B.K. BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
A CBSE DAY-CUM-BOYS' RESIDENTIAL SCHOOL

PRE-BOARD-1 EXAMINATION 2025-26
BIOLOGY (044)

Class: XII | Duration: 3 Hours
Date: 10/11/2025 | Max. Marks:70
Admission no: | Roll no:

General Instructions:

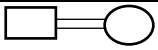
(i) All questions are compulsory.
(ii) The question paper has five sections and 33 questions.
(iii) Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.
(iv) There is no overall choice. Answer all 33 questions. 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 labeled diagrams should be drawn.

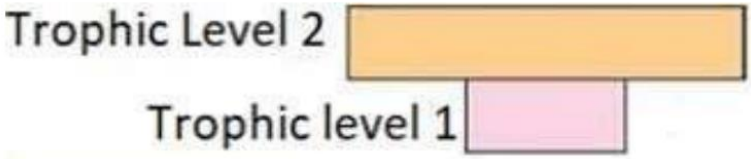
SECTION-A

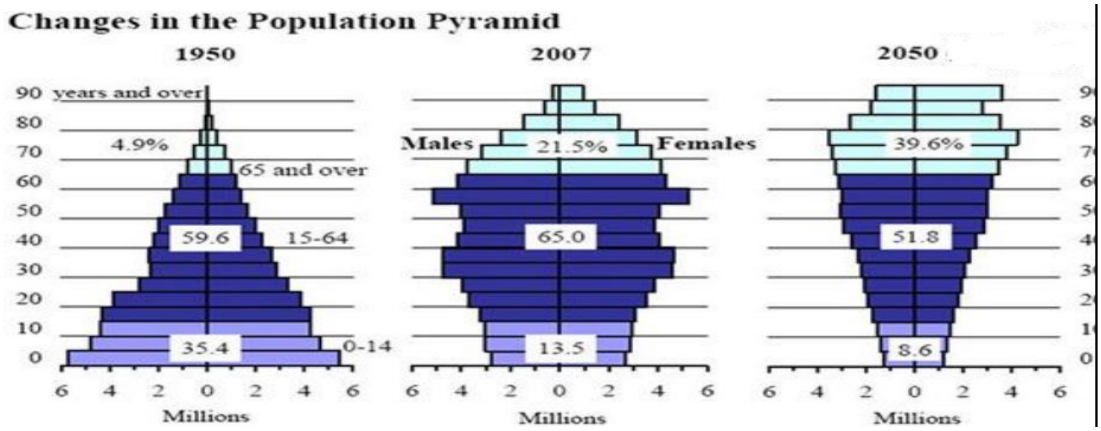
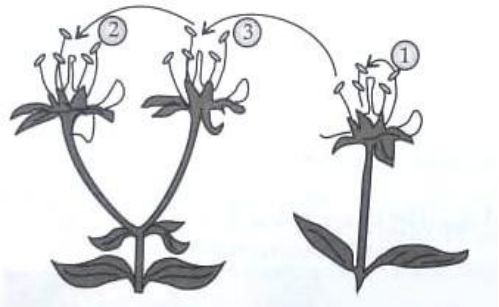
Q. No. 1 to 12 are multiple choice questions. Only one of the choices is correct. Select and write the correct choice as well as the answer to these questions.

