

SET 3

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PRE BOARD EXAMINATION 2020-21

CLASS XII

BIOLOGY

TIME : 3 HOURS

M.M 70

General instructions :

- i) All questions are compulsory.
- ii) The question paper has four sections with 33 questions in all.
- iii) Section A has 14 questions of 1 mark each 02 case based questions.
- iv) Section B has 9 questions of 2 marks each.
- v) Section C has 5 questions of 3 marks each
- vi) Section D has 3 questions of 5 mark each
- vii) There is no overall choice ,however internal choices have been provided in some questions.
- viii) Wherever necessary ,neat and labeled diagrams should be drawn.

SECTION A		
	QUESTIONS	MARKS
1	Mention the event that induces the completion of the event of the meiotic division of the secondary oocyte.	1
2	Give one application of amniocentesis other than pre-natal sex diagnosis.	1
3	Name the phenomenon exhibited by the genetic disorder phenylketonuria.	1
4	Write two functions of the codon AUG.	1
5	Why is colostrum advisable for new born babies ?	1

6	Why is bottled fruit juice is clearer as compared to homemade juice ?	1
7	What is GEAC? Mention its one role.	1
8	How DNA fragments can be visualized in gel electrophoresis technique?	1
9	Mention the level of biodiversity represented by the following: i) 1000 varieties of mangoes ii) Coral reefs,wetlands	1
10	Why do cattles avoid grazing on Calotropis plants?	1
11	Assertion: BOD indicates the extent of water pollution by organic wastes. Reason: Flocs reduces the BOD by consuming the organic wastes. a. Both assertion and reason are true,and the reason is correct explanation of the assertion. b. Both assertion and reason are true, but the reason is not the correct explanation of the assertion. c. Assertion is true but reason is false. d. Both assertion and reason are false.	1
12	Assertion: If an endosperm cell of angiosperm contains 24 chromosomes ,the number of chromosomes in each cell of root will be 16. Reason: As endosperm is triploid and root cells are diploid ,the chromosome number in each of the root cell will be 16. a. Both assertion and reason are true,and the reason is correct explanation of the assertion. b. Both assertion and reason are true, but the reason is not the correct explanation of the assertion. c. Assertion is true but reason is false. d. Both assertion and reason are false.	1

13	<p>Assertion: Each restriction endonuclease recognizes a specific palindromic nucleotide sequences in the alien and vector DNA.</p> <p>Reason: Action of same restriction enzyme at its recognition sequence on foreign DNA and plasmid leaves sticky-ends.</p> <ol style="list-style-type: none"> Both assertion and reason are true, and the reason is correct explanation of the assertion. Both assertion and reason are true, but the reason is not the correct explanation of the assertion. Assertion is true but reason is false. Both assertion and reason are false. <p style="text-align: center;">OR</p> <p>Assertion: Biotechnology is also known as recombinant DNA technology.</p> <p>Reason: Biotechnology produces organisms with changed phenotype</p> <ol style="list-style-type: none"> Both assertion and reason are true, and the reason is correct explanation of the assertion. Both assertion and reason are true, but the reason is not the correct explanation of the assertion. Assertion is true but reason is false. Both assertion and reason are false. 	1
14	<p>Assertion: In humans the gamete contributed by male determines whether the child produced will be male or female.</p> <p>Reason: Sex in human is a polygenic trait depending upon a cumulative effect of some genes on X-chromosomes and some on Y-chromosomes.</p> <ol style="list-style-type: none"> Both assertion and reason are true, and the reason is correct explanation of the assertion. 	1

	<p>b. Both assertion and reason are true, but the reason is not the correct explanation of the assertion.</p> <p>c. Assertion is true but reason is false.</p> <p>d. Both assertion and reason are false.</p>	
15	<p>Read the following and answer any four questions from 15(i) to 15(v) given below:</p> <p style="text-align: center;">Adaptation</p> <p>Some creatures, like leafy sea dragon fish have evolved adaptation that allow them to blend in with their environment to avoid attention of their hungry predators. Organisms can adapt to an environment in different ways like biological adaptation means organisms can alter their body function to improve their chances of survival in their environment. For ex. Biological adaptation can be seen in the bodies of people living at high altitudes, such as Tibet. Tibetans thrive at altitudes where oxygen levels are upto 40% lower than at sea level. Breathing air that thin would cause most people to get sick but Tibetans body have evolved changes. Organisms also exhibit behavioural adaptation. One example of behavioural adaptation is how emperor penguins in Antarctica crowd together to share their warmth in the middle of winter.</p> <p>i) Mention any two symptoms of altitude sickness.</p> <p>a) Sweating profusely</p> <p>b) Fatigue and heart palpitation</p> <p>c) Nausea and fever</p> <p>d) Shivering</p> <p>ii) How does a human body adapt to survive at high altitude?</p> <p>a) By decreasing RBC count</p> <p>b) By increasing binding capacity of haemoglobin</p> <p>c) By increasing RBC count and decreasing binding capacity of haemoglobin</p> <p>d) By decreasing breathing rate</p> <p>iii) How polar seas aquatic mammals like seal deal with very</p>	4

