

Reg. No. :

Code No. 2017

Name :

**Second Year – JUNE 2016
SAY / IMPROVEMENT**

Time : 2 Hours
Cool-off time : 20 Minutes
Preparatory Time : 5 Minutes

Part – III
BIOLOGY
Maximum : 60 Scores

General Instructions to Candidates :

- There is a 'cool-off time' of 10 minutes each for Botany and Zoology in addition to the writing time of 1 hour each. Further there is '5 minutes' 'Preparatory Time' at the end of the Botany Examination and before the commencement of Zoology Examination.
- You are not allowed to write your answers nor to discuss anything with others during the 'cool-off time' and 'Preparatory Time'.
- Use the 'cool-off time' to get familiar with questions and to plan your answers.
- Read questions carefully before answering.
- All questions are compulsory and only internal choice is allowed.
- When you select a question, all the sub-questions must be answered from the same question itself.
- Calculations, figures and graphs should be shown in the answer sheet itself.
- Malayalam version of the questions is also provided.
- Give equations wherever necessary.
- Electronic devices except non-programmable calculators are not allowed in the Examination Hall.

നിർദ്ദേശങ്ങൾ :

- നിർദ്ദിഷ്ട സമയത്തിന് പുറമെ ബോട്ടണിയിലും സുവോളജിക്കും 10 മിനിറ്റ് വീതം 'കൂൾ ഓഫ് ടൈം' ഉണ്ടായിരിക്കും. കൂടാതെ ബോട്ടണി പരീക്ഷയ്ക്കുശേഷം സുവോളജി പരീക്ഷ തുടങ്ങുന്നതിനുമുമ്പ് '5 മിനിറ്റ്' തയ്യാറെടുപ്പുകൾ നടത്തുന്നതിനായി നൽകുന്നതാണ്. ഈ വേളകളിൽ ചോദ്യങ്ങൾക്ക് ഉത്തരം എഴുതാനോ, മറ്റുള്ളവരുമായി ആശയവിനിമയം നടത്താനോ പാടില്ല.
- ഉത്തരങ്ങൾ എഴുതുന്നതിന് മുമ്പ് ചോദ്യങ്ങൾ ശ്രദ്ധാപൂർവ്വം വായിക്കണം.
- എല്ലാ ചോദ്യങ്ങൾക്കും ഉത്തരം എഴുതണം.
- ഒരു ചോദ്യനമ്പർ ഉത്തരമെഴുതാൻ തെരഞ്ഞെടുത്തു കഴിഞ്ഞാൽ ഉപചോദ്യങ്ങളും അതേ ചോദ്യനമ്പറിൽ നിന്ന് തന്നെ തെരഞ്ഞെടുക്കേണ്ടതാണ്.
- കണക്ക് കൂട്ടലുകൾ, ചിത്രങ്ങൾ, ഗ്രാഫുകൾ എന്നിവ ഉത്തരപേപ്പറിൽ തന്നെ ഉണ്ടായിരിക്കണം.
- ചോദ്യങ്ങൾ മലയാളത്തിലും നൽകിയിട്ടുണ്ട്.
- ആവശ്യമുള്ള സ്ഥലത്ത് സമവാക്യങ്ങൾ കൊടുക്കണം.
- പ്രോഗ്രാമുകൾ ചെയ്യാനാകാത്ത കാൽക്കുലേറ്ററുകൾ ഒഴികെയുള്ള ഒരു ഇലക്ട്രോണിക് ഉപകരണവും പരീക്ഷാഹാളിൽ ഉപയോഗിക്കുവാൻ പാടില്ല.

Part – A
BOTANY
(Maximum : 30 Scores)

Time : 1 Hour

Cool-off time : 10 Minutes

1. The development of pollengrains in Angiosperms is called
(a) Microsporogenesis (b) Embryogenesis
(c) Megasporogenesis (d) Gametogenesis (Score : 1)

2. Select the one which is not helping vegetative propagation.
(a) Bulb (b) Clone
(c) Adventitious buds (d) Eyes of the potato (Score : 1)

3. (a) Describe the major steps followed for the production of new genetic variety starting from the collection of germplasm upto elucidating the cultivars.
(Scores : 1½)
(b) A plant breeder has a rare variety of cultivar with him but unfortunately it has become infected with virus. Suggest a suitable technique to produce many viable number of progenies with a short note. (Scores : 1½)

