



माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

परीक्षार्थी द्वारा भरा जायें ↓

24 पृष्ठीय

विशेष नोट :- सिलाई खुली हुई अथवा क्षतिग्रस्त उत्तर पुस्तिका को न तो पर्यवेक्षक वितरण करें और न ही छात्र उपयोग में ले। ऐसी उत्तर पुस्तिका में लिखे उत्तरों का मूल्यांकन नहीं किया जायेगा।
परीक्षार्थी द्वारा भरा जायें ↓
केन्द्राध्यक्ष/सहायक केन्द्राध्यक्ष एवं पर्यवेक्षक द्वारा भरा जायें ↓
परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जायें ↓

परीक्षा का विषय	विषय कोड	परीक्षा का माध्यम									
Biology	2 3 1	English									
स्टीकर तीर के निशान ↓ से मिलाकर लगायें											
उत्तर पुस्तिका का सरल क्रमांक - 321 - 948672											
अंकों में परीक्षार्थी का रोल नम्बर											
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BOARD OF SECONDARY EDUCATION, M.P., BHOPALE माध्यमिक शिक्षा मण्डल, म.प्र., भोपाल											

नीचे दिये गये उदाहरण अनुसार रोल नम्बर भरें।

उदाहरणार्थ	1	1	2	4	3	9	5	6	8
	एक	एक	दो	चार	तीन	नौ	पाँच	छः	आठ

क - पूरक उत्तर पुस्तिकाओं की संख्या अंकों में <input checked="" type="checkbox"/> शब्दों में <input checked="" type="checkbox"/>	
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ग - परीक्षा की दिनांक <input type="text" value="24"/> <input type="text" value="02"/> <input type="text" value="2022"/>	
परीक्षा का नाम एवं परीक्षा केन्द्र क्रमांक की मुद्रा	
हायर सेकेण्डरी परीक्षा सन् 2022 परीक्षा केन्द्र क्रमांक-261004	
पर्यवेक्षक का नाम एवं हस्ताक्षर	केन्द्राध्यक्ष/सहायक केन्द्राध्यक्ष के हस्ताक्षर
प्रिण्टेन्द्र भारती	

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जायें ↓

प्रमाणित किया जाता है कि मूल्यांकन के समय पूरक उत्तर पुस्तिकाओं की संख्या उपरोक्तनुसार सही पाई हो। निर्धारित मुद्रा : नाम, पदनाम, मोबाईल नम्बर, पता, पदाधिकारी का नाम की मुद्रा लगाएं। A4 99.1mm x 33.9mm	उप मुख्य परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा UMT. (8661) Govt Model H.S.S. Agar-Maiwa	परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा Ranjeet Songara PGT (471002002)
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नोट :- "हायर सेकेण्डरी परीक्षा में केवल वाणिज्य सकार्य के विषयों तथा हाई स्कूल परीक्षा में प्रायोगिक विषय को छोड़कर शेष विषयों हेतु नियमित एवं स्वाध्यायी छात्रों के लिये प्रश्न पत्र 100 अंकों का होगा किन्तु नियमित छात्रों को 100 अंक के प्राप्तांक का 80% अधिभार एवं स्वाध्यायी छात्रों को 100 अंक के प्राप्तांक ही अंकसूची में प्रदर्शित किये जायेंगे।"

केवल परीक्षक द्वारा भरा जायें		
प्रश्न क्रमांक	पृष्ठ क्रमांक	प्राप्तांक (अंकों में)
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कुल प्राप्तांक शब्दों में		

mm x 16



प्रश्न क्र.

Ans of Q.No.1

Fill in the blanks:

- (i) span
- (ii) Outside the abdominal cavity in "scrotum"
- (iii) "Gregor John Mendel"
- (iv) *Wuchereria bancrofti* (Worm)
- (v) *Penicillium notatum*
- (vi) undifferentiated
- (vii) Antiviral protein

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M
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Ans of Q.No.2

2. One word:

- (i) "Amoeba" is an immortal creature.
- (ii) "Initiation codon" which codes for methionine amino acid.
- (iii) "*Bacillus thuringiensis* (Bt)" is an important biopesticides.
- (iv) Methane is the main constituent of biogas.
- (v) There are two types of curves obtained in growth of organisms:
 - (a) J shaped growth curve
 - (b) S-shaped growth curve or logistic curve



प्रश्न क्र.

(vi.) Pyramid of energy in forest/
pond ecosystem is erect / upright.

(vii.) 90% of the energy is lost at
each level of energy flow.

