

# MODEL EXAMINATION – MARCH - 2021

## PART – III

### BIOLOGY (BOTANY & ZOOLOGY)

#### SCORING KEY

#### BOTANY

Qn. No.	Scoring indicators	Marks																				
	<b>PART - I</b>																					
1. *	(a) Rhizome	1																				
2. *	Pericarp	1																				
3. *	False fruit	1																				
4. *	Honey & Bee wax	1																				
5. *	<i>E. coli / Escherichia coli</i>	1																				
6.	(a) DNA ligase	1																				
7. *	(c) Epiphytic orchid	1																				
8. *	Parthenogenesis Rotifers / Honey bee / some lizards / birds / Turkey	(Any one example) 1 + 1 = 2																				
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10.	Oestrus cycle Eg :- Cow/ Sheep/Rats/Deers/Dogs/Tiger/ Non-primate mammals Menstrual cycle Eg :- Monkey/ Apes / Humans /Primate mammals (Any one example)	$\frac{1}{2} \times 4 = 2$																				
11. *	Sporopollenin is the most resistant organic material known. /It can withstand high temperature, strong acid and alkali/ No enzyme that can degrade sporopollenin is not known/ Pollengrains are well preserved as fossils due to the presence of sporopollenin. (Any two points)	1 x 2 = 2																				



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	(Any two points in each)		1 + 1 = 2				
13. *	(a) Removal of anthers from the bisexual flower bud before the anther dehisces.		1 + 1 = 2				
	(b) It prevent natural pollination/contamination by unwanted pollens.						
14. *	(a) Endosperm provide nutrition to the developing embryo.						
	(b) Primary endosperm nucleus undergo free nuclear division to form tender coconut. Cell wall formation occur later to produce cellular endosperm called white kernel.						
	Or						
	Free nuclear and cellular development		1 + 1 = 2				
15.	(a) Cross breeding						
	(b) Bikaneri ewes and Marino rams		1 + 1 = 2				
16. *	(a) Polymerase Chain Reaction						
	(b) Denaturation, Annealing / Primer annealing and Extension / Extension of Primers		1 + 1 = 2				
17. *	(a) Simple stirred-tank bioreactor / Boireactor						
	(b) Used for large scale production of products / Obtaining the foreign gene product.		1 + 1 = 2				
18. *	Made crops tolerant to abiotic stress. Develop pest resistance. Helped to produce reduced post-harvest losses. Enhanced nutritional value of food. Eg :- Vitamin 'A' enriched rice Increased efficiency of mineral usage by plants	(Any two points)	1 + 1 = 2				
19.	Genetic Engineering Approval Committee. GEAC make decisions regarding the validity of GM research It also make decisions regarding the safety of introducing GM- organism for public service	(Any one function)	1 + 1 = 2				
20. *	In brood parasitism the parasitic bird lays its eggs in the nest of its host and lets the host incubate them. Eggs of parasitic bird resemble the host's egg in size and colour Eg :- Cuckoo (Koel) and crow interaction		1 + 1 = 2				

Qn. No.	Scoring indicators	Marks
21. *	a. Rock minerals b. Producers	1 + 1 = 2
22. *	when energy flows from one trophic level to the next level some energy is lost as heat at each step. /It always follow law of 10%.	2
23.	The gradual and fairly predictable change in the species composition of a given area is called ecological succession. Hydrarch succession – Succession in wet area or water bodies / Pioneer species is phytoplankton Xerarch succession - Succession in dry area / Pioneer species is lichen	1 + 1 = 2
24. *	Farmers cut down the trees of the selected forest areas and burn the plant remains . Ash is used as fertilizer for the cultivation/farming or cattle grazing. After cultivation, the land is left for several years for the recovery of forests. Farmers then move on to other areas and repeat this process.	2
25. *	Reduce the use of fossil fuels / Improve the efficiency of energy usage / Reduce deforestation. Slowing down the growth of Human Population / Planting more trees (Reforestation and Afforestation) / Taking International initiatives to reduce the emission of greenhouse gases.	$\frac{1}{2} \times 4 = 2$
26.	(a) Joint Forest Management (b) Protecting and managing forests by participating the local communities. These communities get benefit of various forest products like fruits, gum, rubber, medicine. JFM provides the sustainable conservation of forests. ( Any two point)	1 + 1 = 2
27. *	Pollen grains are light and non-sticky Plants produces enormous amount of pollen. Flowers with well exposed stamens. Large feathery stigma to trap air-borne pollen grains. Most wind pollinated flowers contain single ovule in one ovary and numerous flowers packed into an inflorescence e.g. corn cob. (Any three points)	1+1+1 =3
28. *	(a) Evaluation and selection of parents (3) (b) Cross hybridization among the selected parents (2) (c) Selection and testing of superior recombinants	1+1+1 =3
29. *	(a) Gel electrophoresis (b) Isolation and separation of DNA fragments. (c) Ethidium bromide	1+1+1 =3
30. *	(a) <i>Bacillus thuringiensis</i> (b) The cry gene of Bt cotton produce inactive protoxin The inactive protoxin is converted into active toxin when ingested by the insect. This conversion is mediated by the alkaline PH of insects gut. Active Bt toxin binds to the gut epithelium and causes cell lysis leading to insect's death.	1+2 = 3
31. *	Desert plants have a thick cuticle, Leaves are reduced to spines, flattened stem etc. Their stomata are arranged in deep pits (Sunken stomata) to minimize water loss through transpiration. They have a special photosynthetic pathway (CAM) (Any three points)	3

