CLASS : XII **MAX. MARKS : 70**

SUBJECT : BIOLOGY (044) **DURATION : 3 HRS**

GENERAL INSTRUCTIONS:

(i) *All questions are compulsory.*

(ii) *The question paper has four sections: Section A, Section B, Section C and Section D. There are 33 questions in the question paper.*

(iii) *Section–A has 14 questions of 1 mark each and 02 case-based questions. Section–B has 9 questions of 2 marks each. Section–C has 5 questions of 3 marks each and Section–D 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 labeled diagrams should be drawn.*

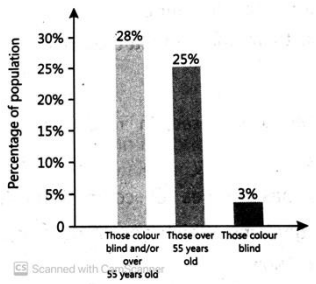
SECTION A		
	Questions	Marks
1.	Coconut palm is monoecious while date palm is dioecious. Why are they called so?	1
2.	How many sperms will be produced from 10 primary spermatocytes and how many eggs will be produced from 10 primary oocytes?	1
3.	Mention the phenomena that occur when homologous chromosomes do not separate during meiosis.	1
4.	State the fate of a pair of autosomes during gamete formation.	1
5.	Name the type of cells the AIDS virus enters into after getting in the human Body.	1
6.	Write the scientific name of the microbe used for fermenting malted cereals and fruit juices.	1
7.	How can bacterial DNA be released from the bacterial cell for biotechnology experiments?	1
8.	What are Cry genes? In which organism are they present?	1
9.	Write what do phytophagous insects feed on.	1
10.	Differentiate between in situ and ex situ approaches of conservation of biodiversity.	1

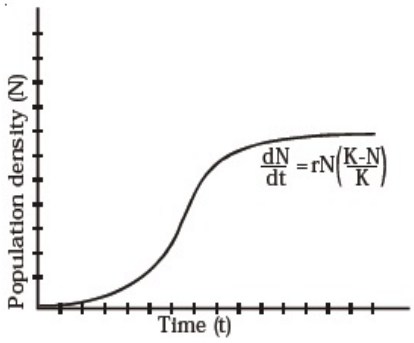
11.	**Assertion :** UAA, UAG and UGA terminate protein synthesis. **Reason :** They are not recognised by tRNA. a. Both assertion and reason are true, and reason is the correct explanation of assertion. b. Both assertion and reason are true, but reason is not the correct explanation of assertion. c. Assertion is true but reason is false. d. Both assertion and reason are false. **OR** **Assertion:** To study mutation, haploids are used. **Reason :** Most of the mutations are recessive. a. Both assertion and reason are true, and reason is the correct explanation of assertion. b. Both assertion and reason are true, but reason is not the correct explanation of assertion. c. Assertion is true but reason is false. d. Both assertion and reason are false.	1
12.	**Assertion:** Ethidium bromide (EtBr) under UV radiation gives bright orange coloured bands. **Reason:** The separated DNA fragments can be seen after staining the DNA with compound EtBr. a. Both assertion and reason are true, and reason is the correct explanation of assertion. b. Both assertion and reason are true, but reason is not the correct explanation of assertion. c. Assertion is true but reason is false. d. Both assertion and reason are false.	1
13.	**Assertion :** Predation is an interspecific interaction with a feeding strategy. **Reason:** Predation and their prey maintain fairly stable population through time and rarely one population become abundant or scarce. a. Both assertion and reason are true, and reason is the correct explanation of assertion. b. Both assertion and reason are true, but reason is not the correct	1

