

KHADERIA HIGHER SECONDARY SCHOOL, VANIYAMBADI.

XII- BIOLOGY QUARTERLY EXAM ANSWER KEY 2024

YOUTUBE / AKWA ACADEMY

BIO BOTANY

Q. NO	ANSWER	MARKS								
1	(B) Embryo Sac	1								
2	(C) Pod Length	1								
3	(B) Possibility Of Double Cross Over	1								
4	(C) 5' GAATTC 3'----- 3' ATTCGTA 5'	1								
5	(B) capacity to generate a whole plant from any plant cell/ explant	1								
6	(c) Anotropous	1								
7	(b) AUG	1								
8	(b) Bio Augmentation	1								
9	In some species the inner layer of integument may become specialized to perform nutritive function for the embryosac and is called endothelium. Example : Asteraceae.	2								
10	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Incomplete Dominance</th> <th style="width: 50%; text-align: center;">Co dominance</th> </tr> </thead> <tbody> <tr> <td>When one allele is not completely dominant to another allele it shows incomplete dominance.</td> <td>This pattern occurs due to simultaneously (joint) expression of both alleles in the heterozygous.</td> </tr> <tr> <td>The F1 heterozygous phenotype differs from both the parental homozygous phenotype</td> <td>The F1 heterozygous genotype differ from either of the homozygous genotype.</td> </tr> <tr> <td>Example: Mirabilis jalapa (or) 4'O clock plant.</td> <td>Example: Red and white flower of camella (or) ABO blood group in human.</td> </tr> </tbody> </table>	Incomplete Dominance	Co dominance	When one allele is not completely dominant to another allele it shows incomplete dominance.	This pattern occurs due to simultaneously (joint) expression of both alleles in the heterozygous.	The F1 heterozygous phenotype differs from both the parental homozygous phenotype	The F1 heterozygous genotype differ from either of the homozygous genotype.	Example: Mirabilis jalapa (or) 4'O clock plant.	Example: Red and white flower of camella (or) ABO blood group in human.	2
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11	The growing of cells including the culture of single cells or small aggregates of cells in vitro in liquid medium. The cell suspension is prepared by transferring a portion of callus to the liquid medium and agitated using rotary shaker instrument.	2								
12	Cytoplasmic organelles such as chloroplast and mitochondrion that act as inheritance vectors, it is also called Cytoplasmic inheritance. It is based on independent, self-replicating extra chromosomal unit called plasmogene	2								
13	Biopiracy can be defined as the manipulation of intellectual property rights laws by corporations to gain exclusive control over national genetic resources, without giving adequate recognition or remuneration to the original possessors of those resources.	2								
14	Primary metabolites are molecules that are essential for an organism's growth, development, and reproduction. E.g: Amino acid, Citric acid.	2								

15	It is a process of preservation of plant extracts at -196°C using liquid nitrogen. Protectants – Dimethyl sulphoxide, glycerol or sucrose. It stops the enzymatic or chemical activity.	3
16	Cytoplasmic organelles such as chloroplast and mitochondrion that act as inheritance vectors, called Cytoplasmic inheritance.	3
17	Somatic cells of organisms are derived from the zygote by repeated cell division (mitosis). These consist of two identical sets of chromosomes. One set is received from female parent (maternal) and the other from male parent (paternal). These two chromosomes constitute the homologous pair.	3
18	Agrobacterium tumefaciens is known as a natural genetic engineer of a plant because it has the natural ability to integrate its plasmid genes into the plant genomes. It can deliver a piece of T-DNA in the plant genome.	3
19	The foreign DNA is coated onto the surface of minute gold or tungsten particles (1-3 μm) and bombarded onto the target tissue or cells using a particle gun (also called as gene gun/micro projectile gun/shotgun).	3
20(A)	Tapetum: It is the innermost layer of anther wall and attains its maximum development at the tetrad stage of microsporogenesis. It is derived partly from the peripheral wall layer and partly from the connective tissue of the anther lining the anther locule. Thus, the tapetum is dual in origin. It supplies nutrition to the developing microspores. • It contributes sporopollenin through ubisch bodies thus plays an important role in pollen wall formation. The pollenkitt material is contributed by tapetal cells and is later transferred to the pollen surface. • Exine proteins responsible for 'rejection reaction' of the stigma are present in the cavities of the exine. These proteins are derived from tapetal cells.	Explanation – 1 mark Origin – 1 marks Function – 3 marks
20(B)	In Nicotiana self sterility or self incompatibility is due to multiple alleles. ➤ The pollen from a plant is unable to germinate on its own stigma - and no fertilization. ➤ The gene for self incompatibility can be - 'S' which has allelic series S1, S2, S3, S4 & S5	5 Marks

