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Time : 2½ Hours

**BIOLOGY**

Subject Code

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Total No. of Questions : 28 (Printed Pages : 4)

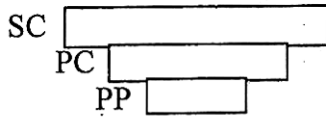
Maximum Marks : 55

- INSTRUCTIONS :**
- (i) All questions are compulsory.
  - (ii) Draw diagrams in lead pencil only.
  - (iii) The question paper consists of *four* Sections A, B, C and D.
    - Section A has **10** questions of **01** mark each.
    - Section B has **11** questions of **02** marks each.
    - Section C has **05** questions of **03** marks each.
    - Section D has **02** questions of **04** marks each.
  - (iv) The total number of questions is **28**.
  - (v) There is no overall choice, however an internal choice is provided in *one* question of Section B, *one* question of Section C and both questions of Section D.
  - (vi) Multiple choice questions should be attempted only once, if attempted more than once it will not be evaluated. Choose the correct option and rewrite on the answer-sheet.

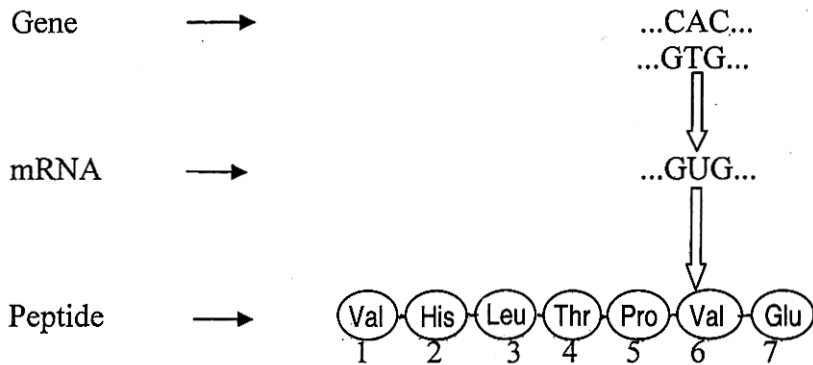
**SECTION – A (1 mark each)**

1. The organism that has capacity to reproduce without fertilisation of eggs is \_\_\_\_\_.
  - Crow
  - Frog
  - Honey bee
  - Earthworm
2. The District Medical and Health officials in association with the authorities of the Municipal Corporation of Karimnagar, Telengana, released *Gambusia* fish into the water-logged areas in various parts of the town. The release of *Gambusia* in water bodies will help to eradicate \_\_\_\_\_.
  - Rhino virus
  - Ring worms
  - Mosquito larvae
  - Round worms

3. The following ecological pyramid represents \_\_\_\_\_.



- Pyramid of number in a grassland
  - Pyramid of biomass in a grassland
  - Pyramid of biomass in sea
  - Pyramid of number in sea
4. A mixture of fragmented DNA was electrophoresed in an agarose gel. After staining with ethidium bromide and observed, no DNA bands were visible. The reason for this is \_\_\_\_\_
- DNA fragments did not segregate
  - DNA bands were not exposed to UV light
  - DNA bands were too small to visualize
  - Desired DNA fragments were absent
5. Given below is the representation of a portion of a mutated  $\beta$  globin chain of haemoglobin due to a single base substitution at 6<sup>th</sup> codon on mRNA.



Such a mutation will cause \_\_\_\_\_.

- Sickle cell anaemia
  - Thalessemia
  - Haemophilia
  - Phenyleketonuria
6. State any two factors that accelerate the rate of decomposition.

7. After a successful in-vitro fertilisation, the zygote was allowed to divide up to 8 blastomeres stage. Where will this embryo be transferred in the mother to complete further development ?
8. At a recent Press Conference, Dr. Rakesh Mishra, the director of CCMB, Hyderabad disclosed that the farmers need not buy new hybrid seeds for every cropping season from now on, as scientists have successfully developed hybrid seeds that will not only allow the farmers to obtain seeds from their own farm but also would maintain the hybrid characters in the progeny.  
Identify the phenomenon used by the scientists at CCMB for the development of such seeds.
9. A sequence of a heterogeneous nuclear RNA (hnRNA) is given below.  
5' – AUG GGG CCC GAG CUC AAU GCC GCG UAG – 3'  
Assuming that the codons containing C represent introns, derive the processed mRNA that would be formed from the above sequence.
10. A look at 2011 Census report offers a sad story of an imbalanced child sex ratio regardless of the rising literacy levels. Among urban areas, Mahesana in Gujrat reported the lowest child sex ratio of 762 girls per 1,000 boys, followed by Agra with 772 and English Bazar in West Bengal with 781.  
What is the major cause for such decline in the sex ratio.

**SECTION – B (2 marks each)**

11. Draw a neat diagram showing the structure of a human sperm.
12. Write a note on Pills as a popular contraceptive.
13. In our country, the tropical region of Malabar coast embraces greater species diversity compared to the species diversity in temperate region of Zaskar range of Western Himalayas. Justify giving reasons.
14. Draw a neat diagram of an anatropous ovule.
15. Give the cause of the following genetic disorders.  
a) Klinefelter's Syndrome      b) Turner's Syndrome
16. A biotechnology research student was designing and constructing an artificial cloning vector. His guide instructed him to incorporate a selectable marker and a single recognition site in addition to the other features.  
Why is emphasis given to the above two features by the guide ?

17. Draw a neat diagram of DNA double helix.
18. Briefly describe micro injection and gene gun as methods used to introduce alien DNA into host cell.

OR

Briefly describe the isolation of genetic material (DNA) from a plant cell.

19. A plant breeder crossed a red flowered plant of Snapdragon with a pink flowered plant. Using Punnett Square, work out the phenotypic and genotypic ratio that he would get in the F1 generation.
20. On an excursion to a Wild Life Sanctuary, students observed 'a cuckoo laying eggs in a crow's nest' and 'a wasp laying eggs in a fig fruit'. They wondered whether both these interactions are of same type or not.  
As a student of biology help them to arrive at the correct conclusion giving reasons.
21. Mention any four salient features of human genome.

#### SECTION – C (3 marks each)

22. Give an account of any three benefits that humans gain from transgenic animals.
23. Distinguish between follicular phase and luteal phase of menstrual cycle in human females.
24. What are municipal solid wastes ? Add a note on management of solid wastes.
25. Homologous and analogous organs are the anatomical and morphological evidence of evolution. Elucidate with the help of examples.
26. Describe Dairy Farm Management as a strategy for enhancement in food production.

OR

Describe Bee-keeping as a strategy for enhancement in food production.

#### SECTION – D (4 marks each)

27. Explain the importance of microbes in house hold products.

OR

Explain the importance of microbes as biofertilizers.

28. Discuss the diseases Typhoid and Pneumonia with respect to causal organism, mode of transmission and symptoms.

OR

Discuss lymphoid organs in the human immune system.