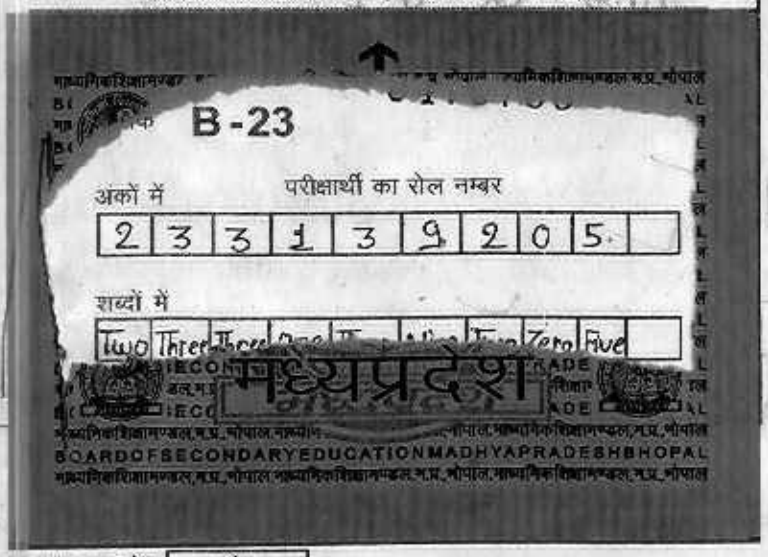
माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

2023

परीक्षार्थी द्वारा भरा जावे ↓

शिक्षा का विषय	विषय कोड	परीक्षा का माध्यम
Biology	231	English

स्टीकर तीर के निशान ↓ से मिलाकर लगाये



अंकों में परीक्षार्थी का रोल नम्बर

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प्रश्न पत्र का सेट A

क - परीक्षार्थी का कक्ष क्रमांक Hall

ख परीक्षा का दिनांक 10 03 2023

परीक्षा का नाम एवं परीक्षा केन्द्र क्रमांक की मुद्रा

311219

हायर सेकेण्डरी परीक्षा

परीक्षक का नाम एवं हस्ताक्षर	केन्द्राध्यक्ष / सहायक केन्द्राध्यक्ष के हस्ताक्षर
विमला प्रजापति	

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे ↓

प्रमाणित किया जाता है कि होलो क्राफ्ट स्टीकर क्षतिग्रस्त नहीं पाया गया तथा अन्दर के पृष्ठ के अनुरूप मुख्य पृष्ठ पर अंकों की प्रविष्टी एवं अकों का योग सही है।

निर्धारित मुद्रा : नाम, पदनाम, मोबाईल नम्बर, परीक्षक क्रमांक एवं पदांकित संस्था के नाम की मुद्रा लगाएं।

उपमुख्य परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा	परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा
SANDEEP SINGH TOMAR Uchh Madhyamik Shikshak V.No.-2015202 Govt. Excellence H.S.S. No.1 Morena Mob.9713918898	VIPIN BIHARI SHARMA (U.M.S.) Govt. H.S.S. Mal V.No.-2023002

केवल परीक्षक द्वारा भरा जावे।

प्रश्न क्रमांक के सम्मुख प्राप्त [illegible] ठीक करें।

प्रश्न क्रमांक	पृष्ठ क्रमांक (कॉलम में)
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Ans of Q.1

(i) c.
(ii) lyembryony
(iii) dometrium
(iv) viduct
(v) regor Johann Mendel
(vi) Cannabinoids
(vii) Upright

Ans of Q.2

(i) rheumatoid Arthritis
(i) idal test
(i) e number of deaths in the population during the given period is known as ortality. and death per thousand of individuals is death rate.
(ii) estern Ghats
(v) striction enzymes are known as molecular scissors as they cut the DNA strand and breaks phosphodiester bond
(v) sie
(vii) Transcription

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Ans of Q.3

(i) Sutton and Boveri
(ii) Bacillus thurigiensis
(iii) Dormancy
(iv) Lactobacillus
(v) ~~Middle layer~~ Tapetum
(vi) Consumers
(vii) Stem cells

Ans of Q.4.

