Sample Question Paper 2023-24 Class XII Biology (Subject Code-044)

Maximum Marks: 70

Time: 3 hours

General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper has five sections and 33 questions. All questions are compulsory.
- (iii) Section-A has 16 questions of 1 mark each; Section-B has 5 questions of 2 marks each; Section-C has 7 questions of 3 marks each; Section-D has 2 case-based questions of 4 marks each; and Section-E has 3 questions of 5 marks each.
- (iv) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

	Section - A							
Q.No.	Question						Marks	
Ι	Remnants of nucellus are persistent during seed development in:						I	
	a) pea b) groundnut c) wheat d) black pepper							
2	The wall layer of	microspora	ngium whicl	n nourishes	the pollen	grain is:		I
	a) epidermis b) endothecium c) middle layers d) tapetum							
3	A short piece of nucleotide bases shown in the tab	DNA, hav in each o le.	ing 20 base f the polyni	pairs, was ucleotide st	analyzed to rands. Som	o find the r ne of the r	number of results are	I
			Nu	mber of nuc	cleotide bas	ses]	
			Adenine	Cytosine	Guanine	Thymine		
		Strand I	4	4				
		Strand 2		5				
	How many nucle	otides cont	aining Aden	ine were pr	esent in sti	rand 2!		
	a) 2							
	b) 4							
	c) 5							
	u) /							
				1				

(v) Wherever necessary, neat and properly labeled diagrams should be drawn.

4	In a certain species of insects, some have 13 chromosomes, and the others have 14chromosomes. The 13 and 14 chromosome bearing organisms are	I
	a) males and females, respectively	
	b) females and males, respectively	
	d) all females	
5	At a particular locus, the frequency of allele A is 0.8 and that of allele a is 0.2. What would be the frequency of heterozygotes in a random mating population at equilibrium?	I
	a) 0.32	
	b) 0.16	
	c) 0.24 d) 0.48	
	u) 0.48	
6	Variations caused due to mutations are	1
	a) random and directionless	
	b) random and directional	
	d) random small and directional	
	· · ·	
7	What is the smallest part of a DNA molecule that can be changed by a point mutation?	I
	a) Oligonucleotide	
	b) Codon	
	c) Gene d) Nucleotide	
8	What should be the genotype of the indicated member?	I
	a) AA	
	b) Aa	
	uj aa	



