbox="786 1136 1333 1188">(b) Dryopithecus</td> </tr> <tr> <td data-bbox="237 1188 786 1241">(2) 2-3 mya</td> <td data-bbox="786 1188 1333 1241">(f) Homohabilis</td> </tr> <tr> <td data-bbox="237 1241 786 1293">(3) 2 mya</td> <td data-bbox="786 1241 1333 1293">(c) Australopithecus</td> </tr> <tr> <td data-bbox="237 1293 786 1346">(4) 1.5 mya</td> <td data-bbox="786 1293 1333 1346">(e) Homoerectus</td> </tr> <tr> <td data-bbox="237 1346 786 1398">(5) 100000 – 40000 mya</td> <td data-bbox="786 1346 1333 1398">(d) Neanderthals</td> </tr> <tr> <td data-bbox="237 1398 786 1451">(6) 75000 – 10000 mya</td> <td data-bbox="786 1398 1333 1451">(a) Homo sapiens</td> </tr> </tbody> </table> | Period | Organism | (1) 15 mya | (b) Dryopithecus | (2) 2-3 mya | (f) Homohabilis | (3) 2 mya | (c) Australopithecus | (4) 1.5 mya | (e) Homoerectus | (5) 100000 – 40000 mya | (d) Neanderthals | (6) 75000 – 10000 mya | (a) Homo sapiens | ½ X 6 = 3 |
| Period | Organism | | | | | | | | | | | | | | | |
| (1) 15 mya | (b) Dryopithecus | | | | | | | | | | | | | | | |
| (2) 2-3 mya | (f) Homohabilis | | | | | | | | | | | | | | | |
| (3) 2 mya | (c) Australopithecus | | | | | | | | | | | | | | | |
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