Duration: 3 Hours **Maximum Marks: 100**

Instructions to the candidates:-

1) All the questions are compulsory. Choice is internal.
2) Figures to the right indicate full marks.
3) All questions carry equal marks.
4) Draw flowcharts /diagrams wherever necessary.
5) Use of simple calculator is permitted.

Q1 A) Fill in the blanks: **4**

i) Activation of fatty acids require breakdown of ATP to _____.
ii) Acyl-CoA is transferred to the hydroxyl group of carnitine by _____.
iii) Acetone, acetoacetate and _____ are considered as ketone bodies.
iv) Oxidation of a fatty acid containing 18 carbon atoms to acetyl CoA would require _____ number of cycles.

Q1 B) Write a note on (ANY ONE) **4**

i) Beta oxidation of odd carbon chain fatty acids
ii) FAS complex

Q1 C) Answer ANY TWO **12**

i) Compare the activation steps of beta-oxidation and lipogenesis. Elaborate the same with detailed chemical reactions.
ii) Justify- The liver cannot utilise ketone bodies. Add a note on the significance of ketone bodies in starvation and alcoholism
iii) Calculate the total number of ATPs generated from the stearic acid.

Q2 A) Fill in the blanks **4**

i) The coenzyme used in transamination reaction is _____
ii) Decarboxylation of histidine produces _____.
iii) _____is an intracellular receptor.
iv) Epinephrine receptor on the cell membrane contains _____ subunits.

Q2 B) Write a note on ANY ONE **4**

i) Hormone receptors
ii) Ketogenic and glucogenic amino acids

Q2 C) Answer ANY TWO **12**

i) Compare oxidative and non-oxidative deamination
ii) Discuss in detail the contributions of Kurt Henseliet and Hans Kreb to the field of protein metabolism.
iii) With reference to signal transduction comment on
(a) G protein (b) Adenylate cyclase (c) Calcium

Q3 A) Fill in the blanks **4**

i) Wavelength selectors are of two types, filter and _____.
ii) Centrifugal field with respect to gravity is known as _____.
iii) Unit of sedimentation coefficient is _____.
iv) Amino acids are estimated in colourimeter by reacting with _____ as colour developing agent.

Q3 B) Compare ANY ONE **4**

i) Preparative and Analytical ultracentrifuge
ii) Detectors in colorimeter and spectrophotometer

Q3 C) Attempt any TWO **12**

i) Derive an expression for Beer Lambert's law. Calculate the molar extinction coefficient of a solution containing 3M of a given substance which absorbs 80% incident light of wavelength 340 nm when the path length is 1 cm.
ii) Sujata is asked to prepare a write-up for gradient material used in density gradient centrifugation. Help her collate the data with the aid of following points:
   a) Ideal properties of gradient materials
   b) Two examples of gradient material.
iii) Elaborate on the colorimeter with reference to
   (a) Source of light (b) Wavelength selector (c) Sample holder

Q4 A) Fill in the blanks **4**

i) Increase in temperature _____ the rate of migration of analytes.
ii) The gas produced at the anode during an electrophoretic run is _____
iii) _____ radiation is used for food preservation
iv) In GM counter the outer chamber wall serves as _____ electrode.

Q4 B) Write a short note on ANY ONE **4**

i) Agarose electrophoresis for the separation of DNA.
ii) Isoelectric focusing

Q4 C) Attempt any TWO **12**

i) Defend- Selecting the appropriate support medium, buffer and electric field strength is crucial for electrophoresis.
ii) Deriving an expression, explain how the radioactive decay constant is associated with half-life.
iii) Compare:
   (a) Moving boundary and zone electrophoresis
   (b) Beta and Gamma radiations

Q5 A) Define **8**

a) Lipogenesis
OR
b) Beta oxidation
c) cAMP
OR
d) Ornithine

e) Swinging bucket rotor

OR

f) DNSA

g) Radioactivity

OR

h) Southern blotting

Q5 B) State True or False with justification **12**

i) Oxidation of fatty acids takes place in mitochondrial matrix.

ii) The atomic mass number is denoted by 'Z'.

iii) RCF and rpm are not related to each other.

iv) Lambda max is independent of concentration for a particular biomolecule.

v) Svedberg (S) is the unit of absorbance.

vi) pH of the separating gel is 2 units lower than that of stacking gel.

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