4. Which of the following part in a flower is haploid ?
(a) Antherwall (b) Pollen mother cell
(c) Synergid (d) Secondary nucleus (Score : 1)

5. In aquatic plants like water hyacinth and water Lily the pollinating agent is
(a) Wind and insect (b) Water
(c) Birds and butterflies (d) Aquatic organisms (Score : 1)

6. Electrophoresis is a method commonly used in Biotechnology. Write briefly about GelElectrophoresis. (Scores : 2)

7. RNA can suppress the activity of a gene. Explain it with suitable example. (Scores : 2)

8. (a) Biogeochemical cycle is an important phenomenon in very ecosystem. Describe phosphorus cycle. (Scores : 3)

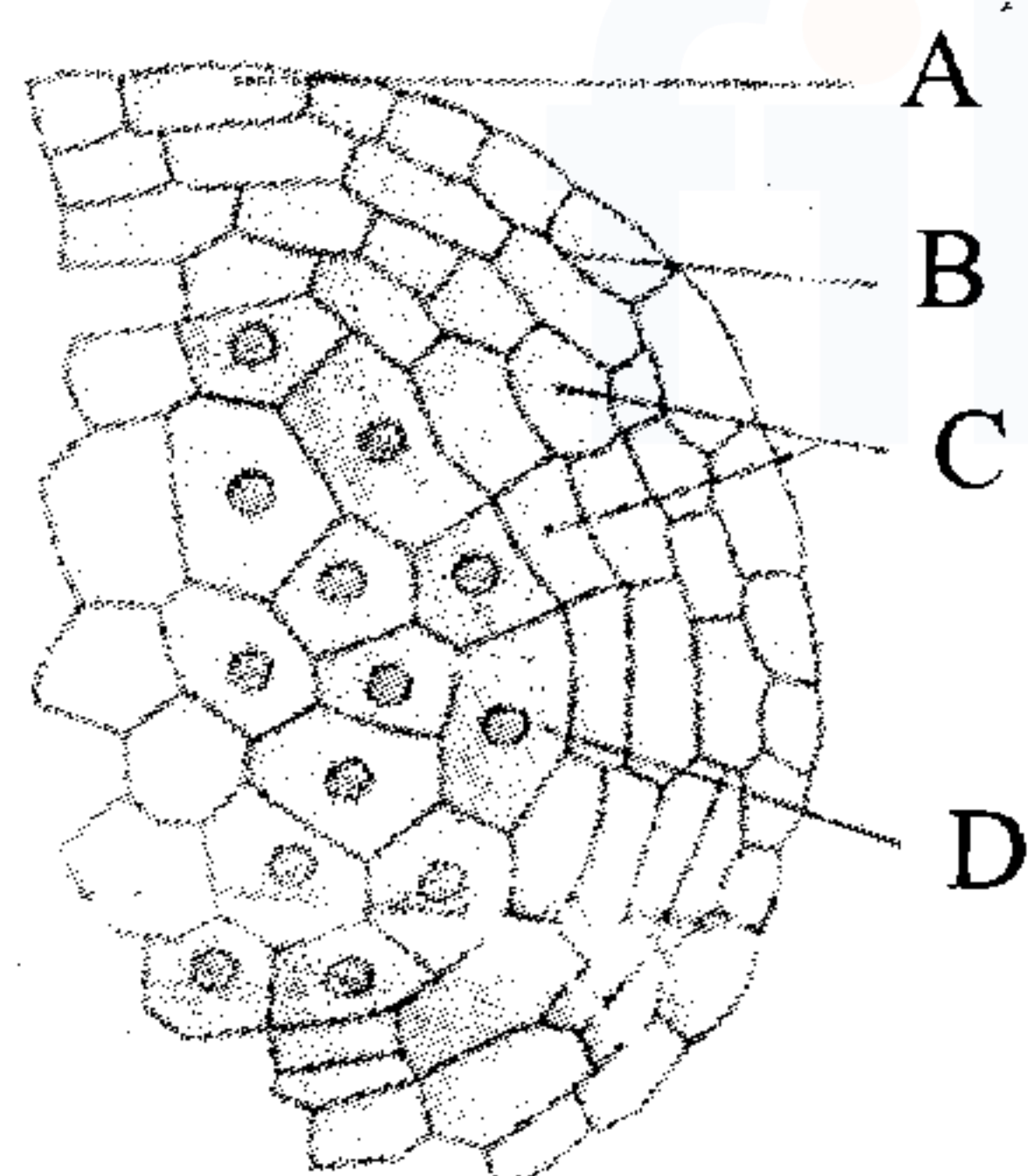
OR

(b) The plant communities in a given area show successive changes. Mention the stages of succession in a xerosere. (Scores : 3)

