

CCE(M)/BTN-I/10/2024

BOTANY

(PAPER—I)

Time : 3 hours]

[Full Marks : 250

Please read each of the following instructions carefully before attempting the questions :

- (i) There are **eight** questions divided in **two Sections**.
- (ii) Candidate has to attempt **five** questions in all.
- (iii) Question Nos. **1** and **5** are compulsory and out of the remaining, **three** are to be attempted choosing at least **one** question from each Section.
- (iv) The number of marks carried by a question/part is indicated against it.
- (v) Word limit in questions, wherever specified, should be adhered to.
- (vi) Attempts of questions shall be counted in sequential order. Unless struck off, attempt of a question shall be counted even if attempted partly. Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.

SECTION—A

ESTD : 1988

1. Answer *any five* of the following questions :

10×5=50

- (a) Write a note on fungal toxins.
- (b) Briefly describe plant tissue culture.
- (c) Write a short note on types of trichomes.
- (d) Write a short note on somaclonal variations in plants.
- (e) What are the characteristic features of Orchidaceae?
- (f) Give a brief account of bacterial structure and reproduction.
- (g) Write a short note on numerical taxonomy.

2. Answer the following questions :

- (a) What is Kranz anatomy? What is its significance? With the help of suitable diagrams, show the anatomical differences between C3 and C4 plants.

5+15=20

(b) What are stomata? Write their significance. With the help of suitable diagrams, explain the different types of stomata found in plants. 5+10=15

(c) What is the primary function of xylem and phloem in plants? Distinguish between them in terms of structure and function. 5+10=15

3. Answer the following questions :

(a) How does anomalous secondary growth occur in plants? Explain using one example of stem. Draw a suitable diagram to depict the same. 5+10+5=20

(b) Describe the origin of cultivated plants with special reference to Vavilov's centre of origin. Give the botanical names of plants (any two) used in edible oil extraction. 10+5=15

(c) What are the salient features of bryophytes? Give points in favour of unique and advanced sporophyte of *Anthoceros* indicating evolutionary trend. 5+10=15

4. Answer the following questions :

(a) Give detailed explanation of different types of life cycle patterns found in different algal groups. Explain with the help of suitable sketch/line diagrams. 15

(b) Describe any five crop diseases in plants. Mention their causal organism, host plant and symptoms. 15

(c) What are phanerogams? How do they differ from cryptogams? Write the characteristic features of gymnosperms. Describe the salient features of Gnetales, their structure and reproduction. 5+5+10=20

SECTION—B

5. Write short notes on *any five* of the following : 10×5=50

(a) Mycoplasma

(b) Plant quarantine

(c) Energy Plantations

(d) Applications of palynology

(e) Salient features of family Rubiaceae

(f) Protoplast culture and its applications

(g) Pollination

6. Answer the following questions :

- (a) What is endosperm? Write its significance. Discuss the development of different types of endosperms with the help of suitable diagrams. 5+15=20
- (b) What are the major spices obtained from plant sources in India? Give the common name, botanical name, part of the plant used and any two uses for five spices. 5+10=15
- (c) Name any five different types of embryo sacs existing in plants. With the help of a suitable diagram, explain Polygonum type of embryo sac. 5+10=15

7. Answer the following questions :

- (a) What is chemotaxonomy? Write its significance. Give suitable diagrams and examples to elaborate how anatomical features can be used as taxonomic evidence. 5+15=20
- (b) Differentiate between microsporogenesis and megasporogenesis. Explain the development of male gametophyte with the help of suitable diagrams. 5+10=15
- (c) What is somatic hybridization? What is its significance? Explain the key steps involved in somatic hybridization. Explain with the help of suitable diagram(s)/flowchart. 5+10=15

