

**KENDRIYA VIDYALAYA SANGATHAN CHENNAI REGION  
PRE BOARD EXAMINATION 2024-25  
CLASS XII**

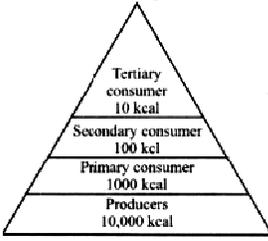
**SUBJECT – BIOLOGY**

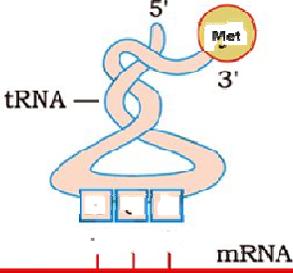
**MAX MARKS 70**

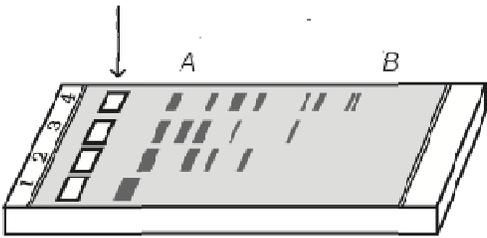
**TIME 3 HOURS**

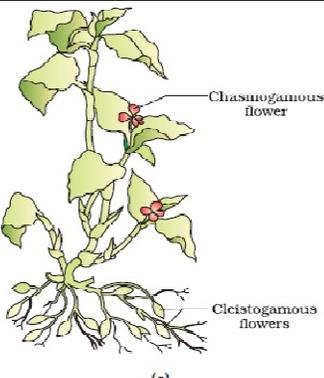
**General Instructions-**

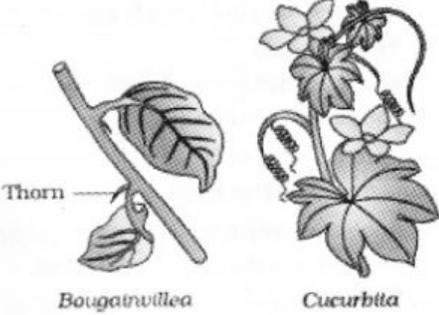
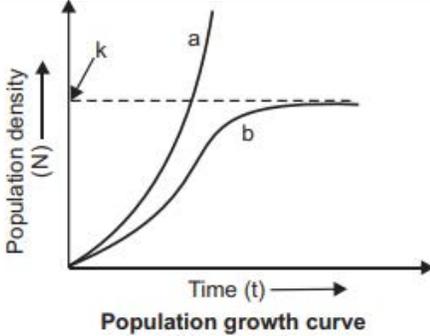
- i) All questions are compulsory.
- ii) The question paper has 5 sections and 33 questions.
- iii) Section A has 16 questions of 1 mark each, Section B has 5 questions of 2 marks each, Section C has 7 questions of 3 marks each, Section D has 2 Case based questions of 4 marks each and Section E has 3 questions of 5 marks each.
- iv) There is no overall choice. However internal choice has 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.

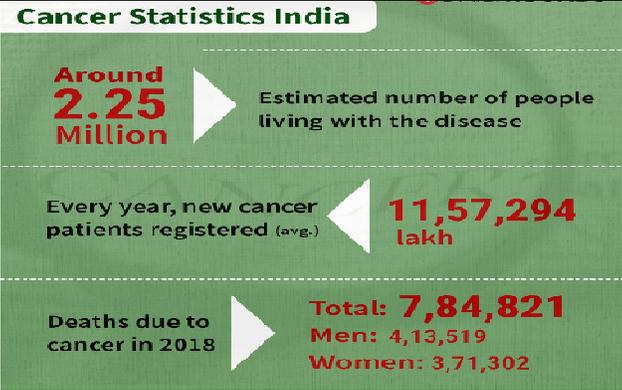
<b>SECTION A</b>		
1.	Identify the enzyme that helps in the process of transcription in Prokaryotes. A. DNA dependent DNA polymerase B. RNA dependent DNA polymerase C. RNA dependent RNA polymerase D. DNA dependent RNA polymerase	1
2.	Given below are some stages of human evolution. Arrange them in the correct sequence from the past to the present- a-Homo habilis b. Homo sapiens c. Neanderthal man d. Homo erectus Choose the correct sequence of human evolution from the options given below- A. b-a-d-c B. c-b-d-a C. a-d-c-b D. d-a-c-b	1
3.	Which of the following statements is incorrect with reference to the given  pyramid i. Only 1% of the energy in the sunlight is available to the primary producers as NPP. ii. This pyramid can never be inverted.	1