9. The hard outer layer of pollen is composed of

- | | | |
|----------------|-------------------|-------------|
| (a) Exine | (b) Intine | |
| (c) Integument | (d) Sporopollenin | (Score : 1) |

10. Observe the following diagram and label A, B, C and D.



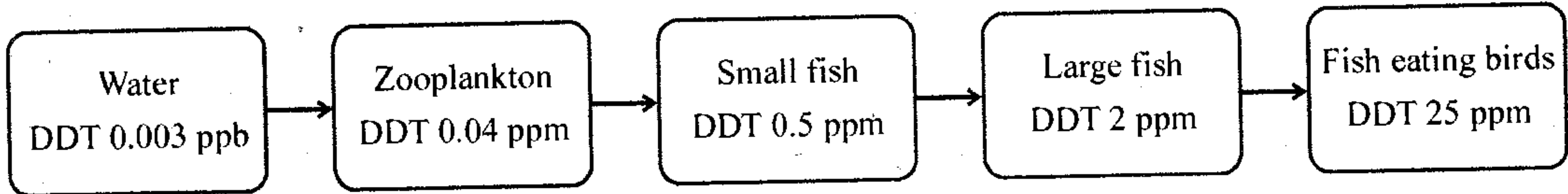
(Scores : 2)

11. Genetic engineering is a promising branch recently developed in biological science.

(a) Expand PCR and name three steps in each cycle. (Scores : 2)

OR

(b) What is a plasmid ? Name three features required for cloning vectors. (Scores : 2)

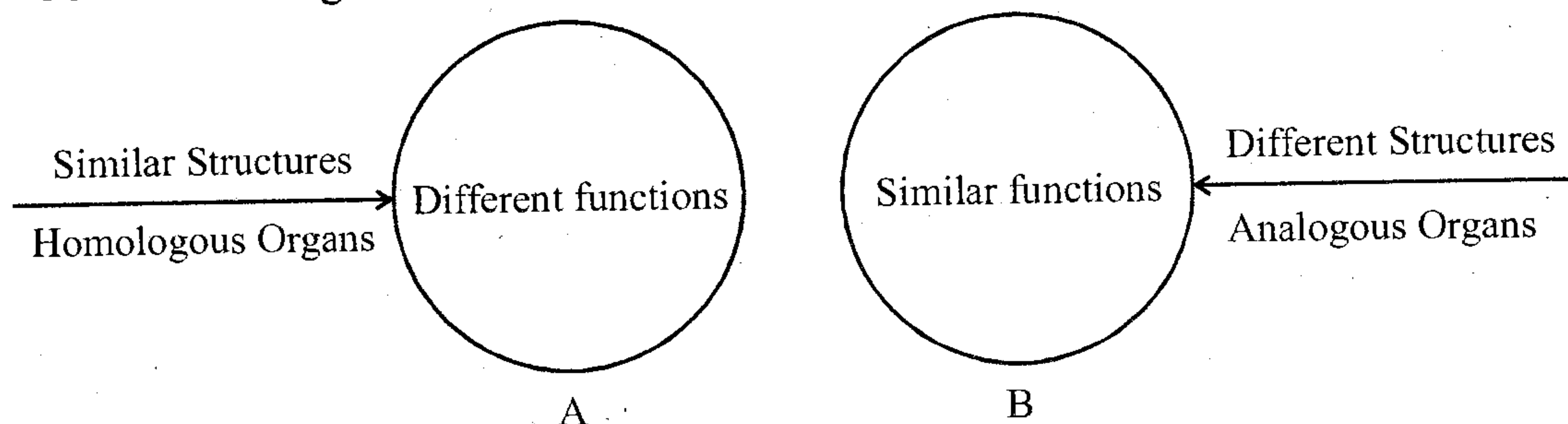
12. Many diseases could be treated by an advanced technique called gene therapy. Assess its role in the treatment of lymphocyte disorder, giving any suitable example. (Scores : 2)
13. Population growth may be exponential or logistic. Differentiate between them. (Scores : 2)
14. Quantity of pollutants increase in successive trophic levels. Observe the flowchart regarding biomagnifications of DDT in an aquatic food chain and answer the following :
- (a) What is biomagnification ?
- (b) What are the consequences of biomagnification ? (Scores : 2)
- 
- ```
graph LR; A["Water
DDT 0.003 ppb"] --> B["Zooplankton
DDT 0.04 ppm"]; B --> C["Small fish
DDT 0.5 ppm"]; C --> D["Large fish
DDT 2 ppm"]; D --> E["Fish eating birds
DDT 25 ppm"]
```
15. Plants are adapted to grow in different habitats. Name any four adaptations of plants in desert habitat. (Scores : 2)
16. Earthworms are commonly referred as farmers' friends. Define fragmentation. (Score : 1)
17. Adequate waste management is an environmental issue to be considered. Discuss the advantages of Eco-san toilet. (Scores : 2)

