



# B.K. BIRLA CENTRE FOR EDUCATION

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



TERM-I EXAMINATION 2025-26  
BIOLOGY (044)

Class: XII  
Date: 10/09/2025  
Admission no:  
General Instructions:

Duration: 3 Hours  
Max. Marks:70  
Roll no:

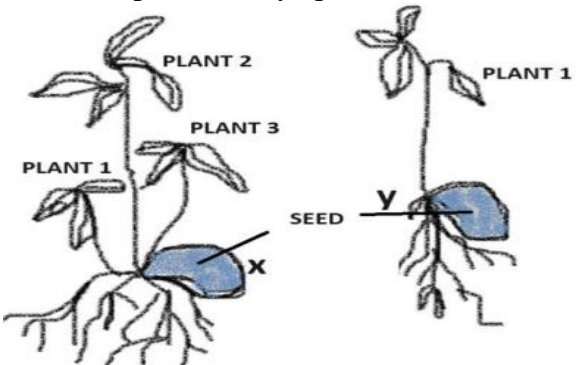
- (i) All questions are compulsory.
- (ii) The question paper has five sections and 33 questions.
- (iii) Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E 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.

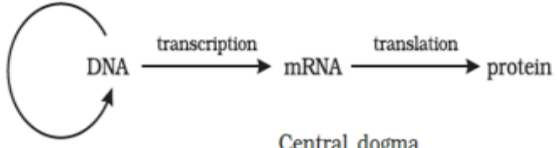
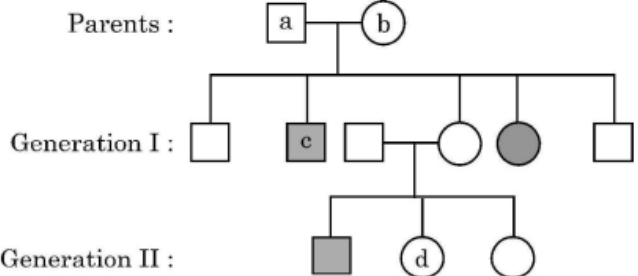

## SECTION-A

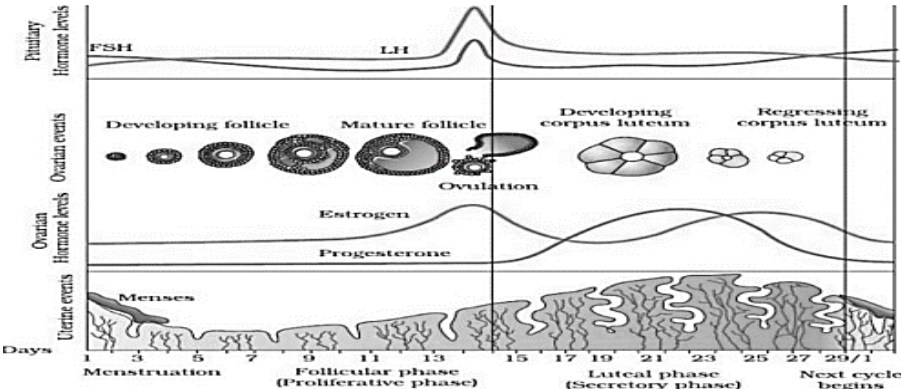
Q. No. 1 to 12 are multiple choice questions. Only one of the choices is correct. Select and write the correct choice as well as the answer to these questions.

Q.no	Question	Marks
1.	In which of the following plants are both male and female flowers born on same plant and the mode of pollination can be geitonogamy or xenogamy? A. Papaya B. Date Palm C. Maize D. Spinach	1
2.	The primary endosperm nucleus is formed by fusion of which of the following? A. A male gamete and a female gamete B. A male gamete and two polar nuclei C. A female gamete and two synergids D. Two male gametes and an egg cell	1
3.	Which of the following is the correct sequence of events during human fertilization? A. Sperm penetrates the egg, zygote forms, implantation occurs B. Zygote forms, sperm penetrates the egg, implantation occurs C. Implantation occurs, zygote forms, sperm penetrates the egg D. Sperm penetrates the egg, implantation occurs, zygote forms	1
4.	Penetration of the sperm in the ovum is followed by A. Formation of first polar body. B. Completion of meiosis II. C. First meiosis. D. Dissolution of zona pellucida.	1
5.	A female undergoing IVF treatment has blocked fallopian tubes the technique by which the embryo with more than 8 blastomeres will be transferred into the female for further development is A. ZIFT B. GIFT C. IUT D. AI	1