Ans of Q No. 3

M

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(i) (c) ~~Respiration~~ Reproduction

(ii) (b) Triploid

(iii) (a) X linked disease

(iv) (c) Alec Jeffreys

(v) (b) Cancer

(vi) (b) Insulin

(vii) (a) Banana plant

Laser Inkjet



प्रश्न क्र.

Ans of Q. No. 4Matching:
'A'

'B' (Answers)

(i) Budding → (b) Hydra

(ii) Vasectomy → (g) Male sterilization

(d) Gender linked disease

(iii) Colour blindness → (h) ~~Genetic disorder~~

(iv) Entamoeba histolytica → (e) Amoebiasis

(i) Interferon → (f) Antimicrobial substance

(ii) Gene Interferon therapy → (a) ~~Obelid~~
(h) Genetic disorder

(iii) Transgenic animals → (c) Transgenic

M
E
S
E



प्रश्न क्र.

Ans of Q.No. 5

- \Rightarrow Apple is called virtual fruit because along with the ovary, its development takes place from "Thalamus".

In the apple, "Thalamus" contributes to the formation of the apple.

M

P

B

S

F

Ans of Q.No. 6GIFT

- \Rightarrow Full form of GIFT is "Germete Intra fallopian transfer."
- \Rightarrow It is a type of Assisted Reproductive technology (ART) which is used for the fertilization treatment of unfertilized couples.
- \Rightarrow In this process, "Ovum" from female and Sperm from male are taken out and with the help of laproscope, they are transferred into the fallopian tube where sperm and Ovum fuses with each other to diploid zygote (2N).



प्रश्न क्र.

Ans of Q. No. 7 (OR)Test tube baby

- ⇒ Test-tube baby technique Or In-vitro fertilization is a type of assisted reproductive technology.

⇒ In this technique, egg is made to combine with sperm outside ^{the body of female parent} in the laboratory dish or in vitro.

Thus, this technique is called "Test-tube baby technique" and the child/baby produced by this technique is called "Test-tube baby".

⇒ The first test tube baby was "Louis Joy Brown".

Ans of Q. No. 8Mutation

- ⇒ "Mutation is a phenomena in which there occurs alternation in the sequence of gene and consequently change in the genotype and phenotype of the organism." Chemical and physical factors causing mutation are called "mutagens" e.g. UV rays.



प्रश्न क्र.

Ans of Q. No. 19 (OR)

Ecological succession

• ⇒ "The sequential and progressive replacement of one plant community by the another community upto the development of climax community is called Ecological Succession."

M
P
B
S
E

In other words,

"Serial development of a plant community in an area is called Ecological Succession."

⇒ The term "Succession" was given by Hult.

Steps of Ecological Succession

• 1^o Nudation

It is the first & step in the process of succession.

The development of a bare area for the arrival of a "pioneer species" is called Nudation.



प्रश्न क्र.

The area may become barren due to landslides, drought, fires, etc.

2. Invasion

⇒ Arrival of various species or community in the area of succession is called "Invasion".

⇒ Invasion takes place by spores, seed germination or by other means.

M
P
B
S
E

3. Competition

⇒ As the number of members of the community increases, due to scarcity of food and water resources, there occurs interspecific and intraspecific competition.

⇒ Community which proves themselves "fit" for the nature are able to survive while the rest extinct.



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• 4. Reaction

⇒ Modification in the environment by the community which succeed in the "competition" is called "Reaction".

• 5. Climax stage

⇒ Climax stage comes in the end. In this stage, equilibrium of the community with its surrounding environment takes place. Thus, stabilization occurs.

M
P
B
S
E



प्रश्न क्र.

Ans of Q. No. 18 (OR)

• PCR (Polymerase Chain Reaction)

⇒ Polymerase chain reaction is a modern technique of the "gene amplification" by which millions of genes can be produced within a short period of time.

⇒ This technique was developed by "Kary Mullis".

• Requirements of PCR:

For PCR, following materials are required:

1. Desired gene which is to be amplified.
2. Two 15-35 bp long Primers.
3. All four types of Deoxyribonucleotides.
4. A highly thermostable "Taq polymerase" enzyme is also required which is obtained from "thermus aquaticus".

• Steps of Polymerase chain reaction

It is completed in following three steps:-

1. Denaturation
2. Renaturation (Annealing)
3. Extension or Synthesis



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- Importance of PCR techniques

PCR is an important technique because of the following reasons:-

- 1. "Forensic crime of test" of any crime can be done by using this technique.

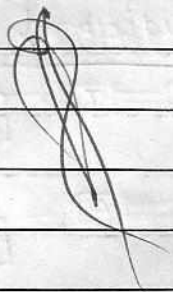
M
P
B
S
E

- 2. It helps in studying the "DNA sequencing" and "DNA amplification"

- 3. It helps in studying "evolutionary biology"

- 4. It is used to identify genetic disorders such as "sickle cell anaemia".