**Part – B**  
**ZOOLOGY**  
**(Maximum : 30 Scores)**

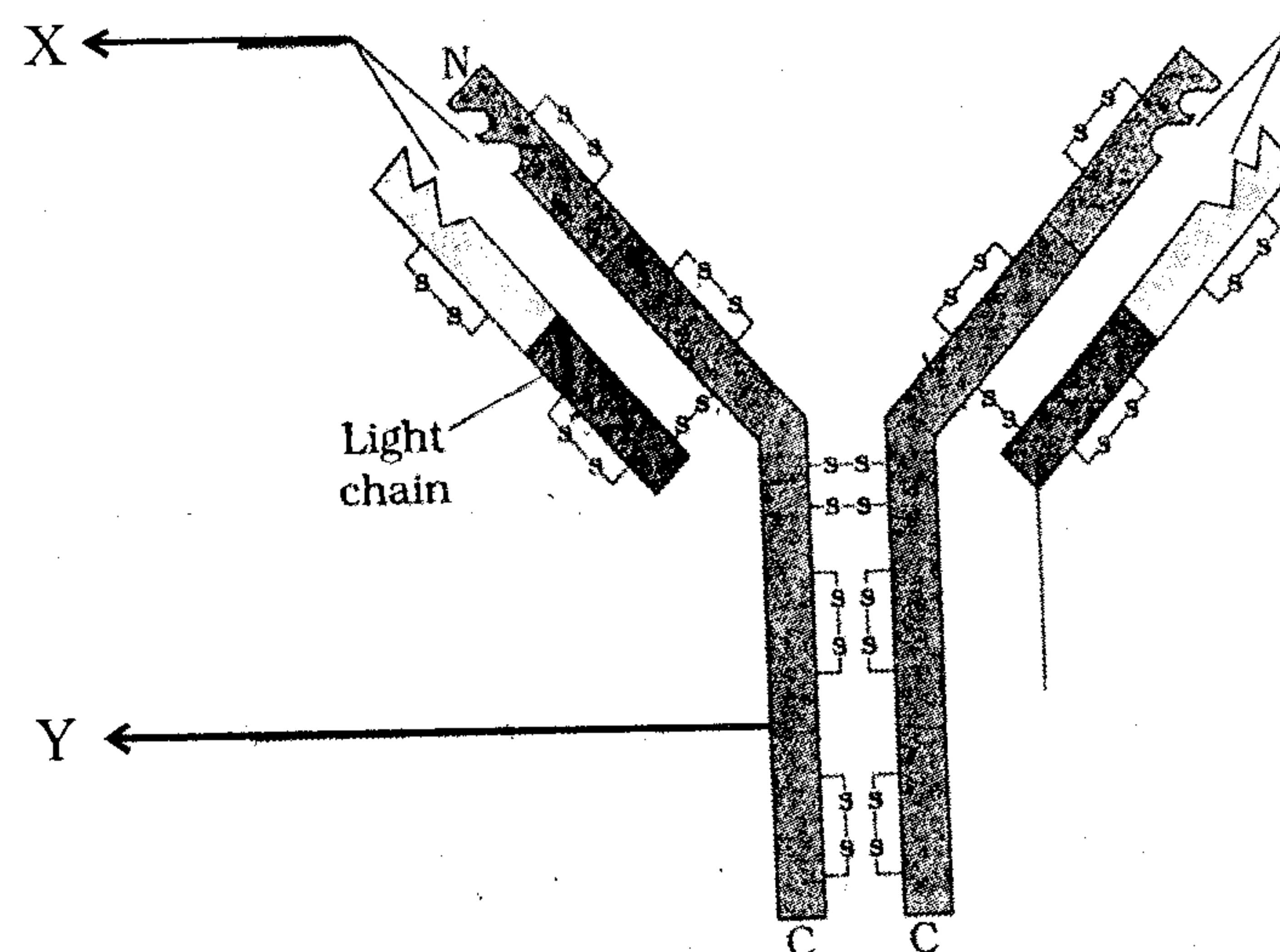
**Time : 1 Hour**

**Cool-off time : 10 Minutes**

1. The process of fusion of a sperm with ovum is called \_\_\_\_\_. **(Score : 1)**
2. Observe the diagram and answer the questions below :



- (a) Identify the types of evolution in the concept diagrams A and B. **(Score : 1)**
- (b) Write example pair each for homologous and analogous organs. **(Score : 1)**
3. Choose the correct answer from the bracket.  
Cyclosporin A is produced by \_\_\_\_\_.  
[(a) Aspergellus (b) Clostridium (c) Trichoderma (d) Acetobacter] **(Score : 1)**
4. Answer the questions about the given figure :



- (a) Identify the parts X and Y. **(Score : 1)**
- (b) Name any two types of this molecule. **(Score : 1)**

5. Select a bio-control agent from the given microbes :

- (a) Baculo virus (b) Rhino virus  
