Reg No :……..

ALL KERALA COMMON MODEL EXAMINATION 2023 - 24

BIOLOGY (044)

SET-3

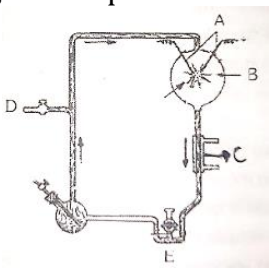
Time Allowed : 180 Minutes **Maximum Marks :** 70

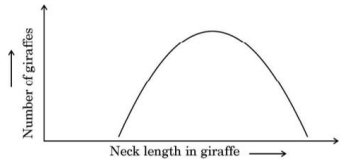
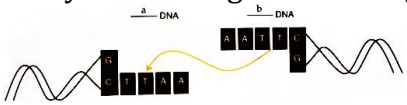
General Instructions:

All questions are compulsory.

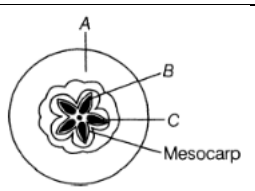
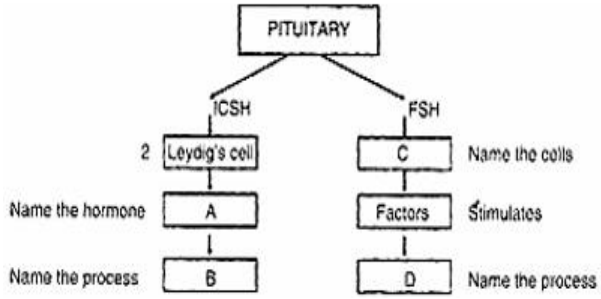
a. The question paper has five sections and 33 questions. All questions are compulsory.
b. Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case - based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.
c. 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.
d. Wherever necessary, neat and properly labeled diagrams should be drawn.

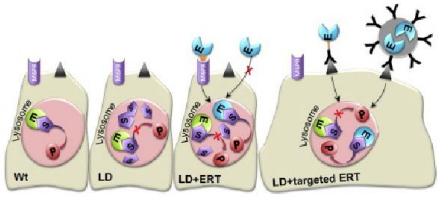
	Section A (16x1=16)	
1	Vulnerable species are those species: a) Presently the population is sufficient but is undergoing depletion. b) Presently the population is sufficient and stable. c) Presently population is insufficient and undergoing depletion. d) Presently population is insufficient but undergoing addition.	**[1]**
2	Oral contraceptives for the female containing non - steroidal preparation with very few side effects and high contraceptive value, "once a week pill". a) Mala - D b) Loveregen c) Femilon d) Saheli	**[1]**
3	An MNC exploiting biological resources (turmeric) of other nation without proper authorization will be called as: a) Eugenics b) Bioethics	**[1]**

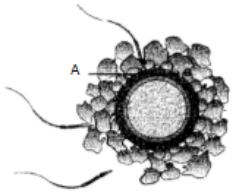
	c) Biopiracy d) Biopatent	
4	One of the free - living anaerobic nitrogen - fixer is: a) Rhodospirillum b) Beijerinckia c) Azotobacter d) Rhizobium	**[1]**
5	Occasionally, a single gene may express more than one effect. The phenomenon is called: a) polygeny b) pleiotropy c) multiple allelism d) mosaicism	**[1]**
6	The diagram represents miller's experiment. Choose the correct combination of labelling.  a) A - electrodes, B - $NH_3 + H_2O$, C - hot water, D - tap, E - U trap b) A - electrodes, B - $NH_4 + H_2 + CO_2 + CH_3$, C - hotwater, D - vacuum, E - U trap c) A - electrodes, B - $NH_3 + H_2 + H_2O + CH_2$, C - cold water, D - vacuum, E - U trap d) A - electrodes, B - $NH_3 + H_2 + H_2O + CH_4$, C - steam, D - vacuum, E - U trap	**[1]**
7	The second trophic level in a lake is a) Phytoplankton b) Zooplankton c) Benthos d) Fishes	**[1]**