	<p>iii. Each trophic level indicates the amount of biomass present in a given time.</p> <p>iv. As energy flows from higher trophic level to lower trophic level, only 10% of the energy is transferred.</p> <p>Choose the correct answer-</p> <p>A. i and ii</p> <p>B. iii and iv</p> <p>C. i and iv</p> <p>D. ii and iii</p>	
4.	 <p>The anticodon and the codon in the given figure are-</p> <p>A. UAC &amp; ATG</p> <p>B. UAC &amp; AUG</p> <p>C. TAC &amp; UAC</p> <p>D. AUG &amp; UAC</p>	1
5.	<p>A specialised method to form an embryo in the laboratory in which the sperm is directly injected into the ovum is</p> <p>A. ZIFT</p> <p>B. ICSI</p> <p>C. IUT</p> <p>D. IUI</p>	1
6.	<p>The correct sequence of the steps in decomposition is-</p> <p>A. Fragmentation – Leaching- Catabolism – Humification – Mineralisation</p> <p>B. Fragmentation – Catabolism – Leaching – Humification – Mineralisation</p> <p>C. Fragmentation – Humification – Leaching – Catabolism – Mineralisation</p> <p>D. Fragmentation – Leaching – Humification – Catabolism - Mineralisation</p>	1
7.	<p>What will be the amount of cytosine in the DNA if the amount of adenine and thymine in the DNA is 55% ?</p> <p>A. 45%</p> <p>B. 22.5%</p> <p>C. 27.5%</p> <p>D. 55%</p>	1
8.	<p>The sequence of arrangement of wall layers of the anther from outside to inside is-</p> <p>A. Epidermis- Endothecium – Middle layer – Tapetum</p> <p>B. Epidermis – Middle layer – Endothecium – Tapetum</p> <p>C. Epidermis – Tapetum – Endothecium – Middle layer</p> <p>D. Endothecium – Epidermis – Middle layer- Tapetum</p>	1

9.	 <p>A typical agarose gel electrophoresis is shown in the given figure. The smaller fragments of DNA are observed-</p> <p>A. Close to the wells B. Close to the anode C. Positioned in the middle D. Do not move in the gel.</p>	1
10.	<p>The vector used to introduce functional ADA gene into lymphocytes is-</p> <p>A. Retrovirus B. Bacteriophage C. Bacteria D. Agrobacterium</p>	1
11.	<p>Immuno suppressants are administered to patients during organ transplantation to suppress-</p> <p>A. Innate immunity B. Autoimmunity C. Humoral immunity D. Cell mediated immunity</p>	1
12.	<p>Bottled fruit juices bought from the market are clearer as compared to those made at home. This is due to the use of-</p> <p>A. Streptokinase B. Pectinase C. Lipase D. Statins</p>	1
<p><b>ASSERTION AND REASONING</b> Question No. 13 to 16 consists of two statements- Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below-</p> <p>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.</p>		
13.	<p>Assertion- Predators in nature are prudent. Reason –If the predator overexploits the prey, the prey might become extinct and following this the predator will also become extinct.</p>	1
14.	<p>Assertion - Metastasis is the most feared property of malignant cancers. Reason –Cancer cells actively divide and starve the normal cells by competing for nutrients.</p>	1
15.	<p>Assertion - DNA is a negatively charged molecule.</p>	

	Reason –Histones are positively charged acidic proteins wrapped around the DNA.	1
16.	Assertion – Parturition is induced by a complex neuro endocrine mechanism. Reason - At the end of the gestation period, the maternal pituitary releases oxytocin which induces uterine contractions.	1
	<b>SECTION B</b>	
17.	<b>Attempt either option A or B</b> A.A young girl was playing with her pet cat.Suddenly she started sneezing and developed watery eyes.What is this response of the body referred to as? Name the type of antibody involved in this response. Certain chemicals are produced in the body by special cells. Identify the cell and the chemicals produced by it. <b>OR</b> B. Under the Pulse Polio Programme , infants are vaccinated on a large scale at regular intervals to eradicate polio from our country. a. What is the principle of vaccination? b. How does the vaccine impart immunity to the child against polio?	2
18.	<b>Attempt either option A or B</b> A.A cross is performed between tall pea plants having green pods (heterozygous for both the traits) and a dwarf pea plant with yellow pods. Perform the cross and depict the results in a punnet square. <b>OR</b> B. Explain aminoacylation of t-RNA.What is its role in the process of translation?	2
19.	Why are both the strands of DNA not copied in transcription ?	2
20.	 <p style="text-align: center;">(a)</p> <p>The given plant has both chasmogamous and cleistogamous flowers. Name any such plants. What is a cleistogamous flower? Why do Cleistogamous flowers produce assured seed set?</p>	2
21.	<b>Attempt either option A or B</b> Why should the host cells be made competent ? Explain the methods by which bacterial cells can be made competent. <b>OR</b>	2

