SET	A

INDIAN SCHOOL MUSCAT
FINAL EXAMINATION 2022
BIOLOGY

CLASS:XII Max.Marks: 70

MARKING SCHEME			
SET	QN.NO	VALUE POINTS	MARKS SPLIT UP
A	1	d	1
	2	b	1
	3	c	1
	4	b	1
	5	c	1
	6	d	1
	7	b	1
	8	d	1
	9	a	1
	10	b	1
	11	d	1
	12	b	1
	13	A	1
	14	D	1
	15	A	1
	16	A	1
	17	a) Zona pellucida b) Second polar body and ootid	2

	18	Genotypic ratio 1WW:2Ww:1ww OR (I) ♀ II) ♂III) ♂ IV) ♀ Phenotypic ratio 3 widow's peak: 1 straight	2
	19	Sneezing, watery eyes, running nose, difficulty in breathing (any two) Anti-histamine, adrenalin and steroids (any two)	2
	20	BOD stands for biochemical oxygen demand which represents the amount of dissolved oxygen that would be consumed if all the organic matter in one litre of water were oxidised by micorbes. Flocs present in the effluent consume the organic matter during their growth and decrease the BOD.	2
	21	Proinsulin has A and B peptide chains connected by a C chain. ½ Mature insulin has no C peptide. ½ Eli Lily prepared two DNA sequences corresponding to A and B chains of human insulin and introduced them to plasmids of E coli to produce insulin chains. Chains A and B were prepared separately, extracted and combined by creating disulfide bonds to form human insulin. 1mark	2
	22	Starts at puberty due to increase in GnRH secretion. 1 Pituitary secretes LH – Leydig cells and stimulates the synthesis and secretion of androgens 1 FSH acts on the Sertoli cells and stimulates the secretion of factors helping in the process of spermiogenesis.1	3
	23	a) Production of unisexual flowers. b) Pollen release and stigma receptivity are not synchronised. c) Anthers and stigma are positioned at different levels. Self incompatibility (any three)	3
	24	Plasmid pBR322 is a most widely used cloning vector. It has two resistance genes ampicillin resistance (ampR) and tetracycline resistance (tetR) which are considered useful as selectable markers. Selectable markers help in identifying and eliminatingnon-transformants and selectively permitting the growth of transformants. Bacterial cells containing recombinant pBR322 will be unable to grow in the presence of ampicillin, but will grow on tetracycline. (b) Selection of recombinants due to inactivation of antibiotics is a cumbersome procedure because it requires simultaneous plating on two plates having different antibiotics. Therefore, alternative selectable markers have been developed which differentiate recombinants from non-recombinants on the basis of their ability to produce colour in the presence of a chromogenic substrate. In this, a recombinant DNA is inserted within the coding sequence of an enzyme, b-galactosidase. This results into	3

		inactivation of the enzyme, which is referred to as insertional inactivation. The presence of a chromogenic substrate gives blue coloured colonies if the plasmid in the bacteria does not have an insert. Presence of insert results into insertional inactivation of the b-galactosidase and the colonies do not produce any colour, these are identified as recombinant colonies.	
	25	Homologous organs have same anatomical structure but different functions. Plants: thorns of Bougainvillea and Tendrils of Cucurbits. Animals : Forelimbs of vertebrates (or any other correct example)	1. Stabilising or 2. directional 3. disruptional 3
	26	a) Snake bite, tetanus infection. If a person is infected with some deadly microbes to which quick immune response is required as in tetanus, we need to directly inject the preformed antibodies or antitoxin. Even in the cases of snakes bites the injection which is given to the patients, contain preformed antibodies against the snake venom. This type of immunisation is called passive immunisation. It provides immediate relief. (b) In vaccination, a preparation of antigenic proteins of pathogens or inactivated weakened pathogens are introduced into the body. This produces immune response and the type of immunity is called active immunity.	3
	27	No bands will be obtained as/All DNA will be seen in the well only; (½ Mark) DNA fragments being negatively charged will not move towards -ive end/ cathode. DNA being negatively charged will remain stationed at the positive end/ anodeend of the agar block; (1 Mark) (b) (a) Position of the positive terminal/ end/ anode and the negative terminal/ end/ cathode was inter-changed (½ Mark) (ii) The fragment with least base pairs will get separated faster and move faster to the anode end. (1 Mark)	3
	28	Amplification of gene of interest Taq polymerase Thermophilus aquaticus	3
	29	a) Three, multiple alleles b) Codominance Yes, if both the parents are heterozygous for the blood group gene child may inherit i gene from both the parents.	OR on the surface of RBC polysachharides 4
	30	(a) Concentration of nicotine is maximum at 10 minutes/ conc. of nicotine increases steadily in the blood to reach 45mg/cm3 (1 Mark) (b) The Concentration of CO will increase resulting in reduced concentration of haemboundoxygen.(1 Mark) (c) Nicotine results in stimulating the adrenal gland which results in release of adrenaline / nor -adrenaline in the blood resulting in increase of blood pressure and heart rate. (2 Marks)	4

