**Series OSR/1/C**

कोड नं. **57/1/2**
**Code No.**

रोल नं.
Roll No.

परीक्षार्थी कोड को उत्तर-पुस्तिका के मुख-पृष्ठ पर अवश्य लिखें ।

Candidates must write the Code on the title page of the answer-book.

- कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ **8** हैं ।
- प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए कोड नम्बर को छात्र उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें ।
- कृपया जाँच कर लें कि इस प्रश्न-पत्र में **30** प्रश्न हैं ।
- **कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, प्रश्न का क्रमांक अवश्य लिखें ।**
- इस प्रश्न-पत्र को पढ़ने के लिए 15 मिनट का समय दिया गया है । प्रश्न-पत्र का वितरण पूर्वाह्न में 10.15 बजे किया जाएगा । 10.15 बजे से 10.30 बजे तक छात्र केवल प्रश्न-पत्र को पढ़ेंगे और इस अवधि के दौरान वे उत्तर-पुस्तिका पर कोई उत्तर नहीं लिखेंगे ।
- Please check that this question paper contains **8** printed pages.
- Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains **30** questions.
- **Please write down the Serial Number of the question before attempting it.**
- 15 minutes time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the students will read the question paper only and will not write any answer on the answer-book during this period.

# जीव विज्ञान (सैद्धान्तिक)

# BIOLOGY (Theory)

*निर्धारित समय : 3 घण्टे* *अधिकतम अंक : 70*

*Time allowed : 3 hours* *Maximum Marks : 70*

*सामान्य निर्देश :*

*(i)* ***सभी*** *प्रश्न अनिवार्य हैं ।*

*(ii)* *इस प्रश्न-पत्र में चार खण्ड* ***A, B, C*** *और* ***D*** *हैं । खण्ड* ***A*** *में* ***8*** *प्रश्न हैं जिनमें प्रत्येक का* ***एक*** *अंक है, खण्ड* ***B*** *में* ***10*** *प्रश्न हैं जिनमें प्रत्येक के* ***दो*** *अंक हैं, खण्ड* ***C*** *में* ***9*** *प्रश्न हैं जिनमें प्रत्येक के* ***तीन*** *अंक हैं तथा खण्ड* ***D*** *में* ***3*** *प्रश्न हैं जिनमें प्रत्येक के* ***पाँच*** *अंक हैं ।*

*(iii)* *कोई समग्र चयन-विकल्प (ओवरऑल चॉइस) उपलब्ध नहीं है । फिर भी,* ***2*** *अंकों वाले एक प्रश्न में,* ***3*** *अंकों वाले एक प्रश्न में और* ***5*** *अंकों वाले सभी तीनों प्रश्नों में भीतरी चयन-विकल्प दिए गए हैं । ऐसे प्रश्नों में विद्यार्थी को केवल एक ही विकल्प का उत्तर देना है ।*

*(iv)* *जहाँ भी आवश्यक हो, बनाए जाने वाले आरेख साफ़-सुथरे तथा समुचित रूप में नामांकित हों ।*

***General Instructions :***

*(i)* ***All*** *questions are compulsory.*

*(ii)* *This question paper consists of four Sections* ***A, B, C*** *and* ***D****. Section* ***A*** *contains* ***8*** *questions of* ***one*** *mark each, Section* ***B*** *is of* ***10*** *questions of* ***two*** *marks each, Section* ***C*** *is of* ***9*** *questions of* ***three*** *marks each and Section* ***D*** *is of* ***3*** *questions of* ***five*** *marks each.*

*(iii)* *There is no overall choice. However, an internal choice has been provided in one question of* ***2*** *marks, one question of* ***3*** *marks and all the three questions of* ***5*** *marks weightage. A student has to attempt only one of the alternatives in such questions.*

*(iv)* *Wherever necessary, the diagrams drawn should be neat and properly labelled.*

## खण्ड A

## SECTION A

**1.** सहप्रभाविता दर्शाने वाले किसी एकसंकर संकरण में $F_2$ पीढ़ी में कितने प्रकार के लक्षणप्ररूपों की आशा की जाएगी ? *1*

How many kinds of phenotypes would you expect in $F_2$ generation in a monohybrid cross exhibiting co-dominance ?

**2.** अच्छी ओज़ोन कहाँ होती पाई जाती है ? इसे यह नाम क्यों दिया गया ? *1*

Where is good ozone present ? Why is it called so ?

