

[This question paper contains 10 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 2482

IC

Unique Paper Code : 42167901

Name of the Paper : Economic Botany and  
Biotechnology

Name of the Course : B.Sc. (Prog.) Life Sciences :  
DSE - 1B

Semester : VI

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 Section A and B on SEPARATE SHEETS.
3. Question No. 1 of both sections is COMPULSORY.
4. Attempt three questions from Section A and three questions from Section B including question number 1 of both sections.
5. Attempt all parts of the question together.

**SECTION - A**

1. (a) Give the botanical name and family of the plant which is major source of the following : Attempt any five :

(5×1=5)

P.T.O.

- (i) Caffiene
- (ii) Eugenol
- (iii) Cellulosic fibre
- (iv) Bread
- (v) Edible oil
- (vi) A plant which is the richest source of proteins amongst the legumes.
- (vii) A legume plant which is a rich source of oil.

(b) Expand any five of the following : (5×0.5=2.5)

- (i) CIMAP
- (ii) CIMMYT
- (iii) IARI
- (iv) NBPGR
- (v) FAO
- (vi) FRI

2. (a) Differentiate between any two of the following :  
(2×2.5=5)

- (i) Black tea & Green tea
- (ii) Animal fibre & Vegetable fibre
- (iii) Assam Tea & China Tea
- (iv) Semi drying oil & Drying oil

(b) Give the principal state of India where the following are extensively grown :  
(5×1=5)

- (i) Groundnut
- (ii) Tea
- (iii) Cotton
- (iv) Soybean
- (v) Pepper

(c) Give botanical names and family of the plants exhibiting the following special features :

- (i) Caryopsis fruit

(5×1=5)

P.T.O.



- (ii) Most plant parts aromatic in nature
- (iii) Dimorphic branching
- (iv) Geocarpic fruit
- (v) Drupe fruit

3. (a) Draw well labelled diagrams of any **two** of the following : (2×2.5=5)

- (i) V.S. of tea leaf
- (ii) L.S. of Clove floral bud
- (iii) C.S. of black pepper
- (iv) L.S. of wheat caryopsis

(b) Write short notes on any four of the following :

(4×2.5=10)

- (i) Origin of hexaploid wheat
- (ii) General utilization of spices
- (iii) Significance of antioxidants in fatty oils

(iv) Importance of study of centre of origin of cultivated crops

(v) Economic Importance of Legumes

4. (a) Comment on any **four** of the following statements. Support your answer giving reasons : ( $4 \times 2.5 = 10$ )

(i) Toxic substances in some legumes can cause diseases in humans.

(ii) Hydrogenated end product of fatty oil has better keeping quality than the fatty oil itself.

(iii) Dwarf varieties have played an important role in increasing the productivity in wheat.

(iv) Tea plant is pruned regularly.

(v) The groundnut fruits develop underground but the flowers are aerial.

(b) Fill in the blanks. Attempt any **ten** of the following : ( $10 \times 0.5 = 5$ )

- (i) The term ..... is given to those members of the Poaceae which are cultivated for their fruits (grains).
- (ii) ....., Russian botanist, worked extensively on origin of cultivated crops.
- (iii) Triglycerides of complex organic acids are called .....
- (iv) Legumes are important source of ..... in daily diet of vegetarians.
- (v) Wonder bean/poor man's meat is botanically known as .....
- (vi) ..... fibers are epidermal prolongations of the seed coat cells.
- (vii) Botanical name of New world or American Cotton is .....
- (viii) ..... is known as the King of Spices.
- (ix) ..... non-volatile fraction responsible for the pungency of black pepper.



- (x) The stimulating and refreshing characteristic of tea is due to the presence of alkaloid .....
- (xi) ..... is the protein which results in the formation of an elastic dough and excellent baking quality of wheat.
- (xii) "Mother of cloves is the ripened ..... of clove.

### SECTION - B

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

- (i) Hybridoma
- (ii) Monoclonal antibodies
- (iii) Microprojectile bombardment
- (iv) Somaclonal variation
- (v) Chimeric plant
- (vi) T-DNA

P.T.O.

(b) Fill in any **five** of the blanks : (5×0.5=2.5)

- (i) The technique of DNA fingerprinting was devised by \_\_\_\_\_.
- (ii) Crown gall disease in plants is caused by \_\_\_\_\_.
- (iii) \_\_\_\_\_ technique is used in forensics to identify criminals and also for paternity determination.
- (iv) Haploid plants can be produced by \_\_\_\_\_ culture.
- (v) Incorporation of \_\_\_\_\_ causes the pre-mature termination of polynucleotide chain in DNA sequencing reaction.
- (vi) \_\_\_\_\_ genes of Ti plasmid are responsible for T-DNA transfer into plants.

2. (a) Differentiate between any **two** of the following : (2×2.5=5)

- (i) PCR and RT-PCR
- (ii) Northern and western blotting



(iii) RAPD and RFLP

(b) Match the following :

(5×1=5)

- |                        |                   |
|------------------------|-------------------|
| (i) Southern blotting  | Kary Mullis       |
| (ii) Endosperm culture | Western blotting  |
| (iii) PVDF membrane    | Genomic DNA       |
| (iv) Androgenesis      | Triploids         |
| (v) PCR                | Guha & Maheshwari |

(c) Write explanatory notes on any one : (5)

(i) Micropropagation

(ii) ELISA

3. (a) Describe in detail Sanger's method of DNA sequencing and its advancement in recent times. (8)

(b) Describe the process of embryo culture. Mention the applications of the technique. (7)

4. (a) Illustrate the process of *Agrobacterium*-mediated gene transfer in plants and its role in the production of golden rice. (8)

P.T.O.

(b) Explain the technique of PCR. Mention a few applications and limitations of the technique.

(7)

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