	<p>low temperature of its environment?</p> <ul style="list-style-type: none"> a) By having thick layer of blubber below their skin b) By having shorter ears and limbs c) By minimizing heat loss d) All of the above <p>iv) Desert lizard show behavioral response to cope up variations in their environment by</p> <ul style="list-style-type: none"> a) By burrowing into the soil b) By moving to colder areas during hot environment c) By basking in the sun and moving to shade when the ambient temperature increases d) None of the above <p>v) Select the correct option from the following with reference to adaptation of parasites :</p> <ul style="list-style-type: none"> a) Well developed sense organs b) High reproductive capacity c) Well developed digestive system d) Resource partitioning with its host 	
16	<p>Read the following and answer any four questions from 16(i) to 16(v) given below:</p> <p style="text-align: center;">Covid 19</p> <p>Corona viruses are a large family of viruses. They usually cause just the common cold. Examples of animal corona viruses that infect humans include: Middle East respiratory syndrome corona virus (MERS-CoV), severe acute respiratory syndrome corona virus (SARS-CoV) and the one we're dealing with now, called SARS coronavirus-2 (SARS-CoV-2). And all 3 have their origin in bats. They cause cross-species infections by jumping from one host to another. Scientists have mapped the genomes of over 70,000 samples (and counting) of SARS-CoV-2 from patients in the United States, China, Europe, Brazil and South Africa. Subsequent genetic analysis revealed that SARS-CoV-2 is 96% similar to a bat virus. It spreads very easily from person to person, and that's why it's</p>	

spreading so quickly.

i) Which of the statement is false regarding novel corona virus :

- a) People with chronic diseases such as asthma, cancer, diabetes etc are at higher risk.
- b) Asymptomatic people can't transmit corona virus
- c) Corona virus is similar to severe acute respiratory syndrome virus
- d) Antibodies taken from plasma of recovered covid patients are used as treatment therapy.

ii) From where corona virus got its name?

- a) Due to their crown-like projections.
- b) Due to their leaf-like projections.
- c) Due to their surface structure of bricks.
- d) None of the above

iii) What are the precautions that need to be taken to protect from the corona virus?

- a) Cover your nose and mouth when sneezing.
- b) Add more garlic into your diet.
- c) Visit your doctor for antibiotics treatment
- d) Wash your hands after every hour.

iv) Mild Symptoms of Novel corona virus are :

- a) Fever
- b) Cough
- c) Shortness of breath
- d) All the above

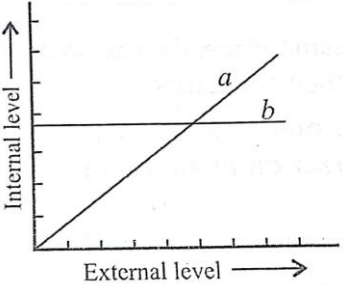
v) How does Corona virus transmit?

- a) When a person sneezes or cough, droplets spread in the air or fall on the ground and nearby surfaces.
- b) If another person is nearby and inhales the droplets or touches these surfaces and further touches his face, eyes or mouth, he or she can get an infection.
- c) If the distance is less than 1 meter from the infected

	<p>person.</p> <p>d) All the above are correct.</p>	
	SECTION B	
17	<p>Mention the function of each of the following:</p> <p>a) Acrosome</p> <p>b) Leydig cell</p>	2
18	<p>Embryo at 16 blastomere stage is transferred in the reproductive tract of human female.</p> <p>a) What is this technique of IVF known as ?</p> <p>b) Name the site in the reproductive tract of female where this embryo is transferred ?</p>	2
19	<p>Give reason for the following statements :</p> <p>a) Pollen grains are well preserved as fossils.</p> <p>b) Pollen tablets are in use as food supplements these days</p> <p style="text-align: center;">OR</p> <p>Differentiate between perisperm and endosperm with one example of each.</p>	2
20	<p>Although a prokaryotic cell has no defined nucleus , yet DNA is not scattered throughout the cell. Explain.</p>	2
21	<p>A woman with blood group O married a man with AB blood group. Show the possible blood groups of the progeny. List the alleles involved in this inheritance.</p>	2
22	<p>It is generally observed that the children who had suffered from chicken pox may not contract the same disease in their later life. Explain giving reasons the basis of such immunity in an individual. Name the kind of immunity.</p>	2
23	<p>How do B-lymphocytes and T-lymphocytes differ in their role in</p>	2