(c) Picorna virus (d) Adeno virus

(Score : 1)

6. Match columns A and B :

| A               | B            |
|-----------------|--------------|
| Ovulation       | Sperm        |
| Luteal Phase    | Oogenesis    |
| Acrosome        | Blasto cyst  |
| Inner cell mass | LH           |
|                 | Progesterone |

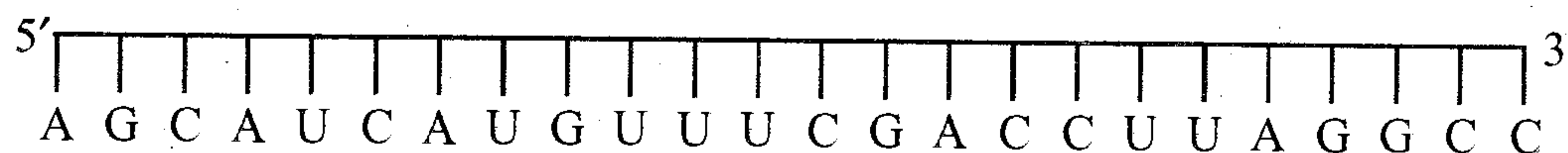
(Scores : 2)

7. Statements below show the features of some human fossils. Read carefully and identify the fossil.

- (a) Human like beings with brains capacities between 650 – 800 cc  
(b) Lived in East and Central Asia with brain capacity of 1400 cc.

(Scores : 2)

8. Observe the figure of mRNA and answer the questions :



- (a) Find the start and stop codons. (Score : 1)  
(b) How many amino acids will be present in the protein translated from this mRNA ? (Score : 1)  
(c) The additional sequences that are not translated in mRNA are called \_\_\_\_\_.