**3.** किसी पारितंत्र में उत्पादकता के लिए नीचे दिए जा रहे समीकरण में 'R' क्या प्रतिदर्शित करता है ? *1*

$$GPP - R = NPP$$

What does 'R' represent in the given equation for productivity in an ecosystem ?

$$GPP - R = NPP$$

**4.** किसी एक लड़के में ADA-अभाव की पहचान हुई है । इसका कोई एक संभव उपचार सुझाइए । *1*

A boy has been diagnosed with ADA-deficiency. Suggest any one possible treatment.

**5.** निम्नलिखित में से ***दो*** सही कथन चुनिए : *1*

(i) अंग्रेज़ी के शब्द "एपिकल्चर" का अर्थ है एपिकल (शीर्षस्थ) विभज्योतक संवर्धन ।

(ii) पालक लौह-भरपूर होता है ।

(iii) हरित क्रांति के द्वारा दालों का उत्पादन अधिक होने लगा है ।

(iv) तौरिया सरसों में एफ़िडों का आग्रसन नहीं हो सकता ।

Identify the ***two*** correct statements from the following :

(i) Apiculture means apical meristem culture.

(ii) Spinach is iron-enriched.

(iii) Green revolution has resulted in improved pulse-yields.

(iv) Aphids cannot infest rapeseed mustard.

**6.** उस प्रकार के क्रमविकास का नाम लिखिए जो तितली के पंखों तथा पक्षियों के पंखों के बनने के रूप में हुआ है । ऐसी संरचनाओं को क्या कहा जाता है ? *1*

Name the type of evolution that has resulted in the development of structures like wings of butterfly and bird. What are such structures called ?

7. एक ऐसी आंतरगर्भाशयी युक्ति (IUD) का नाम लिखिए जिसका सुझाव आप इसलिए दे सकते हैं कि गर्भाशय ग्रीवा शुक्राणुओं के लिए प्रतिकूल हो जाए । *1*

Name an IUD that you would recommend to promote the cervix hostility to the sperms.

8. नीचे दी गई घटनाओं में से, जो दो निषेचन-पूर्व की घटनाएँ हैं, लिखिए : *1*

युग्मकसंलयन, युग्मकजनन, भ्रूणजनन, परागण

Write the two pre-fertilization events from the list given below :

Syngamy, Gametogenesis, Embryogenesis, Pollination

## खण्ड B

## SECTION B

9. मवेशियों में अंतःप्रजनन का महत्त्व समझाइए । *2*

Explain the importance of inbreeding in cattle.

10. दूध से दही बनाने के लिए उसमें 'जामन' क्यों मिलाया जाता है ? समझाइए । *2*

Why is 'starter' added to set the milk into curd ? Explain.

11. एक उदाहरण देते हुए समझाइए कि सहभोजिता क्या होती है । *2*

Explain commensalism, with the help of an example.

12. जैवविविधता हानि के चार कारणों की सूची दीजिए । *2*

**अथवा**

उत्प्रेरक परिवर्तक में इस्तेमाल किए जाने वाले दो धातुओं के नाम लिखिए । पर्यावरण को स्वच्छ रखने में ये किस प्रकार सहायता करते हैं ? *2*

List four causes of biodiversity loss.

**OR**

Name two metals used in a catalytic converter. How do they help in keeping the environment clean ?

13. किसान लोग केले की फ़सल को बिना बीज बोए उगाते हैं । समझाइए कि पौधे का संचरण किस प्रकार किया जाता है । *2*

Banana crop is cultivated by farmers without sowing of seeds. Explain how the plant is propagated.

**14.** मानव अंडवाहिनी के उन भिन्न भागों के नाम लिखिए जिनमें से होता हुआ अण्डा तब तक चलता जाता है जब तक निषेचन हेतु उसकी भेंट शुक्राणु से नहीं हो जाती । *2*

List the different parts of the human oviduct through which the ovum travels till it meets the sperm for fertilisation.

**15.** DNA की प्रतिकृति को मात्र एक आरेख द्वारा दर्शाइए । *2*

Show DNA replication with the help of a diagram only.

**16.** किसी एक प्रत्यूर्जक का नाम लिखिए और उससे उद्‌भासित होने पर मानव शरीर में क्या अनुक्रिया होती है, लिखिए । *2*

Name an allergen and write the response of the human body when exposed to it.

**17.** आलू के एक पौधे में एक वायरस (विषाणु) का संक्रमण हो गया है । इससे वायरस-मुक्त आलू पौधों को प्राप्त करने की एक विधि का नाम लिखिए और उसके विषय में समझाइए । *2*

A potato plant is infected with a virus. Name and explain a method to obtain virus-free potato plants from it.

**18.** मारिजुआना और भांग नाम के औषधों के स्रोत पौधे का वैज्ञानिक नाम लिखिए और उनसे मानव शरीर पर पड़ने वाले प्रभाव लिखिए । *2*

Write the scientific name of the source plant of the drugs, marijuana and hashish and mention their effect on the human body.