		OR a) Lung, urinary bladder and throat cancer. Bronchitis,emphysema, coronary heart disease, gastric ulcer. (any two) b) Nicotine stimulates adrenal gland to release adrenaline and nor-adrenaline into blood circulation. c) Smoking increases CO content in blood and reduces the concentration of haembound oxygen.	
	31	a) Epidermis,endothecium, middle layers and tapetum b) Tapetum c) Cells of sporogenous tissue acts as PMC. They undergo meiosis/pollen tetrad/dehydration **OR** a) The process of delivery of foetus/childbirth b) Oxytocin c) Signals originate from the fully developed foetus and the placenta which induce mild uterine contractions called foetal ejection reflex/this triggers release of oxytocin from the maternal pituitary/oxytocin acts on the uterine muscle and causes stronger uterine contraction/stimulates further oxytocin secretion. This continues resulting in stronger contratictions leading to expulsion of the baby out of the uterus through the birth canal.	5
	32	(i) Isloation of DNA (ii) Digestion of DNA by restriction endonuclease (iii)Separation of DNA fragments by electrophoresis (iv)Transferring (blotting) of separated DNA fragments to synthetic membranes such as nitrocellulose or nylon (v) Hybridisation using labelled VNTR probe (vi)Detection of hybridised DNA fragments by autoradiography. **OR** a) Splicing- primary transcript has exons and introns/introns are removed and exons are joined in a defined order. b) Capping and tailing/ an unusual nucleotide (Mgtp) is added to the 5'-end of the hnRNA. In tailing, adenylate residues are added at 3'end in a template independent manner.	5
	33	(a) Species III is least susceptible (1 Mark) species I is most affected (b) Bt toxin protoxins are converted into an active form in the gut which	5

		solubilises the toxin crystals. The activated toxin binds to the surface of midgut epithelial cells and create pores that cause cell swelling and lysis and eventually cause death of the insect (2 Marks) (c) Insect species I and II have alkaline gut pH which solubilises the insecticidal protein crystals of protoxin and makes it active. Species III has an acidic and the protoxin continues to remain in an inactive form doing no harm to insect species III (2 Marks) **OR** a) Chitinase/protease/lipase/RNAse/chilled ethanol.(2) b) Micro injection/ biolistic or gene gun (1) c) A.tumifaciens has Ti plasmid. Made disarmed and used as cloning vector.(2)	

SET	B

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MARKING SCHEME			
SET	QN.NO	VALUE POINTS	MARKS SPLIT UP
B	1	D	1
	2	A	1
	3	A	1
	4	D	1
	5	B	1
	6	B	1
	7	B	1
	8	B	1
	9	A	1
	10	B	1
	11	B	1
	12	D	1
	13	A	1
	14	C	1
	15	A	1
	16	A	1
	17	C and D is maximum. Map distance and recombinant frequency are proportional. So it will show maximum recombination.	2

	18	Colostrum – Passive immunity Vaccination – Active immunity Ig A OR i) B12 increases ii) check the harmful bacteria in digestive track	2
	20	a) Saccharomyces cereviseae Nucleopolyhedrovirus b) Protease and pectinase	2
	22	Antivenom (preformed antibody). It gives quick immune response. So the life can be saved. Passive immunity	3
	24	Darwin – slow, directional, natural selection, small De Vries – fast, random, mutation, large saltation. (any three)	3
	28	Restriction endonuclease. Strain RY13 It recognises a palindromic sequence on the DNA. Cut between the same base pairs on both the strands little away from the centre leaving sticky ends. Which can be later joined with complementary strand.	3

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SET	**C**

MARKING SCHEME			
SET	QN.NO	VALUE POINTS	MARKS SPLIT UP
C	1	D	1
	2	A	1
	3	A	1
	4	D	1
	5	B	1
	6	A	1
	7	B	1
	8	A	1
	9	B	1
	10	C	1
	11	B	1
	12	B	1
	13	B	1
	14	D	1
	15	A	1
	16	A	1

	17	Organs in which immature lymphocytes mature into antigen-sensitive lymphocytes. Bone marrow, thymus.	2
	19	The settling tank flocs are allowed to sediment. It is called activated sludge. The sludge is pumped into anaerobic sludge digesters where they are anaerobically digested. During this digestion, bacteria produce biogas.	2
	21	Test cross	2
	25	Treat with divalent cation, ice, heat, ice. Microinjection.	3
	26 a)	Analogous – anatomically not similar but perform similar functions. Relults of convergent evolution. Homologous – anatomically similar but perform different functions. Result of divergent evolution.	3
		b) Wings of butterfly and birds (A) Tubers of sweet potato and potato (A) tendrils of cucurbita and bougainvillea and vertebrates heart (H) OR peppered moth	
	28	Metastasis is the property in chich tumour cells reach distant sites in the body through blood and start a new tumor. Biopsy/radiography/ CT/MRI Surgery/chemotherapy/radiotherapy/immunotherapy	3