

Q.P. Code :08926

[Time: Three Hours]

[Marks:100]

Please check whether you have got the right question paper.

- N.B:
1. Attempt all questions.
 2. All questions carry equal marks.
 3. Do not write any explanation for diagram and schematic representation questions.

Q.1 Attempt the following (any four).

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- (a) With the help of chemical structures and enzymes represent oxidation of catechol by meta cleavage pathway.
- (b) Write a note on biosynthesis of PHB molecules in bacteria.
- (c) Write a note on assimilatory reduction of NO_3^- .
- (d) Discuss assembly of proteins in the membrane and protein export.
- (e) Write a short note on Glycogen breakdown.
- (f) Discuss the use of biochemical mutants to study metabolic pathways.

Q.2 (a) Answer the following (any two)

12

- (i) Compare and contrast between passive diffusion and facilitated diffusion.
- (ii) Discuss ubiquinone and flavoproteins as hydrogen atom carriers in the electron transport chain.
- (iii) Diagrammatically represent histidine uptake model.

Q.2 (b) Give one example of the following (any four)

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- (i) Siderophore
- (ii) Sugar transported by PTS
- (iii) Ionophores
- (iv) Reductase complex in *E. coli*
- (v) Protein subunits of BF_1
- (vi) Structural analogues used for studying solute uptake

Q.2 (c) Define the following (any four)

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- (i) Transporter
- (ii) Active transport
- (iii) Proton pump
- (iv) Rotational catalysis
- (v) Cold osmotic shock
- (vi) Uncoupler

Q.3 (a) Schematically represent (any two)

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- (i) Preparatory phase of glycolysis
- (ii) Butyric acid fermentation
- (iii) Incomplete TCA

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Q.3 (b) Give word equation for reaction catalysed by the following enzymes (any four) 04

- (i) β galactosidase
- (ii) Pyruvate carboxylase
- (iii) Hexose phosphoketolase
- (iv) Fructose 1,6 biphosphatase
- (v) Isocitrate lyase
- (vi) Alcohol dehydrogenase

Q.3 (c) Name the following (any four) 04

- (i) An organism performing mixed acid fermentation
- (ii) An enzyme unique to ED pathway
- (iii) An intermediate formed during propionic acid fermentation
- (iv) An amino acid in N-acetyl muramic acid unit of peptidoglycan
- (v) A disachharide formed upon breakdown of cellulose
- (vi) Lipid carrier transporting monomer units across the cell membrane for peptidoglycan biosynthesis

Q.4 (a) Answer the following. (any two) 12

- (i) Briefly discuss aerobic and anaerobic breakdown of protein.
- (ii) With the help of chemical structures and enzymes represent beta oxidation of palmitic acid.
- (iii) With the help of chemical structures and enzymes represent biosynthesis of Cysteine.

Q.4 (b) Answer the following. (any two) 04

- (i) Explain-Transamination
- (ii) Name the end product of purine degradation and write its structure. With the help of chemical structures and
- (iii) State any two differences between fatty acid biosynthesis and degradation.

Q.4 (c) Name the enzyme catalyzing following reactions (any four) 04

- (i) Aldehyde + $H_2O + NAD^+ \rightarrow$ Carboxylic acid + $NADH + H^+$
- (ii) Glutamic acid + $H_2O + NAD^+ \rightarrow$ α ketoglutarate + $NADH + NH_4^+$
- (iii) Carbamoyl Phosphate + Asparatate \rightarrow Carbamoylaspartate + Pi
- (iv) Citramalate \rightarrow Pyruvate + Acetate
- (v) Adenine + PRPP \rightarrow AMP + PPI
- (vi) Histidine \rightarrow Histamine + CO_2

Q.5 (a) Answer the following (any two). 12

- (i) Explain concerted feedback inhibition and give one example of the same.
- (ii) Write a note on photosystem II of Cyanobacteria.
- (iii) Diagrammatically represent regulation of lac operon.

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Q.5 (b) Explain the terms (any two).

- (i) Chlorosome
- (ii) Nitrogenase reductase
- (iii) Zymogen

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Q.5 (c) Answer the following (any four).

- (i) Purple Sulphur bacteria is an example of anoxygenic phototroph. State whether true or false.
- (ii) State any one function of ppGpp.
- (iii) Name an allosteric enzyme.
- (iv) What is the effect of adenylation on glutamine synthetase?
- (v) Give word equation for ribulose-1,5-bisphosphate carboxylase.
- (vi) Give an example of dissimilatory sulfate reducer.

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