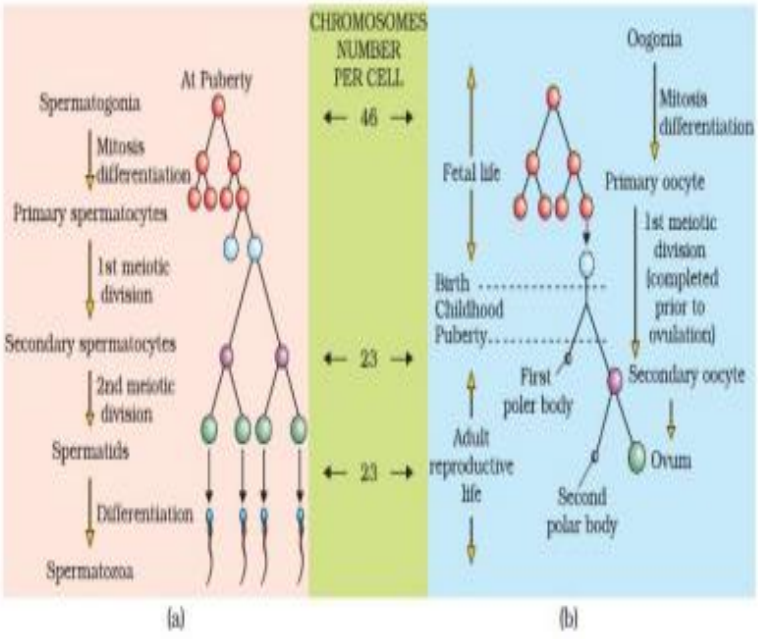
	explanation of assertion. c. Assertion is true but reason is false. d. Both assertion and reason are false.	
14.	**Assertion:** The species diversity present in a given community or habitat is referred to as alpha diversity. **Reason:** Alpha diversity is usually expressed by species richness and species evenness in that community habitat. a. Both assertion and reason are true, and reason is the correct explanation of assertion. b. Both assertion and reason are true, but reason is not the correct explanation of assertion. c. Assertion is true but reason is false. d. Both assertion and reason are false	1
15.	Read the following and answer any four questions from 15 (i) to 15(v) given below: **Loss of biodiversity** Loss of biodiversity is caused by the over population, urbanisation and industrialisation. (i) The colonisation of tropical Pacific Islands by humans have led to the extinction of more than 2,000 species of native birds. (ii) The IUCN Red list (2004) documents the extinction of 784 species (including 338 vertebrates, 359 invertebrates and 87 plants) in the last 500 years. (iii) Some latest examples of recent extinctions are dodo (Mauritius), Quagga(Africa), Thylacine (Australia), Steller's sea cow (Russia) and three sub-species (Bali, Javan and Caspian) of tiger. (iv) The last twenty years alone have witnessed the disappearance of 27 species. (v) Presently, 12% of bird species, 23% of all mammal species, 32% of all amphibian species and 31% of all gymnosperm species in the world face the threat of extinction. (vi) Careful analysis of records shows that amphibians appear to be more vulnerable to extinction. (vii) The grim scenario of extinctions is the fact that more than 15,500 species world wide are facing the threat of extinction.	4
i.	Biodiversity loss can lead to everything except this: a) increased resistance to the environmental perturbance b) a decline in plant production c) increased variability in water use	

	d) increased variability in pest and disease cycle	
ii.	The World Summit on Sustainable Development (2002) was held in a) Brazil b) South Africa c) Sweden d) Argentina	
iii.	The most important cause of extinction of animals and plants, especially in tropical rain forests is: a) habitat loss b) afforestation c) pollution d) soil erosion	
iv.	Which of the following is not a cause for loss of biodiversity? a) Destruction of habitat: b) Invasion by alien species c) Keeping animals in zoological parks d) Over-exploitation of natural resources	
v.	**Assertion:** Threatened species are those living species which have been greatly reduced in their number and are liable to become extinct if the causative factors continue. **Reason:** IUCN is an international organisation which maintains the IUCN red list of threatened species, to assess the conservation status of different species. c. Both assertion and reason are true, and reason is the correct explanation of assertion. d. Both assertion and reason are true, but reason is not the correct explanation of assertion. c. Assertion is true but reason is false. d. Both assertion and reason are false.	
16.	<u>Read the following and answer any four questions from 16 (i) to 16(v) given below:</u> Colour blindness is a common hereditary (inherited) condition which means it is usually passed down from your parents. Red/green colour blindness is passed from mother to son on the 23rd chromosome, which is known as the sex chromosome because it also determines sex. Chromosomes are structures which contain genes – these contain the instructions for the development of cells, tissues and organs. If you are colour blind it means the instructions for the development of your cone cells	4

