This question paper contains 4 printed pages.]

Your Roll No. .....

1302-A **A**

B.Sc. (Hons.)/III

BOTANY–Paper VII

(Plant Physiology)

(OC—Admissions of 2003 and before)

Time : 3 *Hours* *Maximum Marks* : 55

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt ***five*** *questions in all, including Question No.* **1** *which is compulsory.*

All parts of a question should be answered together.

1. (a) Name any ***six*** of the following :

   (i) A synthetic auxin

   (ii) An ethylene-releasing substance

   (iii) The metal present in the chlorophyll molecule

   (iv) A calcium-binding regulatory protein

   (v) Location of catalase

   (vi) An enzyme involved in sucrose degradation

   (vii) A CAM plant 6

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(b) Answer any ***three*** of the following :

(i) What is the other name for the C_4 cycle ?

(ii) What are the sites of the light and dark reaction of photosynthesis ?

(iii) How many ATP molecules are generated by the complete oxidation of one glucose molecule ?

(iv) What is the unique feature of phytochrome which differentiates it from all other pigments ? 3

(c) Write a major contribution of any ***four*** of the following :

(i) R. Emerson

(ii) M. H. Zimmermann

(iii) G. Melchers

(iv) Miller et al

(v) Pfeffer, Julius Sachs and Knop 4

(d) How have the following helped in our understanding of plant physiology ? Attempt any ***two***.

(i) Aphids

(ii) *Avena* seedlings

(iii) Leaves of the bean plant 2

2. Answer any ***five*** of the following :

(a) How can we determine the wavelengths best suited for a light mediated process ?

(b) Why are hedges pruned at regular intervals ?

(c) Why do imbibed embryoless half-grains of barley lack amylase activity ?

(d) What are the general functions of mineral elements ?

(e) How are plants able to acquire iron from the soil although iron is often in the insoluble form ?

(f) What happens to the nitrate absorbed by plants ? 10

3. Briefly explain the following :

(a) RQ

(b) Scarification

(c) Apparent free space

(d) Trace element

(e) Substrate-level phosphorylation

(f) Callus

(g) Isoelectric point

(h) Bioassay

(i) Water potential

(j) Senescence $1 \times 10 = 10$

4. Differentiate between the following. Attempt any ***five***.

   (a) Holoenzyme and apoenzyme

   (b) Hypotonic and hypertonic solutions

   (c) Short-day and long-day plants

   (d) Channel and carrier proteins

   (e) Epigeal and hypogeal germination

   (f) Constitutive and inducible enzymes 10

5. Write an account on any ***two*** of the following :

   (a) Stomatal movements

   (b) Münch's mass flow hypothesis

   (c) Geotropism 10

6. Answer any ***two*** of the following :

   (a) Discuss how is Ammonia assimilated in plants.

   (b) Discuss the mechanism of action of enzymes.

   (c) Differentiate C_3 plants from C_4 plants. 10

7. (a) Diagrammatically represent the citric acid cycle. 6

   (b) Explain the method by which we can find out whether a hormone shows polar transport or not. 4

8. Discuss any ***two*** of the following :

   (a) Growth and its measurement

   (b) Cohesion-tension theory

   (c) β–oxidation 10

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