- 5. It helps in the diagnosis of cancer and viral diseases by amplifying the gene of the patient.

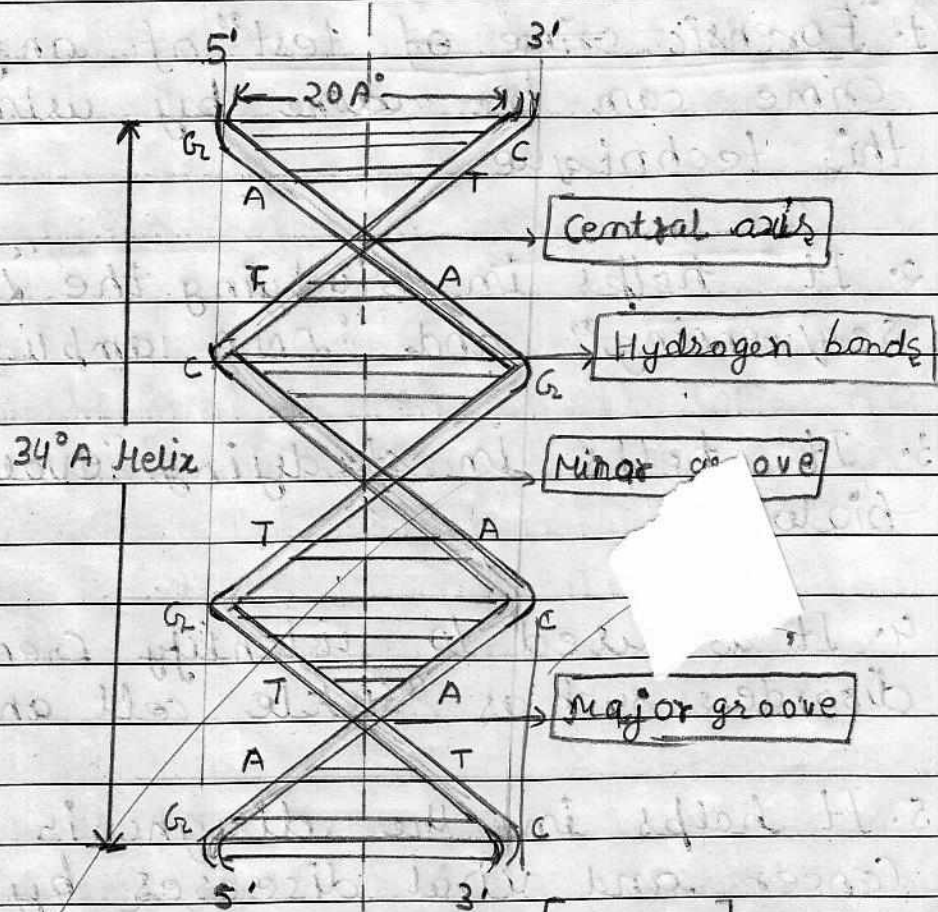




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Ans of Q.No. 17

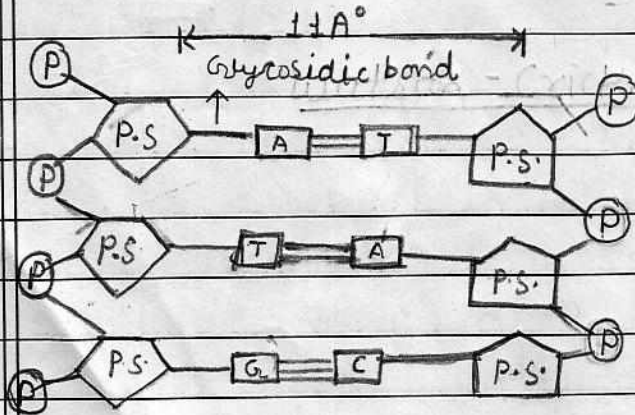
• Diagram:



M
P
B
S
E

Watson-Crick Model of DNA

A = T
G = C



Polypeptide chain of DNA



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- ⇒ Watson-Crick presented the "double helix model of DNA."
 - ⇒ This model is universally accepted.
 - ⇒ They got noble prize for this model.

- ⇒ Salient features of Watson-Crick model is presented below:

1. DNA is made of two strands. Both the strands of the DNA form a helical structure by rotating on a central axis in right handed manner.

2. Both the strands are antiparallel to each other and are joined using hydrogen bonding.

3. length of the strand one helix is about 34 \AA which consists of 10 nucleotide.

4. width of the helix is about 20 \AA while distance between two pentose sugar is 11 \AA .