## खण्ड C

## SECTION C

**19.** एक प्ररूपी बायोगैस संयंत्र का नामांकित आरेख बनाइए । *3*

**अथवा**

(a) निम्नलिखित रोगों के उत्पन्नकर्ता जीवों के नाम लिखिए :

(i) श्लीपद

(ii) दद्रु (दाद)

(iii) अमीबिऐसिस

(b) इस प्रकार के रोगों के नियंत्रण में सार्वजनिक स्वास्थ्य रक्षा किस प्रकार सहायक हो सकती है ? *3*

Draw a labelled sketch of a typical biogas plant.

**OR**

(a) Name the causative organisms for the following diseases :
   (i) Elephantiasis
   (ii) Ringworm
   (iii) Amoebiasis

(b) How can public hygiene help control such diseases ?

**20.** एक भयंकर दुर्घटना में घटना स्थल से, झुलसे और बदशक्ल हुए अनेक मृत शरीर पाए गए जिनको पहचाना जाना अत्यंत कठिन था । उस तकनीक का नाम लिखिए एवं उसके विषय में समझाइए जिसकी सहायता से अधिकारीगण मृत जनों की पहचान कर सकें और उन्हें उनके अपने-अपने रिश्तेदारों को सौंप सकें । *3*

Following a severe accident, many charred-disfigured bodies are recovered from the site making the identification of the dead very difficult. Name and explain the technique that would help the authorities to establish the identity of the dead to be able to hand over the dead to their respective relatives.

**21.** (a) बायोरिऐक्टर किसे कहते हैं ? यह किस प्रकार कार्य करता है ?

(b) सामान्यतः इस्तेमाल किए जाने वाले दो बायोरिऐक्टरों के नाम लिखिए । *3*

(a) What is a bioreactor ? How does it work ?

(b) Name two commonly used bioreactors.

**22.** एक उपयुक्त उदाहरण देते हुए समझाइए कि बहुजीनी वंशागति क्या होती है । *3*

Explain polygenic inheritance with the help of a suitable example.

**23.** पोषी पादप तथा उसके उस भाग का नाम लिखिए जिसको *मेलॉइडोगाइन इन्कॉग्निटा* संक्रमित करता है । पोषी पादप में *ds*-RNA के उत्पादन में *ऐग्रोबैक्टीरियम* की भूमिका समझाइए । *3*

Name the host plant and its part that *Meloidogyne incognita* infects. Explain the role of *Agrobacterium* in the production of *ds*-RNA in the host plant.

**24.** किसी ट्राँसक्रिप्शन (अनुलेखन) इकाई में निम्नलिखित के पाए जाने का स्थान और उनकी भूमिका के विषय में एक योजना आरेख की सहायता से समझाइए : *3*

प्रोमोटर (उन्नायक), संरचनात्मक जीन, अंतकारी ।

With the help of a schematic diagram, explain the location and the role of the following in a transcription unit :

Promoter, Structural gene, Terminator.

**25.** मॉर्गन ने *ड्रोसोफ़िला* पर कई द्विसंकर संकरण किए और पाया कि $F_2$-अनुपात प्रत्याशित मेंडलीय अनुपात से बहुत भिन्न-भिन्न आए । एक उदाहरण की सहायता से उसकी इन खोजों के विषय में समझाइए । *3*

Morgan carried out several dihybrid crosses in *Drosophila* and found $F_2$-ratios deviated very significantly from the expected Mendelian ratio. Explain his findings with the help of an example.

**26.** आवृतबीजी में भ्रूणपोष के परिवर्धन का वर्णन कीजिए । *3*

Describe endosperm development in angiosperm.

**27.** आपकी बस्ती के कुछ निवासियों ने व्यवसाय लाभ के लिए कुछ छोटे पैमाने वाले औद्योगिक/व्यापारिक क्रियाकलाप स्थापित किए हैं जैसे कि विकृतिविज्ञान प्रयोगशालाएँ तथा वस्त्र रंगने के केंद्र जिसके लिए उन्होंने नगरपालिका अधिकारियों से "कोई आपत्ति नहीं" सर्टिफ़िकेट नहीं ले रखे थे ।
क्या आप ऐसे क्रियाकलापों का समर्थन करेंगे ? अपने उत्तर के पक्ष में कोई तीन कारण बताइए । *3*

A few residents in your locality, for business gains, have established small-scale industrial / commercial activities such as pathological labs and fabric dyeing centres without obtaining 'No objection certificates' from municipal authorities.
Would you support these activities ? Give any three reasons in support of your answer.

