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DATE: **26-04-2018**

**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU-27**

**B.Sc. BIOTECHNOLOGY–VI SEMESTER**

**SEMESTER EXAMINATION-  APRIL 2018**

**BT 6212: Biostatistics and Plant Biotechnology**

(For supplementary candidates)

Do not write the register number on the question paper

Please attach the question paper along with the answer script.

**Time : 3hrs                                                                   Maximum marks : 100**

**This paper contains four printed pages and four parts**

1. **Choose the right answer 1x10=10**

1. The mean of a sample is

|  |
| --- |
| A. always equal to the mean of the population B. always smaller than the mean of the population C. computed by summing the data values and dividing the sum by (n - 1) D. computed by summing all the data values and dividing the sum by the number of items  2. A(*n*) \_\_\_\_\_\_\_\_\_\_ is an excised piece of leaf or stem tissue used in micropropagation. |
| |  |  |  |  | | --- | --- | --- | --- | | [A.](javascript:%20void%200;) | microshoot | [B.](javascript:%20void%200;) | medium | | [C.](javascript:%20void%200;) | explant | [D.](javascript:%20void%200;) | scion | |
| 3. Protoplasts can be produced from suspension cultures, callus tissues or intact tissues by enzymatic treatment with |
| |  |  | | --- | --- | | [A.](javascript:%20void%200;) | cellulotyic enzymes | | [B.](javascript:%20void%200;) | pectolytic enzymes | | [C.](javascript:%20void%200;) | both cellulotyic and pectolytic enzymes | | [D.](javascript:%20void%200;) | proteolytic enzymes | |
| 4. Organogenesis is |
| |  |  | | --- | --- | | [A.](javascript:%20void%200;) | formation of callus tissue | | [B.](javascript:%20void%200;) | formation of root and shoots on callus tissue | | [C.](javascript:%20void%200;) | both (a) and (b) | | [D.](javascript:%20void%200;) | None of the above | |

5. Find the median of the following data: 160,180, 200, 280, 300, 320, 400

A. 140 B. 300 C. 180 D. 280

6. In a week, the prices of a bag of rice were Rupees 350,280,340,290,320,310,300. The range is:

A. 60 B. 70 C. 60 D. 100

|  |
| --- |
| 7. In a callus culture |
| |  |  | | --- | --- | | [A.](javascript:%20void%200;) | increasing level of cytokinin to a callus induces shoot formation and increasing level of auxin promote root formation | | [B.](javascript:%20void%200;) | increasing level of auxin to a callus induces shoot formation and increasing level of cytokinin promote root formation | | [C.](javascript:%20void%200;) | auxins and cytokinins are not required | | [D.](javascript:%20void%200;) | only auxin is required for root and shoot formation | |
| 8. What is/are the benefit(s) of micropropagation or clonal propagation?  A. Rapid multiplication of superior clones |
| B. Multiplication of disease free plants  C. Multiplication of sexually derived sterile hybrids  D. All of the above |

9**.** A researcher selects a probability sample of 100 out of the total population. It is

A. A cluster sample B. A random sample

C. A systematic sample D. A stratified sample

|  |
| --- |
| 10.Cellular totipotency is the property of |
| |  |  | | --- | --- | | [A.](javascript:%20void%200;) | plants | | [B.](javascript:%20void%200;) | animals | | [C.](javascript:%20void%200;) | bacteria | | [D.](javascript:%20void%200;) | all of these | |

**II. Answer any FIFTEEN of the following 2x15=30**

11. Define micropropagation.

12. Explain totipotency.

13. What is a cybrid?

14. Define the role of reporter genes.

15. What is the function of phytase?

16. Explain biolistic particle delivery.

17. What is RFLP?

18. Explain the role of IAA in plant tissue culture.

19. Define the role of PEG in protoplast fusion.

20. Explain Binominal distribution and its significance.

21. What are the merits of Standard deviation?

22. Define probability

23.Give two applications of Poisson distribution

24. Differentiate Correlation and Regression

25. What is t-test? When is it used?

26. Explain significance of data presentation by histogram.

27. What is null hypothesis?

28. What is the role of Chi-Squared test in statistical significance?

**III. Answer any FIVE of the following 6x5=30**

29. How do plants respond to biotic and abiotic stresses?

30. Explain the procedure of Particle gun method for gene transfer

31. Explain the Biochemical production of Hirudin.

32. Describe molecular mapping.

33. A bag contains 5 white and 3 black balls 2 are drawn at random one after the other without replacement. Find the probability that a) both are black b) both are white c) one black and one white.

34. Find the SD and variance of the following observations.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sl. No. | 1 | 2 | 3 | 4 | 5 |
| Observation | 20 | 22 | 27 | 30 | 25 |

35. The following table gives the frequency distribution of the number of orders received each day during the past 50 days at the office of a mail-order company. Calculate the mean.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. of orders | 10-12 | 13-15 | 16-18 | 19-21 |
| f | 4 | 12 | 20 | 14 |

**IV. Answer any THREE of the following 10x3=30**

36. Describe the development of Bt crops.

37. Explain Agrobacterium mediated gene transfer in plants

38. Calculate Karl Pearson’s Coefficient of Skewness from the following data:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Class | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 |
| Frequency | 5 | 6 | 11 | 21 | 33 | 30 | 22 | 18 |

39. Calculate the correlation coefficient and test its significance.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Plant | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| No. of fruits | 15 | 11 | 19 | 21 | 16 | 10 | 18 | 16 | 13 | 11 |
| No. of branches | 5 | 6 | 4 | 5 | 7 | 4 | 5 | 6 | 7 | 5 |

40. Explain Molecular Farming. What are the advantages and disadvantages of using plants as hosts for Molecular Farming?