(i) Entamoeba - Amoebiasis
(i) Gel electrophoresis - Separation of DNA fragments
(ii) Penicillin - First antibiotic
(i) Thalassemia - Recessive gene blood disease
(v) Turner's syndrome - Absence of 1 X-chromosome
(i) Ex-situ conservation - Zoological parks
(vii) Sunken stomata - Adaptation

Ans of Q.5

Triple fusion :- It is a part of double fertilisation which is exclusive to angiosperms only. It is the process of fusion of one of the male gametes with the secondary nucleus. Secondary nucleus (2n) is formed by the

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fusion of 2 polar nuclei. In this process, overall 3 nucleus i.e nucleus of one male gamete and 2 polar nuclei fuses and hence it is known as triple fusion. It gives rise to primary endosperm nucleus (triploid)

Polar nuclei (n) + Polar nuclei (n) → Secondary nucleus (2n)

Secondary nucleus (2n) + Male gamete (n) → Primary endosperm nucleus (3n)

Ans of Q.6

Parturition :- When the foetus becomes fully developed inside the female body, then the muscles of the uterus starts contracting and leads to the expulsion of the foetus. The process of delivery of child or the expulsion of the foetus is known as parturition.

The signals for parturition comes from the fully formed foetus and placenta which causes mild contraction of uterine muscle and this is known as foetus ejection reflex. This leads to

the secretion of oxytocin from the maternal pituatary gland which causes greater contraction of uterine muscle and leads to the delivery of child known as parturition. Relaxin hormone released by corpus luteum dialates pubic symphysis for the easy delivery of child

Ans of Q.7 OR

The names of two sexually transmitted diseases are as follows :-

① AIDS - AIDS is acquired immuno deficiency syndrome caused by the Human Immuno deficiency virus and is transmitted from an infected person to the healthy person through sexual intercourse

② Syphilis - It is another sexually transmitted disease caused by Traponema Pallidum

Ans of Q.8.

BOD :- BOD refers to the biochemical oxygen demand. It is defined as the amount of oxygen required to decompose the organic matter (waste) present in unit volume of waste water by the

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aerobic bacteria. More is the organic waste present in the waste water, more is its BOD and more the water is polluted. Hence, BOD is indirectly a measurement of the amount of pollutants present in the sewage (waste water). Less BOD means water is less polluted

Ans of Q.9 OR

Cry gene :- Cry gene is a gene present in the DNA of the bacillus thuringiensis and forms endotoxin proteins. Since the proteins are crystalline so the gene name is 'cry' which is the abbreviated form of crystalline. The endotoxin proteins remains inactive in the body of bacteria but it get activated in the alkaline midgut of insects and kills them. So it somehow saves the bacterias from the insects. Cry gene is of two types - Cry I Ac and Cry II Ab which is effective against cotton bollworms

(i) Cry I Ab is effective against corn borers

Cry gene is inserted with the help of recombinant

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DNA technology in the DNA of cotton plant to make them pest resistant.

Ans of Q.10 OR

The treatments of cancer are as follows -

(1) Chemotherapy :- The various chemicals like vincristin and vinblastin obtained from periwinkle are used in this therapy to treat cancer. It causes mitotic inhibition and hence has sideeffects like hair loss and anaemia

(2) Radiatie therapy - In this therapy, radioactive isotopes like ~~I~~ cobalt I^{131} is used

(3) Surgery - Benign tumour can be easily treated by surgery

(4) Immunotherapy - Certain biological response modifiers like interferons are produced in the body to generate immune system response against the cancerous cells

Ans of Q.11 OR

The nitrogenous bases found in the RNA are as follows :-

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2) Purines :- In purines, Adenine and guanine nitrogenous bases are found