**\* FOCUS AREA QUESTIONS**

# ZOOLOGY

**Qn. No.**

**Scoring indicators**

**Marks**

## PART - I

1. \* Sertoli cells 1
2. \* MTP (Medical Termination of Pregnancy) or induced abortion 1
3. \* (a)  (b)   $\frac{1}{2} + \frac{1}{2} = 1$
4. \* A – Replication B – Translation  $\frac{1}{2} + \frac{1}{2} = 1$
5. \* (a) CH<sub>4</sub>, NH<sub>3</sub>, H<sub>2</sub>O, H<sub>2</sub> 1
6. (b) *Propionibacterium sharmanii* 1
7. IARI – Indian Agricultural Research Institute  $\frac{1}{2} + \frac{1}{2} = 1$   
KVIC – Khadi and Village Industries Commission

## PART - II

8. a. Mammary tubules  
b. Lactiferous duct 1 + 1 = 2
9. 

ZZ – ZW Mechanism	XX – XO Mechanism
<ul style="list-style-type: none"> <li>• Female heterogamety type</li> <li>• Male and female have same number of chromosomes</li> <li>• Female individual or fusing egg determine the sex of offspring</li> </ul>	<ul style="list-style-type: none"> <li>• Male heterogamety type</li> <li>• Male always have one chromosome less than the female</li> <li>• Male individual or fusing sperm determine the sex of offspring</li> </ul>

 $\frac{1}{2} \times 4 = 2$   
(Any two points in each type)
 

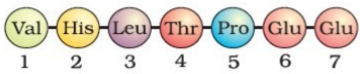
10. (a) Translation / Protein synthesis / polypeptide synthesis  
(b) Required for efficient translation process. 1 + 1 = 2

11. \* Drop in academic performance / unexplained absence from school or college / lack of interest in personal hygiene / withdrawal / isolation / depression / fatigue / aggressive and rebellious behavior / deteriorating relationships with family and friends / loss of interest in hobbies / change in sleeping and eating habits / fluctuations in weight / appetite  $\frac{1}{2} \times 4 = 2$   
(Any four relevant points)

12. \* (a) Lactobacillus / LAB / Lactic acid bacteria  
(b) A small amount of curd added to the fresh milk act as an inoculum contain millions of LAB, which at suitable temperatures multiply and convert milk to curd / It also improves the nutritional quality by increasing vitamin B<sub>12</sub> 1 + 1 = 2

13. \* (a) Acrosome  
(b) Help in fertilization of ovum / help the sperm to enter into the cytoplasm of egg. 1 + 1 = 2

14. \* Habitat loss and fragmentation, Over-exploitation, Alien species invasions, Co-extinctions  $\frac{1}{2} \times 4 = 2$