5. Adenine pairs with Thymine by two hydrogen bonds while Guanine pairs with Cytosine by three hydrogen bonds.

M
P
B
S
E



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Ans of Q.No. 16Food chainFood web

1. It represents the 'simple path' of transfer of energy in the form of food.

2. Only one organism is present at one trophic level.

3. It is not practically existing in nature.

4. It is

2. It represents the "Complex path" of transfer of energy.

2. More than one organisms may occupy one trophic level.

3. It is practically present in nature because in nature, several food chains function unitedly at the same time.



प्रश्न क्र.

Ans of Q.No. 15

Characteristics of Antigen

- 1. Antigen brings about a chemical reaction in the body.
- 2. They trigger the formation of antibodies in the host organism.
- 3. Antigen are protein or polysaccharide molecules. They are responsible for causing disease in the host organism.

M
P
B
S
E

Ans of Q.No. 14

Transcription:

"The process of formation of RNA from DNA is called Transcription."

- ⇒ In this process, only one strand of DNA synthesizes the RNA. This strand is called "Template strand" while the strand of DNA which do not synthesizes the RNA is called Non-template or Coding strand."

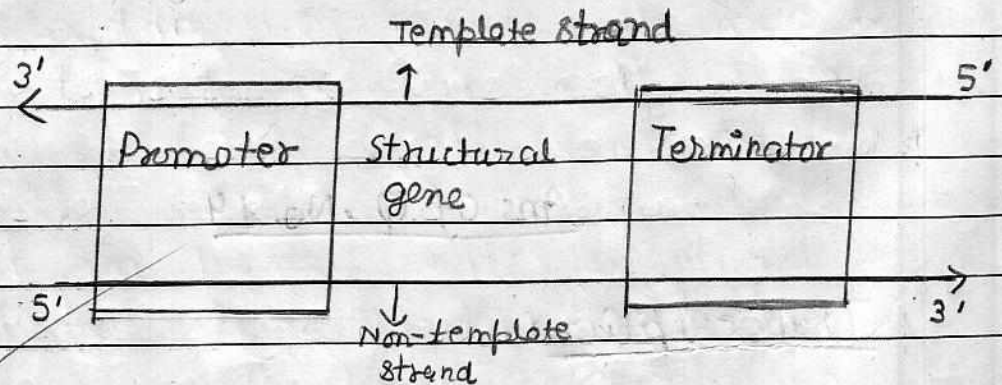


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⇒ Process of transcription takes place differently in prokaryotic and eukaryotic organism.

⇒ In prokaryotes, a single "RNA polymerase" synthesizes all types of RNA while it is not so in the case of eukaryotes. Different RNA polymerases are responsible for the synthesis of different RNA i.e. mRNA, rRNA and tRNA in eukaryotic organism.

M
P
B
S
E



Transcription in Prokaryotes



प्रश्न क्र.

Ans of Q. No. 13.

Spermatogenesis

Oogenesis

1. It takes place in the testis.

1. It takes place in the ovary.

2. Polar bodies are not formed in this process.

2. Polar bodies are formed in this process.

3. Single "Primary Spermatoocyte" is responsible for the formation of four sperms.

3. Single "Primary spermatoocyte" forms one Ovum in this process of oogenesis.

M
P
B
S
E



प्रश्न क्र.

Ans of Q.No.12

GMO (Genetically modified organism)

• ⇒ Full form of GMO is "Genetically modified Organism."

⇒ "Organisms such as plants, animals, microorganisms whose genetic material is produced, modified or manipulated by the use of ~~is~~ "Genetic engineering" are called "Genetically Modified Organisms."

M
P
B
S
E

⇒ Now-a-days, Genetically modified organisms are being used in various fields of health, agriculture etc.

⇒ Genetically modified organisms are also called "Transgenic organism".

⇒ First transgenic cow was "Rosie".

Ans of Q.No.11 (OR)

• Today, a large number of drugs are available for the treatment of diseases.



प्रश्न क्र.

These drugs are harmful and long term use of these drugs makes a person habituated to it. Thus,

"Physiological or ~~ph~~ psychological dependence on the use of drugs is called drug addiction or drug dependency."

M

P

B

S

E

Ans of Q.No 10 (OR)

• AIDS

• Full form of AIDS is "Acquired Immuno Deficiency Syndrome".

• HIV

• Full form of HIV is "Human Immuno deficiency Virus".



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Ans of Q.No. 9 (OR)

Genotype

Phenotype

• 1. Genetic makeup or constitution of an organism is called "Genotype".

• 1. External morphology of an organism is called "Phenotype."

• 2. It remains same throughout the life.

• 2. It may change with time and environment.

P
B
S
E

MPSE