

-1 BSC

em VI A.T.K.T.

Subject: Biochemistry PI
Metabolism, Analytical
techniques. 2016-17

QP Code : 77134

(2½ Hours)

[Total Marks : 75

- N.B. : (1) All the question are compulsory.
(2) Internal choices have been given.
(3) Figures to the right indicate marks.

1. (a) Choose the MOST APPROPRIATE answer (any three):
- A C-18 fatty acid will undergo _____ cycle of Beta Oxidation.
a) 9 b) 8 c) 7
 - Enzymes which digest fats are _____.
a) Lipases b) Hexokinase c) Thiophorase
 - Acetyl CoA is converted to malonyl CoA with the help of a coenzyme _____.
a) CoA b) FAD c) Biotin
 - The starting substance for the process of ketone body formation is _____.
a) Fatty acid b) glucose c) Acetyl CoA
 - Inter mediates during fatty acid synthesis are bound to _____.
a) Lauric acid b) ACP c) Biotin
 - Fatty acid synthetase is a _____.
a) Multiple enzyme complex b) Phosphoenzyme c) Single enzyme

- (a) Choose the MOST APPROPRIATE answer (any three):
- (b) Define and Explain (any one):
- Ketosis
 - Lipogenesis

- (c) Attempt any one :
- Describe the utilization of ketone bodies by our body using biochemical equations.
 - Give the biochemical equations of Beta oxidation in mitochondria for one cycle.

- (d) Attempt any one :
- Describe the biosynthesis of fatty acid using fatty acid synthetase enzyme.
 - Discuss the formation of ketone bodies in the liver using biochemical equation and their significance in pregnancy and starvation.

[TURN OVER

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- Ketosis

QP Code : 77134

2

2. (a) Fill in the blanks (any three):

- Proinsulin contains _____ amino acid residues.
a) 84 b) 76 c) 102
- Dopamine is synthesised from _____ amino acids.
a) Glutamic acid b) Histidine c) Tyrosine
- Blood urea increases in _____.
a) liver cirrhosis b) pregnancy c) renal failure
- _____ is the steroid hormone in humans.
a) Insulin b) oxytocin c) glucocorticoid
- Oxytocin can best be classified as _____.
a) An amino acid residues
b) a steroid
c) a peptide
- Insulin Causes _____.
a) Increase in glycolysis and decreases in glycogenolysis
b) Increase in glycogenesis and decreases in glycogenolysis
c) Increase in glycogenesis and decreases in glyconeogenesis
- L-Glutamic acid on decarboxylation gives _____.
a) Glutamine b) α -ketoglutarate c) Gamma amino butyric acid

QP Code : 77134

- Dopamine is synthesised from _____ amino acids.
a) Glutamic acid b) Histidine c) Tyrosine
- (b) Attempt any one:
i) Decarboxylation ii) Non oxidative deamination
- (c) Attempt any one:
i) Explain the mechanism of transamination
ii) Discuss the synthesis of insulin from preproinsulin.
a) An amino acid residues

- (d) Attempt any one:
i) Draw a diagram to show the formation of urea by urea cycle, showing all the enzymes and equations.
ii) Explain diagrammatically the effect of epinephrine on glycogen breakdown on its release.
a) Increase in glyconeogenesis and decreases in glycogenolysis
b) Increase in glyconeogenesis and decreases in glyconeogenesis
c) Increase in glycogenesis and decreases in glyconeogenesis

3. (a) Fill in the blanks (any three):
i) The first fraction obtained at lowest RCF in differential centrifugation is _____
a) Glutamine b) α -ketoglutarate c) Gamma amino butyric acid

- a) Microsome b) Mito chondria c) Nucleus
- i) Decarboxylation ii) Non oxidative deamination

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- Attempt any one :
- Explain the mechanism of transamination
 - Discuss the synthesis of insulin from preproinsulin

- Attempt any one
- Draw a diagram to show the formation of urea by urea cycle, showing the enzymes and equations.
 - Explain diagrammatically the effect of epinephrine on glycogen breakdown

QP Code : 77134

3

- ii) _____ is not used as gradient maker in density gradient centrifugation
a) Glycerol b) Sucrose c) maltose
- iii) The visible light is generated in spectrophotometer by _____ lamp
a) Mercury b) Deuterium c) Tungsten
- iv) A solution of Albumin can be quantitatively estimated by _____
a) DNSA method b) Biuret method c) Fiske subborow method
- v) Analytical ultracentrifuge have _____
a) Flexible drive shaft
b) a max speed of 30,000.rpm
c) been used to separate inorganic precipitates from solution
- vi) Preparative centrifugation is concerned with _____
a) The isolation of biological material for subsequent investigation
b) Determine the Concentration of DNA in a preparation
c) The study of pure molecules.

