

M.Phil. Science Examination**Paper-1****Botany****April 2019****Time : 2-30 Hours]****[Max. Marks : 70**

- Q.1.A. Explain Safety in a research laboratory. 14
OR
- Q.1 A. Write brief notes on: 14
i. Cleaning Glassware ii. Care of Microscopes
- Q.1 B. Explain in one line any four: 04
percent solution, ppm, buffer, pH, distillation, SI units
- Q.2. A. Explain the significance of information technology in detail. 14
OR
- Q.2.A. Write Short notes on : 14
i. IPR ii. Online tools.
- Q.2. B. Explain in one line any four: 04
Plagiarism, WWW, word processor, CBD, NBA, NCBI
- Q.3. A. Explain various methods of communicating scientific information. 14
OR
- Q.3.A. Describe: 14
i. Types of research ii. Need to improve presentation skills
- Q.3. B. Explain in one line any three: 03
ISSN, H-index, Research Gate, Scopus, Impact factor
- Q.4. A. Justify the significance of ANOVA in research. 14
OR
- Q.4 A. Explain: 14
i. Correlation ii. Hypothesis testing
- Q.4. B. Explain in one line any three: 03
t-test, chi-square, SPSS, standard, errors
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M.Phil. Science Examination

Paper-2

Botany

April 2019

Time : 2-30 Hours]

[Max. Marks : 70

Note: Draw the diagram where ever required.

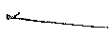
Q1- A	Explain in details the phenotyping technologies and their application of modelling.	14
OR		
Q1-A (i)	Describe the developmental origin of plant organs	07
Q1-A (ii)	What are the approaches to study plant development and generation mutants	07
Q-1 B	Short Question (Any four)	04
	1. What do you mean by agamospermy?	
	2. What is cell polarity?	
	3. Define morphometrics.	
	4. What is the role of mutagens in relation to organ development.	
	5. Explain the term phenomics.	
	6. What is CRISPR-Cas based genome editing.	
Q2-A	Give details on Fluorescence and Phase contrast Microscopy	14
OR		
Q2-A (i)	Explain the working of cellular measurements.	07
Q2-A (ii)	Give a note on Density gradient centrifugation method.	07
Q2-B	Short Question (Any four)	04
	1. Define Spectroscopy.	
	2. Full form of SEM	
	3. What is Cytophotometer.	
	4. What do you mean by fluorescence microscopy?	
	5. What is ultracentrifugation	
	6. Principle of UV visible spectrometry	
Q3-A	Write a note on DNA isolation, purification and quantification.	14
OR		
Q3-A (i)	Explain the working of HPTLC technique	07
(ii)	Describe the principle and applications of IEF.	07
Q3-B	Short Question (Any three)	03
	1. What is FISH?	
	2. Explain PAGE.	
	3. Principle of electrophoresis	
	4. What do you mean by karyotyping?	
	5. Give full form of PFGE.	
Q4-A	Describe Bio-remediation Hazards	14
OR		
Q4-A (i)	Principles of thermodynamics and their classification of energy rich compounds	07
(ii)	What are the applications of genetic engineering?	07

E109-2

Q4-B

Short Question (Any three)

03

1. What is chromosomal aberration?
 2. What is cloning?
 3. What is gene shot gun method?
 4. What are non-conventional renewable sources??
 5. What is Euploidy?
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E110-3

- (iv) What happens when maxmin and minmax values of the game are same?
- no solution exists.
 - solution is mixed.
 - saddle point exists.
 - none of the above.

Q.2

14

- (a)(i) Find the sequence that minimizes the total elapsed time required to compute the tasks and also find idle time of each machines (if any). Each job is processed in the order ABC.

		Job						
		1	2	3	4	5	6	7
Machine	A	12	6	5	11	5	7	6
	B	7	8	9	4	7	8	3
	C	3	4	1	5	2	3	4

- (ii) Solve the following sequencing problem giving an optimal solution when passing is not allowed.

		Job				
		A	B	C	D	E
Machine	P	11	13	9	16	17
	Q	4	3	5	2	6
	R	6	7	5	8	4
	S	15	8	13	9	11

OR

- (b)(i) A shop has four machines A, B, C and D. Two jobs must be processed through each of these machines. The time (in hrs) taken on each of the machine and the necessary sequence of jobs through the shops are given below:

Job 1	Sequence	A	B	C	D	E
	Time (in hrs)	2	4	5	1	2
Job 2	Sequence	D	E	A	C	B
	Time (in hrs)	6	4	2	3	6

Use the graphical method to obtain the total minimum elapsed time.

- (ii) We have six jobs, each of which must go through machines A, B and C in the order ABC. Processing time (in hrs) are given in the following table.

