



केवल मूल्यांकनकर्ता के उपयोग हेतु!

माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

32 पृष्ठीय

केवल परीक्षक द्वारा भरा जावे। प्रश्न क्रमांक के सम्मुख प्राप्तांकों की प्रविष्टि करें।

प्रश्न क्रमांक	पृष्ठ क्रमांक	प्राप्तांक (अंकों में)	प्रश्न क्रमांक	पृष्ठ क्रमांक	प्राप्तांक (अंकों में)
1			17		
2			18		
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परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे ↓

→ परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे

प्रमाणित किया जाता है कि अन्दर के पृष्ठों के अनुरूप मुख्य पृष्ठ पर अंकों की प्रविष्टि एवं अंकों का योग सही है।
निर्धारित मुद्रा: नाम, पदनाम, मोबाईल नम्बर, परीक्षक क्रमांक एवं पदांकित संस्था के नाम की मुद्रा लगाएं।

उप मुख्य परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा

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परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा

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Question-1:- Write True / False

Answer-1:- (i) False ✓

(ii) True ✓

(iii) True ✓

(iv) True ✓

(v) True ✓

(vi) False ✓

Question-2:- Match the correct pair and write :-

Answer-2:- (i) Spornixis

→

(e) grass family ✓

(ii) Darwin

→

(a) Galapagos Island ✓

(iii) Teddy

→

(b) Southern India ✓

(iv) Agarose

→

(c) sea weeds ✓

(v) Detritivorous

→

(d) Earthworm ✓



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Question-3 :- Answer in one word / sentence :-

Answer-3 → (i) Ovary is the part of flower that forms fruit.

(ii) Colostrum is a pale yellowish fluid secreted by breasts for a few days after child birth. It's rich in antibody A and is necessary to provide passive immunity to newborn baby.

(iii) One Mendelian disorder is Haemophilia.

(iv) Restriction enzymes are important tools of biotechnology. These cut the strands of DNA at a specific palindromic site. In bacteria, they were meant to for defense mechanism against bacteriophage.

(v) There are 34 biodiversity hotspots in the world.



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Question-4:- Choose and write the correct option:-

Answer-4:- (i) (a) Herbivorous

(ii) (a) Penicilium

(iii) (b) 12-18 years

(iv) (b) The three rising

(v) (a) LH

(vi) (b) Hilum

Question-5:- Fill in the blanks with correct answer:-

Answer-5:- (i) over-exploitation

(ii) recombinant prot

(iii) negatively

(iv) Trichoderma polyspora

(v) ~~analogy~~ Habitat

(vi) ~~Health~~ Reproductive Health



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Question-6

Answer-6 ⇒ Two components of the ecosystem are:-

(a) Biotic component: All the living organisms of an ecosystem. Eg. Animals.

Abiotic component: All the non-living and physical factors of an ecosystem.

Eg. Temperature.

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EQuestion-7 (OR)

Answer 7 (OR) ⇒ EX-SITU CONSERVATION: A method of conservation in which wildlife, plants and other living parts of an ecosystem are protected and safeguarded outside their natural habitat.

Eg. Zoological parks - where animals are brought from their habitat and kept in protection here.



Question - 8

Answer-8 :- Parts of an ~~anther~~ anther are as follows:-

(a) Four wall layers - Epidermis, Endothecium, Middle Parenchymatous layers and Tapetum.

(b) Microsporangium - It contains microspores that further convert into pollen grains.

Question - 9 (OR)

Answer 9 (OR) ⇒ (i) DOMINANT GENE :- The gene that is able to express its effect in a heterozygous condition. It is denoted by a capital letter.

Eg. Tt :- This is a tall plant (T is dominant) by dominant gene

(ii) RECESSIVE GENE :- The gene whose effect is suppressed and it can't express itself in a heterozygous condition due to presence of a dominant gene. It is denoted by a



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small letter.

eg. Tt - Tall plant ('t' being recessive can't express itself.)

Question-10

Answer 10 → DNA ∴ It stands for Deoxyribonucleic acid. It is a polymer of deoxyri-bonucleotides. It's a negatively charged molecule.
 • DNA is present as genetic material in most of the organisms because it's chemically stable.

Question-11 (OR)

Answer 11 → The species of fungus used in the production of antibiotics is called "Penicilium notatum".
OR

It was discovered by Alexander Fleming in 1928.

