2018

ZOOLOGY

ZOO : 303

GENETICS, CYTOGENETICS AND GENETIC ENGINEERING

Full Marks:80

Time: 3 hours

The figures in the margin indicates full marks for the questions :

1)Answer the following multiple choice questions (any eight) **1x 8=8**

i) The genotypic and phenotypic ratio for lethal gene would be
   a) 3:1
   b) 2:1
   c) 1:2:1
   d) None of these

ii) Chronic myelogenous leukemia is cause when chromosomal segment is translocated between
   a) Chromosome no.8 and 14
   b) Chromosome no.9 and 14
   c) Chromosome no.9 and 22
   d) Chromosome no.8 and 22

iii) In G-Banding technique, the banding that are evident are
   a) AT rich facultative heterochromatin
   b) AT rich constitutive heterochromatin
   c) GC rich facultative heterochromatin
   d) GC rich euchromatin

iv) The action of DNA modifying enzyme Polynucleotide kinase is
   a) Addition of specific PO32- group
   b) Removal of specific OH group

P.T.O.

c) Both a) and b)
d) None of the above

v) Transfection of DNA into cells by exposing to high voltage electric impulse is called
a) Electrolysis
b) Electrofission
c) Electrofussion
d) Electroporation

vi) Which restriction enzyme cleave the DNA sequence into blunt end
a) Pru-I
b) Pru-II
c) EcoRI
d) None of these

vii) If a male parent of a cross has a mutation in its mitochondria, during segregation of F2 in how many progenies the mutation will be found?
a) None of the progenies
b) All of the progenies
c) 50% of the progenies
d) 25% of the progenies

viii) The single strand of telomere DNA that invades the double-stranded telomere stand is termed as
a) t-loop
b) D-loop
c) C-loop
d) None of these

ix) Which of the following(s) is/are the characteristics of Taq Poly merase ?
a) It is a RNA polymerase
b) It is obtained from bacterium Termus piticus
c) Both a) and b)
d) None of the above

x) Chronic Myelogenous Leukemia results from chromosomal translocation between
a) Chromosome 8 and 14
b) Chromosome 9 and 22
c) Chromosome 8 and 22
d) Chromosome 9 and 14

2) Answer the following short type questions (any five) 2 x 5=10

a) How does founder effect influences population genetic makeup?
b) What is the significance of a chromosome puff?
c) What is the significance of telomerase in a cell?
d) What do you mean by Klenow fragment?
e) Define lethal gene.
f) What is the significance of siRNA in Genetic Engineering??

3) Answer the following (any four) 5 x 4=20

a) Distinguish between cloning vector and expression vector.
b) Distinguish between co-dominance and incomplete dominance
c) What do you mean by nick translation?
d) Distinguish between Linker and Adapter
e) What do you mean by paracentric and pericentric chromosomal aberration?

4) Answer the following long type question (any two) 9 x 2=18

a) What is the gene library? Illustrate the construction of cDNA library. **(3+6)**
b) What do you mean by transfection? Illustrate the chemical transfection technique. **(3+6)**
c) What do you mean by Epistasis? Illustrate the recessive, dominant and double recessive epistasis with suitable examples. **(3+6)**

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5) Answer the following very long type question (Any two)

12 x 2=24

a) How is the sex ratio detected in the drosophila? Describe the mechanism of transcription of various genes and proteins for determination of female in drosophila. **(3+9)**

b) What do you mean by malignancy? What are the characteristic of a Burkitt's lymphoma? Describe the chromosomal anoma lies during Burkitt's lymphoma. **(3+9)**

c) What do you mean by genotype frequency and allele frequency? If a population having 371 nos. of individual with genotype TT =39, TU=70, UU=48, UV=173, VV=29, TV=12, then what will be the genotype frequencies of all genotype and allele fre quencies of T, U and V? **(4+8)**

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