Duration: $2\frac{1}{2}$ Hours **Marks: 75**

Instructions to the candidates:

Please check whether you have got the right question paper

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.

Q1(A) Choose the **MOST APPROPRIATE** answer (**any three**): **3**

i) A fatty acid with 20 carbon atoms will undergo ____ cycles of β oxidation

a) 9 (b) 10 (c) 18

ii) Animals cannot convert fatty acid into glucose because _____

a) acetyl coA cannot be converted to pyruvate

b) of absence of malate synthase

c) of absence of malate dehydrogenase

iii) ____ number of NADH + H molecules are produced,, after 6 "turns" of the β-oxidation pathway

a) 6 (b) 7 (c) 12

iv) ____ is not a ketone body.

(a) acetoacetate (b) β-hydroxybutyrate (c) acetobutyrate

v) ACP is abbreviation of _____

a) acetyl carrier pathway (b) acyl carrier protein (c) acyl carnitine protein

vi) NADPH is the reducing agent needed in the process of _____.

a) lipogenesis (b) lipolysis (c) ketosis

Q1(B) Answer in brief **any one** of the following: **2**

i) State the site/s of lipolysis and ketogenesis

ii) State true or false giving reason- Fatty acids are the preferred fuel for "running" the heart (cardiac muscle) and the brain.

Q1(C) Attempt **any one** of the following: **4**

i) Write a short note on the FAS complex

ii) For the metabolic processes - ketogenesis, lipogenesis or β-oxidation pathway; select the appropriate biomolecules, with which they are associated. The responses may be used more than once or not be used at all.

a) Beta hydroxyacyl ACP; (b) Acyl CoA; (c) 3-hydroxy acyl CoA; (d) beta hydroxybutyrate

Q1(D) Answer **any one** of the following: **6**

i) Schematically represent synthesis of a saturated fatty acid.Comment on the utilization of ATP in the process.

ii) Elaborate on ketone body formation and its significance in diabetes mellitus

Q2(A) Choose the **MOST APPROPRIATE** answer (**any three**): **3**

i) In A chain of Insulin molecule the C-terminal amino acid is _____.

a) glycine b) valine (c) serine

ii) Thiocynate competes with _____uptake mechanism.

a) tyrosine b) iodine c) phenylalanine

iii) Glycogen phosphorylase is active in _____ state

a) phosphorylated b) dephosphorylated c) decarboxylated

iv) Oxidative deamination is the conversion of an amino _____

a) group from an amino acid to a keto acid b) acid to a keto-acid and ammonia
c) acid to a carboxylic acid and ammonia

v) _____ is a lipid soluble hormone

a) Insulin b) Vasopressin c) Tetraiodothyronine

vi) Transaminases are present in _____

a) liver b) pancreas c) intestine

Q2(B) Attempt in brief **any one**: **2**

i) State true or false, giving reasons: Amino acid degradation is similar to any other catabolic processes

ii) Define and explain the term- Myxedema

Q2(C) Write a noteon**any one** of the following : **4**

i) Deamination reactions

ii) Physiological role of glucocorticoids

Q2(D) Write detailed answers to **any one** of the following: **6**

i) Discuss the effect of epinephrine on glycogen synthesis and its breakdown.

ii) Elaborate on Krebs -Henseleit cycle and give its significance

Q3(A) Choose the **MOST APPROPRIATE** answer (**any three**): **3**

i) _____wavelength ranges is NOT associated with UV spectroscopy.

a) upto 380 nm b) 400 - 100nm c) 380 - 750nm

ii) A series of 3 coloured glass plates of equal thickness are placed in a light beam. Each sheet absorbs half of the light incident upon it. The intensity of the light transmitted by the third glass plate is _____.

a)12.5 % b) 56.25% c) 75.00%

iii) The wavelength of light source is 560 nm. _____ is the corresponding wave number.

a) 1780×10^5 cm -1 b) 1.78 cm -1 c) 0.178×10^3 cm-1

iv) High speed centrifuge operates at the maximum speed upto _____.

a) 5000 rpm b) 50,000 rpm c) 12,000 rpm

v) Rayleigh scatterring is used in _____centrifuge.

a) table-top b) high speed c) analytical

vi) _____ compound/s can be used as denisty gradient substance.

a) CsCl b) maltose c) Both a and b

Q3(B) Define and explain **<u>any one</u>**: **2**

(i) Centrifugal force ii) Extinction

Q3(C) Describe the applications/uses of any one of the following: **4**

i) Colorimeter

ii) Analytical centrifuge

Q3(D) Write detailed answers for **<u>any one</u>** of the following: **6**

i) Differentiate between rate zonal and isopycnic centrifugation. Add a note on sedimentation coefficient

ii) Write the (a) Derivation (b) limitations and (c) applications of Beer- Lambert law.

Q4(A) Choose the **MOST APPROPRIATE** answer (**<u>any three</u>**): **3**

i) TEMED is used as a _____

a) staining agent (b) matrix base c) catalyst

ii) In electrophoresis proteins will migrate to _____

a) cathode (b) anode

c) cathode or anode and is dependent on charge on the protein

iii) In SDS-PAGE seperation is based on ____

(a) molecular weight (b) shape (c) shape and molecular weight

iv) The pH of resolving gel is _____that of stacking gel.

(a) more than (b) less than (c) same as

v) The electrophoretic mobility denoted by μ is denoted as _____

a) 1/ VE (b) E/V (c) V/E

vi) _____ blotting technique uses probes to detect RNA, post electrophoresis
a) Northern (b) Southern (c)Western

Q4(B) Give the role of **any one** of the following: **2**
i) Coomassie Brilliant blue (ii) Bis-acrylamide

Q4(C) Write short notes on **any one** of the following: **4**
i) Use of electrophoresis in nucleic acids separation.
ii) Support material used in electrophoresis.

Q4(D) Answer **any one** the following: **6**
i) Write an elaborative note on NATIVE PAGE
ii) Justify: "Electrophoresis is a technique governed by various factors".

Q5(A) Write short note on **any one** of the following: **3**
i) Acyl malonyl shuttle
ii) Utilization of ketone bodies

Q5(B) Write a note on **any one** of the following: **3**
i) Insulin
ii) Transamination

Q5(C) Answer in brief **any one** of the following: **3**
i) State true or false giving reasons: No relation exists between RCF and RPM
ii) Write a note on construction and working of a simple colorimeter

Q5(D) Answer in brief **any one** of the following: **3**
i) Describe the principle of electrophoresis and enlist two buffers used for the same.
ii) Write a note on application of electrophoresis in protein study

Q5(E) State true or false (**any three**) **3**
i) Oxytocin is a female hormone
ii) Acetyl coenzyme A is associated with ketolysis
iii) Molar absorptivity is not constant for any single biomolecule.
iv) SDS is an cationic detergent
v) Extinction and absorbance are antonyms
vi) Centripetal force and centrifugal forces act in opposite direction

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