Question - 12 (OR)

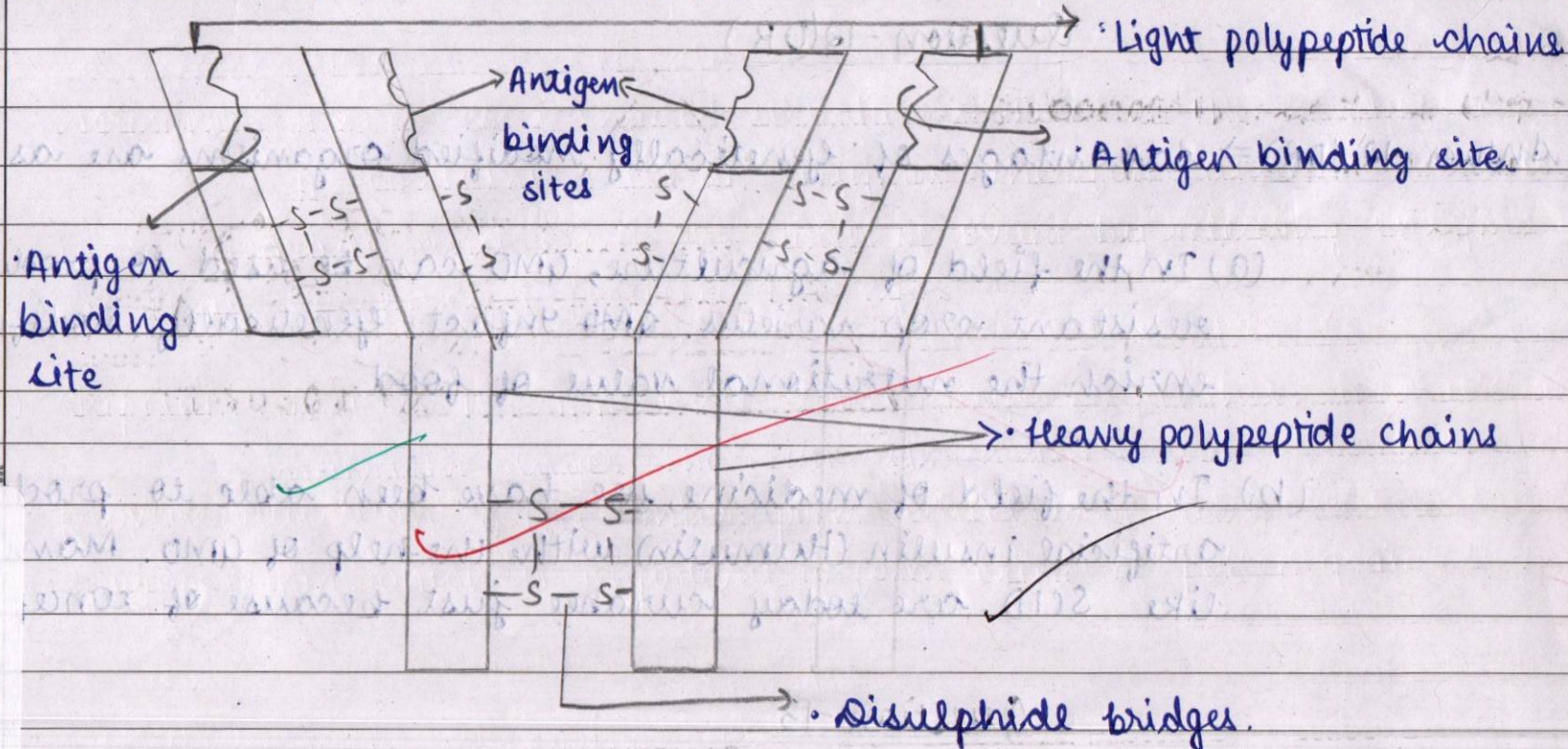
Answer - 12 (OR) ⇒ Advantages of Genetically Modified Organisms are as follows:-

- (a) In the field of agriculture, GMO can be used to produce pest-resistant crop varieties. ~~GMO~~ In fact, Genetically Modified crops enrich the nutritional value of food.
- (b) In the field of medicine, we have been able to produce artificial insulin (Humulin) with the help of GMO. Many diseases like SCID are today curable just because of concept of GMO.

Question - 13

Answer - 13:- Antibody molecule consists of four polypeptide chains, two heavy and two light chains. They also have antigen-binding sites. Both the chains are bonded through disulphide bridges. ~~Diagram of an antibody molecule is as follows:-~~ This antigen-binding site is specific for each antigen. ~~Diagram of an antibody molecule is as follows:-~~