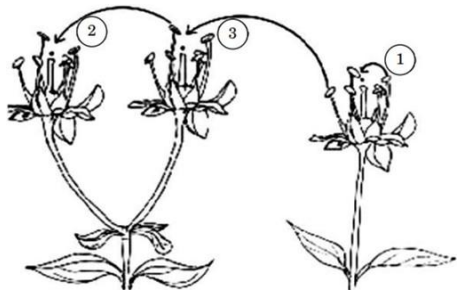
8	Select the option that gives the correct description of the process of Natural Selection with respect to the length of the neck of giraffe.  a) Stabilising selection as giraffes with medium neck lengths are selected. b) Directional selection as giraffes with longer neck lengths are selected. c) Stabilising selection as giraffes with longer neck lengths are selected further. d) Disruptive selection as giraffes with smaller and longer neck lengths are selected.	**[1]**
9	The first natural antibiotic was discovered by: a) Howard Florey b) Ernest Chain c) Alexander Fleming d) Selman Waksman	**[1]**
10	Study the linking of DNA fragments shown below and name the 'a' DNA and 'b' DNA:  a) a - Vector DNA, b - Foreign DNA b) a - Foreign DNA, b - Vector DNA c) Vector DNA, b - Vector DNA d) Foreign DNA, b - Foreign DNA	**[1]**
11	A mother of one-year-old daughter wanted to space between her children. The best contraceptive method she should use is: a) Oral contraceptives b) Copper-T c) Tubectomy d) Diaphragm	**[1]**
12	Activated sludge should have the ability to settle quickly so that it can: a) Be rapidly pumped back from the sedimentation tank to the aeration tank. b) Be discarded and anaerobically digested.	**[1]**

	c) Absorb colloidal organic matter. d) Absorb pathogenic bacteria present in waste water while sinking to the bottom of thesettling tank.	
13	**Assertion (A):** A wide range of contraceptive methods are available for family planning. **Reason (R):** Natural method includes condoms, diaphragms, etc., while barrier methods use of an included method like periodic abstinence, lactational amenorrhea, etc. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but 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]**
14	**Assertion (A):** Dough used for making food such as dosa and idli is fermented by bacteria. **Reason (R):** The puffed - up appearance of dough is due to the production of lactic acid. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but 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]**
15	**Assertion (A):** An ecosystem can be visualized as a functional unit of nature. **Reason (R):** Living organisms interact among themselves and also with the surrounding physical environment in the ecosystem. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but 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]**
16	**Assertion:** There was no atmosphere on the early earth. **Reason:** Water vapour, methane, carbon dioxide, and ammonia released from molten mass covered the surface. a) Assertion and reason both are correct statements and reason is correct explanation for assertion. b) Assertion and reason both are correct statements but reason is not correct	**[1]**

	explanation for assertion. c) Assertion is correct statement but reason is wrong statement. d) Assertion is wrong statement but reason is correct statement.	
	Section B (5x2=10)	
17	Examine the diagram of mRNA given below. Mark the 5' and 3' ends of the mRNA by giving reason. 	**[2]**
18	 a. Given below is a TS of an apple. Identify A, B, and C. b. Why is an apple categorised as a false fruit?	**[2]**
19	Given below is an incomplete chart showing the influence of hormones on gametogenesis in males. Observe the chart carefully and fill in the blanks A, B, C and D 	**[2]**
20	a. Why do organic farmers not recommend eradication of insect pests? Explain by giving reasons. b. How do ladybird beetles and dragonflies act as biocontrol agents? **OR** What is LAB? What is its role in human stomach?	**[2]**
21	Many proteins are secreted in their inactive form. This is also true of many toxic proteins produced by microorganisms. Explain how the mechanism is useful for the organism producing the toxin?	**[2]**
	Section C (7x3=21)	
22	Generally, it is observed that human males suffer from hemophilia more than human	**[3]**