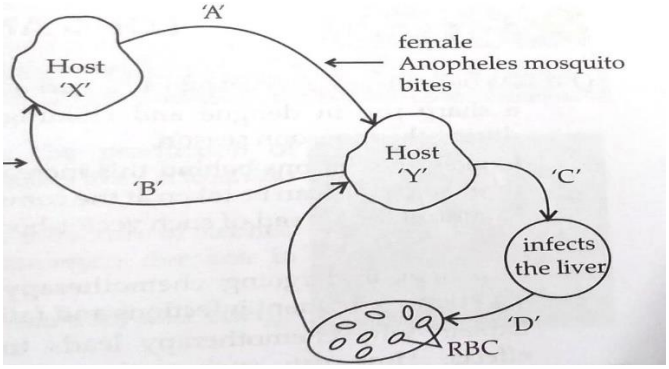
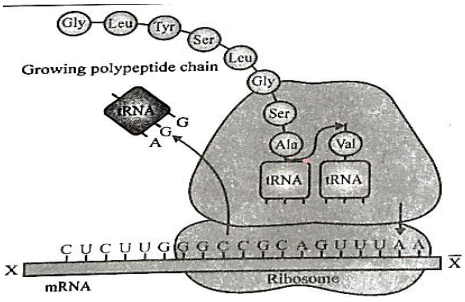
Q.no	Question	Marks
1.	To produce 1600 seeds, the number of meiotic divisions required will be A. 2400 B. 2000 C. 1600 D. 1800	1
2.	To carry artificial hybridisation in a female parent producing unisexual flowers, there is a need of: A. Emasculation B. Bagging C. Emasculation and bagging D. Bagging and rebagging	1
3.	Given below are structural details of a human mammary gland: i) The glandular tissue in the breast has 15-20 clusters of cells called alveoli. ii) The mill is stored in the lumen of alveoli. iii) The alveoli join to form the mammary ducts. iv) Mammary ampulla is connected to lactiferous ducts. Choose the option that five the correct detail of the human mammary gland.	1

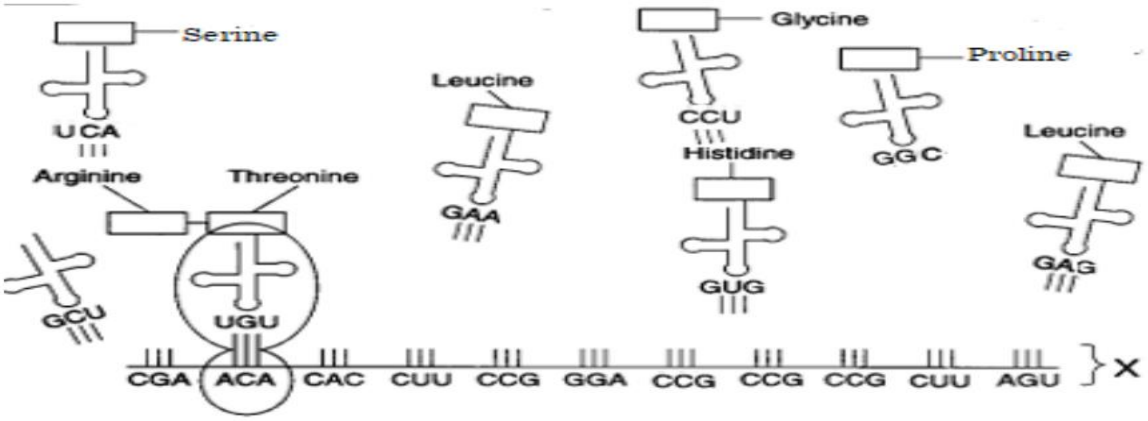
	A. i & ii B. ii & iii C. ii & iv D. I & iii	
4.	Heterozygous round and yellow seeded pea plants were self-crossed and total of 1600 seeds were collected. What will be the total number of seeds with both recessive traits? A. 600 B. 100 C. 300 D. 900	1
5.	What does the chart given below represent? Male X Female AA+XO AA+XX A+X A+O A+X A+X A. Sex determination in humans. B. Sex determination in hens C. Sex determination in grasshopper D. Sex determination in honey bee	1
6.	The sequence of nitrogenous bases in a segment of a coding strand of DNA is 5`- AATGCTAGGCAC-3`. Choose the option that shows the correct sequence of nitrogenous bases in the mRNA transcribed by the DNA. A. 5`-UUACGAACCGAG-3` B. 5`-AAUGCUAGGCAC-3` C. 5`-UUACGUACCGUG-3` D. 5`-AACGUAGGCAGC-3`	1
7.	Which was the last of the 24 human chromosomes to be completely sequenced? A. Chromosome-1 B. Chromosome-11 C. Chromosome-21 D. Chromosome-X	1
8.	"In Cricket species, the sound produced by rubbing the wings or legs together play a crucial role in attracting mates, any change in the morphology of Cricket legs could potentially affect their ability to produce sound". A mutant Cricket had thicker hind legs. What would you expect for this cricket species? A. The leg mutation will not lead to speciation if they diversify into new habitats. B. The leg mutation will have little effect on other external features, and therefore have little effect on speciation. C. The leg mutation will have no effect on behavior, and thus have little effect on speciation. D. The leg mutation might lead to reproductive isolation and speciation due to an effect on the mating call.	1

