M.Sc. 3rd Semester Examination, 2018
BOTANY
Paper : BOT-301C(T)
Cytogenetics, Plant Breeding and Biostatistics
Course ID : 31351

Time: 2 Hours   **Full Marks: 30**

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Group-A
Cytogenetics and Plant Breeding

1. Answer *any two* questions: 1×2=2

   (a) What are retransposons? Cite an example.

   (b) What is BLAST?

   (c) Mention the names of two cancer causing retroviruses in human being.

   (d) Distinguish between penetrance and expressivity.

2. Answer *any one* from the following: 5×1=5

   (a) What is pleiotrophy? How does it differ from polygenic inheritance?   2+3=5

   (b) Explain cytological basis of crossing over with suitable diagram.   5

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

   (a) How does microfilaments differ from microfibrils? Characterise intermediate filaments.   3+5=8

   (b) What is the difference between membrane channel and pump in terms of energy budget? Differentiate rooted and unrooted phylogenetic tree. Deletion and duplications are associated events during chromosomal mutation.— Explain with suitable diagram.   1+5+2=8

Group-B
Biostatistics

4. Answer *any two* of the following: 1×2=2

   (a) Write the major difference between population and sample.

   (b) Define probability mass function of Binomial distribution.

   (c) Define *K*th order central moment.

   (d) What is null hypothesis?

5. Answer *any one* of the following: 5×1=5

   (a) Find the mean of the Normal distribution.   5

   (b) The mean and the SD of birth weights were found to be 2.9 kg and 0.65 kg respectively from 832 first born infants, and 3.3 kg and 0.55 kg respectively for 608 third born infants. Is the mean birth weight significantly higher in the third born infants?   5

6. Answer *any one* of the following: 8×1=8

   (a) Define variance for discrete distribution. Find the variance of Poisson distribution, hence deduce SD of Poisson distribution.   2+5+1=8

   (b) Apply one way ANOVA to find whether or not there is a significant difference between the mean wing length (in mm) of the following two groups of flies sampled from the different habitats.

   Group–1: 3·8, 4·3, 4·6, 5·1, 4·6, 5·3, 4·5, 2·8, 4·0, 5·0.

   Group–2: 3·0, 4·6, 3·1, 3·7, 2·8, 4·5, 3·0, 2·2, 2·4, 4·7.

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