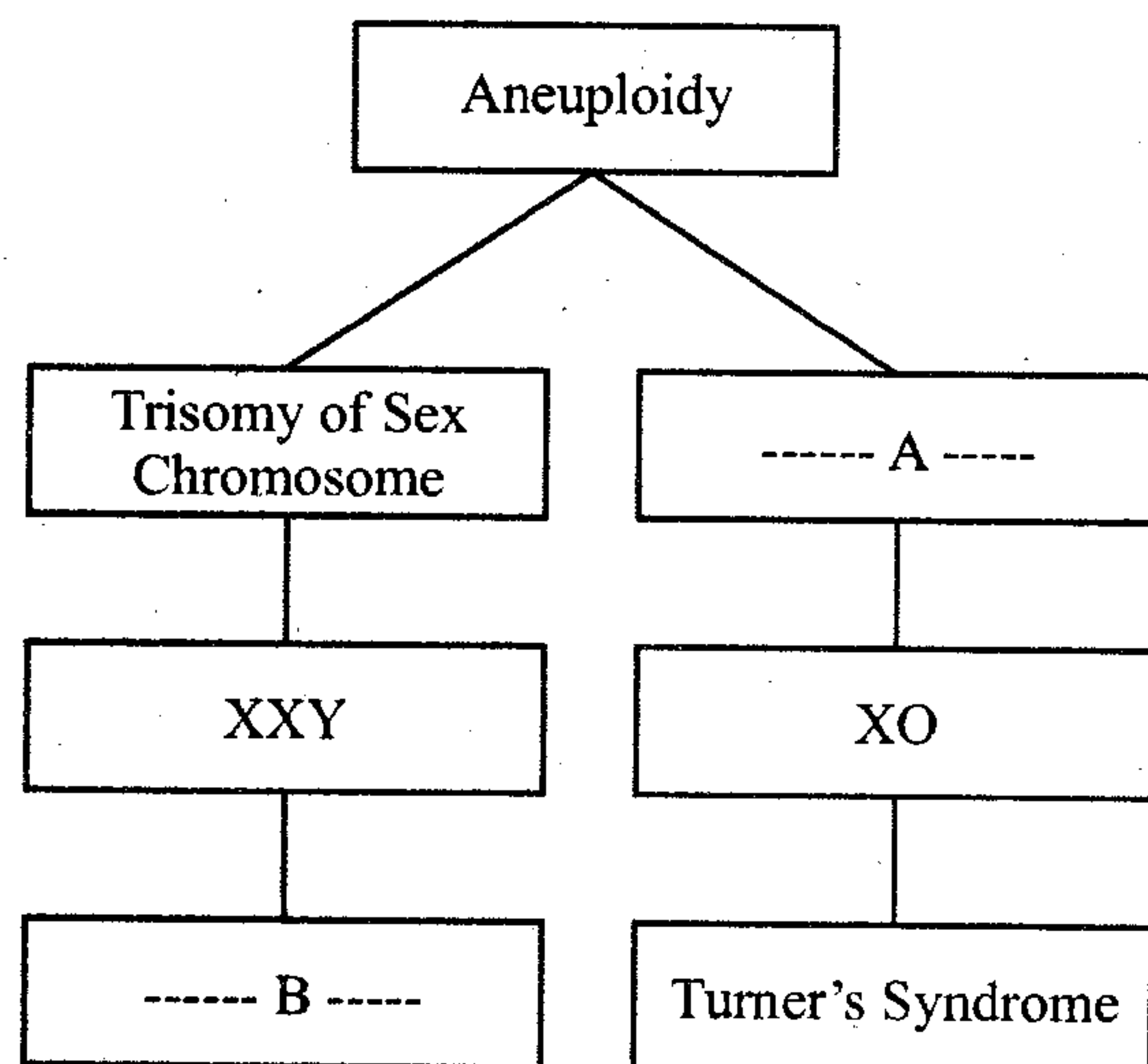
(Score : 1)

9. Select the odd one out and justify your selection.

Malaria, Gonorrhea, Amoebiasis, Filariasis

(Score : 1)

10. (a) Complete the flow chart of chromosomal disorder by filling the blank boxes (A and B) :



(Scores : 2)

- (b) What is aneuploidy ?

(Score : 1)

11. (a) The hints of the lac operon is given below :

**Hints :**

Inducer, Repressor,  
Structural genes, operator  
Regulatory gene

- (i) Which substance is acting as inducer in this operon ?

(Score : 1)