	<p>➤Cross-fertilizing tobacco - were not always homozygous as S1 S1 or S2 S2 , but heterozygous</p> <p>➤Crosses between different S1 S2 plants, pollen tube did not develop normally.</p> <p>➤But effective - development observed when cross was made with other than S1 S2 Eg. S3 S4 . (or) table</p>	
21(A)	<p>Single cell protein from Spirulina is utilized in food industries.</p> <p>➤Biochip based biological computer is one of the successes of biotechnology.</p> <p>➤The synthesis of vaccines, enzymes, antibiotics, dairy products and beverages are the products of biotech industries.</p> <p>➤Production of secondary metabolites, biofertilizers, biopesticides and enzymes.</p> <p>➤The synthesis of human insulin and blood protein in E.coli and utilized for insulin deficiency disorder in human is a breakthrough in biotech industries in medicine.</p> <p>➤Biomass energy, biofuel, Bioremediation, phytoremediation for environmental biotechnology.</p>	<p>Any 5 points</p> <p>5 marks</p>
21(B)	<p>Diagram</p> <p>Totipotency</p> <p>➤The property of a living plant to have a potential to give rise to a complete individual plant.</p> <p>Differentiation</p> <p>➤The process of biochemical and structural changes by which cells become specialized in form and function.</p> <p>Redifferentiation</p> <p>➤The further differentiation of already differentiated cell into another type of cell.</p> <p>Dedifferentiation</p> <p>➤Reversion of mature cells leads to the formation of callus.</p>	<p>1 Mark</p> <p>4 Marks</p>

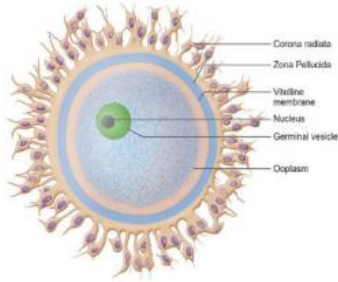
YOUTUBE / AKWA ACADEMY

BIO - ZOOLOGY

Q. NO	ANSWER	MARKS
1	(a) (a-3), (b-1), (c-4), (d-2)	1
2	(a) Both A and R are true and R is the correct explanation for A	1
3	(b) Leydig cell	1
4	(a) Allantois	1
5	(a) Inhibition of spermatogenesis	1
6	(b) A,B and AB	1
7	(d) Replication, Transcription, Translation	1
8	(c) in water	1
9	Amoeba reproduces by fission, that is by cell division itself a mode of reproduction.	2
10	a. FSH - Follicle Stimulating Hormone b. LH - Lutenizing Hormone c. HCG - Human Chorionic Gonadotropin d. HPL - Human Placental Lactogen	2
11	Intra-Uterine Insemination (IUI) ➤ In Vitro Fertilization, (IVF) ➤ Embryo Transfer (ET) ➤ Zygote Intra-Fallopian Transfer (ZIFT) ➤ Gamete Intra Fallopian Transfer (GIFT) ➤ Intra-Cytoplasmic Sperm Injection (ICSI)	Any 4 methods
12	This type of inheritance of recessive sex linked character from father to daughter and then from the daughter to her sons is known as criss -cross inheritance or sex linked or X-linked inheritance.	2
13	➤ The genetic code is universal.	2

	<ul style="list-style-type: none"> ➤ All known living systems use nucleic acids and the same three base codons (triplet codon) direct the synthesis of protein from amino acids. 	
14	<ul style="list-style-type: none"> ➤ Severe mental retardation, ➤ Defective development of the central nervous system, ➤ Increased separation between the eyes, ➤ Flattened nose, ➤ Ears are malformed, ➤ Mouth is constantly open and the tongue protrudes. 	Any 4 points
15	The male and female gametes are produced by different parents and they fuse to form a zygote. E.g: Human	3
16	<ul style="list-style-type: none"> ➤ Testes present inside scrotal sac of skin that hangs outside the abdominal cavity. ➤ The scrotum acts as a thermoregulator for spermatogenesis. 	3
17	<ul style="list-style-type: none"> ➤ Yes it is necessary. ➤ Amniocentesis is a prenatal technique used to diagnose chromosomal abnormalities. ➤ Amniocentesis is misused to find out the sex of the foetus leading to female foeticides, it is necessary. ➤ Hence, a legal ban on amniocentesis is necessary. 	3
18	<ul style="list-style-type: none"> ➤ Male producing dissimilar gametes. ➤ Female produce similar gametes. ➤ It is of two kinds XX-XO type and XX-XY type. ➤ E.g: Bugs, insects, cockroaches, grasshoppers. 	3
19	<ul style="list-style-type: none"> ➤ It took 13 years to complete. ➤ HGP is 25 times larger than other organisms. ➤ Human genome is said to have approximately 3×10^9 bp 	3

