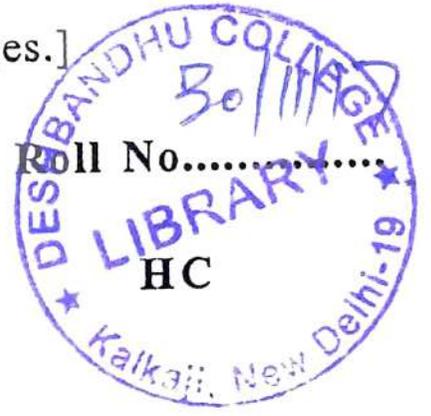


[This question paper contains 4 printed pages.]

Your Roll No.....



Sr. No. of Question Paper : 6466

Unique Paper Code : 32161501

Name of the Paper : Reproductive Biology of Angiosperms

Name of the Course : **B.Sc. (H) Botany**

Semester : V

Duration : 3 Hours

Maximum Marks : 75

### Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **Five** questions in all including Question No. 1 which is compulsory.
3. All the parts of a question must be attempted together.
4. Draw well-labelled diagrams and write botanical names wherever necessary.

1. (a) Give the contribution of **any three** of the following :  
(1×3=3)

- (i) E. Strasburger
- (ii) G.B. Amici
- (iii) P. Maheshwari
- (iv) B.M. Johri

P.T.O.

- (b) Explain the following terms : (1×4=4)
- (i) Tristyly
  - (ii) Integumentary tapetum
  - (iii) Tenuinucellate
  - (iv) Caruncle
- (c) Fill in the blanks with suitable term/word : (1×8=8)
- (i) Highly specialized outermost layer of endosperm in cereals is the \_\_\_\_\_.
  - (ii) \_\_\_\_\_ type of embryogeny is where the first division of the zygote is vertical.
  - (iii) Persistent nucellus in the seed is called \_\_\_\_\_.
  - (iv) Pollination by bat is known as \_\_\_\_\_.
  - (v) Cyperaceae are characterized by \_\_\_\_\_ type of pollen grain.
  - (vi) Synergids are absent in \_\_\_\_\_ embryo sac.
  - (vii) When the pollen tube enters the ovule from the micropylar end it is called \_\_\_\_\_.
  - (viii) Ovular structure which guides the pollen tube inside the embryo sac is called the \_\_\_\_\_.

2. Draw well-labeled diagrams of the following : (3×5=15)
- (a) T.S. of young anther
  - (b) Ultrastructure of MGU or FGU
  - (c) Bitegmic anatropous ovule
  - (d) Helobial endosperm
  - (e) Ultrastructure of pollen wall
3. Write short notes on **any three** of the following : (5×3=15)
- (i) Anemophily
  - (ii) Double fertilization
  - (iii) Intra-ovarian pollination
  - (iv) Pollenkitt
  - (v) Pseudo-embryo sac
4. Differentiate between **any three** of the following : (5×3=15)
- (i) Bisporic embryo sac and Tetrasporic embryo sac
  - (ii) Egg cell and Synergid
  - (iii) 2-celled pollen and 3-celled pollen

- (iv) Amoeboid tapetum and secretory tapetum
5. (a) What is self incompatibility? What are the two efficient ways to overcome this phenomenon? (5)
- (b) What is palynology and mention its application? Discuss NPC system. (5)
- (c) Define polyembryony and give its classification. (5)
6. (a) What is monosporic embryo sac development? Discuss in detail with any one example. (5)
- (b) What is germline transformation? Substantiate your answer with any one method. (5)
- (c) Briefly discuss the various means of seed dissemination with example. (5)
7. (a) What is apomixis? Elaborate on its role in crop breeding. (5)
- (b) Briefly discuss the types of embryogeny. (5)
- (c) What is the significance of callose in megasporogenesis? (5)

6

[This question paper contains 4 printed pages.]

Your Roll No.....



Sr. No. of Question Paper : 6467

Unique Paper Code : 32161502

Name of the Paper : Plant Physiology

Name of the Course : B.Sc. (Hons.) Botany

Semester : V

Duration : 3 Hours

Maximum Marks : 75

**Instructions for Candidates**

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt five questions in all.
3. Question No. 1 is compulsory.
4. All questions carry equal marks.

1. (a) Comment on any five of the following : (5×1=5)

- (i) Calcium binding regulatory protein
- (ii) A synthetic chelating agent
- (iii) Hormone associated with foolish seedling disease

- (iv) A disease associated with Zn deficiency
- (v) A continuous system of cell walls, intercellular air spaces and xylem vessels in water and mineral transport
- (vi) Inhibitor of active transport of minerals

(b) Fill in the blanks : (5×1=5)

- (i) Skoog and Miller are associated with the discovery of .....
- (ii) Precursor of ethylene is .....
- (iii) Pigment responsible for blue light mediated responses is .....
- (iv) ..... is a natural plant antitranspirant.
- (v) Region of soil surrounding the root system is called .....

