Practical – IV : Physiology, Tissue culture, Biotechnology, Seed Technology and Horticulture

Practical Syllabus

MODEL QUESTION PAPER

Time: 3 Hrs **Maximum : 50 Marks**

I. Major Experiment (ONE)	**: 15 Marks**
II. Minor Experiment (ONE)	**: 10 Marks**
III. Scientific Observations (ONE)	**: 5 Marks**
IV. Critical notes on spotters of scientific interest (FIVE)	**(5×2): 10 Marks**
V. Project Work	**: 5 Marks**
VI. Record	**: 5 Marks**

Practical – IV : Physiology, Tissue culture, Biotechnology, Seed Technology and Horticulture

Practical Syllabus

QUESTION BANK

Time: 3 Hrs **Maximum : 50 Marks**

I. Major Experiments : 15 Marks

1. Determination of osmotic potential of vacuolar sap by plasmolytic method using leaves of *Rhoeo/ Tradenscantia.*
2. Determination of stomatal frequency using leaf epidermal peeling.
3. Separation of chlorophyll pigments using paper chromatography technique.
4. Estimation of protein by biuret method/ Lowry et al mthod
5. Estimation of DNA

II. Minor Experiments : 10 Marks

6. Determination of rate of transpiration using cobalt chloride method.
7. Determination of catalase activity using plant material/photographs.
8. Demonstration of seed dressing using fungicide to control diseases.
9. Demonstration of seed dressing using biofertiliser (*Rhizobium)* to enrich nutrient supply.
10. Demonstration of Micropropagation using explants like axillary buds and shoot meristems.

III. Scientific Observations : 5 Marks

11. Study of mineral deficiency symptoms using plant material/ photographs.
12. Study of non-dormant seed germination: Breaking of seed dormancy caused by hard seed coat using scarification technique.
13. Study of the application of plant growth regulator (IBA and NAA) for rooting of cuttings using Ornamental plants.
14. Study of protocols and photographs/charts related to Plant biotechnology: Isolation of plasmid DNA, separation of DNA by gel electrophoresis.
15. Study visits to places of horticultural and biotechnological interest-Commercial nurseries/ Botanical gardens; Biotechnology R & D laboratories/Industries

IV. Critical notes on spotters of scientific interest : 10 Marks

16. Spade
17. Pick-axe
18. Shade net (photo)
19. Glass house (photo)
20. Mist chamber (photo)
21. Antibiotics
22. Vaccines
23. Biofertiliers
24. Single Cell Protein
25. Cosmetics
26. Multiple shoots
27. Somatic embryos
28. Artificial/ Synthetic seeds

V. Project Work : 5 Marks

VI. Record : 5 Marks

MODEL QUESTION PAPER FOR PRACTICAL EXAMIATION
&
SCHEME FOR EVALUATION

Time: 3 h Maximum Marks: 50

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Note: Questions to be set based on prescribed Laboratory Exercises in the following pattern

I. Major Laboratory Exercise: 15 Marks

- For in-depth testing of scientific and major technical skill of students.

Perform/conduct the experiment or prepare the given material by taking sections and doing staining for scientific study.

Scheme for valuation: Procedure- 3 marks + Experimentation -6 marks + Observations or Recording of results – 3 marks + Discussion – 3 marks (*Total: 15 marks*).

II. Minor Laboratory Exercise: 10 Marks

- To test minor technical skill of students.

Make suitable minor preparation of the given plant material(s) for scientific study.

Scheme for valuation: Preparation- 5 marks + Identification - 3 marks + Discussion – 2 marks (*Total: 10 marks*).

III. Scientific Observation and data analysis: 5 Marks

Using specimens/ scientific data in a Figure / Photograph/ Table/ Diagram etc.

Scheme for valuation: Observations -2 marks + Identification- 1 mark + analysis - 2 marks (*Total: 5 marks*).

IV. Critical notes on (FIVE **) spotters of scientific interest 10 Marks**

Using specimens/ slide/ Photograph/ data in a Figure or Table

Scheme for valuation: Identification – 1mark + Notes- 1 mark for each spotter (*Total: 10 marks for five spotters*).

V. Project Work: 5 Marks

VI. Record(s) and Submission: (Scientific preparations/ collection like preserved specimens, slides, herbarium, working models, clippings of scientific articles, etc.) **5 Marks**

Suggested Titles Related to Third Year Syllabus: (For Project Work)

1. Prospecting of plants for alternative (non-conventional) energy sources.
2. Phytoremediation of polluted soils / water.
3. Biodiversity of a habitat.
4. Biodiversity of a selected sacred groove.
5. Study of a natural ecosystems around.
6. Explore the food chain in the local natural ecosystem.
7. Agrobiodiversity of a region.
8. Threatened plants of a region.
9. Survey of root-nodule forming plants of a region.
10. Invasive plants of a region.
11. Identification of C4 and CAM plants of a region.
12. Mineral deficiency of selected element in plants and its control.
13. Breaking of seed dormancy (of a tree species).
14. Seed variability of commercially available seeds.
15. Applications of antitranspirants.
16. Factors affecting photosynthesis (light, CO_2 , temperature).
17. Effects of water stress on growth and development of plants.
18. Micropropagation of endangered or threatened medicinal plants.
19. Production of synthetic seeds.
20. Application of plant growth regulators for rooting of stem cuttings.
21. Prolongations of self- life of vegetables / edible fruits /flowers.
22. Applications of plant growth regulators in Horticulture.
23. Prolongation of self life of vegetables / edible fruits / flowers.
24. Mineral deficiency of selected elements in plants and its control.
25. Seed quality, storage ad viability of selected crop plant.
26. Colonel propagation of Horticulture plants.

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