Qn. No.	Scoring indicators	Marks				
15. *	Yes The yellowish fluid colostrum secreted by mother during the initial days of lactation has abundant antibodies (IgA) / It provide immunity to infant / It provide passive immunity	$\frac{1}{2} + 1\frac{1}{2} = 2$				
16. *	(a) Transforming Principle / Griffith experiment (b) The R strain bacteria had been transformed by the heat-killed S strain bacteria / Some 'transforming principle', transferred from the heat-killed S strain, enabled the R strain to synthesize a smooth polysaccharide coat and make it virulent or Due to pneumonia / Due to transformation– give $\frac{1}{2}$ score	$1 + 1 = 2$				
17. *	Possible blood groups of children's are 'A' group and 'O' group Representation of genetic cross	$1 + 1 = 2$				
18. *	(a) Tubectomy/ surgical method or sterilization method in female (b) It is a terminal or permanent method of birth control in female	$1 + 1 = 2$				
19.	<table border="1"> <thead> <tr> <th>Narrowly Utilitarian Argument</th> <th>Broadly Utilitarian Argument</th> </tr> </thead> <tbody> <tr> <td>It refers to countless direct and indirect benefits of nature to human. The benefit include food, fiber, firewood, industrial products, drugs etc.,</td> <td>Biodiversity play a major role in many ecosystem services. It include production of oxygen, pollination etc.,</td> </tr> </tbody> </table>	Narrowly Utilitarian Argument	Broadly Utilitarian Argument	It refers to countless direct and indirect benefits of nature to human. The benefit include food, fiber, firewood, industrial products, drugs etc.,	Biodiversity play a major role in many ecosystem services. It include production of oxygen, pollination etc.,	$\frac{1}{2} \times 4 = 2$
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20. *	(a) Sickle-cell anaemia (b) 	$1 + 1 = 2$				
21. *	a. User-friendly b. easily available c. effective d. reversible (In any order )	$\frac{1}{2} \times 4 = 2$				
22. *	(a) Blastocyst (b) Inner cell mass – develop into embryo / develop into germ layers	$1 + \frac{1}{2} + \frac{1}{2} = 2$				
23. *	Completely curable – Chlamydiasis, Trichomoniasis Non curable – HIV infection, Hepatitis – B	$1 + 1 = 2$				
24. *	(a) Acquired Immuno Deficiency Syndrome (b) Human Immuno deficiency Virus or HIV (c) ELISA Test / Enzyme Linked Immuno-Sorbent Assay (d) Use disposable syringe and needles / Proper monitoring of blood before blood transfusion / Condomise, which means using male or female condoms consistently and correctly / Control drug abuse / Avoid intercourse with unknown partner. (Any 2 point)	$\frac{1}{2} \times 4 = 2$				

Qn. No.	Scoring indicators	Marks
25.	a. Opioids b. <i>Papaver somniferum</i> c. hashish d. <i>Cannabis sativa</i>	$\frac{1}{2} \times 4 = 2$
26.	(a) Figure A and Figure C (b) The change in allele frequency in the small population from a large population leads to the evolution of new species The original drifted population becomes founders and the effect is called founder effect.	1+1 = 2

**PART - III**

27. *	(a) Transcriptional unit / transcription (b) A – Promoter B – Terminator (c)					
	<table border="1"> <thead> <tr> <th>Template strand</th> <th>Coding strand</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> <li>Strand with 3' – 5' polarity</li> <li>mRNA is produced from template strand</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>Strand with 5' – 3' polarity</li> <li>It does not code for anything</li> </ul> </td> </tr> </tbody> </table>	Template strand	Coding strand	<ul style="list-style-type: none"> <li>Strand with 3' – 5' polarity</li> <li>mRNA is produced from template strand</li> </ul>	<ul style="list-style-type: none"> <li>Strand with 5' – 3' polarity</li> <li>It does not code for anything</li> </ul>	1+1+1 = 3
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28. *	(a) <i>In vitro</i> Fertilisation (IVF) followed by Embryo Transfer (ET) technologies such as Zygote Intra Fallopiian Transfer (ZIFT) and Intra Uterine Transfer (IUT). (Relevant explanation with IVF, ET methods 1 score) (b)					
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	(c) physical / congenital / diseases / drugs / immunological or even psychological. (Any two points)	1+1+1=3				

29. *	(a) Perimetrium, Myometrium , Endometrium (b) Myometrium (c) Endometrium	1+1+1=3
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30. *	(a) Klinefelter's syndrome (b) 47 / 44A + XXY / XXY. masculine development, development of breast / Gynaecomastia, Sterile nature	1+2=3
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31. *	(a) Homologous organ (b)					
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