6.	What would be the genotype of the parents if the offspring have the phenotypes in 1:1 proportion? A. Aa X Aa B. AA X AA C. Aa X AA D. Aa x aa	1										
7.	Total number of nucleotide sequences of DNA that codes for a hormone is 1530. The proportion of different bases in the sequence is found to be Adenine = 34%, Guanine = 19%, Cytosine = 23%, Thymine = 19%. Applying Chargaff's rule, what conclusion can be drawn? A. It is a double stranded circular DNA. B. It is a single stranded DNA. C. It is a double stranded linear DNA. D. It is a single stranded DNA coiled on Histones.	1										
8.	E. coli has $4.6 \times 10^6$ base pairs and completes the process of replication in 18 minutes, then the average rate of polymerization is approximately A. 2000 bp/s B. 4000 bp/s C. 3000 bp/s D. 1000 bp/s	1										
9.	Evolutionary convergence is development of a A. Common set of functions in groups of different ancestry. B. Dissimilar set of functions in closely related groups. C. Common set of structures in closely related groups. D. Dissimilar set of functions in unrelated groups.	1										
10.	Interferons are most effective in making non-infected cells resistant against the spread of which of the following diseases in humans? A. ascariasis B. ringworm C. amoebiasis D. AIDS	1										
11.	Which one of the following is not a nitrogen-fixing organism? A. Anabaena B. Nostoc C. Azotobacter D. Pseudomonas	1										
12.	Match the following list of bacteria and their commercially important products: <table border="1"><thead><tr><th>Bacterium</th><th>Product</th></tr></thead><tbody><tr><td>a. Aspergillus niger</td><td>i. Lactic acid</td></tr><tr><td>b. Acetobacter aceti</td><td>ii. Butyric acid</td></tr><tr><td>c. Clostridium butylicum</td><td>iii. Acetic acid</td></tr><tr><td>d. Lactobacillus</td><td>iv. Citric acid</td></tr></tbody></table> Choose the correct match: A. a-ii, b-iii, c-iv, d-i B. a-ii, b-iv, c-iii, d-i C. a-iv, b-iii, c-ii, d-i D. a-iv, b-i, c-iii, d-ii	Bacterium	Product	a. Aspergillus niger	i. Lactic acid	b. Acetobacter aceti	ii. Butyric acid	c. Clostridium butylicum	iii. Acetic acid	d. Lactobacillus	iv. Citric acid	1
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	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): Parturition is induced by a complex neuro endocrine mechanism. Reason (R): At the end of gestation period, the maternal pituitary releases prolactin which causes uterine contractions.	1										

14.	Assertion (A) : Whales, bats, cheetah and human share similarities in the pattern of bones of forelimb. Reason (R): All of them have humerus, radius, ulna, carpals, metacarpals and phalanges.	1
15.	Assertion (A): Active immunity develops after vaccination. Reason (R): Vaccines introduce ready-made antibodies into the body.	1
16.	Assertion (A): Toddy is a traditional drink of some part of southern India. Reason (R): Toddy is made by fermenting sap from sugarcane.	1
<b>SECTION-B</b>		
17.	Draw a well labelled diagram of sectional view of male gametophyte/microspore of an angiosperm and write the functions of any two parts labelled.	2
18.	Name any two copper related IUD's. Explain how it acts as a contraceptive?	2
19.	Why is it not possible to study the inheritance pattern of traits in human beings, the same way as it is done in pea plant? Name the alternate method employed for such an analysis of human traits.	2
20.	Write the scientific name of the first human-like hominid. Mention one feature.	2
21.	<u>Attempt either option A or B.</u> A. A patient had tested positive to ELISA Test. Identify the disease and the pathogen responsible, give reasons for the reduced/ weak immunity of the patient. <b>OR</b> B. What are the various public health measures, which you would suggest as safeguard against infectious diseases?	2
<b>SECTION-C</b>		
22.	The image below shows two germinated seeds X and Y which belong to the same species. Seed X is produced by apomixis whereas seed Y is a product of sexual reproduction.  A. Write the number of embryo(s), embryo sac(s) and ovules in the ovary of seed X. B. How multiples embryos are formed in citrus fruits? C. What advantage will plants developed from seed Y have over seed X?	3
23.	Name the place in human ovary where the first meiotic division is completed during oogenesis. What are the products of this division? Give the chromosome number of each type of cells involved in the process.	3
24.	Explain the role of <i>Amniocentesis</i> in prenatal diagnosis and state why its misuse is legally banned in India.	3
25.	The schematic representation given below shows the concept of Central Dogma.	3