	females, who rarely suffer from it. Explain giving reasons.	
23	Differentiate between intraspecific and inter specific competition.	**[3]**
24	The image below eleborates enzyme-replacement therapy.  a. Explain enzyme - replacement therapy to treat adenosine deaminase deficiency. b. Mention two disadvantages of this procedure.	**[3]**
25	Species diversity decreases as we move away from the equator towards the poles. What could be the possible reasons? **OR** Define biosphere. What are the main sub - divisions of the biosphere?	**[3]**
26	Sweet potato tubers and potato tubers arethe result of convergent evolution. Justify the statement.	**[3]**
27	a. Name the causative agents of pneumonia and the common cold. b. How do these differ in their symptoms? c. Mention two symptoms common to both.	**[3]**
28	A 14 year old boy thinks smoking makes him more energetic and feel like adult and thus more responsible citizen. He tries to smoke when he is with his peer group. As a friend you have to educate him: a.Why he feels more energetic while smoking? b.Effects of CO in smoke c.Other ill effects on body	**[3]**
	Section D (2x4=8)	
29	**Read the text carefully and answer the questions:** Malaria and dengue fever are major mosquito - borne public health problems in tropical countries. The authors report a malaria and dengue co - infection in an 11 - year - old boy who presented with sustained fever for 10 days. The physical examination revealed a flushed face, injected conjunctivae and left submandibular lymphadenopathy. His peripheral blood smear showed few ring - form trophozoites of Plasmodium falciparum. His blood tests were positive for dengue NS - 1 antigen and IgM antibody, and negative for IgG antibody. After the initiation of antimalarial treatment with artesunate and mefloquine, his clinical	**[4]**

	condition gradually improved. However, he still had low - grade fever that persisted for 6 days. Finally, he recovered well without fluid leakage, shock or severe bleeding. a. Name the fish that help in eradication of mosquito larvae. b. What is the reason of symptoms of malaria? c. Name the body parts and host in which following events takes place in life cycle of plasmodium. i. asexual reproduction ii. sexual reproduction. **OR** Name two vector borne diseases and their vector.	
30	**Read the text carefully and answer the questions:** Study the image below:  a. Where exactly in the fallopian tube doesthis occur? b. One of the sperms is observed topenetrate 'a' of the ovum, as shown in the above diagram. Name 'a'. c. How is the sperm able to do so? **OR** Explain the events thereafter upto morula stage.	**[4]**
	Section E (3x5=15)	
31	a. Write the contributions of the following scientists in deciphering the genetic code.Georce Gamow ; Hargobind Khorana ; Marshall Nirenberg ; Severo Ochoa b. State the importance of a Genetic code in protein biosynthesis. **OR** Explain the relationship of ribosomes, t - RNA and m - RNA during the process of translation in Prokaryotes.	**[5]**
32	What are bioreactors? Draw labelled diagrams of the two types of bioreactors. What is their utility? Which is the common type of bioreactors?	**[5]**

	OR a. Explain the different steps carried out in the Polymerase Chain Reaction, and the specific roles of the enzymes used. b. Mention application of PCR in the field of i. Biotechnology ii. Diagnostics	
33	State the similarity and differences between geitonogamy and xenogamy. Why do cleistogamous flowers assure seed sets? **OR** Study the diagram given below showing the modes of pollination. Answer the questions that follow.  i.The given diagram shows three methods of pollen transfer in plants. What are the technical terms used for pollen transfer methods 1, 2 and 3? ii.How do the following plants achieve pollination successfully? a. Water lily b. Vallisneria iii.Flowering plants have developed many devices to avoid inbreeding depression. Explain one hereditary and one physiological device which helps plants to achieve this target.	**[5]**