## खण्ड D
## SECTION D

**28.** (a) किसी थलीय पारितंत्र में फ़ॉस्फ़ोरस चक्रण के एक सरलीकृत मॉडल का आरेख बनाइए ।

(b) पारितंत्रों में इस प्रकार के चक्रों का महत्त्व लिखिए । *5*

**अथवा**

(a) जैवविविधता के संरक्षण के पक्ष में अल्पतः उपयोगी, व्यापकतः उपयोगी तथा नैतिक तर्क क्या हैं, समझाइए ।

(b) कुछ निश्चित क्षेत्रों को "अधिस्थलों" की संज्ञा देना जैवविविधता संरक्षण की ओर एक कदम क्यों कहा जाता है ? भारत के किन्हीं दो अधिस्थलों के नाम लिखिए । *5*

(a) Draw a simplified model of phosphorus cycling in a terrestrial ecosystem.

(b) Write the importance of such cycles in ecosystems.

**OR**

(a) Explain the narrowly utilitarian, broadly utilitarian and ethical arguments in favour of conservation of biodiversity.

(b) How is designation of certain areas as hotspots a step towards biodiversity conservation ? Name any two hotspots in India.

**29.** (a) मटर के एक ऊँचे पौधे जिसमें बैंगनी फूल लगते हैं (दोनों के लिए विषमयुग्मजी) का मटर के एक बौने पौधे जिसमें सफ़ेद फूल लगते हैं, के साथ संकरण कराया गया । इनकी संतान के जीनप्ररूप तथा लक्षणप्ररूप उनके अनुपातों सहित लिखिए ।

(b) इसी प्रकार के संकरण को दिया जाने वाला नाम लिखिए और उसका महत्त्व बताइए । *5*

**अथवा**

ट्रांसलेशन की प्रक्रिया समझाइए । *5*

(a) Work out a cross between a tall pea plant bearing violet flowers (heterozygous for both) with a dwarf pea plant having white flowers. Write the genotypes and phenotypes of the progeny along with their ratios.

(b) Name such a cross and state its importance.

**OR**

Explain the process of translation.

**30.** मानवों में शुक्राणुजनन घटनाओं को योजना रूप में दर्शाइए तथा उनके विषय में समझाइए । *5*

**अथवा**

आवृतबीजी फूल उभयलिंगाश्रयी हो सकते हैं, अनुन्मील्य-परागणी हो सकते हैं या उनमें स्व-निषेच्यता (आत्म-असंगतता) हो सकती है । इनमें से प्रत्येक के विशिष्ट लक्षणों का वर्णन कीजिए और बताइए कि इनमें से कौन-से एक प्रकार के फूल क्रमशः अंतःप्रजनन तथा बाह्यप्रजनन को बढ़ावा देते हैं । *5*

Schematically represent and explain the events of spermatogenesis in humans.

**OR**

Angiosperm flowers may be monoecious, cleistogamous or show self-incompatibility. Describe the characteristic features of each one of them and state which one of these flowers promotes inbreeding and outbreeding respectively.

## SECTION A

1. **How many kinds of phenotypes would you expect in $F_2$ generation in a monohybrid cross exhibiting co-dominance?**

Ans. Three 1

2. **Where is good ozone present? Why is it called so?**

Ans. Stratosphere; shield against UV radiation of sun 1/2x2=1

3. **What does 'R' represent in the given equation for productivity in an ecosystem? GPP-R=NPP**

Ans. Respiratory losses 1

4. **A boy has been diagnosed with ADA deficiency. Suggest any one possible treatment**

Ans. Bone marrow transplant; enzyme replacement therapy/gene therapy (any two) (1/2 x2=1 )

5. **Identify the two correct statements form the following**
   - **(i) Apiculture means apical meristem culture.**
   - **(ii) Spinach is iron –enriched.**
   - **(iii) Green revolution has resulted in improved pulse-yields**
   - **(iv) Aphids cannot infest rapeseed mustard.**

Ans. ii,iv 1/2x2=1

6. **Name the type of evolution that has resulted in the development of structures like wings of butterfly and bird .What are such structures called?**

Ans. Analogous, convergent. (1x1=1)

7. **Name an IUD that you would recommend to promote the cervix hostility to the sperms**

Ans. LNG-20 /progestasert (Any one) 1

8. **Write the two pre- fertilization events from the list given below:**

**Syngamy, Gametogenesis, Embryogenesis, Pollination**

Ans. Gametogenesis , Pollination (1/2 x 2=1)

## SECTION B

9. **Explain the importance of inbreeding in cattle.**

Ans. For maintaining purelines , inbreeding exposes harmful recessive genes that are eliminated by selection, helps in accumulation of superior genes, and elimination of less desirable genes. (1 x 2=2 )

10. **Why is 'starter' added to set the milk into curd? Explain**

Ans. Acts as an innoculum; contains LAB, at suitable temperature,coagulates milk to curd (1/2 x 4=2)

11. **Explain commensalism, with the help of an example**.