(c) Define any five of the following : (5×1=5)

- (i) Uniport
- (ii) Chelating agents
- (iii) Embolism
- (iv) Aeroponics

- (v) Apical dominance
- (vi) Necrosis

2. Distinguish between any **three** of the following : (5×3=15)

- (i) Scarification and Stratification
- (ii) Short Day Plant and Long Day Plant
- (iii) Simple and Facilitated diffusion
- (iv) Chlorosis and Etiolation

3. Discuss briefly any **three** of the following : (5×3=15)

- (i) Proton ATPase pump in nutrient uptake
- (ii) Acid growth hypothesis
- (iii) Jasmonates
- (iv) ABC model of flowering

4. (a) Illustrate the role of Gibberellic acid in  $\alpha$ -amylase synthesis in cereal aleurone layer. (5)

(b) Discuss the concept of water potential and its components. (5)

- (c) How does water rise from the root to the top of tall trees in the form of a continuous column? Explain with reference to the most accepted theory. (5)
5. (a) Give a brief account of factors affecting transpiration. (5)
- (b) List the physiological roles of Auxin **OR** Abscisic acid. (5)
- (c) Enumerate the biological responses controlled by phytochrome. (5)
6. (a) Comment on the role of Phytosiderophores in overcoming the Iron deficiency. (5)
- (b) Explain the structure and role of aquaporins in regulation of cellular water flow. (5)
- (c) Write the significant contribution of any **five** of the following : (5×1=5)
- (i) Bennet-Clark
  - (ii) A. Fick
  - (iii) S. B. Hendrick and H. A. Borthwick
  - (iv) E. Munch
  - (v) J. Levitt
  - (vi) F. W. Went

7

[This question paper contains 6 printed pages.]

Your Roll No. 12112117

Sr. No. of Question Paper : 8434

Unique Paper Code : 32167502

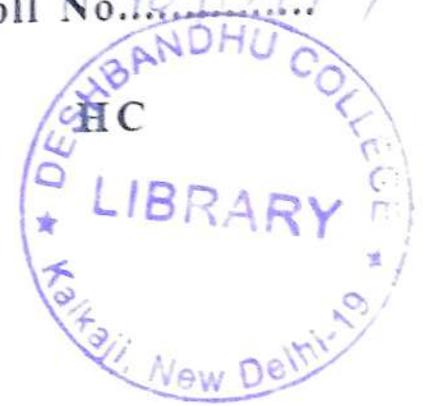
Name of the Paper : Biostatistics

Name of the Course : BOTANY : DSE for Honours

Semester : V

Duration : 3 Hours

Maximum Marks : 75



**Instructions for Candidates**

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions in all.
3. Question No. **1** is compulsory.
4. Nonscientific calculator allowed. Statistical tables provided by the college may be used if required.

1. (a) Define any **five** : (1×5=5)

(i) Secondary data

P.T.O.

- (ii) Scatter diagram
- (iii) Quartile deviation
- (iv) Degree of freedom
- (v) Range
- (vi) Paired  $t$ -test

(b) Fill in the blanks : (1×5=5)

- (i) Average of position is called .....
- (ii) The average of the upper and lower limit of a class is known as .....
- (iii) Arrangement of data into row and column is called .....
- (iv) Number of observations falling within a particular class interval is called .....
- (v) In a symmetric distribution the relation between mean, median and mode is as follows, Mode = 3 Median - .....

(c) Match the following : (5)

A	B
(i) $Q_2$	I. Mode
(ii) $\Sigma$	II. Mean Deviation
(iii) $\rho$	III. Median
(iv) $\delta$	IV. Summation
(v) $M_o$	V. Spearman Correlation coefficient

2. Discuss any **three** of the following : (5×3= 15)

- (a) What is data? Describe various methods of classification of data. Discuss significance of data classification.
- (b) What do you mean by sampling? Discuss the different sampling methods used in biostatistics.
- (c) What is arithmetic mean? How to calculate arithmetic mean? Discuss its merits and demerits.
- (d) What is correlation coefficient? Explain any two methods to calculate correlation coefficient.

3. Differentiate between any **five** of the following : (3×5=15)

- (a) Random and non-random sampling

- (b) Pie chart and histogram
- (c) Positive and negative correlation
- (d) Variable and attributes
- (e)  $t$ -test and chi square test
- (f) Standard deviation and Standard error

4. (a) Make a bar diagram for following data of a country representing the population in different year. (3)

Year	1840	1860	1880	1900	1920	1940	1960	1980
Population in Million	17.1	31.4	50.2	76.0	105.7	131.7	176.3	220.1

- (b) In a city total rainfall during the month of July 2017 were recorded day wise. With the help of  $\chi^2$  test explain if there is any significant difference. (5)

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Total Rainfall (mm)	15	17	12	10	14	20	17

- (c) Calculate the student  $t$ -test of the following data of leaf length of a plant species and check the significance. (7)

<b>Plant A (in cm)</b>	20	24	20	28	22	20	24	32	24	26
<b>Plant B (in cm)</b>	12	10	8	10	6	4	14	20	10	6

5. (a) Define biostatistics ? Mention its aims and application in biological research. (4)
- (b) Explain significance of standard deviation and coefficient of variance. (4)
- (c) Calculate the standard deviation for height of plant "Withania somnifera" from following three different locations. (7)

<b>Delhi</b>	36	56	41	46	54	59	55	51	52	44	37	59
<b>Meerut</b>	58	54	21	51	59	46	65	31	68	41	70	36
<b>Jaipur</b>	65	55	26	40	30	74	45	29	85	32	80	39

5. (a) Define regression coefficient. Why there are two regression lines ? Discuss its similarities and dissimilarities with correlation coefficient. (7)

- (b) Calculate the regression coefficient for the following data. Calculate the expected ash content is Carbohydrate content is 60. (5+3=8)

Carbohydrate content (% dw)	44	56	47	48	55	41	54	58	45	46
Ash Content (% dw)	16	14	15	17	15	19	12	11	17	14