9.	A sample of normal double-stranded was found to have thymine content of 27%. What will be the expected proportion of guanine in this strand? A. 23% B. 32% C. 36% D. 73%	1
10.	In which of the following conditions/disease is there a substantial increase in the activity of mast cells observed in the human body? A. Typhoid B. Allergy C. Ascariasis D. AIDS	1
11.	The role of cyanobacteria in paddy fields is primarily to: A. Increase oxygen concentration B. Fix atmospheric nitrogen C. Control fungal diseases D. Degrade plastic residues	1
12.	In a pedigree analysis,  represents: A. Unrelated mating B. Affected individuals C. Non-identical twins D. Consanguineous mating	1
Question No. 13 to 16 consist of two statements-Assertion (A) and Reason (R). Answer these questions by 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.		
13.	Assertion (A): Endosperm is completely consumed during the development of embryo in ex-albuminous seeds. Reason (R): Castor, pea and beans are all examples of ex-albuminous seeds.	1
14.	Assertion (A): Darwin showed how even a slow growing animal like an elephant could reach enormous numbers. Reason (R): When resources in the habitat are unlimited, each species has the ability to realise its innate potential fully.	1
15.	Assertion (A): Virus-infected cells produce interferons. Reason (R): Interferons can cause inflammation of virus-infected cells.	1
16.	Assertion (A): Biopiracy refers to the illegal use of biological resources or traditional knowledge. Reason (R): Developing countries often patent biotechnological discoveries made from indigenous resources without compensation.	1

	SECTION-B	
17.	Attempt either option A or B. A. Banana and many citrus fruits are formed without fertilization. Name and explain the process of fruit/seed formation in both. OR B. Explain the mechanism of pollination in marine sea grasses like Zostera.	2
18.	State any four salient observations drawn from the human genome project.	2
19.	Write the scientific name of the plant and its part from which opioids are extracted. How does it affect our body functions?	2
20.	Attempt either option A or B. A. A cheese maker claims to be a biotechnologist. How will you support the same? OR B. Why does the 'insertional inactivation' method to detect recombinant DNA is preferred to 'antibiotic resistance' procedure?	2
21.	Attempt either option A or B. A. i) Given below is a pyramid of biomass in an ecosystem where each bar represents the standing crop available in the trophic level. With the help of an example explain the conditions where this kind of pyramid is possible in nature?  ii) Will the pyramid of energy be also of the same shape in this situation? Give reason for your response. OR B. i) Draw a pyramid of numbers where a large number of insects are feeding on the leaves of a tree. What is the shape of this pyramid? ii) Will the pyramid of energy be also of the same shape in this situation? Give reason for your response.	2
	SECTION-C	
22.	Trace the journey of a zygote from the isthmus of the fallopian tube to its implantation in the uterus of a human female. Highlight the changes the zygote undergoes during the course of its journey up to implantation.	3
23.	A doctor advised to a female to undergo MTP, as she diagnosed a certain problem in the foetus. A. Name the technique the doctor has used to detect the problem in the foetus. B. What is done in this technique? C. How has the government been handling the misuse of this technique?	3
24.	In an animal, assume that rough coat (R) is dominant over smooth coat (r) and the black (B) is dominant over white (b) Consider that these two pairs of alleles assort independently then: i)What proportion of the offspring from the cross RrBb X RRBB would be rough and black?	3

