



COMMON PRE-BOARD EXAMINATION 2022-23

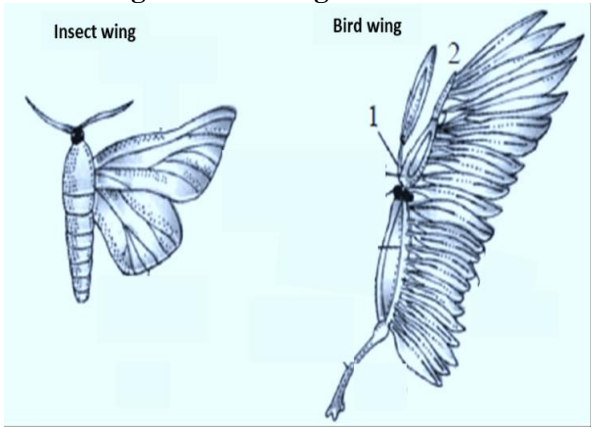
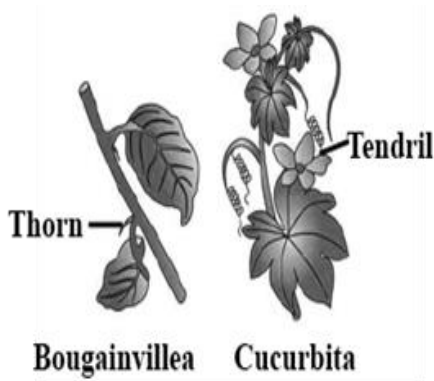

Subject: BIOLOGY-044




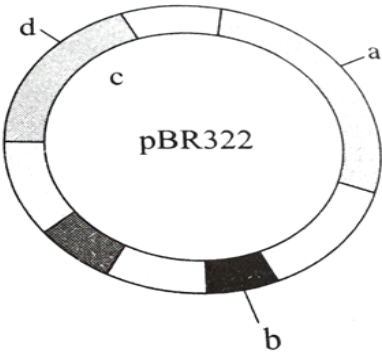
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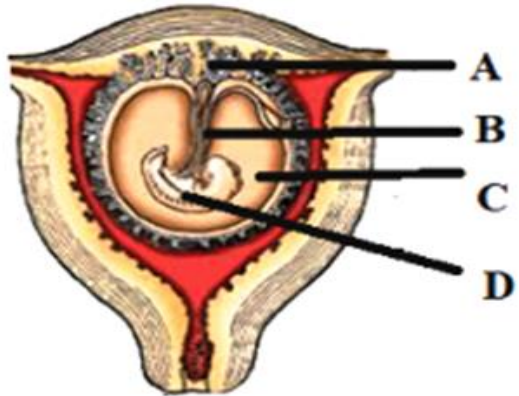
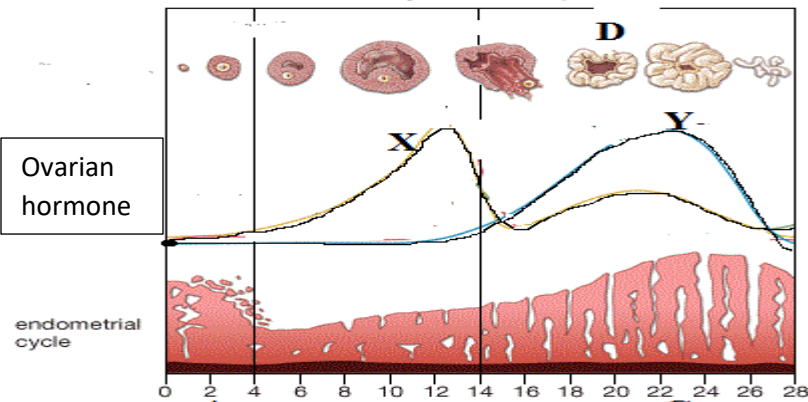
General Instructions:

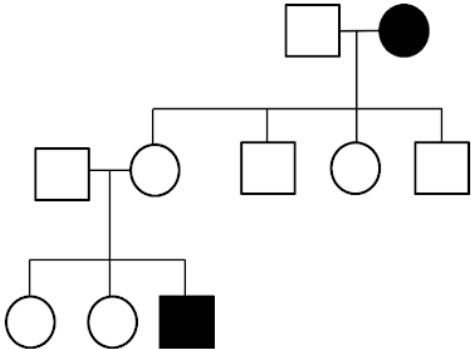
1. This question paper has five sections and 33 questions.
2. Section **A** has 16 questions of 1 mark each
3. Section **B** has 5 questions of 2 marks each
4. Section **C** has 7 questions of 3 marks each
5. Section **D** has 2 case-based questions of 4marks each
6. Section **E** has 3 questions of 5 marks each.
7. All questions are compulsory. 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.
8. Wherever necessary, neat and properly labelled diagrams should be drawn.