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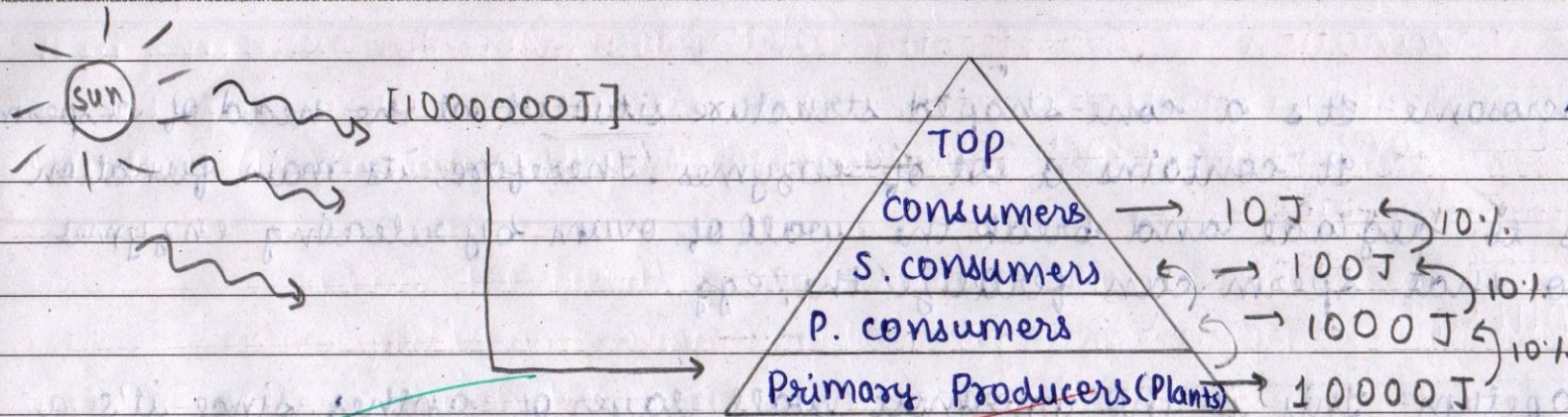


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Question-14

Answer 14 → Energy Pyramid: It represents the flow of energy from one trophic level to another in an ecosystem. It's always erect and upright due to 10% law of energy. As per this law, only 10% of the energy will be gained by successive trophic level. Ideal Pyramid of energy is shown below:

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→ Here, we need to note that plants (P. producers) convert only only 1% of the total sunlight energy to chemical energy.

Due to 10% law of energy, the number of trophic levels in a food chain are always restricted to three or four.

Question-15 (OR)

Answer 15 (OR): Functions of the following structures is given below:

(1) Corpus luteum: It is an yellowish structure formed after rupturing of graffian follicle.

The main function of corpus luteum is to secrete the hormone "progesterone" which helps in maintaining the thickness of endometrium.



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- (2) Acrosome: It's a cone-shaped structure situated at the head of a sperm. It contains a lot of enzymes. Therefore, its main function is to degrade and break the wall of ovum by releasing enzymes so that sperm can fertilize the egg.

Tapetum: This is the innermost wall layer of anther. Since it's a nutritive layer, therefore, its main function is to provide nutrition to the microspores of tetrad. It also secretes sporopollenin which is important to form exine of pollen grain.

Question-16

Answer 16 → Given terms are defined below:-

- (1) HETEROZYGOUS: The condition combination of alleles in which both the alleles are different, having separate phenotypic effect. One is dominant allele while other is a recessive one.

Eg. Tt → This is a heterozygous condition.

• T ÷ dominant allele

• t ÷ recessive allele



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(2) LINKAGE:- The phenomenon of certain genes inheriting together because they are located ^{on} ~~at~~ the same chromosome at a closer distance. Such type of genes ~~are~~ ^{are} called linked genes and their inheritance is known as linkage.

1) TEST CROSS:- A type of cross in which, heterozygous dominant offspring is crossed with a homozygous recessive parent. Test cross is done to know the ~~the~~ ^{unknown} genotype of that heterozygous dominant offspring.

Question-17

Answer-17:- Given terms are described below:-

(i) VACCINATION $\Rightarrow$ It is a type of active immunity. In this method, a dead micro-organism or the protein/part of that pathogen is injected into the body of an individual so that our immune system ~~may~~ ^{can} be able to develop antibodies against it. Vaccination follows the principle of memory of immune system. This exposure to the dead pathogen activates memory cells of our immunity so, when actually pathogen enters our body next time, it can be killed after immediately recognising it. ~~by our body.~~



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* Vaccination is an effective method to promote well being and health in a society. Infact, mass vaccination is a step taken by government which is beneficial for us. Vaccination leads to immunisation.

- (ii) ALLERGY:- It's an exaggerated response of our body towards any foreign particle. Ultimately, allergy can also be defined as the hypersensitivity of the immune system ^{towards} to counter the impact of foreign agents on our body. The ~~living~~ biotic and abiotic factors that ~~can~~ cause allergy are termed as allergens. The body produces 'antibody E' in response to allergic reactions. Rashes on the body, sneezing, itching etc. are the responses ~~our~~ antibody E produces. To avoid the allergy, we're advised to take anti-histamine tablets and steroids.



