

केन्द्रीय विद्यालय संगठन, कोलकाता संभाग
KENDRIYA VIDYALAYA SANGATHAN, KOLKATA REGION
द्वितीय प्री-बोर्ड परीक्षा / 2ND PRE-BOARD EXAMINATION – 2025-26

कक्षा / CLASS –XII

विषय /SUB. – जीव विज्ञान/ Biology

अधिकतम अंक/MAX. MARKS – 70

समय/TIME – 03 Hours

General Instructions:

(i) All questions are compulsory.

(ii) The question paper has five sections and 33 questions.

(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.

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

Q.No.	Questions SECTION-A	Marks								
1.	Match the pollinating agents with suitable examples: <table style="width: 100%; border: none;"> <tr> <td style="text-align: left;">Pollination Agent</td> <td style="text-align: left;">Example Plant</td> </tr> <tr> <td>a. Wind</td> <td>i. Vallisneria</td> </tr> <tr> <td>b. Water</td> <td>ii. Grass</td> </tr> <tr> <td>c. Insect</td> <td>iii. Calotropis</td> </tr> </table> Choose the correct matching combination: A. a–ii, b–i, c–iii B. a–iii, b–ii, c–i C. a–i, b–iii, c–ii D. a–ii, b–iii, c–i	Pollination Agent	Example Plant	a. Wind	i. Vallisneria	b. Water	ii. Grass	c. Insect	iii. Calotropis	1
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2	Which of the following statements are correct with respect to hormones secreted by placenta? (i) Placenta secretes high amount of FSH during pregnancy. (ii) Placenta secretes relaxin during later stage of pregnancy. (iii) Placenta secretes relaxin during initial stage of pregnancy. (iv) Placenta secretes hCG and hPL during pregnancy. A. (i) and (iv) B. (ii) and (iv) C. (iii) and (iv) D. (ii), (iii) and (iv)	1								
3	“ Gametes are never hybrid ”. This is the statement that supports the law of- A. dominance B. random fertilization C. segregation D. independent assortment	1								
4	1. A man whose father was colour-blind marries a woman who had a colour-blind mother and normal father. What percentage of male children of this couple will be colour-blind? (A) 25% (B) 0% (C) 50% (D) 75%	1								
5	Which of the following ratio is generally constant for a given species? A) A+C / T+G B) A+G/C+T C) T+G/C+A D) G+C/T+A	1								
6	In <i>lac operon</i> , the role of the repressor protein is to:	1								

	A. Promote transcription of lac genes B. Bind to the operator to prevent transcription C. Help RNA polymerase bind to promoter D. Code for β -galactosidase	
7.	The principle of DNA fingerprinting is based on: A. Polymorphism in DNA sequences B. Similarity in DNA among individuals C. Universal genetic code D. Semi-conservative replication	1
8	The most primitive ancestor of humans is : A. Homo habilis B. Australopithecus C. Ramapithecus D. Homo neanderthalensis	1
9	ELISA technique is based on the principle of 1 (A) DNA replication (B) antigen-antibody interaction (C) pathogen – antigen interaction (D) antigen – protein interaction	1
10	Active immunity differs from passive immunity because it: A. Is provided through ready-made antibodies B. Is short-lived and immediate C. Develops after exposure to pathogen or vaccine D. Does not involve memory cells	1
11	The first restriction enzyme discovered was: A. EcoRI B. HindII C. BamHI D. TaqI	1
12	Match column I with the items in Column II COLUMN I COLUMN II A. Lady Bird 1. Plant pathogens B. Bacillus thuringiensis 2. Insects C. Baculoviruses 3. Aphids,mosquitoes D. Trichoderma Fungus 4. Caterpillars,cotton bollworms Choose the correct options of column II from the following: a) A2 B4 C3 D1 b) A3 B4 C2 D1 c) A4 B1 C2 D3 d) A3 B2 C1 D4	1
	Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below: A. Both A and R are true and R is the correct explanation of A. B. Both A and R are true and R is not the correct explanation of A. C. A is true but R is false. D. A is False but R is true.	1
13	Assertion (A) : Megaspore mother cell divides mitotically to produce 4 spores Reason (R) : Megaspore mother cells is diploid and megaspores are haploid	1
14	Assertion (A) : Agrobacterium tumefaciens is a pathogen of several monocot plants.	1