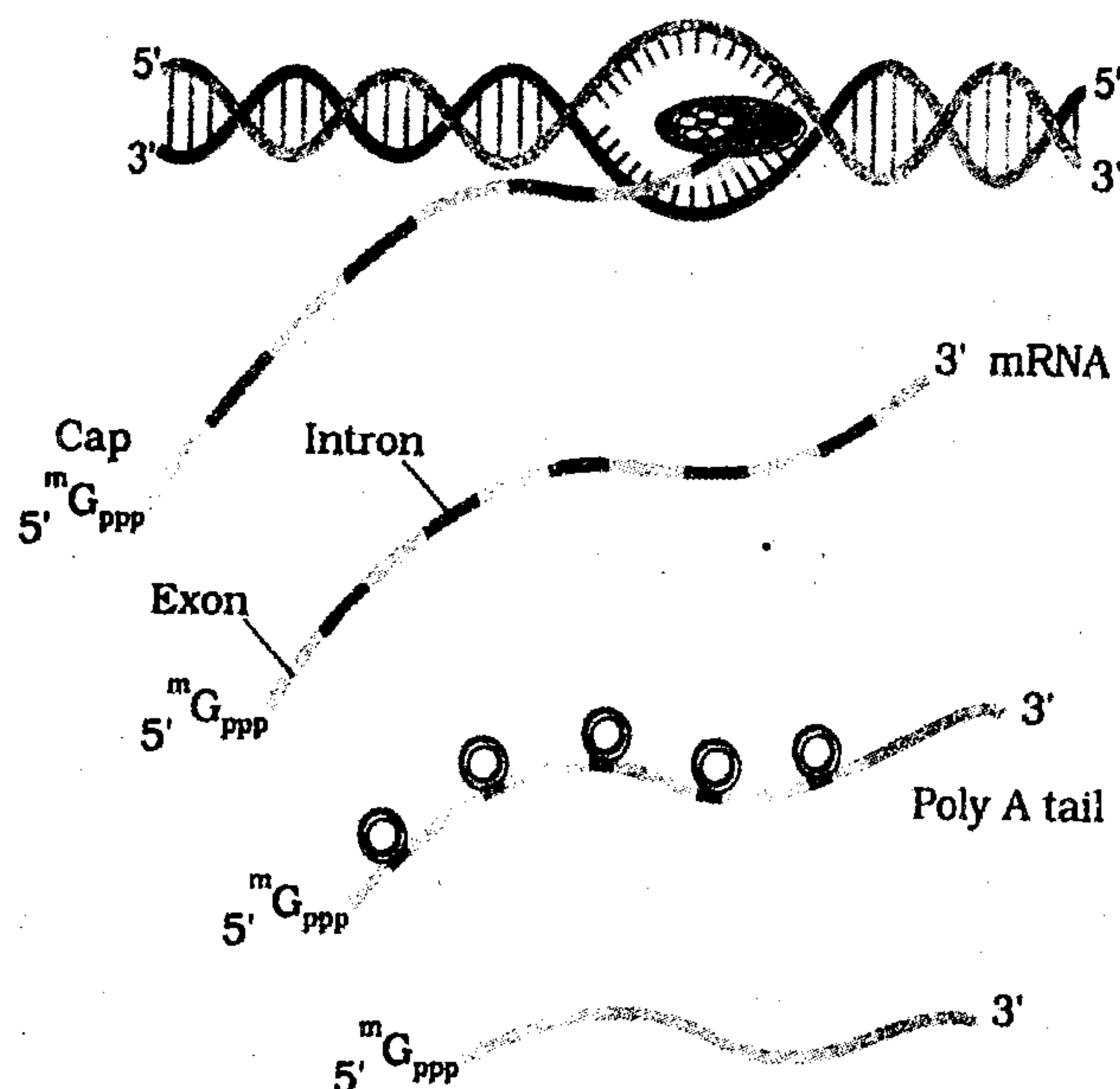
- (ii) Explain the working of operon in presence of the inducer.

(Scores : 2)

