

Total No. of Printed Pages—3

**5 SEM TDC ZOOH (CBCS) C 12**

**2 0 2 3**

( November )

ZOOLOGY

( Core )

Paper : C-12

( Principles of Genetics )

Full Marks : 53

Pass Marks : 21

Time : 3 hours

*The figures in the margin indicate full marks  
for the questions*

1. Fill in the blanks : 1×5=5

(a) 'One gene one enzyme' hypothesis was proposed by \_\_\_\_\_.

(b) Sigma factor is associated with sensitivity to \_\_\_\_\_.

(c) C-locus, which is responsible for colour in maize, is present on chromosome number \_\_\_\_\_.

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- (d) In *Drosophila*, Lozenge mutant is responsible for \_\_\_\_\_ type of eye.
- (e) Operon model was proposed by \_\_\_\_\_.
2. Write briefly on any *two* of the following :  $3 \times 2 = 6$
- (a) Somatic cell hybridization
- (b) Pleiotropy
- (c) Chemical mutagens
3. Write about the molecular mechanism of crossing-over. What are the theories related to crossing-over and chiasma formation?  $3 + 4 = 7$
- Or
- What is chi-square distribution? How can it be used for detection of linkage? Discuss the recombination frequency as a measure of linkage intensity.  $1 + 2 + 4 = 7$
4. What do you understand by spontaneous mutation? Discuss the variation in mutation rates and frequencies at different loci within an organism.  $2 + 5 = 7$
- Or
- What do you understand by reciprocal translocation? Give a list of different types of structural changes in chromosome.  $2 + 5 = 7$

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( Continued )

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5. Explain the mechanism of sex determination in *Drosophila*. 7
6. What are the basic criteria for extra-chromosomal inheritance? Write about the mitochondrial mutation in *Saccharomyces*.  $3 + 4 = 7$
7. What are the three methods for transfer of genetic material in bacteria? Differentiate between transformation and transduction in bacteria.  $3 + 4 = 7$
8. What is transposon in bacteria? Describe various transposons found in eukaryotes.  $2 + 5 = 7$

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