	Reason (R) : It is able to deliver a piece of DNA known as T-DNA to transform normal plant cells into a tumor.																	
15	Assertion (A) : Primary transcripts in eukaryotes are subjected to splicing to remove the introns. Reason (R) : Primary transcripts contain both exons and introns and the introns are non-functional in eukaryotes.	1																
16	Assertion (A) : Cyanobacteria act as biofertilizers in rice fields. Reason (R) : They fix atmospheric nitrogen in symbiotic association with roots of legumes.	1																
SECTION-B																		
17	A. During artificial hybridization, it is important to ensure that only desired pollen grains are used for pollination. How is it ensured? OR B. Name 2 incurable STDs . name their causal organism. Mention 1 symptoms and 1 complications that may arise due to STDs.	2																
18	A segment of DNA has the following base sequence on its template strand: 5'– T A C G G T A G C A T G G A C –3' Answer the following: a. Write the sequence of mRNA transcribed from this DNA strand. b. Identify the coding strand and write its sequence.	2																
19	(a) A farmer while working on his farm was bitten by a poisonous snake. He was rushed to a nearby health centre where the doctor gave him an injection to save his life. (i) What did the doctor inject and why ? (ii) Name the kind of immunity provided by this injection.	2																
20	Correctly depict (also indicate the trophic level) and describe the ecological pyramid of number with 32 birds dependent on 20 insects feeding on one banyan tree. OR Name the growth curve and depict a graphical plot for a population of any species in nature that has unlimited resources at its disposal.	2																
21	(a) Different varieties of cheese are known by their characteristic texture, flavour and taste, the specificity coming from the microbes used. Support this statement with the help of two suitable examples. OR (b) Identify A, B, C and D in the following table :	2																
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 35%;">Scientific name of source plant</th> <th style="width: 15%;">Drug</th> <th style="width: 45%;">Harmful effects / Body part affected</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td><i>Papaver somniferum</i></td> <td>A</td> <td>Depressant/slows down body functions</td> </tr> <tr> <td>2.</td> <td><i>Cannabis sativa</i></td> <td>B</td> <td>C</td> </tr> <tr> <td>3.</td> <td><i>Erythroxylum coca</i></td> <td>Cocaine</td> <td>D</td> </tr> </tbody> </table>				Scientific name of source plant	Drug	Harmful effects / Body part affected	1.	<i>Papaver somniferum</i>	A	Depressant/slows down body functions	2.	<i>Cannabis sativa</i>	B	C	3.	<i>Erythroxylum coca</i>	Cocaine	D
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SECTION-C		
22	Explain the process of formation of placenta in a human female after the implantation of the blastocyst in the endometrium of the uterus.	3
23	“Many of the flowering plants producing hermaphrodite flowers have developed many devices to discourage self-pollination and to encourage cross-pollination.” Mention 3 different mechanisms that plants had adopted and explain in brief.	3
24	In a population of lizards, both very small and very large individuals survive better than those of intermediate size because small lizards can hide easily, while large ones can fight predators. (a) Identify the type of natural selection. (b) Predict how the phenotype distribution of this population will change over time. (c) Draw and describe the likely shape of the resulting graph in due course of time.	3
25	Name one commonly occurring genetic disorder in humans which is caused due to monosomy (one chromosome less than the normal number of chromosomes) of sex chromosome. Give its two symptoms. Mention the chromosome number and sex of the individual.	3
26	Explain the beneficial role of the following, produced as a result of the processes of biotechnology, to mankind : (a) Cow named Rosie (b) α -1-antitrypsin	3
27	Answer the following questions with respect to the sex determining mechanism observed in honey bee. (a) What is the type of cell division involved in the formation of gametes in a female bee and a male bee respectively ? (b) Name the type of sex determination system observed in honey bee. (c) What is the sex of honey bee formed from the unfertilised eggs ? Write the number of chromosomes present in it. OR (i) Explain the convention for naming EcoRI. (ii) With the help of an illustration only, show the action of EcoRI on a DNA Polynucleotide	1+1+ .5+.5 =3 2+1
28	Alien species are highly invasive and are threat to indigenous species Support the statement with three examples?	3
SECTION-D		
29	Biodiversity, the variety of life on Earth from genes to ecosystems, is crucial for our survival. It provides us with food, water, medicine, and a stable climate, underpinning over half the world's economy. However, this interconnected web of life faces a crisis, with up to a million species potentially disappearing within decades due to human actions. The primary driver is land use for food production, which has already altered over 70% of ice-free land, destroying habitats and causing extinctions. Climate change further exacerbates the problem, disrupting ecosystems, forcing species migration, and increasing the risk of diseases. The loss of biodiversity has far-reaching consequences, impacting not only the environment but also our health, economy, and culture. Rising temperatures and extreme weather events threaten marine and terrestrial ecosystems alike, leading to coral reef destruction and shifts in species distribution. Fortunately, it's not too late to act. Protecting 30% of the world's lands and waters by 2030 is a key goal, allowing nature to recover and continue providing essential services. Even small actions like choosing sustainable products and avoiding	

