**QUESTION PAPER SPECIFIC INSTRUCTIONS**

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

There are EIGHT questions divided in Two Sections and printed both in HINDI and in ENGLISH. Candidate has to attempt FIVE questions in all.

Question Nos. 1 and 5 are compulsory and out of the remaining, THREE are to be attempted choosing at least ONE from each Section.

The number of marks carried by a question/part is indicated against it.

Answers must be written in the medium authorized in the Admission Certificate which must be stated clearly on the cover of this Question-cum-Answer (QCA) Booklet in the space provided. No marks will be given for answers written in a medium other than the authorized one.

Word limit in questions, wherever specified, should be adhered to.

Diagrams/Figures, wherever required, shall be drawn in the space provided for answering the question itself.

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.
Q. 1 Explain the following:

Q. 1(a) Mitochondria

Q. 1(b) Extrinsic and Intrinsic proteins

Q. 1(c) Genetic code

Q. 1(d) Hybrid vigour

Q. 1(e) Self-incompatibility

Q. 2(a) Distinguish between prokaryotic and eukaryotic cell.

Q. 2(b) Discuss briefly the evidence of organic evolution.

Q. 2(c) Describe briefly the various methods of gene transfer.

Q. 3(a) Describe the structure, behaviour and significance of special types of chromosomes.

Q. 3(b) What is the role of RNA in the origin and evolution of living organisms?

Q. 3(c) Describe the method of developing disease and insect resistant varieties through back cross method of breeding crop varieties.
Q. 4(a) गुणसूत्रों में संख्यात्मक विभिन्नता का क्षण कीजिए।
Describe the numerical variation in chromosomes. 15

Q. 4(b) उत्परिवर्तनों का जैवरसाधारण और आधिक आधार क्या है?
What is the biochemical and molecular basis of mutations? 20

Q. 4(c) रोग प्रतिरोध की क्रियाविधि (सेक्लेनिज्म) पर संक्षेप में चर्चा कीजिए।
Discuss briefly the mechanism of disease resistance. 15

SECTION—B

Q. 5 निम्नलिखित को स्पष्ट कीजिए :—
Explain the following :— 10×5=50

Q. 5(a) ए.टी.पी. सिंथेज
ATP synthase 10

Q. 5(b) जीर्णता
Senescence 10

Q. 5(c) जैव-विषयता का संरक्षण
Conservation of biodiversity 10

Q. 5(d) अंत:क्रमण (इक्वेजन) की स्पीषीज आधारित क्रियाविधि
Species based mechanism of invasion 10

Q. 5(e) नेशनलीय ऊर्जा के मुख्यारूप
Mainstream forms of renewable energy. 10

Q. 6(a) जैविक नाइट्रोजन भौगोलिकरण के प्रक्रम का, वित्त-नाइट्रोजे व पर विशेष बल देते हुए, वर्णन कीजिए।
Describe the process of biological nitrogen fixation with special emphasis on denitrogenase. 15+5

Q. 6(b) पदार्थविद्यारायण प्रदूषण के प्रमुख तत्तवों पर और उनके कारणों पर चर्चा कीजिए।
Discuss the principal systems of environmental pollution and the reasons thereof. 15

Q. 6(c) वायु श्वसन की इलेक्ट्रॉन अभिप्रेरण शृंखला से संबंध विभिन्न उप-सूत्रकणिकीय (माइटोकोडियल) कंपैक्टेस का वर्णन कीजिए।
Describe different sub-mitochondrial complexes associated with electron transport chain of aerobic respiration. 15
Q. 7(a) Enumerate the salient features of water relations in crop plants.

Q. 7(b) What are the characteristics of phytochrome induced responses in flowering of higher plants? How do they control flowering?

Q. 7(c) Distinguish between natural and social forests. Discuss in detail the various objectives of social forestry.

Q. 8(a) Describe the mechanism of CO₂ fixation in CAM plants.

Q. 8(b) Describe any four principal phytogeographical regions of India.

Q. 8(c) Discuss the various advantages and limitations of phytoremediation.