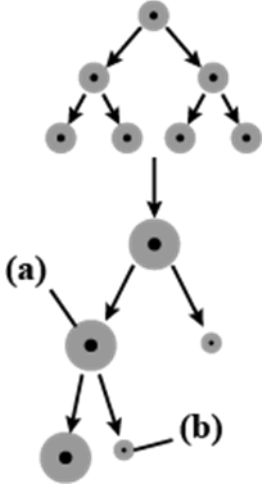
Q.No	SECTION A	Marks
1.	<p>Select the correct answer</p> <p>i) Insect wing and bird wing</p>  <p>ii) Bougainvillea thorn and cucurbita tendril</p>  <p>iii) Potato and sweet potato</p>  <p>a) i-homologous ii-analogous iii-homologous b) i-homologous ii-homologous iii-analogous c) i-analogous ii-homologous iii-analogous</p>	1

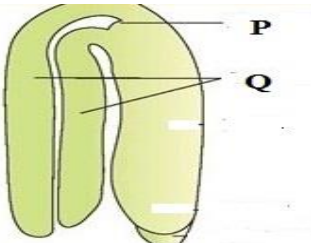
	d) i-analogous ii-analogous iii-homologous	
2	Which of the following is not a lymphoid tissue? a)spleen b)tonsils c)pancreas d)thymus	1
3	Breast feeding the baby acts as a natural contraceptive method for the mother because it prevents i)ovulation ii)menstruation iii)insemination iv)menopause a)i and iii b)ii and iv c)i and iv d)i and ii	1
4	The bottled juices brought from the market are clearer than homemade juices because a)bottled juices are clarified by cyclosporine b) bottled juices are clarified by streptokinase c) bottled juices are clarified by pectinases d) bottled juices are clarified by statin	1
5	A particular species of plant produces light, non-sticky pollen in large numbers and its stigmas are long and feathery. These modifications facilitate pollination by a) insects b) water c) wind d) animals.	1
6	 <p>Identify the type of population interaction a)mutualism b)commensalism c)parasitism d)predation</p>	1
7	The human chromosome with the highest and least number of genes in them are respectively a) Chromosome 21 and Y b) Chromosome 1 and X c) Chromosome 1 and Y d) Chromosome X and Y	1
8	Which of the following statement is correct? a)Ring worm disease is caused by trichoderma b)Heroin is commonly called as cocaine c) Excessive dosage of cocaine causes hallucinations. d) Natural cannabinoids are obtained from <i>Papaver somniferum</i>	1
9	The trophic level has a certain mass of living material at a particular time called as the----- a)productivity b) standing rate c)net primary productivity d)standing crop	1
10	What is common to the techniques i)in vitro fertilization ii)cryopreservation and iii)tissue culture a)all are <i>in situ</i> conservation methods b)all are <i>ex situ</i> conservation methods c)adversely affect biodiversity d)all are methods of conservation of extinct organisms	1
11	In -----age pyramid, the number of pre reproductive individuals are very large, reproductive individuals are in moderate number and post reproductive individuals are fewer. a)declining b)expanding c)stable d)all of these	1

12	 <p>Identify a,b,c and d</p> <p> a)a-BamH I b-Pvu II c-ampR d-Hind III b) a-EcoR I b-Sal I c-Ori d- Pvu I and Pst I c)a-BamH I b-Pvu II c-tetR d-Pvu I and Pst I d)a-BamH I b-Pvu II c-ampR d-Pvu I and Pst I </p>	1
	<p>Question No.13 to 16 consist of two statements- Assertion (A) and reason (R). Answer these questions selecting the appropriate options 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: Thalassemia and sickle cell anaemia are caused due to a problem in globin molecule synthesis</p> <p>Reason: Thalassemia is due to the reduction in the amount of alpha and beta chain of globin</p>	1
14	<p>Assertion: In coconut, the water represents the cellular endosperm and the white kernel represents free nuclear endosperm</p> <p>Reason: In the most common type of endosperm development PEN undergoes successive nuclear divisions to give rise to free nuclei.</p>	1
15	<p>Assertion: The historic convention on biological diversity held in Rio de Janeiro in 1992 is known as bio summit.</p> <p>Reason: The main aim of historic convention on biological diversity held in Rio de Janeiro was to take appropriate measures for conservation of biodiversity and sustainable utilization of its benefits.</p>	1
16	<p>Assertion: Recombinant DNA is injected into the nucleus of an animal cell by microinjection.</p> <p>Reason: Gene gun is used to introduce recombinant DNA into the plant cells.</p>	1
	SECTION B	
17	<p>Microbes can be used to decrease the use of chemical fertilizers and pesticides.</p> <p>Explain how this can be accomplished.</p>	2

