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Your Roll No. .....

942

B.Sc. (Hons.)/III **C**

BOTANY—Paper XII

(Plant Metabolism)

(Admissions of 2004 and onwards)

Time : 3 *Hours* *Maximum Marks* : 38

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

Answer *five* questions in all, including

Question No. 1 which is compulsory.

1. (*i*) Name the rhizobial symbiont which fixes N_2 with *Sesbania* stem nodules.

(*ii*) Name the step of reaction between succinyl CoA and succinic acid in Krebs cycle.

(*iii*) Which enzyme catalyzes the reaction between HCO_3^- and PEP in the mesophyll cells of Zea *mays* ?

P.T.O.

(*iv*) Define Pasteur effect.

(*v*) Name the *two* components of the nitrogenase enzyme complex.

(*vi*) Which metabolism exhibits a temporal separation in terms of CO_2 fixation ? 6×1=6

2. (*i*) Outline the steps of β-oxidation of fats. Explain with the help of a 16C long fatty acid. 3+3=6

(*ii*) What is temperature coefficient ? What is its value for photosynthesis I ? 1+1=2

3. (*i*) Define the following : 4×1=4

(*a*) Coenzymes

(*b*) RQ

(*c*) Oxidative Phosphorylation

(*d*) Reaction center chlorophyll.

(*ii*) Give *one* contribution each of the following scientists (any *eight*) : 8×½=4

(*a*) T.Cech

(*b*) Lipmann

(*c*) Hatch & Slack

(*d*) Michaelis

(*e*) Govindjee

(*f*) Winogradsky

(*g*) Decker & Tio

(*h*) D.I. Arnon

(*i*) Renben et al.

4. (*i*) Give a schematic view (with enzymes) of Krebs cycle, indicating the reversible steps. 3+1=4

(*ii*) Comment on the inhibitors of light reaction. 2

(*iii*) Define light and CO_2 compensation points. 2

5. Differentiate between (any *four*) : 4×2=8

(*i*) Photorespiration and photophosphorylation

(*ii*) Competitive and non-competitive inhibition

(*iii*) Preparatory and pay-off phase in glycolysis

(*iv*) Action and absorption spectrum

(*v*) Reductive amination and transamination

(*vi*) Synthesis and degradation of fats.

6. (*i*) Diagrammatically represent the Z-scheme of light reaction.

(*ii*) Explain the chemiosmotic mechanism for ATP synthesis. 4+4=8

7. Write explanatory notes on the following (any *four*) : 4×2=8

(*i*) Genes involved in nodule formation

(*ii*) High energy bonds in ATP

(*iii*) PPP and its significance

(*iv*) Allosteric enzymes

(*v*) Shuttle mechanisms for NADH oxidation.