	Name the source of DNA polymerase used in PCR and why?	
	<b>SECTION C</b>	
22.	Explain the steps in the secondary treatment of sewage.	3
23.	Blood samples were collected from the scene of crime and handed over to the forensic department. Name the method employed to identify the criminal. Explain the steps involved in this method.	3
24.	What is RNA interference? How was this technique employed to obtain pest resistant tobacco plants?	3
25.	<div style="text-align: center;">  <p>The diagram shows two plant stems. On the left, a stem of <i>Bougainvillea</i> has a sharp, pointed thorn. On the right, a stem of <i>Cucurbita</i> has a curved, coiled tendril. Labels 'Thorn', 'Bougainvillea', and 'Cucurbita' are present.</p> </div> <p>a. Study the figures given above and comment on them in the light of evolution. b. Give an example of this type of organs in animals.</p>	3
26.	Oral pills are considered ideal contraceptive by some women. What is the composition of oral pills? And how do they provide contraception?	3
27.	Draw the sectional view of the seminiferous tubule showing spermatogenesis. Name and label the following in the diagram- <ul style="list-style-type: none"> <li>a. Sperm mother cell</li> <li>b. The cell providing nourishment to developing sperms.</li> <li>c. The cell that undergoes Meiosis I</li> <li>d. The cell that undergoes spermiogenesis</li> </ul>	3
28.	<div style="text-align: center;">  <p>The graph plots Population density (N) on the y-axis against Time (t) on the x-axis. Curve 'a' is an exponential growth curve that rises steeply. Curve 'b' is a logistic growth curve that starts with an initial lag phase, then rises, and finally levels off at a constant population density. A horizontal dashed line labeled 'k' represents the carrying capacity, which curve 'b' approaches.</p> </div> <p><b>Population growth curve</b></p> <p>A. Identify 'a' and 'b' in the given graph. B. List the conditions responsible for the curve b. C. Which of the curve is a more realistic one ?</p>	3

<b>SECTION D</b>		
29.	<p>The loss of biodiversity is a global crisis. There is hardly any region on earth that is not facing ecological catastrophes. Of the 1.7 million species living on earth, about one fourth of them is likely to be extinct in the next few decades. Biological extinction has been a natural phenomenon in the geological history. There has been five episodes of mass extinction. But the rate of extinction was very slow. But the present episode of mass extinction is due to the activities of man. It is estimated that around 50 species are driven to extinction every year, the bulk of them from the tropical forests.</p> <p>Answer the questions given below-</p> <p>A. Which is the most important cause for the loss of biodiversity?            B. Give 2 examples of recent extinctions of species.</p> <p><b><u>Attempt either option C or D</u></b></p> <p>C. Explain giving a suitable example what happens when an alien species is introduced in a particular area.</p> <p style="text-align: center;"><b>OR</b></p> <p>D. Why is it essential to conserve the hotspots of biodiversity? Give an example of hotspot of biodiversity in India.</p>	4
30.	<div style="background-color: #4CAF50; color: white; padding: 5px; margin-bottom: 10px;"> <b>Cancer Statistics India</b> </div>  <p>Global cancer statistics for 2023 includes close to 20 million new cases of cancer world wide. The causes of cancer range from various chemicals, radiations and certain viruses. Right diagnosis and timely treatment helps in curing the disease.</p> <p>Answer the following questions on cancer-</p> <p>A. X-rays and UV rays are potent carcinogens. How do they cause cancer?            B. Name the genes identified in the normal cells which when activated could cause cancer.</p> <p><b><u>Attempt either option C or D</u></b></p> <p>C. Why are cancer patients given <math>\alpha</math>- interferon as a part of treatment?  <b>OR</b>            D. What is the difference between benign tumour and malignant tumour?</p>	4
<b>SECTION E</b>		
31.	<p>A. Draw a neat diagram of the cloning vector pBR 322 and label the following-</p> <p>i) ori and rop genes    ii) a selectable marker</p>	

	<p>B. A plasmid without a selectable marker was chosen as a vector for cloning a gene. How will it affect the process?</p> <p>C. A recombinant DNA is inserted into the coding sequence of the enzyme <math>\beta</math>-galactosidase. What is the method adopted to identify the recombinants and non-recombinants? Name the process that occurs on insertion of the foreign gene.</p> <p style="text-align: center;">OR</p> <p>What are transgenic animals? Why are they produced? Substantiate your answer by giving any four reasons.</p>	5
32.	<p>A. Draw a schematic representation of the lac operon in switched on condition.</p> <p>B. What is the role of lactose in the lac operon?</p> <p style="text-align: center;">OR</p> <p>How did Hershey and Chase prove experimentally that DNA is the hereditary material?</p>	5
33.	<p>Flowering plants have developed several devices to discourage self pollination and encourage cross pollination.</p> <p style="padding-left: 20px;">A. Why is self pollination discouraged in bisexual flowers?</p> <p style="padding-left: 20px;">B. Name any four outbreeding devices in plants.</p> <p style="text-align: center;">OR</p> <p>Trace the development of the embryo in humans from fertilisation to the process of implantation.</p>	5