

2021**Molecular Biology****[GENERAL]****Paper : IV**

Full Marks : 60

Time : 3 Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.***Answer all the questions.****Use separate answer script for each GROUP.****GROUP-A****(Marks : 30)**1. Answer any **four** of the following questions:

1×4=4

- Name one commercially important microorganism.
- What is causative agent of cholera?
- Name the microorganism where Ti plasmid is found.
- What is a cloning vector?
- What is the function of Ligase?
- What is full form of PCR?

2. Answer any **three** of the following questions:

2×3=6

- What are antibiotics? Give one example.
- Mention the characteristics of RBC in sickle cell anemia.
- State the uses of Penicillin and Streptomycin.
- State two application of Restriction Enzymes in genetic engineering.
- Mention two effects of drug toxicity.

3. Answer any **two** of the following questions:

4×2=8

- What do you mean by Multiple Drug Resistance? State the possible causes of development of Multi-Drug resistance strain.
2+2=4
- Discuss mode of action and uses of chloramphenicol.
3+1=4
- Why Taq DNA polymerase is used in PCR? State the applications of PCR.
1+3=4
- Write a short note on Thalassemia. 4

[Turn over]

4. Answer any **two** of the following questions:

$$6 \times 2 = 12$$

- a) What is causative agent of Malaria? Describe the life cycle of malaria parasite. $1+5=6$
- b) What do you mean by Drug metabolism? Mention two factors that affects metabolism of drug in human body. How cholera toxin causes severe dehydration of the host?
 $1+2+3=6$
- c) What is Agarose Gel Electrophoresis? Briefly discuss the steps involved in a PCR.
 $3+3=6$
- d) Name two clinically important enzymes. State their uses. Name one pathogenic microorganism and the disease it causes.
 $2+2+2=6$

GROUP-B

(Marks : 30)

5. Answer any **four** from the following: $1 \times 4 = 4$

- a) What is phototransduction?
- b) What is subsonic sound?
- c) What does "MRI" stand for?
- d) What is tracer element?

e) What is the function of lacrimal gland?

f) What is isobar?

6. Answer any **four** from the following: $2 \times 4 = 8$

- a) Write down the role of photopigments in vision.
- b) What is Gibbs-Donnan effect?
- c) Write down the characteristics of the trace of ECG.
- d) Write down the functions of tracer elements in medical field.
- e) How does LASER light differ from normal light?
- f) Write down the differences between ultrasound waves and the audible waves.

7. Answer any **two** from the following: $4 \times 2 = 8$

a) What are the criteria of a radioisotope to be selected as a tracer molecule? You want to study on thyroid gland function. How do you test this with the help of tracer molecule?

$$2+2=4$$

b) Describe about Labyrinth (Internal Ear).

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c) What is gamma ray? Write about the components of 'Gamma Camera.' Write about applications of 'Gamma camera'. 1+2+1=4

8. Answer any **one** from the following: 10×1=10

a) i) What are the disadvantages of the use of tracer elements? What is the full name of PET?

ii) Write short notes on :

a) RIA

b) Autoradiography (3+1)+(3+3)

b) Explain about the optical components of the eye. Describe the role of Vitamin A in vision. What is the name of the instrument that helps you to record electrical activity generated by the retinal cells during exposure to light? Write down the components of this instrument. 3+3+1+3
