SECOND YEAR EXAMINATION – MARCH - 2021

PART – III

BIOLOGY (BOTANY & ZOOLOGY) SY - 226

SCORING KEY (UNOFFICIAL)

PART – A BOTANY

Qn. No. Scoring indicators Marks

I

1. (b) / Bamboo 1
2. Zygote 1
3. Biofortification 1
4. (c) / PCR – Amplification of gene 1
5. Parasitism 1
6. Epicotyl 1
7. (d) / Bone marrow transplantation 1

II

8.

Monoecious Plant	Dioecious Plant
• Bisexual plants • Plants with both male and female flower on same plant • Eg :- Cucurbits, Coconuts	• Unisexual plants • Plants with either male or female flower on same plant Or Male and female flower on different plants Eg :- Papaya, Date palm

1 + 1 =2

(Any one example)

9. Ist letter - First letter in the genus of the bacteria from which the enzyme is derived/ From genus name of bacteria.
   IInd & IIIrd letters - First two letters from the species of the organism/ From species name of bacteria.
   IVth letter - First letter of the strain of bacteria/ name of the strain Roman number - Order of isolation.

   Or Expansion of EcoR I ½ x 4 =2

10. Multiple Ovulation Embryo Transfer Technology

Significance

Increases the herd size in short time

This method is successfully used in cattle, sheep, rabbits, buffaloes, mares etc. 1+1 =2

11. Pro-embryo → Globular embryo → Heart shaped embryo → Mature embryo ½ x 4 =2

12. (a) Isogametes / Homogametes

(b) Heterogametes / Egg and sperm / Human gametes morphologically distinct gametes.

Male gamete is small and motile and female gamete is large and non-motile. 1+1 =2

13. Oestrus cycle Eg :- Non-primate mammals/Cows/Sheep/ Rats/Deers/Dogs/ Tiger Menstrual cycle Eg :- Primates/ Man/ Monkey/Apes

(Any one example) 1 + 1 =2

14. i. Providing the best catalyst in the form of improved organisms or pure enzyme.

ii. Creating optimum conditions through engineering for a catalyst to act.

iii. Downstream processing technologies to purify the protein/product

(Any two) 1 + 1 =2

15. Increase in concentration of the toxic substances at successive trophic levels in aquatic food chain is called Biomagnification.

Mercury / DDT 1 + 1 =2

16. Conversion of forest to agricultural land to feed the growing population.

Demand of forest products like Timber, Fire wood, etc.

Slash and burn agriculture (Jhum cultivation)

Hydroelectric projects within dense forests. ½ x 4 =2

(Any four correct response)

17. (a) +

(b) +

(c) –

Proinsulin	Functional Insulin

• 3 polypeptide chains present • It contain A peptide, B peptide & C peptide • Non-functional	• 2 polypeptide chains present • It contain A peptide & B peptide. • C peptide chain absent / removed

(d) Commensalism ½ x 4 =2 18.

1+1 =2

19. amp^R and tet^R

ori – Origin of replication / DNA sequence from where replication starts 1 + 1 = 2 20.

Fragmentation, leaching, catabolism, Humification and mineralization. ½ x 4 =2

Qn. No.	Scoring indicators	Marks

21. Flowers are very large / colorful / fragrant / rich in nectar.
If flowers are small they clustered to form inflorescence.
Pollen grains are sticky.
Flower pollinated by flies and beetles secrete foul odour.
Nectar and pollen grains are the usual floral rewards for insects.

(Any four correct response)

½ x 4 =2

22. Fruit developed without fertilization is called parthenocarpic fruits / seedless fruits By the application of growth hormones.

1 + 1 = 2

23. Genetic mechanism that prevent self -pollen from fertilizing the ovule by inhibiting pollen germination or pollen tube growth in the pistil.
It prevent self-pollination

2

24. (a) Lichen

(b) Succession takes place in the wetter areas and the successional stages progress from hydric to mesic conditions / wet area / water body.

(Stages in hydrarch any 4 stage 2 score)

1 + 1 = 2

25. 1st trophic level - Phytoplankton

2nd trophic level - Zooplankton

3rd trophic level - Fish

4th trophic level – Man

½ x 4 =2

26. (a) Platinum-palladium and rhodium

(b) Unburnt hydrocarbons are converted into carbon dioxide and water.