	a) Cail Can										
	b) Soil San										
	c) Soil San		and B h	oth							
	d) Soil San	nples A		Jour							
Questi questic	ion No. 13 to ons selecting t) 16 co he appr	onsist of opriate	f two st option §	atement given be	s – Ass Iow:	ertion ((A) and	d Reason (R). A	Answer	these
a) Bo	th A and R are	e true a	nd R is	the corr	ect exp	lanation	of A.				
b) Bo	th A and R are	e true a	nd R is	not the	correct	explanat	tion of A	۹.			
i A (C	is true but R is	talse.									
		i u ue.								_	
13	Assertion: P	rimary	endospe	erm nuc	leus is d	iploid.					1
	Reason: It is	the pro	oduct of	f double	fertilisa	tion.					
14	Assertion:Ri	bosom	al RNA	is synthe	esized in	the nuc	leus of	the cel	Ι.		I
	Reason: It is	transla	ted with	, h the en	zyme RN	VA polyı	merase	III.			
					-						
15	Assortion: S	moking			Droccui	co and in	crosso	boart r	250		
15	Assertion: S Reason: Ni	moking	can rais	se blood tes adr	l pressui enal gla	re and in	crease l release	heart r adre	ate. naline and no	r-	I
15	Assertion: S Reason: Ni adrenaline i	moking cotine nto the	can rais stimula e blood	se blood tes adr circulat	l pressur enal gla tion, bo	re and in ands to th of w	crease l release hich rai	heart r e adre se blo	ate. naline and no od pressure ar	or- nd	I
15	Assertion: S Reason: Ni adrenaline i increase hea	moking cotine nto the rt rate.	can rais stimula e blood	se blood tes adr circulat	l pressur enal gla tion, bo	re and in Inds to th of w	crease l release hich rai	heart r e adre se blo	ate. naline and no od pressure ar	nr- nd	I
15	Assertion: S Reason: Ni adrenaline i increase hea Assertion: P	moking cotine nto the .rt rate. CR is a	can rais stimula blood powerf	se blood tes adr circulat ful techn	l pressui enal gla tion, bo	re and in inds to th of w identify	crease l release hich rai genetic	heart r e adre se blo disorde	ate. naline and no od pressure ar ers.	nr- nd	
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21	 Biomass of a standing crop of phytoplankton is 4 kg/m² which supports a large standing crop of zooplankton having a biomass 11 kg/m². This is consumed by small fishes having biomass 25 kg/m² which are then consumed by large fishes with the biomass 37 kg/m². Draw an ecological pyramid indicating the biomass at each stage and also name the trophic levels. Mention whether it is an upright or inverted pyramid. 						
	OR						
	Use the information provided in the table given below to answer the following questions:						
	Tropic level	Net Production(KJm ⁻² y ⁻¹)	Respiration (KJm ⁻² y ⁻¹)				
	Top Carnivore	50	35				
	Carnivores	420	378				
	Herbivores	4490	4041				
	Producers	45000	40,367				
	a) Calculate the b) Analyze the Carnivore. C	e gross primary productivity. trend in the Net Product Give a reason for your observat	tion from Producers to Top ion.				
		Section - C					
22	The figure given belo	ow shows 3 sperms A, B and C		3			
	a) Which one c	of the three sperms will gain en	try into the ovum?				
	b) Describe the	e associated changes induced by	it on P and Q.				
			l				
		B	$\langle \mathbf{c} \rangle$				
	P		R				
		Perivitelline space	3				
		Figure Ovum surrounded b	y few sperms				







Section - E

31

Placed below are case studies of some couples who were not able to have kids. These couples are not ready for adoption or taking gametes from donors. After thoroughly examining the cases, which Assisted Reproductive Technology will you suggest to these couples as a medical expert? Explain briefly with justification of each case.

Couple	Test reports of Female partner	Test reports of male partner
Couple I	Normal reports	Normal sperms in testes, Missing connection in epididymis and Vas deferens
Couple 2	Blockage in the fallopian tube	Normal reports
Couple 3	Normal reports	Poor semen parameters in terms of count, motility and morphology
Couple 4	low ovarian reserve	Normal reports
Couple 5	Sterilization in male	Morphologically abnormal sperms

OR

Given below are certain situations. Analyse the situation and suggest the name of suitable contraceptive device along with mode of action.

Situation	Requirement of contraceptive for -	Name of contraceptive device	Mode of action
I	blocking the entry of sperms through cervix		
2	spacing between children		
3	effective emergency contraceptive		
4	terminal method to prevent any more pregnancy in female		
5	sterilization in male		

5

32	 Given below is a stretch of DNA showing the coding strand of a structural gene of a transcription unit? S'ATG ACC GTA TTT TCT GTA GTG CCC GTA CTT CAG GCA TAA—3' a) Write the corresponding template strand and the mRNA strand that will be transcribed, along with its polarity. b) If GUA of the transcribed mRNA is an intron, depict the sequence involved in the formation of mRNA /the mature processed hnRNA strand. i. In a bacterium ii. In humans c) Upon translation, how many amino acids will the resulting polypeptide have? Justify. OR In shorthorn cattle, the coat colours red or white are controlled by a single pair of alleles. A calf which receives the allele for red coat from its an equal number of red and white hairs in its coat. a) Is this an example of codominance or of incomplete dominance? b) Give a reason for your answer. c) With the help of genetic cross explain what will be the consequent phenotype of the calf when i. red is dominant over white ii. red is incompletely dominant. 	5	
33	Explain the role of Primary and Secondary Lymphoid organs with the help of suitable examples. OR With the help of a flow chart illustrate how an infected animal cell can survive while viruses are being replicated or released.	5	
