2019

BOTANY– PAPER-II

Time Allowed- 3 Hours *Full Marks – 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answers may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Answer any five Questions

1. Answer any four questions :

(a) Answer the following in brief :-

(i) What is oncogene give an example.

(ii) Mention the types of gametes expected from the genotype AABBCa.

(iii) What are phagmid vectors?

(iv) What is florigen?

(v) What is Richmond Lang effect? 2x5

(b) Explain the role of :-

(i) Gibberellin in seed germination.

(ii) Helicase & primase in DNA replication. 5+5

(c) Distinguish between :-

(i) Paracentric & pericentric inversion.

(ii) Cyclic & noncyclic electron transport of photosynthesis. 5+5

(d) (i) Given Km=2.0 $mmol^{-1}$, $[S_o]$=1.0 $mmol^{-1}$ & V_o= 70nimol $L^{-1}mes^{-1}$ Calculate V_{max} using narehaclis- Mention equation. 5

(ii) Mention five applications of micropropagation. 5

(e) (i) Give an account of Agrobacterium mediated gene transfer. 5

(ii) Discuss the structure & properties of nitrogenase. 5

2. Answer any four questions :-

(a) Answer the following in breif :-

(i) What is rebozyme? Give an example.

(ii) Name the termination codons of protein synthesis.

(iii) What structal component is common to ATP, NADP, RNA.

(iv) Define crude drug.

(v) Write the full form of ELISA. 2x5

(b) Justify the following :-

(i) 'Crossing over involves a physical exchange between segments of homologous chromosomes'.

(ii) 'Photorespiration is a necessary evil'. 5+5

(c) Distinguish between :-

(i) Mass selection & pureline selection.

(ii) Oxidative phosphorylation & photophasphorylation. 5+5

(d) (i) Give an breif account of mode of enzyme action.

(ii) Calculate mean, variance & standard deviation of the following data of plant height in cm. 5

161, 183, 170, 155, 191, 162, 167, 150, 210, 201, 211, 179, 188.

(e) (i) Discuss the importance of pharmacognosy in modern medicine. 5

(ii) State the principles & application of confocal microscopy. 5

3. Answer any four questions :-

(a) Answer the following in brief :-

(i) Differentiate between dominonce & epistasis.

(ii) When photosynthesizing plants are deprived of light, PGA contents morease - Justify why?

(iii) Define abenzyme. Give an example.

(iv) How many type of primary & secondary trisomies can be produced in an organism with 2n=10chromosomes.

(v) What is NOR? State its function. 2x5

(b) Explain the following in brief :-

(i) Concept of RNA world

(ii) Morphological evidence of evlution. 5+5

(c) Write short notes on :-

(i) Laws of probability.

(ii) Concept of biological clock. 5+5

(d) (i) Discuss the structure & flow of electrons through PS II. 5

(ii) Discuss the process of aminoacylation of t-RNA. 5

(e) (i) Find out the allelic frequencies (of blood group AB & O) from the sample in Hardy Weinberg equilibrium A=25, B=20, AB=5 & O=50. 5

(ii) Mention the oxidative decarboxylation reactions of krebs cycle. Name the substrate, product and enzyme of each. 5

4. Answer any four.

(a) Answer the following in brief :-

(i) What are 'Okazaki' fragments?

(ii) Define 'null hypothesis'.

(iii) Name the Co_2 acceptors in C_3 & C_4 plants.

(iv) What is lectin? What role does it have in 'symbiotic' N_2 fraction.

(v) What is biolistic gun? 2x5

(b) Explain the following :-

(i) Role of MPF in cell cycle. 5

(ii) Role of ABA in stomatal closing. 5

(c) Distinguish between :- 5

(i) Reversible & Irreversible enzyme inhibition. 5

(ii) Lamarckism and Darwinism.

Contd..P/3.

(d) (i) How will you show Km value corresponds to the substrate concentration which is half of the concentration of the substrate concentration where velocity is maximum (V max). 5

(ii) Gove a brief account of overlapping genes in ϕx174. 5

(e) (i) Discuss the type of RNA present in an eukaryotic cell. 5

(ii) Discuss the species name, family, order and bioactive compound of Adhatoda. 5

5. Answer any four of the following

(a) Answer the following in brief :-

(i) What do you understand when a fatty acid is abbreviated as 20:2Δ9,12?

(ii) A plant has chromosome number 2n=14. What are the member of linkage groups present?

(iii) What is Wobble hypothesis?

(iv) Why pH 7.0 considered as neutral pH?

(v) Draw the structure of 1AA. 2x5

(b) Commen on :-

(i) Role of cold treatment in flowering.

(ii) Henderson - Hasselbalch equation. 5+5

(c) Explain in brief :-

(i) Levels of packaging of eukaryotic DNA.

(ii) Primary, secondary, tertiary structure of proteins. 5+5

(d) (i) There are two adjacent living cells A & B. Cell has an osmotic potential (U) of - 10 bars and pressure potential (U) of 5 bars, whereas cell B has an osmatic potential of - 5 bars and a pressure potential of 2 bars. State the direction of water flow in the cells with explanation. 5

(ii) Mention the criteria of an ideal cloning vector. 5

(e) (i) Discuss the triplet binding technique of deciphering genetic code. 5

(ii) Discuss the 'Mass flow' hypothesis of organic translocation. 5

6. Answer any four of the following :-

(a) Answer the following in brief :-

(i) State the role of Rec A.

(ii) Define'goodnes of fit'.

(iii) What do you understand the dual role of RuBISCO.

(iv) What are palindromic sequesnces? Give example.

(v) Define proteomics. 2x5

(b) Distinguish between :-

(i) Rho dependent & Rho independent termination of transcription.

(ii) Structure and function of DNA And RNA.

Contd..P/4

(c) Explain the following :-

(i) Nomenclature of enzymes.

(ii) SDP should rightly be called long night plants. 5+5

(d) (i) Calculate the number of ATP molecules produced by complete oxidation of a saturated 16 C fatty acid. 5

(ii) Give a brief note on heterosis. 5

(e) (i) Give a brief account of 'split gene concept'. 5

(ii) Discuss allosteric regulation of enzyme. 5

7. Answer any four of the following :-

(a) Answer the following in brief :-

(i) Give an example of nucleic acid sequence data base.

(ii) What is OEC.

(iii) Why is TCA cycle named so.

(iv) Give an example of a buffu system.

(v) Give one example each of a gene coded by cpDNA mtDNA.

(b) Distinguish between :-

(i) Genomic DNA library & cDNA library. 5

(ii) Preparatory phase & payoff phase of photosynthesis. 5

(c) Give a brief account of :-

(i) oxidative pentose phosphate pathway. 5

(ii) Sex linked inheritance. 5

(d) (i) Give a brief account on frameshift mutation. 5

(ii) Mention the role of ethylene in fruit ripening. 5

(e) (i) A test cross between F_1 plant CcSs heterozygous for colour and full endosperm with a corn homozygous and recessive for colourless shrunken show the following results.

Colour full - 4000 Colourless full - 40

Colour shrunken - 100 Colourless shrunken - 4500.

Calculate the map distance between the two genes. 5

(ii) Give a brief account of cytoplasmic inheritance. 5

———————