8. Answer the following questions :

- (a) What is dendrochronology? Discuss its importance. With the help of a diagram, explain the effect of seasonal change in temperate conditions on the anatomy of wood. 5+10=15
- (b) Define fossil and fossilization. Define any five different types of fossils. Discuss any one technique used for the study of fossils. 5+10+5=20
- (c) Discuss the applications of microbiology in agriculture, industry and in controlling soil and water pollution. 15

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SPACE FOR ROUGH WORK



CCE(M)/BTN-II/10/2024

BOTANY

(PAPER—II)

Time : 3 hours]

[Full Marks : 250

Please read each of the following instructions carefully before attempting the questions :

- (i) There are **eight** questions divided in **two Sections**.
- (ii) Candidate has to attempt **five** questions in all.
- (iii) Question Nos. **1** and **5** are compulsory and out of the remaining, **three** are to be attempted choosing at least **one** question from each Section.
- (iv) The number of marks carried by a question/part is indicated against it.
- (v) Word limit in questions, wherever specified, should be adhered to.
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SECTION—A

ESTD : 1988

1. Answer any five of the following questions in about 150 words each :

10×5=50

- (a) What are polytene chromosomes?
- (b) Write a note on Photorespiration.
- (c) Differentiate between prokaryotic organisms and eukaryotic organisms.
- (d) What do you understand by Environmental Impact Assessment (EIA)?
- (e) What is vernalization?
- (f) Write a note on ecosystem.
- (g) What is polyploidy?

2. Answer the following questions :

- (a) What is the difference between tropic and nastic movements in plants? Give a detailed account of tropic movements in plants. 5+10=15
- (b) Distinguish between correlation and regression. Describe standard deviation and chi-square test. 5+10=15
- (c) What are molecular markers? What are the qualities of a good marker? What is the significance of molecular markers in plant breeding? 5+5+10=20

3. Answer the following questions :

- (a) What are mutations? What is their significance? Discuss different types of mutations with examples. 5+5+10=20
- (b) With the help of well labelled diagrams, explain the process of meiosis. What is its significance? 10+5=15
- (c) Describe the structure, properties and function of B-chromosome. 15

4. Answer the following questions :

- (a) What are the abiotic stresses experienced by plants? Describe the salinity stress response in plants. 5+15=20
- (b) What are biogeochemical cycles? Explain the carbon cycle in detail. 5+10=15
- (c) Give a detailed account of phytogeographical regions of India. 15

SECTION—B

5. Write short notes on *any five* of the following :

10×5=50

- (a) Fish
- (b) Southern blotting
- (c) Mitochondria
- (d) Biological nitrogen fixation
- (e) Chemiosmotic theory
- (f) Mass flow hypothesis
- (g) Symptoms of nitrogen deficiency

6. Answer the following questions :

- (a) What is photophosphorylation? Write the full form of ATP and NADPH. What is its significance? Differentiate between cyclic and non-cyclic photophosphorylation with the help of neatly labelled diagrams. $3+2+3+12=20$
- (b) Define reaction center and accessory pigments. Write different types of chloroplast pigments involved in the process of photosynthesis. $5+10=15$
- (c) What is the difference between enzymes and co-enzymes? How does lock and key hypothesis differ from induced fit model of enzyme action? $5+10=15$

7. Answer the following questions :

- (a) Give an account of structure and function of nucleus and nucleus-pore complex. $10+10=20$
- (b) What are plant growth regulators? Elaborate upon the physiological role of auxins in plants. $5+10=15$
- (c) What is plant breeding? What is its significance? Discuss various methods of plant breeding. $5+10=15$

8. Answer the following questions :

- (a) Describe sex linked, sex influenced and sex limited traits with the help of one example in each. Give a detailed account of sex-linked inheritance. $10+10=20$
- (b) What are phytochromes? How does Pr differ from Pfr? What is photoperiodism? Differentiate between short day and long day plants. $5+5+5=15$
- (c) Explain DNA sequencing and give its significance. Elaborate the principle and procedure of Sanger's method of DNA sequencing. $5+10=15$

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SPACE FOR ROUGH WORK