2) Pyrimidines :- In pyrimidines, cytosine and uracil are found

So overall adenine, guanine, cytosine and uracil are the nitrogenous bases found in RNA

Ans of Q.12 OR

Differences between homozygous and heterozygous are as follows :-

Homozygous	Heterozygous
(i) In the homozygous conditions, the individuals have same type of alleles for a particular gene.	(i) In heterozygous condition the individuals have different type of alleles for a particular gene.
(ii) In this, the organism have either dominant allele or recessive allele For example - for stem height	(ii) In this, the organism have both the dominant and recessive allele simultaneously. For example - for stem height

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(i) Homozygous dominant – TT Homozygous recessive – tt	Heterozygous condition Tt
(ii) In this, only one type of gametes are formed	(iii) Two different types of gametes are formed

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Ans of Q.14.

Test cross – when the individual of a F_1 generation showing the dominant phenotype is crossed with its recessive parent then that type of cross is test cross. Test cross helps us to determine the genotype of the individual i.e whether the individual is homozygous dominant or the heterozygous.

For example

we have an individual of garden pea whose stem height is tall. Its genotype may be TT or Tt. So when it is crossed with recessive parent i.e tt then that cross is known as test cross

Diagrammatic representation is as follows :-

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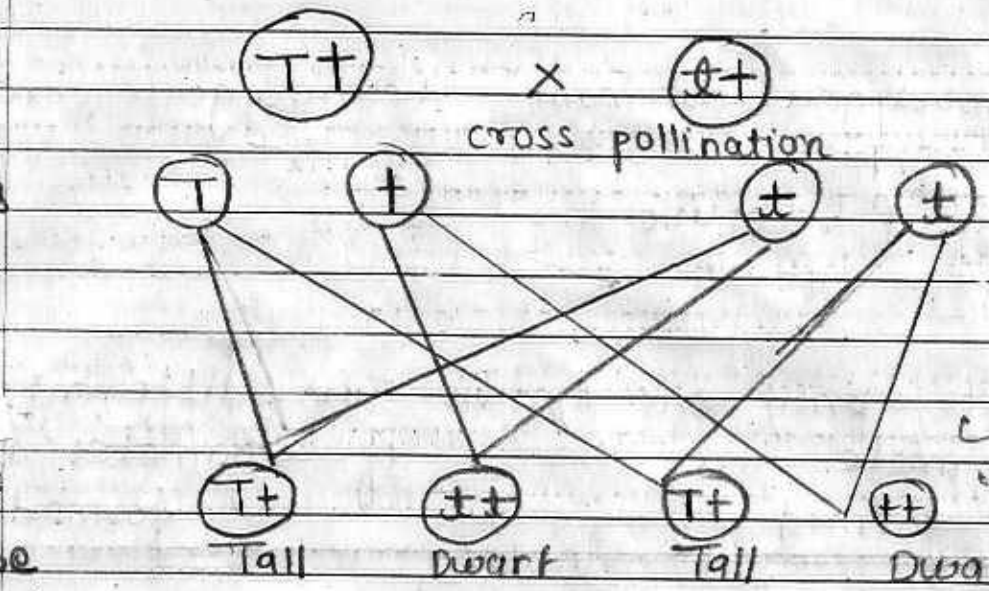

Here we see that

the Generation (1:1) = phenotypic ratio (1:1)

If we have homozygous dominant then

Ans of 9.15 OR

Biofertilizers :- Biofertilizers are the living organisms which has the capacity to increase the soil fertility. Microorganisms act like a very good biofertilizers. The biofertilizers are as follows :-

(1) **Cyanobacteria** - These are autotrophic bacteria also known as blue gree algae These are N_2 fixing bacteria. They convert the atmospheric nitrogen into nitrates which increases

the soil fertility and is very important for plants.