Ans. One is benefitted , other is neither benefitted nor harmed // 0, +.
epiphyte/mango (any other example) (½ x4=2)

12. **List four causes of biodiversity loss.**

**OR**

**Name two metals used in a catalytic converter. How do they help in keeping the environment clean?**

Ans. Habitat loss , fragmentation, overexploitation, alien species invasion ,co-extinction (any four) 1/2x4=2

OR

Platinum- Palladium ,Rhodium,

The catalyst converter changes unburnt hydrocarbons → $CO_2+H_2O$/ CO→$CO_2$/ nitric oxide → $N_2$

(any two) 1/2x4=2

13. **Banana crop is cultivated by farmers without sowing of seeds. Explain how the plant is propagated**.

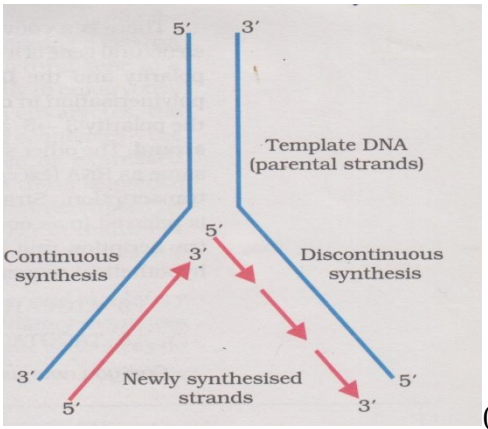
Ans. Vegetative propagation, rhizome 1x2=2

14. **List the different parts of the human oviduct though which the ovum travels till it meets the sperm for fertillsation.**

Ans. Fimbriae, infundibulum, ampulla, isthmus 1/2x4=2

15. **Show DNA replication with the help of a diagram only.**

**Ans.**




(three labels + polarity) (1½+½=2)

16. **Name an allergen and write the response of the human body when exposed to it.**

Ans. Dust / dander/pollen(any two) (½+½=1)

Release of serotonin and histamine, from mast cells (½+½=1)

17. **A potato plant is infected with a virus .Name and explain a method to obtain virus-free potato plants form it.**

Ans. Apical meristem culture, (1)

Micropropagation/producing thousands of plants,through tissue culture/*in vitro* culture. (1/2x2=1)

18. **Write the scientific name of the source plant of the drugs, marijuana and hashish and mention their effect on the human body.**

Ans. *Cannabis sativa*

Effect on cardiovascular system 1+1=2

**SECTION C**

19. **Draw a labeled sketch of a typical biogas plant.**

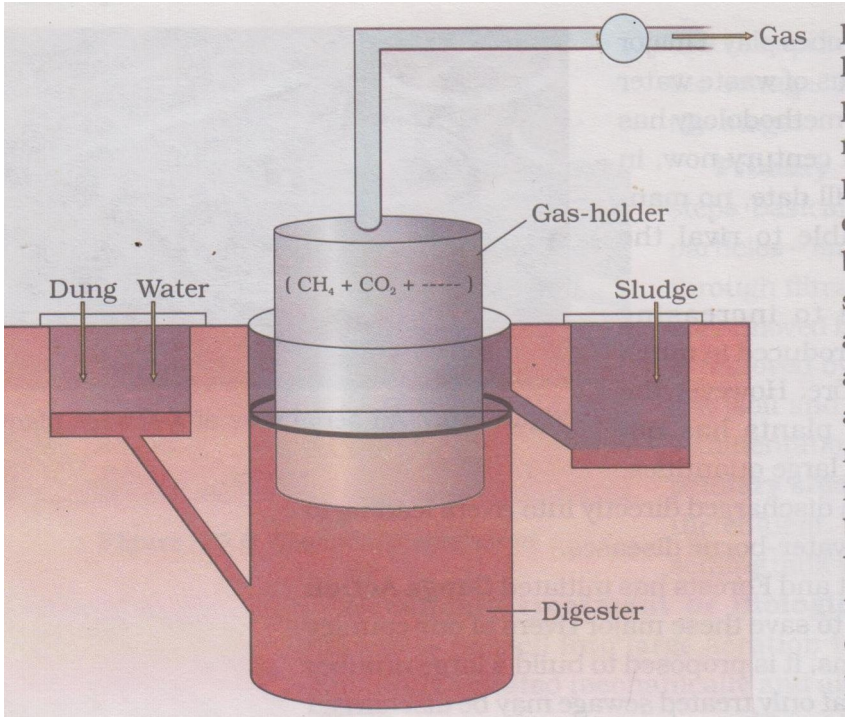
**OR**

**(a) Name the causative organisms for the following diseases:**

**(i) Elephantiasis**
**(ii) Ringworm**
**(iii) Amoebiasis**

**(b) How can public hygiene help control such diseases?**

Ans.Biogas plant




Proper diagram and labeling (1/2x6=3)