(b) Define and explain (any one) :

i) Molar extinction coefficient

ii) RCF _____ is not used as gradient maker in density gradient centrifugation
a) Glycerol b) Sucrose c) maltose

(c) Attempt any one : _____
i) How will you determine the molar extinction coefficient of coloured solution.

ii) Draw a ray diagram of simple colorimeter.
a) DNSA method b) Biuret method c) Fiske subborow method

(d) Attempt any one :

i) Derive Beer-Lambert's equations

ii) Explain the types of centrifuges. Write a note on analytical ultra centrifuge with respect to its applications.
c) with respect to its applications

vi) Preparative centrifugation is concerned with

4. (a) Choose the MOST APPROPRIATE answer (any three):

i) Electrophoresis uses principle of _____ ratio.
a) Magnetism : Charge b) Charge : Volt c) Mass : Charge

ii) the stacking gel in PAGE is used to _____ protein molecules
a) concentrate b) separate c) mixing

iii) Sodium dodecyl sulphate is used in SDS PAGE is _____ detergent.
a) Zwitterionic b) Cationic c) anionic

iv) The full form of TEMED is _____.

a) N,N,N',N' tetra methylene diamine
b) N,N,N',N' tetra ethyl methylene diamine
c) N,N,N',N' tetra methyl ethylene diamine

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i) Explain the types of centrifuges. Write a note on analytical ultra centrifuge with respect to its applications.

ii) Choose the MOST APPROPRIATE answer (any three):
a) _____ principle of _____ ratio.

QP Code : 77134

4

v) Proteins are separated by PAGE may be visualized by

- a) Bromophenol blue
- b) Coomassie Brilliant Blue
- c) Bromothymol Blue

4 B) Define/Explain attempt any one
i) Electrophoresis
ii) Tracker dye

4 C) Attempt any one
i) Discuss the various supporting media of electrophoresis experiment
ii) Draw a diagram of horizontal electrophoresis apparatus and is connect to power pack

4 D) Attempt any one
i) Discuss the factors which affect the rate of migration of sample in electrical field
ii) Discuss the Discontinuous electrophoresis and applications of electrophoresis

5 A) Attempt any one
i) Schematically represent the carnitine shuttle
ii) Explain the knoop's experiment

B) Attempt any one
i) Discuss the reaction of decarboxylation of Histidine with equation & enzyme required
ii) Role of ADH

C) Attempt any one
i) Draw a diagram of horizontal electrophoresis apparatus and is connect to power pack
ii) State any one applications of Beer Lambert's law in the estimation of protein

D) Attempt any one
i) What is Nomogram? Explain in use in centrifugation
ii) Discuss the factors which affect the rate of migration of sample in electrical field

E) Attempt any one
i) Discuss the Discontinuous electrophoresis and applications of electrophoresis
ii) Explain the role of buffer and Ammonium persulphate in PAGE

F) Attempt any one
i) Various dyes used for protein & nucleic acid separation by electrophoresis Name the dyes for both

G) Attempt any one
i) Schematically represent the carnitine shuttle
ii) Explain the knoop's experiment

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Attempt any one

i) Discuss the reaction of decarboxylation of Histidine with equation & enzyme required

ii) Role of ADH

Attempt any one

QP Code : 77134

5

E) Write True or False (any 3)

- i) End product of Lipogenesis is glycerol.
- ii) Action of insulin is supplemented with that of glucocorticoids.
- iii) Deamination of cysteine gives Acetyl CoA.
- iv) Ketonuria shows high level of ketone bodies in the blood
- v) Is RCF = RPM
- vi) Buffers are not required in electrophoretic experiment.

QP Code : 77134

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