	are faulty and the cone cells might be missing, or less sensitive to light or it may be that the pathway from your cone cells to your brain has not developed correctly. The colour blind 'gene' is carried on one of the X chromosomes. Since men have only one X chromosome, if his X chromosome carries the colour blind 'gene' (X) he will be colour blind (XY). A woman can have either:- (i) two normal X chromosomes, so that she will not be colour blind or be a carrier (XX), (ii) or, one normal X and one colour blind carrying X chromosome, in which case she will be a carrier (XX), or rarely (iii) she will inherit a colour blind X from her father and a colour blind X from her mother and be colour blind herself (XX). She will pass on colour blindness to all of her sons if this is the case.	
i.	If a female carrier wants to have children with a color-blind male, what is the probability of one of their sons could be color blind? a) 25% b) 50% c) Nil d) 100%	
ii.	Colour blindness genes show _____ a) Monohybrid inheritance b) Co-dominance c) Sex linked inheritance d) Incomplete dominance	
iii.	Colour blindness is an _____ linked recessive trait. a) Z chromosome b) Y chromosome c) X chromosome d) None of the above	
iv.	Colour blindness is found more in males than in females because ————-	

	a) Heterozygous females are colour blind b) Males having affected Y- chromosomes are colour blind c) Male containing the single affected X- chromosomes are colour blind d) Affected X- chromosome has much more affinity to Y- chromosome as compared to unaffected X- chromosome	
v.	 The following statements are drawn as conclusions from the given graphs: I. Those colour blind who are over 55 years old are more than overall colour blind people. II. The percentage of colour blind people is 3% of total population. III. The percentage of people who are 55 years old is 28% of the total population. Choose from below the correct alternative: a) Only II is true b) I and III are true c) Only I is true d) I, II and III are true	
	SECTION B	
17.	How IUD's acts as a contraceptive? Mention any two copper-related IUD's.	2
18.	Even if a character shows multiple allelism, an individual will only have two alleles for that character. Why?	2
19.	Egrets are often seen along with grazing cattle. What do you refer to this interaction? Give a reason for this association.	2
20.	How are competent cells prepared by the action of CaCl2? **OR** What is GEAC? What are its main objectives?	2
21.	Explain the events that occur in the host cell on the introduction of a nematode-resistant gene into the tobacco plant by using *Agrobacterium* vectors.	2

22.	(i) Name the enzyme that catalyses the transcription of hnRNA. (ii) Why does the hnRNA need to undergo changes? **OR** (a) Draw a neat labelled diagram of a nucleosome. (b) Mention what enables histones to acquire a positive charge.	2
23.	List the important attributes of a stable community.	2
24.	State Gauss' competitive exclusion principle.	2
25.	How does species diversity differ from ecological diversity?	2
	SECTION C	
26.	Write the function of each of the following: (i)Middle piece in human sperm (ii)Tapetum in anthers (iii)Luteinising hormone in human male.	3
27.	. In *Antirrhinum majus* a plant with red flowers was crossed with a plant with white flowers. Work out all the possible genotypes & phenotypes of F1 & F2 generations comment on the pattern of inheritance in this case?	3
28.	(a) What would happen if a large volume of untreated sewage is discharged into a river? (b) In what way anaerobic sludge digestionq is important in sewage treatments?	3
29.	A person shows strong unusual hypersensitive reactions when exposed to certain substances present in the air. Identify the condition. Name the cells responsible for such reactions. What precaution should be taken to avoid such reactions?	3
30.	Comment on the growth curve given below.  	3

	OR Explain the adaptations of the animal parasites while living in and on the host species with suitable examples.	
	SECTION D	
31.	With reference to the below schematic diagram of Spermatogenesis (a) and Oogenesis(b), answer the following:  a) About 300 million spermatozoa may be present in a human male ejaculation at one time. Calculate how many spermatocytes will be involved to produce this number of spermatozoa. b) How many spermatids will be formed? c) How many chromatids are found during Oogenesis in Primary oocyte and First polar body in a human female? **OR** Explain the hormonal control of human male reproduction system with the help of a flow chart and highlight the inhibitory and stimulatory directions in it.	5
32.	How did Hershey and Chase prove that DNA is the hereditary material? Explain their experiment with suitable diagrams. **OR**	5

	What does the lac operon consist of? How is the operator switch turned on and off in the expression of genes in this operon? Explain.	
33.	Discuss the role of lymphoid organs in the immune response. Explain the different types of lymphoid organs giving two examples of each type in humans. **OR** Explain the process of replication of a retrovirus after it gains ' entry into the human body.	5