18	 <p>a) Label any three parts. b) Write the function of the part labelled as 'A'</p>	2
19	<p>a) Name the immunoglobulin responsible for allergic reactions b) What is anamnestic response?</p>	2
20	Explain male and female heterogamety with examples	2
21	<p>Biodiversity must be conserved as it plays an important role in many ecosystem services that nature provides. Give any two examples for broadly utilitarian arguments to conserve biodiversity.</p> <p style="text-align: center;">OR</p> <p>Name the socio-biologist who popularized the term biodiversity. Identify the levels of biodiversity in India represented by</p> <ol style="list-style-type: none"> Diversity among amphibians in Eastern and Western Ghats. 50000 strains of rice in India Presence of deserts, mangroves and coral reefs in India. 	2
SECTION C		
22	Abingdon tortoise in Galapagos Island became extinct within a decade after goats were introduced on the island. Why? What could be the principle behind this situation?	3
23	Draw and label the enlarged view of one microsporangium showing wall layers.	3
24	<p>The menstrual cycle</p>  <p>a) Identify the hormones labelled as 'X' and 'Y' b) Identify and write the function of 'D'</p>	3

	c) What will happen to the structure labelled as 'D' if there is no fertilisation.	
25	Write the significance of biotechnology in gene therapy with one example.	3
26	Rheumatoid arthritis which affects many people in our society is an autoimmune disease. Explain	3
27	What is Hardy Weinberg equilibrium? Name the factors affecting this equilibrium.	3
28	The process of copying genetic information from one strand of the DNA into RNA is termed as transcription. Explain the structure of a transcription unit OR a) If a double stranded DNA has 20 per cent of cytosine, calculate the per cent of adenine in the DNA. b) Explain the structure of tRNA.	3 1 2
SECTION D		
29	The immune system has a vital role. It protects our body from harmful substances, germs and cell changes that could make you ill. When harmful microbes (foreign bodies) enter and invade the body, the body produces white blood cells to fight the infection. Diseases can be classified into infectious and noninfectious diseases. a) In which type of innate immunity barrier WBC belongs to? b) Expand PMNL c) What are interferones? d) Write the scientific name of the pathogen responsible for causing Typhoid OR d) Write the scientific name of the pathogen responsible for causing Pneumonia	4
30	Pedigree analysis is done to determine the mode of inheritance is recessive, dominant, partial dominant, autosomal, or sex-linked. Moreover, it also determines the probability of an individual or offspring being affected in the cross.  <p>The pedigree chart shows three generations. In the first generation, an unaffected male (square) and an affected female (filled circle) are mated. They have four children in the second generation: an unaffected male, an unaffected female, an unaffected male, and an unaffected female. The first couple in the second generation (unaffected male and unaffected female) has three children in the third generation: two unaffected females and one affected male (filled square).</p>	2 1

	<p>c) What will be the genotype of the father?</p> <p>OR</p> <p>c) Myotonic dystrophy is coming under which category.</p>	1
	SECTION E	
31	<p>Management of adult-onset diabetes is possible by taking insulin at regular time intervals. If you discuss this, you would soon realize that one would have to isolate and use insulin from other animals. Now, imagine if bacterium were available that could make human insulin. Suddenly the whole process becomes so simple. You can easily grow a large quantity of the bacteria and make as much insulin as you need.</p> <p>i. Name the source from which insulin was extracted earlier. Why is this insulin no more in use by diabetic people?</p> <p>ii. Explain the process of synthesis of insulin by Eli Lilly company. Name the technique used by the company.</p> <p>iii. How is the insulin produced by human body different from the insulin produced by the above mentioned company?</p> <p>iv. Explain the maturation of proinsulin to insulin.</p> <p>OR</p> <p>Biotechnology involves the exploitation of biological processes for industrial and other purposes, especially the genetic manipulation of microorganisms for the production of antibiotics, hormones etc.</p> <p>Explain briefly</p> <p>a) PCR b) Chitinase</p>	5
32	 <p>a) Identify the process shown in the diagram. Label the parts a and b</p> <p>b) Differentiate between spermatogenesis and oogenesis in humans with respect to</p> <p>(i) Time of their initiation (ii) Number of gametes produced by each primary spermatocyte or primary oocyte</p>	5

	<p>c) Write the role of FSH and LH in regulation of spermatogenesis and oogenesis.</p> <p style="text-align: center;">OR</p> <p>Embryo develops at the micropylar end of the embryo sac where the zygote is situated. Identify the given picture and label the parts P and Q.</p>  <p>b) Depending on the source of pollen, pollination can be divided into three types. What are they?</p>	
33	<p>Operon refers to a set of functional genes (Transcription unit) required for the production of enzymes. They have a single promoter region. In operon the genes encode proteins that allow the bacteria to use lactose as an energy source.</p> <p>Explain the regulation of Lac Operon.</p> <p style="text-align: center;">OR</p> <p>Explain the discovery made by Hershey and Chase using radioactive Sulphur and Phosphorus in their experiment.</p>	5