**OR**

*(a) (i)Wuchereria ,*
*(ii) Microsporum / Epidermophyton/ Trichophyton*
*(iii)Entamoeba*
(b) Proper disposal of waste/periodic cleaning/disinfection of water reservoirs, etc/standard practices of hygiene in public catering/eliminate vectors and their breeding place (any three) (1/2 x6=3)

20. **Following a severe accident, many charred –disfigured bodies are recovered from the site making the identification of the dead very difficult. Name and explain the technique that would help the authorities to establish the identity of the dead to be able to hand over the dead to their respective relatives**.

Ans. DNA fingerprinting -

Isolation of DNA and digestion of DNA by restriction endonucleases,separation of DNA fragments by electrophoresis,transferring(blotting) of separated DNA fragments to synthetic membranes,such as nitrocellulose or nylon,hybridization using labeled VNTR probe and,detection of hybridized DNA fragments by autoradiography. (1/2 x6=3)

21. **What is a bioreactor used for? Name a commonly used bioreactor and any two of its components.**

Ans. Making recombinant protein on a large scale

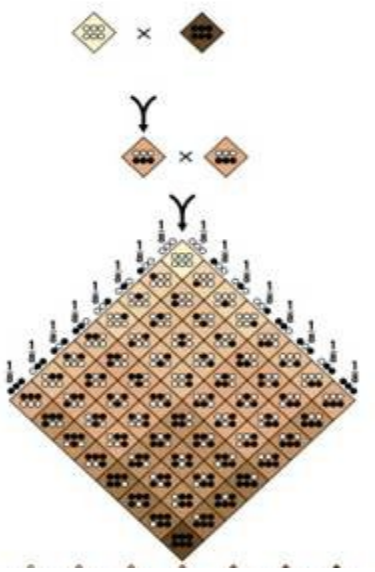
Simple – stirred tank bioreactor

Foam braker/impeller/stirrer/pH control/motor/agitator system/O2 delivery system/temperature control system/sampling ports(any two) (1+1+1/2+1/2=3)

22. **Explain polygenic inheritance with the help of a suitable example**

**Ans.** example : skin color/eye colour in humans /size of grain ½

Quantitative inheritance-several genes are responsible for one character ½



Cross showing P, $F_1$ & $F_2$ generation 2 (½+½+2=3)

23. **Name the host plant and that *Meloidegyne incognitia* infects. Explain the role of *Agrobacterium* in the production of ds-RNA in the host plant.**

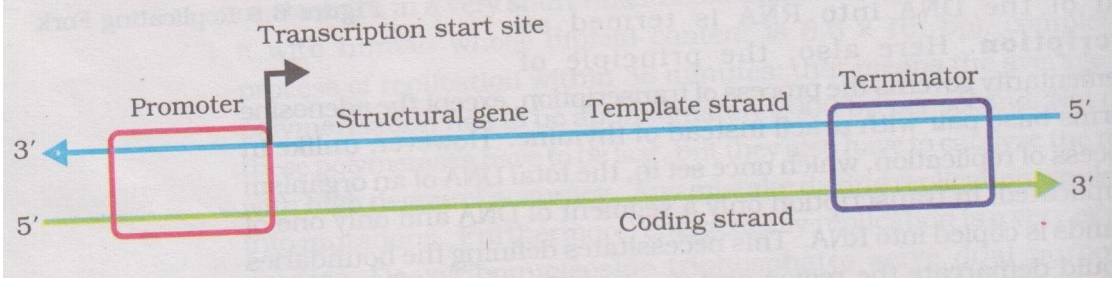
Ans. Tobacco, Roots of tobacco plant . Using *Agrobacterium* vectors, nematode specific genes were introduced into the host plant , because of introduction of DNA both sense & antisense RNA are produced in host cell,the two RNAs being complimentary form a ds RNA (that initiated RNAi)

[1/2 X 6 = 3]

24. **With the help of a schematic diagram, explain the location and the role of the following in a transcription unit:**