Question - 18 (OR)

Answer-18 (OR) :- Biotechnology has significantly contributed in the medical field. Today, we've been enjoying a lot of advantages of biotechnology in the medicine. Some of the applications are given below:-

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(1) Production of Humulin:- Man-made insulin is known as humulin. We're able to ~~able to~~ produce it artificially with the help of biotechnology. Firstly, we need to produce 'A' and 'B' polypeptide chains separately with the help of recombinant DNA technology in the E. coli bacteria. Then, isolate ~~them~~ and join them with the help of disulphide bridges. Mature insulin is ready. It can be used to treat patients of diabetes mellitus.

(2) Gene therapy:- It's a collection of methods used to correct a defective gene using DNA technology. Best example of gene therapy is treatment of SCID (Severe Combined Immuno deficiency). It ~~arises~~ ~~due to~~ ~~deficiency~~ ~~defect~~ in gene coding for enzyme Adenosine Deaminase. Using the concept of GMD and biotech., you can replace this defective gene with a functional one.

(3) Molecular diagnosis:- Many techniques of biotechnology like Polymerase chain reaction, ELISA and probe can be used for the early

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detection a disease. Early diagnosis helps in timely treatment of diseases. Let's take one eg. of PCR, it can detect even small concentrations of pathogens by amplifying their nucleic acid.

Study of Diseases: Using the concept of GMO and biotechnology, you can create transgenic animals. These transgenic animals serve as models for many human diseases like Cancer, Cystic fibrosis and Rheumatoid Arthritis. We can study the impacts of diseases on a body and can this can aid in finding treatments for the same.

Question - 19

Answer - 19



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Question - 19 19

Answer-19: Differences between Oogenesis and spermatogenesis are as follows:-

On the basis of	Oogenesis	Spermatogenesis
→ Definition	1) Process of formation of ovum/ ootid from oogonia is known as oogenesis.	1) Process of formation of spermatozoa (male gametes) from spermatogonia is called spermatogenesis.
→ Time of starting	2) It starts when female is in her foetal life i.e. in the womb of her mother.	2) It starts when boys reach the age of puberty, approximately at 11-12 yrs. of age.
→ Polar bodies	3) <u>Two</u> polar bodies are formed and degenerated during oogenesis.	3) No polar bodies are formed in this process.
→ Site	4) It <u>takes</u> place in ovaries till the formation of secondary oocyte and rest in fallopian tube till fertilization is complete. Only one egg is formed at the end.	4) It takes place entirely in the seminiferous tubules. In seminiferous tubules, finally four spermatozoas are formed.

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Question-20Answer-20

LAW of INDEPENDENT ASSORTMENT: This is the second law of dominance proposed by Mendel. It states that inheritance of one pair of a ~~contrast~~ contrasting trait is independent of the other.

For eg. inheritance of seed colour doesn't depend on that of seed shape.

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→ Mendel proved 'law of independent assortment' by conducting a dihybrid cross taking seed shape and seed colour as the traits under experiment. This contains three steps:

- choosing true-breeding varieties of plants.
- obtaining F_1 -hybrid progeny by cross pollination of parent plants.
- Determining Phenotype and genotype ratio of F_2 -progeny using checkerboard.

Traits used	Dominant	Recessive
→ Seed colour	Yellow	Green
→ Seed shape	Round	Wrinkled

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Experiment is as follows:-

(Round Yellow seeds)

(wrinkled green seeds)

RRYY

X

rryy

(Parents-1) $\Rightarrow$ CROSS-POLLINATION

(RY)

(ry)

(RrYy)

(F-1) generation (all hybrid)

 $\Rightarrow$ (RY) (Ry) (rY) (ry)

X

~~(RY)~~ (RY) (Ry) (rY) (ry)
(Parents-2) $\Rightarrow$ SELF-POLLINATION

Using checker-board,

 $\rightarrow$ conclusions for

$\frac{\sigma}{\phi}$	RY	Ry	rY	ry
RY	RRYY	RRYy	RrYY	RrYy
Ry	RRYy	RRyy	RrYy	Rryy
rY	RrYY	RrYy	rrYY	rrYy
ry	RrYy	Rryy	rrYy	rryy



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प्रश्न क्र. → Conclusion from checker-board:

(a) Phenotypic ratio: 9:3:3:1

(b) Parental combinations: 10/16

Recombinations: 6/16

→ Thus, appearance of new combinations (round ^{green} ~~wrinkled~~ seeds and wrinkled yellow seeds) proves that one character inherited independently of the other. Law of independent assortment is ~~see~~ & hence proved.