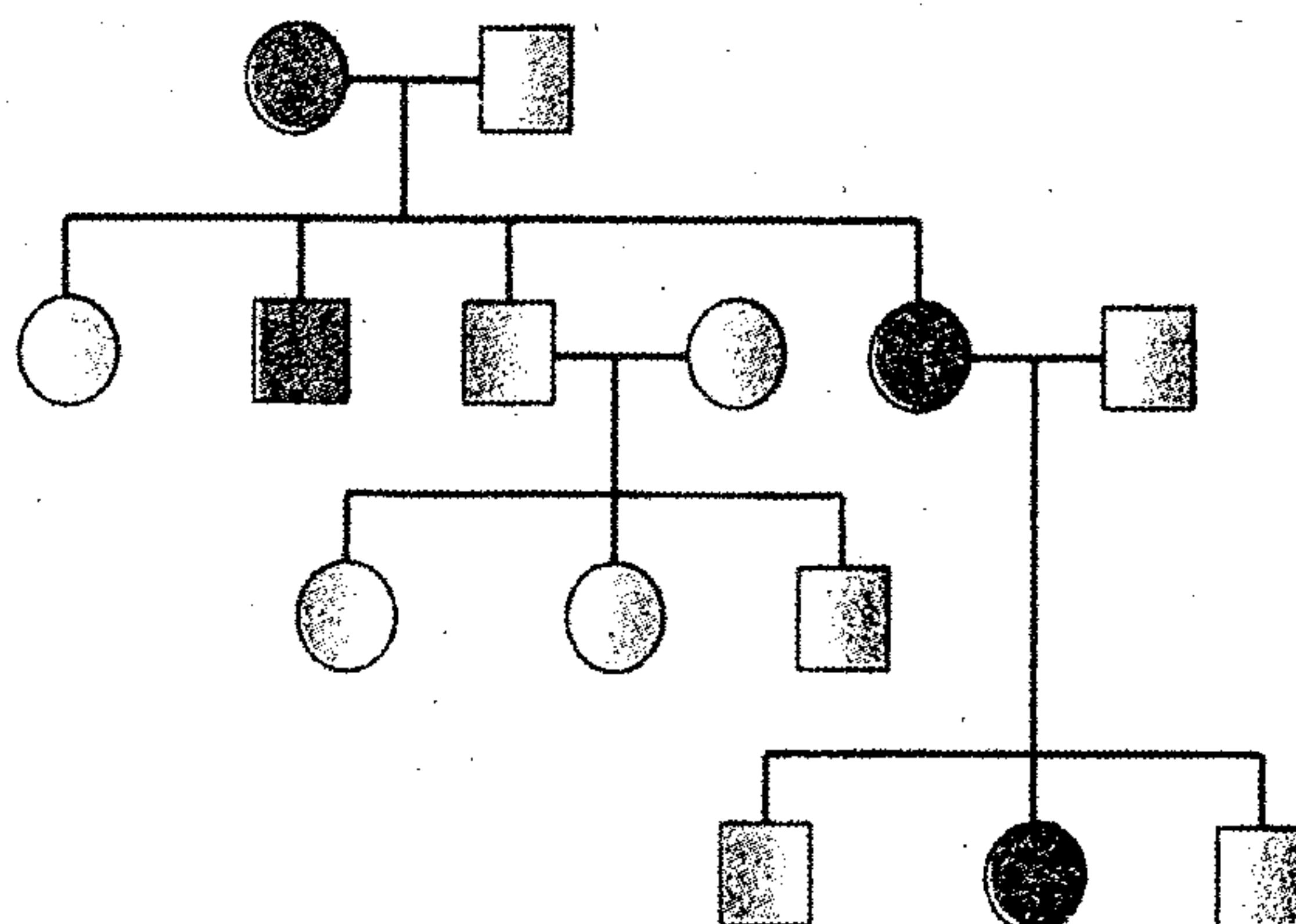
OR

- (b) With the help of the figure given, explain the processing of hnRNA to mRNA in eukaryotes.

(Scores : 3)



12. Observe the figure below and answer the questions following :



- (a) Identify the figure  
(b) What shows the shaded symbols used ?

(Scores : 2)

13. Diagnostic report of two couples having infertility problems are given below :

- (1) The woman cannot produce ovum.  
(2) The man has very low sperm count in semen.

Suggest a suitable Assisted Reproductive Technologies (ART) for each problem in expanded form.

(Scores : 2)

14. Complete the table by filling a, b, c and d.

| Disease     | Pathogen                        | Symptom                        |
|-------------|---------------------------------|--------------------------------|
| -----a----- | <i>Streptococcus pneumoniae</i> | Alveoli filled with fluid      |
| Common cold | -----b-----                     | Nasal congestion and discharge |
| -----c----- | <i>Plasmodium vivax</i>         | Chill and fever                |
| Filariasis  | <i>Wuchereria</i>               | -----d-----                    |

(Scores : 2)

15. (a) “When we conserve and protect the whole ecosystem, its biodiversity at all levels is protected.” Based on this statement explain the strategies of biodiversity conservation.

(Scores : 3)

OR

- (b) “When need turns to greed, it leads to biodiversity loss.” Substantiate this statement by explaining two causes of biodiversity loss.

(Scores : 3)