**Promoter, Structural gene, Terminator**

Ans. Structure



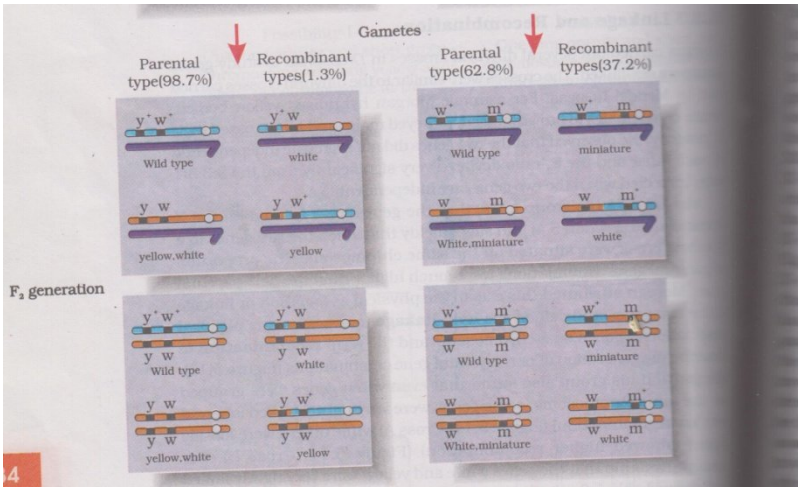

Function-

Promotor- RNA polymerase binds to it starter

Structural gene- functional genes
Terminator- transcription ends here [ ½ X 6= 3]

25. **Morgan carried out several crosses in *Drosophila* and found $F_2$-ratios deviated very significantly from the expected Mendelian ratio. Explain his findings with the help of an example**

Ans. Morgan's findings differ from Mendel's because of the phenomena of
Linkage (genes present on the same chromosome) and Recombination; (1/2x2=1)
Example : Cross A Cross B




$F_2$ generation(any one cross) ; [1/2 X 2=1]
Genes are closely linked- less recombinants, genes are far apart- more recombinants[1/2 X 2=1]

26. **Describe endosperm development in angiosperm**.
Ans. By triple fusion, PEN formed , free nuclear division, endosperm nuclear, cell division , cellular endosperm ( ½ X 6 = 3 )

27. **Few residents in your locality , for business gains, have established small –scale industrial /commercial activities such as pathological labs and fabric dyeing centers without obtaining 'No objection certificates' from municipal authorities.**
**Would you support these activities? Give any three reasons in support of your answer**

Ans. No (Any 3 appropriate reasons)
Yes(Any 3 appropriate reasons) [1X3]

## SECTION D

28. (**a) Draw a simplified model of phosphorus cycling in a terrestrial ecosystem.**

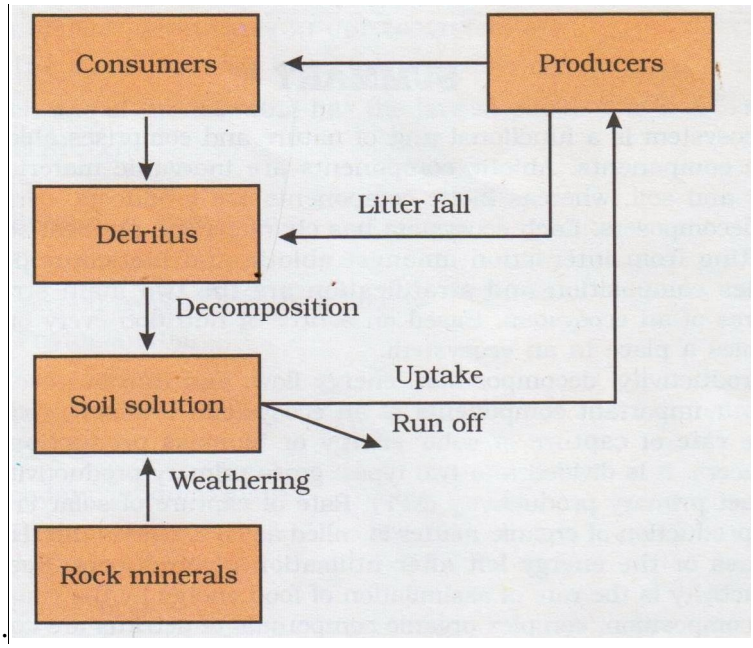
**(b) Write the importance of such cycles in ecosystems.**

**OR**

**(a) Explain the narrowly utilitarian, broadly utilitarian and ethical arguments in favors of conservation of biodiversity.**

**(b) How is designation of certain areas as hotspots a step towards biodiversity conservation? Name any two hotspots in India.**

**(a)**




[1/2X8 = 4]