	<p>harmful chemicals can make a significant difference in preserving biodiversity for future generations.</p> <ol style="list-style-type: none"> 1. What are the key threats for loss of biodiversity? 2. The extinction of <i>Cuscuta reflexa</i> following the extinction of its host plant is an example of <p>(a) Natural selection (b) Co-evolution (c) Co-extinction (d) Genetic drift</p> <p>3. Cryopreservation of gametes of endangered animals is an example of —</p> <p>(a) In-situ conservation (b) Ex-situ conservation (c) Community-based conservation (d) Restoration ecology</p> <p>OR</p> <p>4. Which of the following criteria is used to identify a <i>biodiversity hotspot</i>?</p> <p>(a) Presence of scenic beauty (b) Presence of large number of endemic and threatened species (c) Presence of commercially valuable species (d) High human population density</p>	2+1+1												
30	<p>A senior student, sneezing very badly, with watery eyes and having difficulty in breathing was brought to the school medical room by his fellow friends. The medical room nurse enquired as to what had happened. One of the students said “after the football match we all were sweating profusely, one of our friends sprayed deodorant on us. Soon after the deodorant was sprayed on the senior boy, the symptoms appeared.”</p> <p>(a) What are the symptoms seen in the student indicative of ? Elaborate. 1 (b) State how the cause of such responses can be confirmed. 1 (c) (i) Name the cells in our body and the chemicals produced by them that are responsible for such reactions. Name any two drugs used to reduce these symptoms. 2</p> <p>OR</p> <p>(c) (ii) ‘In recent times there is a rise in such reactions amongst urban human population.’ Do you agree ? Give three reasons in support of your</p>													
SECTION-E														
31	<p>(i) Draw a diagrammatic sectional view of ovary of human female and label the following: (1) Blood vessels (2) Primary follicle (3) Tertiary follicle (4) Ovum</p> <p>(ii) At which stage of life are primary follicles formed in a human female? (iii) Explain the events (both hormonal and structural) that occur at the time of ovulation till the onset of the next menstrual cycle.</p> <p>OR</p> <p>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.</p> <table border="1" data-bbox="274 1722 1378 2029"> <thead> <tr> <th>Couple</th> <th>Clinical diagnosis of Female partner</th> <th>Clinical diagnosis of male partner</th> </tr> </thead> <tbody> <tr> <td>Couple -I</td> <td>Normal</td> <td>Azoospermia or low sperm count, unable to inseminate.</td> </tr> <tr> <td>Couple -II</td> <td>Blocked fallopian tube</td> <td>Normal sperm count, morphology and mobility.</td> </tr> <tr> <td>Couple -III</td> <td>Cannot produce ova but uterus is normal for</td> <td>Normal sperm count, morphology and mobility.</td> </tr> </tbody> </table>	Couple	Clinical diagnosis of Female partner	Clinical diagnosis of male partner	Couple -I	Normal	Azoospermia or low sperm count, unable to inseminate.	Couple -II	Blocked fallopian tube	Normal sperm count, morphology and mobility.	Couple -III	Cannot produce ova but uterus is normal for	Normal sperm count, morphology and mobility.	
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		implantation		
	Couple -IV	Cannot produce egg but otherwise normal	Low sperm count	
	(ii) Differentiate between humoral immune response and cell-mediated immune response			
32	<p>13. (a) Read the paragraph given below and answer the questions that follow: Enzyme Taq polymerase, is extracted from a eubacteria microorganism <i>Thermus aquaticus</i> from Yellowstone National Park in Montana, USA and isolated by Chien et al, (1976). Taq polymerase successfully replaced the DNA polymerase from <i>E.coli</i> that was being used in PCR earlier and this shift revolutionized the PCR technique.</p> <p>(i) Taq polymerase after its discovery replaced <i>E.coli</i> DNA polymerase in PCR technique. Explain giving reasons why was the need felt for the change?</p> <p>ii) Name the three major steps in PCR .</p> <p>(iii) What is a primer and its importance in PCR?</p> <p>(iv) Write the importance of PCR as a diagnostic tool.</p> <p style="text-align: center;">OR</p> <p>A. Human insulin when synthesized in the body needs to be processed before it can act. Explain giving reasons</p> <p>B. Explain how Eli Lilly, an American company, produced insulin by recombinant DNA technology.</p>			<p>1.5</p> <p>1.5</p> <p>1</p> <p>1</p> <p>2+3</p>
33	<p>a) What is polygenic inheritance? Explain with the help of a suitable example.</p> <p>(b) How are pleiotropy and Mendelian pattern of inheritance different from polygenic pattern of inheritance?</p> <p style="text-align: center;">OR</p> <p>(a) Draw a well labelled diagram of "Replication Fork".</p> <p>(b) Explain the mechanism of DNA replication. Highlight the role of enzymes in the process.</p> <p>(c) Why is DNA replication said to be semiconservative?</p>			<p>3+1+2</p>