Carbon monoxide and nitric oxide are changed to carbon dioxide and nitrogen gas respectively. / Reduce air pollution

1 + 1 = 2

Qn. No.	Scoring indicators	Marks
27.	Mortality, Emigration **Mortality** is the number of death in the population during a given period /number of deaths in a population. **Emigration** is the number of individuals of the population who left the habitat during a given period / Number of individual left from a population	1 + 2 = 3
28.	(a) cry gene / cry (b) *Bacillus thuringiensis / Bacillus* (c) Bt toxin gene was introduced into cotton. Gene produce inactive protoxin in cotton. Insect when ingest the protoxin it will be converted to active toxin. This process is mediated by alkaline pH of insect gut. Active toxin causes lysis of gut epithelial cell leading to death of insect.	1 + 1 + 1 = 3
29.	Epidermis, Endothecium, middle layers & Tapetum Nourishes the developing pollen grains.	2 + 1 = 3

30. (c) Isolation of DNA
(e) Fragmentation of DNA
(f) Isolation of desired DNA fragments
(a) Ligation of DNA fragment into a vector
(d) Transferring the rDNA into the host
(b) Culturing of host cells in a medium at large scale

½ x 6 =3

31. 1. Selection of breeds with high milk yield and disease resistance.
2. Scientific method of housing.
3. Scientific method of feeding.
4. Follow stringent cleanliness and hygiene while milking.
5. Provide the service of Veterinary Doctor.
6. Provide the facility of mechanized milking.
7. Healthy storage and marketing of milk.
8. Provide regular vaccination.

(Any six correct response)

½ x 6 =3

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PART – III

BIOLOGY (BOTANY & ZOOLOGY) SY - 226

SCORING KEY (UNOFFICIAL)

PART – B ZOOLOGY

Qn. No.	Scoring indicators	Marks

I

1. Saheli 1
2. Haemophilia 1
3. Nucleosome 1
4. Corpus luteum 1
5. (c) BOD 1
6. (b) Forelimbs of Whales and mammals 1
7. (a) Lipase 1

II

8.

Euchromatin	Heterochromatin
• Loosely packed region • Less stained region of chromatin • Active part of chromatin / Transcriptionally active	• Densely packed region • Dark stained region of chromatin • Inactive part of chromatin / Transcriptionally inactive

1 + 1 =2

9. (a) Down's Syndrome
(b) Short stature, Small round head, Furrowed tongue, Partially open mouth, Physically retarded, Palm broad, Mentally retarded.
1 + 1 =2
(Any two relevant symptoms)

10. (a) Lactic acid bacteria / LAB / Lactobacillus
(b) Biocontrol agent / Insect control/ Control butterfly catterpillars
(c) Citric acid
(d) *Clostridium butylicum / Clostridium*
½ x 4 =2

11. 'B' group and 'O' group
1 + 1 =2

Or

Representing the cross

12. (a) Antibody / Immunoglobulins / Ig (b) A – Antigen binding site B – Light chain / L chain
C – Heavy chain / H chain
½ x 4 =2

13. i. Transcriptional level / Formation of primary transcript
ii. Processing level / Regulation of splicing iii.
Transport of mRNA from nucleus to cytoplasm.
iv. Translational level
½ x 4 =2

14. (a) Intra Cytoplasmic Sperm Injection.
(b) Gamete Intra Fallopian Transfer 1 + 1 =2

15. (a) Lippes loop
(b) CuT / Multiload 375
(c) / (d) Progestasert, LNG -20 ½ x 4 =2

16. i. Creating awareness among people about various reproduction related aspects.
ii. Providing facilities and support for building up a reproductively healthy society.
iii. Provide right information to the young so as to discourage children from believing in myths and having misconceptions about sex-related aspects.
iv. Proper information about reproductive organs, adolescence and related changes, safe and hygienic sexual practices, sexually transmitted diseases
(Any four relevant /correct response) ½ x 4 =2

17. 1. Habitat loss and fragmentation
2. Over-exploitation
3. Alien species invasion
4. Co-extinctions ½ x 4 =2
(The Evil Quartet give half score)

18. • Causes heart failure and hypertension.
• Use of alcohol causes stomach ulcer and pancreatitis.
• Causes lack of interest in personal hygiene, isolation, depression, aggressiveness etc.
• Causes deteriorating relationship with family and friends change in eating and sleeping habit
• The excess usage of alcohol causes liver cirrhosis and damage to nervous system.
• Use of drugs and alcohol during pregnancy adversely affect the foetus.
• Drug users are prone to blood related diseases like AIDS, hepatitis B etc.
• Drug and alcohol users finally may turn to criminals.

½ x 4 =2

(Any four relevant /correct response)

19. (a) The process of evolution of different species in a given geographical area starting from a point and literally radiating to other areas of habitat is called adaptive radiations. 1 + 1 = 2

(b) Marsupial mammal in Australia & Placental mammals

Qn. No.	Scoring indicators	Marks

20.