(b) Recycling of nutrient time & again [1]

OR

Narrowly utilitarian – Human derive countless economic benefits from nature- food,firewood,fibre,construction material,industrial products(tannins,lubricants,dyes,rennin,perfumes) medicines [1/2 X 2 =1]

Broadly utilitarian – Role in many ecosystem services that nature provides eg – 20% O2 from Amazon forest, pollination (any other ecosystem services) [1/2 X 2 = 1]

Ethical argument – what humans owe is the millions of organisms with whom we share this plant eg. philosophically/spiritually – every species has an intrinsic value [1/2 X 2 = 1]

(b) As these regions have very high levels of species richness & high degree of endemism, they need to be identified for maximum protection. [1/2 X 2 = 1]

Hotspots – Western Ghats & Sri Lanka, Indo- Burma, Himalayas (Any two) [1/2 X 2 = 1]

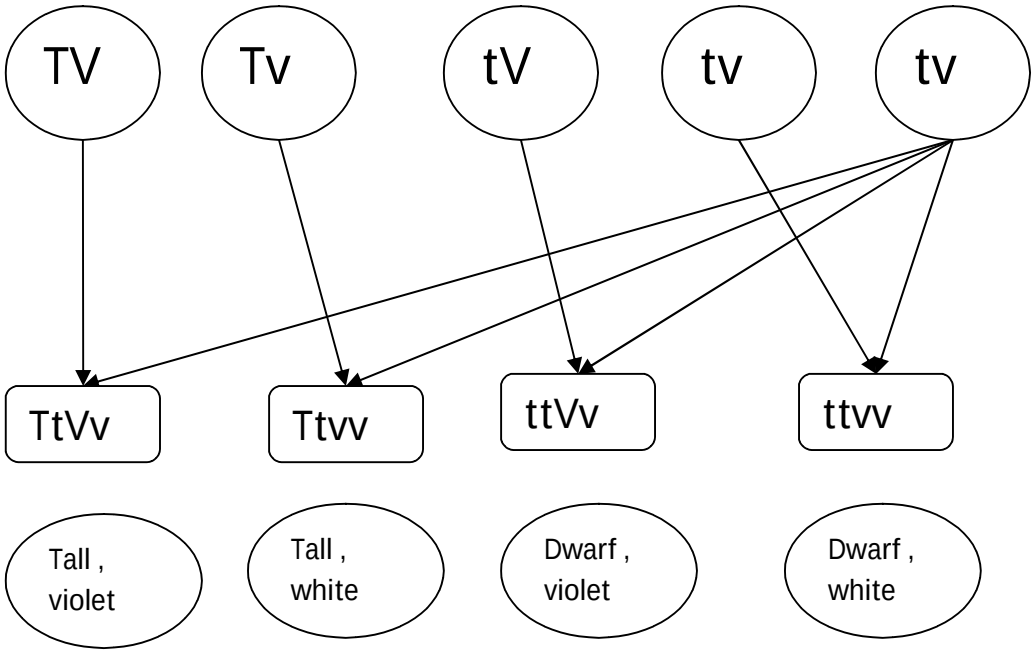
29**.(a) Work out cross between a tall pea plant bearing violet flowers (heterozygous for both )with a dwarf pea plant having white flowers .Write the genotypes and phenotypes of the progeny along with their ratios.**

**(b) Name such a cross and state its importance.**

**OR**

**Explain the process of translation.**

TtVv x ttvv (1)




(1)

1 : 1 : 1 : 1 (1)

Test cross, for finding – genotype of parent/whether homozygous dominant or heterozygous dominant(1+1)

OR

Translation starts with charging of tRNA / aminoacylation of tRNA ,for initiation, the ribosome binds to mRNA at the start codon (AUG), that is recognized by initiator tRNA. For elongation, amino acylated tRNA pairs with mRNA and ribosome moves from codon to codon ,and amino acids are added one by one by forming peptide bond. At the end release factor binds to stop codon, terminating translation , and releasing the complete polypeptide from the ribosome.
(1/2 x 10=5)

30. **Schematically represent and explain the events of spermatogenesis in humans.**

**OR**

**Angiosperm flowers may be monoecious, cleistogamous or show self-incompatibility. Describe the characteristic features of each one of them and state which one of these flowers promotes inbreeding and out-breeding respectively**.

Ans.

Monoecious-male and female flowers are present on the same plant,
Cleistogamous-flowers do not open
Self-incompatibility-genetic mechanism by which self- pollination does not take place (1x3=3)
Inbreeding is promoted by monoecious and cleistogamous flowers (1/2+1/2=1)
Outbreeding is promoted by flower showing self-incompatibility (1)