

Series OSR

Code No.

Roll No.

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

- Please check that this question paper contains **12** 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.

**BIOLOGY (Theory)**

*Time allowed : 3 hours*

*Maximum Marks : 70*

**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.

### SECTION A

1. Name the part of the flower which the tassels of the corn-cob represent. 1
2. Mention any two contrasting traits with respect to seeds in pea plant that were studied by Mendel 1
3. Why is secondary immune response more intense than the primary immune response in humans ? 1
4. Why is it not possible for an alien DNA to become part of a chromosome anywhere along its length and replicate normally ? 1
5. State the role of C peptide in human insulin. 1
6. Name the enzymes that are used for the isolation of DNA from bacterial and fungal cells for recombinant DNA technology. 1
7. State Gauss's Competitive Exclusion Principle. 1
8. Name the type of association that the genus *Glomus* exhibits with higher plants 1

### SECTION B

9. Why are the human testes located outside the abdominal cavity ? Name the pouch in which they are present. 2
10. In Snapdragon, a cross between true-breeding red flowered (RR) plants and true-breeding white flowered (rr) plants showed a progeny of plants with all pink flowers.  
(a) The appearance of pink flowers is not known as blending. Why ? 2  
(b) What is this phenomenon known as ?
11. With the help of one example, explain the phenomena of co-dominance and multiple allelism in human population. 2
12. Write the scientific name of the fruit-fly. Why did Morgan work with fruit-flies

for his experiments ? State any three reasons.

2

**or**

Linkage and crossing-over of genes are alternatives of each other.

Justify with the help of an example.

- 13.** List the symptoms of Ascariasis. How does a healthy person acquire This infection? 2
- 14.** Explain the significant role of the genus *Nucleopolyhedrovirus* in an ecological sensitive area. 2
- 15.** How does a restriction nuclease function ? Explain 2
- 16.** How have transgenic animals proved to be beneficial in: 2
- (a) Production of biological products
  - (b) Chemical safety testing
- 17.** Describe the mutual relationship between fig tree and wasp and Comment on the phenomenon that operates in their relationship. 2
- 18.** Construct an age pyramid which reflects an expanding growth status Of human population. 2

**SECTION C**

- 19.** Make a list of any three outbreeding devices that flowering plants have developed and explain how they help to encourage cross-pollination. 3

**OR**

Why are angiosperm anthers called dithecous ? Describe the structure of its microsporangium.

- 20.** If implementation of better techniques and new strategies are required to provide more efficient care and assistance to people, then why is there a statutory ban on amniocentesis ? Write the use of this technique and give reason to justify the ban? 3
- 21.** Why is pedigree analysis done in the study of human genetics ? State The conclusions that can be drawn from it. 3
- 22.** Identify 'a', 'b', 'c', 'd', 'e' and 'f' in the table given below: 3

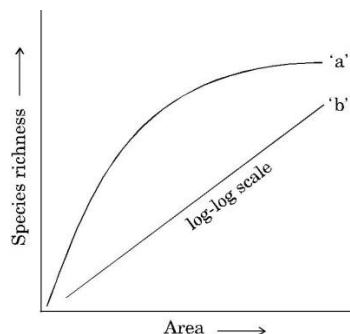
No.	Syndrome	Cause	Characteristics of affected individuals	Sex Male/Female/Both
1.	Down's	Trisomy of 21	'a' <input type="checkbox"/> (i)  (ii)	'b'
2.	'c'	XXY	Overall masculine development	'd'
3.	Turner's	45 with XO	'e' <input type="checkbox"/> (i)  (ii)	'f'

**23.** Community Service department of your school plans area near the school with an objective to educate the slum dwellers with respect to health and hygiene. respect to health and hygiene. 3

(a) Why is there a need to organise such visits ?

(b) Write the steps you will highlight, as a member of this department, in your interaction with them to enable them to lead a healthy life.

**24.** The following graph shows the species – area relationship following questions as directed. 3



- (a) Name the naturalist who studied the kind of relationship shown in the graph. Write the observations made by him
- (b) Write the situations as discovered by the ecologists when the value of 'Z' (slope of the line) lies between
- (i) 0.1 and 0.2
  - (ii) **0.6 and 1.2**

What does 'Z' stand for ?

**25.** Name and describe the technique that helps in separating the DNA fragments formed by the use of restriction endonuclease. 3

**26.** State the function of a reservoir in a nutrient cycle. Explain the simplified model of carbon cycle in nature 3

**27.** Since the origin of life on Earth, there were five episodes of mass extinction of species 3

- (i) How is the 'Sixth Extinction', presently in progress, different from the previous episodes ?
- (ii) Who is mainly responsible for the 'Sixth Extinction' ?
- (iii) List any four points that can help to overcome this disaster.

#### SECTION D

**28.**

(a) Where does fertilization occur in humans ? Explain occur during this Process. 5

(b) A couple where both husband and wife are producing functional gametes, but the wife is still unable to conceive, is seeking medical gametes, but the wife is still unable to conceive, is seeking medical become happy parents.

**OR**

- (a) Explain the different ways apomictic seeds can develop. Give an example of each.
- (b) Mention one advantage of apomictic seeds to farmers.
- (c) Draw a labelled mature stage of a dicotyledonous embryo.

**29.**

(a) Describe the various steps of Griffith's experiment that led to the conclusion of the 'Transforming Principle' 5

(b) How did the chemical nature of the 'Transforming Principle' get established ?

OR

Describe how the *lac* operon operates, both in the presence and absence of an inducer in *E.coli*.

30. With advancements in genetics, molecular biology and tissue culture, new traits have been incorporated into crop plants.

Explain the main steps in breeding a new genetic variety of a crop. 5

OR

(a) State the objective of animal breeding

(b) List the importance and limitations of inbreeding. How can the limitations be overcome ?

(c) Give an example of a new breed each of cattle and poultry.