		Job					
		1	2	3	4	5	6
Machine	A	8	3	7	2	5	1
	B	3	4	5	2	1	6
	C	8	7	6	9	10	9

- (c) Choose correct answer
- (i) The minimum processing time on machine M_1 and M_2 are related as

04

P.T. 0

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E 110-4

- a. $\text{Min } t_{1j} = \text{Max } t_{2j}$
 - b. $\text{Min } t_{1j} \leq \text{Max } t_{2j}$
 - c. $\text{Min } t_{1j} \geq \text{Max } t_{2j}$
 - d. $\text{Min } t_{2j} \geq \text{Max } t_{1j}$
- (ii) If there are n – jobs to be processed, one at a time, on each of m – machines, the possible sequences would be
- a. $(n!)^m$
 - b. $(m!)^n$
 - c. n^m
 - d. m^n
- (iii) Unforeseen factors that prevent plans from actually happening are
- a. Equipment may develop a fault.
 - b. Additional order may arrive to be added to schedules.
 - c. Specifications may be changed.
 - d. all of the above.
- (iv) You would like to assign operators to the machine that has
- a. most jobs waiting to be processed.
 - b. job with the earliest due date.
 - c. job which has been waiting longest.
 - d. all of the above.
- Q.3 (a) Discuss Ritz Element method. 14
- OR**
- (b) Solve $u'' + (1+x^2)u + 1 = 0, u(\pm 1) = 0$ by the finite element method.
- (c) Attempt any ONE 03
- (i) What is convergence analysis?
 - (ii) Discuss interpretation of completeness.
- Q.4 (a) Discuss Weighted Residual and weak form of $A Eu'' + q = 0$ and the boundary 14 conditions $u(0) = u_0$ and $A Eu' \Big|_{x=L} = P_L$.
- OR**
- (b) Consider a 1 m. long steel (3×10 mm cross-section) held fixed at its left end and subject to a concentrated force of 100 N at its right end. The differential equation is as given in Q.4 (a). Set $A = 30 \times 10^{-6} \text{ m}^2$, $E = 2 \times 10^{11} \text{ N/m}^2$, $q_0=0$, $F_1 = R_1$ (the support reaction force), $F_2 = 0$ and $F_3 = 100 \text{ N}$. Solve using FEM.
- (c) Write procedure for finite element analysis starting from a given differential 03 equation.

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2904E0128

Candidate's Seat No : _____

M.Phil. Science Examination
Paper-3 : Botany
603 Advance Plant Physiology
April 2019

Time : 2-30 Hours]

[Max. Marks : 70

- Q.1.A. Explain factors affecting growth and development. 14
OR
- Q.1 A. Write brief notes on: 14
i. Abiotic stress ii Methods of growth analysis
- Q.1 B. Explain in one line any four: 04
ROS, signal transduction, dormancy, growth correlations, biotic stress, senescence
- Q.2. A. Explain any one natural plant hormone in detail. 14
OR
- Q.2.A. Write Short notes on : 14
i. Maleic hydrazide ii. Jasmonic acid
- Q.2. B. Explain in one line any four: 04
. Brassinoids, Polyamines, Saponins, Cycocel, Phenols, Morphactins
- Q.3. A. Explain the physiological aspects of rooting . 14
OR
- Q.3.A. Describe: 14
i. Green House ii. Applications of plant physiology
- Q.3. B. Explain in one line any three: 03
Grafting, bonsai, English gardens, topiary, budding
- Q.4. A Justify Micropropagation for large scale multiplication of plants. 14
OR
- Q.4 A Explain: 14
i. Somatic embryogenesis ii. Protoplast fusion
- Q.4. B. Explain in one line any three: 03
Somaclonal variations, Biosafety, Transgenic plants, cryopreservation, GSBTM
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2904E0128

Candidate's Seat No : _____

M.Phil. Science Examination

Paper-3 : Botany

603 Advance Plant Ecology

April 2019

Time : 2-30 Hours]

[Max. Marks : 70

Note: Draw the diagram where ever required.

Q1- A	Explain the kinds of Ecosystems	14
	OR	
Q1-A (i)	Describe the Abiotic factors of an Ecosystem	07
Q1-A (ii)	Explain the Biotic factors involved in an Ecosystem	07
Q-1 B	Short Question (Any four)	04
	1. What do you mean by food chain?	
	2. What is Ecological energetics?	
	3. Define Productivity	
	4. What is the role of precipitation in relation to plants	
	5. Explain the term antibiosis	
	6. Name the structures of an Ecosystem	
Q2-A	Give the composition and structure of Synecology	14
	OR	
Q2-A (i)	Explain the combining concepts of limiting factors	07
Q2-A (ii)	Give a note on Genecology	07
Q2-B	Short Question (Any four)	04
	1. Define Autecology	
	2. What is Liebig's Law of minimum?	
	3. Define the term mutualism.	
	4. What do you mean by community ecology	
	5. Explain Herbivory	
	6. Define Ecological Niche	
Q3-A	What are the Phytogeographic Regions of India	14
	OR	
Q3-A (i)	Explain the type of soil and climate of Gujarat	07
(ii)	Describe the continental Drift Theory	07
Q3-B	Short Question (Any three)	03
	1. Name the forests of India	
	2. Explain Allelopathy	
	3. What are Boreal regions?	
	4. What do you mean by plant community	
	5. Give full form of NBA and GBB.	
Q4-A	What are conservation Strategies	14
	OR	
Q4-A (i)	Describe the Wetlands of Gujarat	07
(ii)	What are Mangroves and where are they found in India.	07
Q4-B	Short Question (Any three)	03
	1. What is environment monitoring?	
	2. Name any two Bioindicators	
	3. What are ICZM projects?	
	4. Why was the Forest Conservation Law passed?	
	5. Name any Environmental Projects in Gujarat	