	ii)From the cross RrBB X rrBB , how many progeny will be homozygous for both of the characters?	
25.	Differentiate between the explanation given by Darwin and de Vries respectively on the mechanism of evolution. Write any three differences.	3
26.	Effluent from the primary treatment of the sewage is passed through large aeration tanks for biological treatment. Explain the complete process that follows till the water is ready to be released into the natural water bodies.	3
27.	(i) Write the scientific name of the nematode that infests the tobacco plants and the part that it infests. (ii) How is Agrobacterium used to protect tobacco plant from this attack?	3
28.	The population pyramids of Japan for the years 1950, 2007 and on the basis of the estimated value for 2050 have been shown below to answer the questions that follow:  A. Comment upon the growth status of the population on the basis of shape of the age pyramids. B. What insights can you gain about their population dynamics?	3
	SECTION-D	
29.	Attempt either subpart C or D. Study the diagram given below showing the modes of pollination. Answer the questions that follow.  A. The given diagram shows three methods of pollen transfer in plants. What are the technical terms used for pollen transfer methods? B. How do the following plants achieve pollination successfully?	4

	i)Water lily ii)Vallisneria C. Flowering plants have developed many devices to avoid inbreeding depression. Explain one hereditary and one physiological device which help plants to achieve this target OR D. Explain the monosporic development of embryo sac in the ovule of an angiosperm.	
30.	The diagram shows the life cycle of a pathogenic protozoan.  A. Name the parasite stage that is being transferred from host 'X' to host 'Y'. B. Write the changes the parasite undergoes when it enters the liver and the RBC. <u>Attempt either option C or D.</u> C. Trace the changes the parasite undergoes when the host 'X' takes its blood meal from infected host 'Y'. OR D. At which stage during the life cycle of the pathogen does the host 'Y' experience the symptoms of the disease? Name the disease and the toxic substance responsible for these symptoms.	4
	<u>SECTION-E</u>	
31.	A. Study the schematic diagram given below and answer the questions that follow:  i) Identify the polarity from 'X' to 'X' in the mRNA segment shown. Mention how many more amino acids can be added to the polypeptide that is being translated and why. ii) Write the initiating codon for translation, its anticodon and the amino acid it codes for.	5

	iii) Explain the charging of an adaptor molecule. Why this molecule needs to be charged? OR B.i) What is central dogma? ii) How is the process of transcription differs from translation? iii) Given below is a strand of mRNA undergoing the process of translation, what will be the sequence of Amino acids that will be translated? Name the triplet codons that should be added to bring to the end of translation at X.  	
32.	A. Answer the following questions based on Bt-crops: (i) Why do farmers prefer to grow Bt cotton crop than genetically unmodified cotton crops? (ii) Name any two insects that are killed by Bt toxin. (iii)Explain the mechanism by which Bt toxin kills the insects but not the bacterium which possesses the toxin. OR B. (i) How can a bacterial cell be made competent using calcium ions? Explain (ii) Explain the process and importance of gel electrophoresis in biotechnology. (iii) Mention which stain is used in this technique and why?	5
33.	A. India is one of the 12 mega biodiversity countries in the world. i) Explain what makes India a mega-diverse country. ii) Describe any two in-situ and two ex-situ conversation strategies used in India. iii) Why is it important to protect endemic and endangered species? OR B. A recent study shows a drastic decline in pollinator insects due to pesticide use in agricultural fields. i) How does biodiversity loss affect agriculture and food security? ii) What ecological role do pollinators play? iii) Suggest tow sustainable farming practices that support pollinator conservation.	5

**********ALL THE BEST**********