	<p>replication</p>  <p>Central dogma</p> <p>A. During the process of replication and transcription the pairing of nitrogenous bases is not similar. Explain.</p> <p>B. How is the above process modified in a retrovirus? Name the process.</p> <p>C. Justify why during the process of transcription only a segment of DNA is copied into RNA.</p>	
26.	<p>A. How is Hardy-Weinberg's expression "<math>(p^2 + 2pq + q^2) = 1</math>" derived?</p> <p>B. List any two factors that can disturb the genetic equilibrium.</p>	3
27.	<p><u>Attempt either option A or B.</u></p> <p>A. Study the pedigree analysis given below:</p>  <p>Answer the following questions:</p> <p>a) Write genotypes of c and d.</p> <p>b) i. Identify whether the trait is sex-linked or autosomal      ii. Dominant or recessive</p> <p>c) Write any two characteristic features of Phenylketonuria.</p> <p style="text-align: center;"><b>OR</b></p> <p>B. How does gain or loss of chromosome(s) takes place in humans? Describe one example each of chromosomal disorder along with the symptoms involving an autosome and a sex chromosome.</p>	3
28.	<p>A patient admitted in ICU was diagnosed to have suffered from myocardial infarction. The condition of coronary artery is depicted in the image below.</p>  <p>A. Name two bioactive agents and their mode of action that can improve this condition.</p> <p>B. Name an immunosuppressive agent used in organ-transplant patients and the name of the fungus which is producing it?</p>	3
<u><b>SECTION-D</b></u>		
29.	<p>Given below is a stretch of DNA showing the coding strand of a structural gene of a transcription unit?</p> <p>5'--ATG ACC GTA TTT TCT GTA GTG CCC GTA CTT CAG GCA TAA—3'</p>	4

	<p>A. Write the corresponding template strand and the mRNA strand that will be transcribed, along with its polarity. (1)</p> <p>B. If GUA of the transcribed mRNA is an intron, depict the sequence involved in the formation of mRNA /the mature processed hnRNA strand. (2)</p> <p>i. In a bacterium</p> <p>ii. In humans</p> <p><u>Attempt either subpart C or D.</u></p> <p>C. Upon translation, how many amino acids will the resulting polypeptide have? Justify. (1)</p> <p style="text-align: center;"><b>OR</b></p> <p>D. Explain the role of tRNA in translation. (1)</p>	
30.	<p>The primary effluent in the treatment of sewage is sent to tanks for secondary treatment in the presence of aerobic bacteria.</p> <p>A. Your team is considering using anaerobic bacteria instead of aerobic bacteria for secondary treatment. Analyse how this change would impact the Biochemical Oxygen Demand (BOD) of the effluent. What implications might this have for downstream water quality? (1)</p> <p>B. Name one condition that should be maintained in a sludge digester where biogas is produced. (1)</p> <p><u>Attempt either subpart C or D.</u></p> <p>C. The slurry formed after biogas production is recommended as manure for plants. Which nutrients will the slurry be rich in and why? (2)</p> <p style="text-align: center;"><b>OR</b></p> <p>D. Mention the importance of primary treatment in STP.</p>	4
	<b>SECTION-E</b>	
31.	<p><u>Attempt either option A or B.</u></p> <p>A. Observe the following diagram and answer the questions given below.</p>  <p>i) Why is follicular phase also known as proliferative phase?</p> <p>ii) What happens to corpus luteum if pregnancy does not occur?</p> <p>iii) What ovarian changes take place during luteal phase?</p> <p>iv) At what time of Menstrual cycle LH surge occurs?</p> <p>v) What are the uterine changes that occur during menstrual phase?</p> <p style="text-align: center;"><b>OR</b></p> <p>B. Cryptorchidism is a condition in which the testes fail to descend into the scrotum. It can also lead to compromised Sertoli cell function and has an impact on Leydig cell function.</p> <p>i) Identify at least 3 parameters of male fertility which get affected due to cryptorchidism.</p>	5