② Symbiotic association :- Rhizobium bacteria shows symbiotic association with the leguminous plants like peas and increases fertility of soil by N_2 fixing

(3) There are some free living micro-organisms like Azospirillum and Azotobacter which can fix atmospheric nitrogen

Mycorrhiza ⇒ It is a symbiotic association between fungi and roots of higher plants. Fungi adds nutrients to the soil by absorbing phosphorous. It also has high water holding capacity. It makes the plants resistant to salinities and drought. Also, it saves the plants from the root born diseases

Ans of Q.16 OR

What is decomposition ? —

Decomposition ⇒ It is the process of the physical and chemical breakdown of complex organic matter of the dead

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remains of plants and animals (detritus) into simple inorganic matter like CO_2, water etc., by saprophytic microorganism like bacteria and fungi known as decomposers.

* The factors affecting the rate of decomposition are as follows:-

(i) Temperature → High is temp, high is its rate.

(ii) Nature of detritus – If detritus contains complex lignin and chitin then the rate is slow and if it contains simple substances like lamino acids then rate is slow

(iii) Oxygen availability

Steps of decomposition are as follows:-

1) Physical Fragmentation → It is the physical breakdown of detritus into smaller fragments by detritivores like earthworm, ants, etc

ii) Catabolism – It is the chemical breakdown of organic matter into inorganic substances by saprophytic micro-organisms like bacteria, fungi, etc

(ii) Leaching – The water soluble substances percolate into the deeper layers.

(iv) Humification ⇒ It is partially decomposed, detritus, amphorphous, colloidal, black in colour and acidic in nature. It is a reservoir of nutrients and resistant to microbial activity. Its decomposition rate is very slow

(v) Mineralisation - The slow decomposition of ~~minerals~~ humus takes place which finally produce inorganic minerals like CO_2, etc for plants.

In aquatic ecosystem, decomposition occurs at bottom of sea

Ans of Q.17 OR

Dihybrid cross - when the two individuals having two pairs of contrasting traits are crossed then that type of cross is known as dihybrid cross. For example -

Homozygous yellow and round seed (dominant trait) (RRYY) is crossed with homozygous green and wrinkled seed (recessive trait) (rryy) is an example of dihybrid cross

Here dominant allele is represent by R and Y recessive allele (wrinkled and green) is represented by r and y

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Parents RRYY (Round yellow) rryy (wrinkled green)

Gametes RY × ry

Cross pollination

F_1 generation RrYy

(Round yellow)

↓ selfing

Gametes - RY rY ry Ry

F_2 generation represented by punnett square or chocken board is as follows

Gametes	RY	Ry	rY	ry
	F_2 gen			
RY	RRYY	RRYy	RrYY	RrYy
Ry	RRYy	RRyy	RrYy	Rryy
rY	RrYY	RrYy	rrYY	rrYy
ry	RrYy	Rryy	rrYy	rryy

Total no of individuals = 16 in F_2 generation

Looking at the genetype in the F_2 generation the no of individuals

with specific phenotype are as follows

by Round yellow — 9
Round green = 3
wrinkled yellow — 3
wrinkled green — 1

So the phenotypic ratio of F_2 generation will will be

Rund yellow : Round green : wrinkled yellow : wrinkled green

9 : 3 : 3 : 1

Ans of Q.18 OR

(i) **Biopiracy** :- The use of bio resources by the multinational companies and other organisations without the permission of its inventor and without compensatory payment is known as biopiracy. There are many crops and bioresources of India which has became the victim of biopiracy. These are as follows :-

(1) **Rice** — India is very rich in diversity of rice. India has about 2,00,000

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varieties of rice. Basmati rice of India is famous for its aroma and texture and has 27 documented varities of Basmati rice. ~~But~~ in 1997, somebody has taken the patent in America by its government ~~and said that what~~ according to which Basmati rice is their creation and anyone in India using the rice will have to give compensation.

The rice that was granted patent in America was actually made by crossing the India Basmati rice with the Semi-Dwarf varieties. So this is a classic example of bioparacy

(2) Turmeric ~~and~~ Neem - Turmeric has antiseptic properties and neem has antifungal properties. This is written in our scriptures as well for so long but the people in other countries have been granted patent for these. So it is again another example of biopiracy.