20(A)	<ul style="list-style-type: none"> ➤ Identifying all the genes (approximately 30,000) of human DNA. ➤ Determining the sequence of 3 billion chemical base pairs that make up the human DNA. ➤ To store these information in data bases & improve Tools for data analysis. 	5																												
20(B)	<ul style="list-style-type: none"> ➤ Fossilization is the process by which plant and animal remains are preserved in sedimentary rocks. ➤ Actual remains - The original hard parts such as bones, teeth or shells are preserved as such in the earth's atmosphere. ➤ Petrification - When animals die the original portion of their body may be replaced molecule for molecule by minerals and the original substance being lost through disintegration. ➤ Natural moulds and casts - Even after disintegration, the body of an animal might leave indelible impression on the soft mud which later becomes hardened into stones. 	5 Marks																												
21(A)	<ul style="list-style-type: none"> ➤ Three autosomal alleles are on chromosome 9. ➤ These alleles determine the blood group. ➤ The gene for blood group is labeled as 'L' (L - Landsteiner, the discover) or 'I' (I - Isoagglutinin, another word for antigen) ➤ I gene has 3 allelic forms I^A, I^B, I^O. ➤ I^A specifies A antigen, I^B for B antigen and I^O allele specifies no antigen. ➤ I^A allele produces N - acetyl galactose transferase. It can add N - acetyl galactosamine. ➤ I^B allele produces the enzyme galactose transferase. ➤ This adds galactose to the precursor (H substance) ➤ I^O allele produce no enzyme. It cannot add NAG (N-acetyl glucosamine) or galactose to the precursor. <p style="text-align: center;">EITHER EXPLANATION OR TABULAR COLOUMN CAN BE AWARDED WHOLE MARKS</p> <table border="1" data-bbox="954 974 1396 1633" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Genotype</th> <th>ABO blood group phenotype</th> <th>Antigens present on red blood cell</th> <th>Antibodies present in blood plasma</th> </tr> </thead> <tbody> <tr> <td>$I^A I^A$</td> <td>Type A</td> <td>A</td> <td>Anti - B</td> </tr> <tr> <td>$I^A I^O$</td> <td>Type A</td> <td>A</td> <td>Anti - B</td> </tr> <tr> <td>$I^B I^B$</td> <td>Type B</td> <td>B</td> <td>Anti - A</td> </tr> <tr> <td>$I^B I^O$</td> <td>Type B</td> <td>B</td> <td>Anti - A</td> </tr> <tr> <td>$I^A I^B$</td> <td>Type AB</td> <td>A and B</td> <td>Neither Anti - A nor Anti-B</td> </tr> <tr> <td>$I^O I^O$</td> <td>Type O</td> <td>Neither A nor B</td> <td>Anti - A and anti - B</td> </tr> </tbody> </table>	Genotype	ABO blood group phenotype	Antigens present on red blood cell	Antibodies present in blood plasma	$I^A I^A$	Type A	A	Anti - B	$I^A I^O$	Type A	A	Anti - B	$I^B I^B$	Type B	B	Anti - A	$I^B I^O$	Type B	B	Anti - A	$I^A I^B$	Type AB	A and B	Neither Anti - A nor Anti-B	$I^O I^O$	Type O	Neither A nor B	Anti - A and anti - B	Any 5 points EXPLAIN OR TABLE 5 marks
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21(B)	<p><u>Structure of ovum</u></p> <ul style="list-style-type: none"> ➤ Human ovum is non-cleidoic (without shell), alecithal (no yolk) and microscopic in nature. ➤ Its cytoplasm called ooplasm contains a large nucleus called the germinal vesicle. ➤ The ovum is surrounded by <ol style="list-style-type: none"> ➤ 1. Inner thin transparent vitelline membrane, ➤ 2. Middle thick zona pellucida. ➤ 3. Outer thick coat of follicular cells called corona radiata. 		<p>STRU. 2 Mark</p> <p>POINT 3 Marks</p>
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