Spermatogenesis	Oogenesis
It is the process of formation of sperms.	It is the process of formation of ovum.
It starts at puberty.	It starts at the embryonic stage
Meiosis - I in the primary spermatocytes is continuous.	Meiosis - I in the primary oocytes is not continuous
Four sperms are formed from a primary spermatocyte.	Only one ovum is formed from a primary oocyte.
Sterile cells called polar bodies are not formed.	Sterile cells called Polar bodies are formed.

½ x 4 =2

(Any four correct response)

21. (i) Sickle-cell anemia

(ii) Substitution mutation or point mutation at sixth codon / (GAG to GUG) / Defect due to substitution of GLUTAMIC ACID (Glu) by VALINE (Val) at sixth position of beta globulin chain of haemoglobin / It causes RBC become sickle cell shape.

(Any two point) 1 + 1 =2

22. 1. Human chorionic gonadotropin (hCG)

2. Human placental lactogen (hPL)

3. Relaxin (Any two answer) 1 + 1 = 2

23. (i) LH surge - Ovulation

(ii) Leydig cells - Androgens

(iii) Ampullary-isthmic junction - Fertilisation

(iv) Sertoli cells - Nutrition to spermatids ½ x 4 =2

24. Speciation occurs only in undisturbed environment.

Tropical environment are more constant & predictable

Solar energy is more in tropical area than temperate area.

(Any two relevant response) 1 + 1 = 2

25. (a) Vaccines are preparation of antigenic proteins of pathogen or inactivated/weakened pathogen.

(b) Property of memory of the immune system 1 + 1 = 2

26. (i) First month - Heart sound is noticed using stethescope

(ii) Second month – Limbs and digits are developed in foetus

(iii) Fifth month - First movement of foetus is observed

(iv) Sixth month - Eye lids are separated and eye lashes are formed ½ x 4 =2

Qn. No.	Scoring indicators	Marks

III

27. (a) Hardy Weinberg Equilibrium

(b) Gene flow or gene migration , Genetic drift, Mutation, Genetic recombination

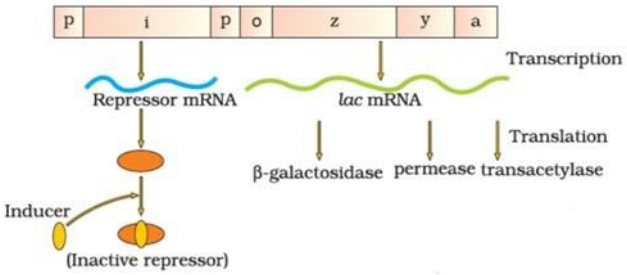
Natural selection (Any four correct response) 1 + 2 = 3

28. (a) LH – Act on the Leydig cell and stimulate the production of androgens / Help in production of male sex hormones / Help in spermatogenesis.

FSH – Act on Sertoli cells and stimulates some factors which help in spermatogenesis / Help in spermatogenesis.

1 + 1 + 1 = 3 (b) Gonadotropins.

29.



2 + 1 = 3

30. (a) 1. Gonorrhoea 2. Syphilis 3. Genital herpes

4. Chlamydiasis 5. Genital warts 6. Trichomoniasis

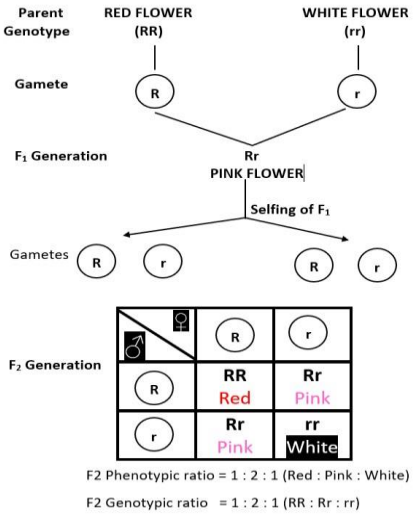
7. Hepatitis – B 8. AIDS (HIV Infection) (Any 4 correct response)

(b) Avoid sex with unknown partners / multiple partners Always use condoms during coitus.

Consult a qualified doctor for early detection and diagnosis. (Any 2 correct response)

½ x 6 =3

31. flower colour in the dog flower (Snapdragon or Antirrhinum) is an example for incomplete dominance.



F2 Phenotypic ratio = 1 : 2 : 1 (Red : Pink : White)

F2 Genotypic ratio = 1 : 2 : 1 (RR : Rr : rr)

$1 + 2 = 3$