	immune response ?										
24	Identify A, B, C, D in the table given below: <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="color: red;">Organism</th> <th style="color: red;">Bioactive molecule</th> <th style="color: red;">Use</th> </tr> </thead> <tbody> <tr> <td>Monascus purpureus</td> <td>A</td> <td>B</td> </tr> <tr> <td>C</td> <td>cyclosporin</td> <td>D</td> </tr> </tbody> </table>	Organism	Bioactive molecule	Use	Monascus purpureus	A	B	C	cyclosporin	D	2
Organism	Bioactive molecule	Use									
Monascus purpureus	A	B									
C	cyclosporin	D									
25	The following illustrates the linking of DNA fragments : <div style="text-align: center; margin: 10px 0;"> </div> <p>a) Name 'a' and 'b'. b) Complete the palindrome which is recognized by EcoRI. c) Name the enzyme that link the two DNA fragments.</p>	2									
SECTION C											
26	Name a disorder, give the karyotype and write two symptoms where a human male suffers due to the absence of one of the X chromosome .	3									
27	Why is DNA molecule a more stable genetic material than RNA ? Justify giving 3 reasons.	3									
28	a) Name the opioid drug and its source plant. b) How does it affect the human body? c) Mention the medicinal use of this drug.	3									
OR											

	<p>a) Name the group of viruses responsible for causing AIDS in humans. Why these viruses are named so?</p> <p>b) Name the enzyme which acts on viral RNA to form viral DNA.</p> <p>c) List any two ways of transmission of HIV infection in humans.</p>	
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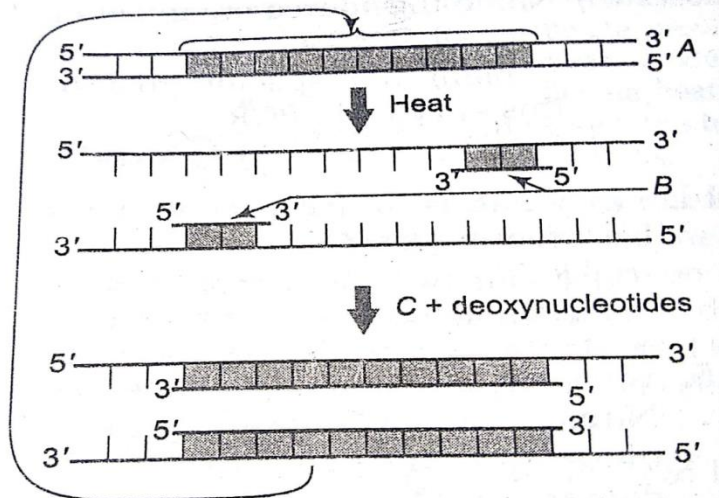
29	<p>The following graph shows the response of organisms to certain environmental condition:</p>  <p>a) What does the 'a' and 'b' depicts ?</p> <p>b) How do these organisms differ with each other with reference to homeostasis?</p>	3
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30	<p>Explain giving one example each, how co-extinction and alien species invasion are the causes of loss of biodiversity.</p>	3
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SECTION D		
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31	 <p>a) Identify the figure that illustrates ovulation and what is the cause of ovulation ?</p> <p>b) Identify the figure that illustrates corpus luteum and name the phase of menstrual cycle during which it is produced.</p> <p>c) Specify the endocrine function of corpus luteum. How does it</p>	5
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	<p>influence the uterus?</p> <p style="text-align: center;">OR</p> <p>a) Draw a diagram of mature embryo sac of an angiosperm and label the following parts in it :</p> <ul style="list-style-type: none"> i) Filliform apparatus ii) egg cell iii) Polar nuclei iv) Antipodals <p>Write the fate of polar nuclei and egg cell after fertilization</p>								
32	<p>Study the schematic representation of the genes involved in the <i>lac</i> operon given below and answer the questions that follows:</p> <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">p</td> <td style="padding: 5px;">i</td> <td style="padding: 5px;">p</td> <td style="padding: 5px;">o</td> <td style="padding: 5px;">z</td> <td style="padding: 5px;">y</td> <td style="padding: 5px;">a</td> </tr> </table> <ul style="list-style-type: none"> i) Name the regulatory gene of the operator and why it is known so? ii) Name the inducer molecule and explain its role. iii) What are the products of genes 'z' and 'y' of the operon. Also write the function of these genes product. <p style="text-align: center;">OR</p> <p>With reference to the process of transcription, explain the following:</p> <ul style="list-style-type: none"> a) Name the DNA strand on which mRNA is transcribed. b) Which enzyme catalyses transcription in bacteria? c) Explain the role of 'sigma' and 'Rho' factor. d) Why hnRNA is subjected to splicing. e) What is capping of mRNA. 	p	i	p	o	z	y	a	5
p	i	p	o	z	y	a			
33	<p>With reference to the following schematic representation of PCR, answer the questions:</p>	5							



- Name the process A
- Identify B and mention its role.
- What is the source and importance of C?
- Give its application medical science.

OR

- Draw a schematic representation only of the maturation of a pro-insulin into a insulin.
- Explain how Eli-Lily Company produced insulin by rDNA technology.
- Why is this insulin considered better than the ones used earlier by diabetic person?