योग पूर्व पृष्ठ

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(1) **Restriction enzyme** – Restriction enzymes belong to a longer class of enzymes known as nucleases. They are of two types –

(Restriction endonuclease – These enzymes cuts the DNA strand at any position but not from the ends

(Restriction exonuclease – These enzymes cuts the DNA strand at the ends

B
S
E

These enzymes are also known as molecular scissors, chemical knives, scalples, etc. They are obtained from prokaryotic organism. Till now, 900 restriction endonuclease have been discovered from 230 strains of bacteria Eg - Hind II, BamHI, EcoRI, etc.

The credit of discovery goes to W. Arber.

Naming of R.E.

The first letter of the name denotes the name of genus

The second and the third letter denotes the name of species of bacteria from which they are isolated

Then the fourth letter tells the name of strain

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of bacteria from which they are extracted. The Roman Numerals after the name tells us the order of extraction of enzyme from that strain of bacteria like

ECORI

E refers for Eichhercia
Co refers for Coli
R - strain
I - order of extraction
It means ECORI is derived from Eichhercia coli.

Action of Restriction endonuclease

① Inspection of the length of the DNA
② Recognises its recognition site - Recognition site is a specific nucleotide sequence which is palidromic The enzymes cuts the DNA strand at this site only and each restriction endonuclease have different recognition site. They generally cut the recognition site away from its centre forming overhanging ends, For ECORI has recognitic site GAATTC which cuts between G and A while when this nucleotide sequence is present and

breaks the phosphodiester bond.

Ans of

Ecological succession — ~~Gradi~~ It is a gradual and predictable change in the species of an area which is parallel with the changing environment and is sequential

B The ecological succession taking place in dry condition is known as xerarch.
S and that taking place on a bare rock
E is known as lithosere.

The following are the steps of ecological succession on a bare rock

(i) Nudation :- This is the process of development of a bare area which is actually bare rock here before the arrival of pioneer community

(ii) Invasion :- This is the process of movement of individuals from one area to the other area. Establishment of new species in an area is known as Ecesis. The community which starts the succession is known as pioneer

community. In case of bare rock, lichens are the pioneer communities

They secrete chemicals which convert the barren rock into soil. This results in the attack of mosses which have root like rhizoid.

(iii) Interspecific struggle :- There will be struggle between the mosses and the lichens for space food etc and ~~the species~~ in this struggle mosses wins due to the gregarious nature of moss, high water holding capacity, etc. This type of succession is known as autogenic succession which is due to the environment.

After the mosses, Annual grasses, perennial grasses and then herbs and shrubs develop.

(iv) Climax community :- After the shrubs, the climax community i.e forests develop. These community forms the equilibrium with the

environment and have a balance between them and the nature. This is the final community.

All the communities between pioneer and climax community are known as seral stages and sequence of organism is seral.

Sere of bare rock is as follows :-

Lichens → Mosses → Annual grasses → Perennial grasses → Herbs → Shrubs → Forest (climax community).

Ans of Q.13.

Amniocentesis :- It is a technique which is used for the diagnosis of the prenatal genetic disorders. In this technique, cells of the amniotic fluid are taken out with the help of needle. The cells are then cultured on a cultural plate and foetus are karyotyped. The cultured cells are used to study all the chromosomes of the

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foetus due to which any genetic disorder like sickle cell anaemia, down syndrome, etc can be detected at an early stage.

The uses of amniocenteis are as follows :-

(1) It is used to detect genetic disorder like sickle cell anaemia, down Syndrome, Patau syndromic, etc at an early stage during the foetal life so that treatment can be made easily available. But the problems like cleft palate is not identified with this technique.

(2) This technique is also used to determine the sex of the child before the birth. But, nowadays, due to the misuse of this technique it is now banned as people used to abort the female foeticides which can disturb the sex ratio.