Lipid Metabolism

I. MCQ :

Choose the correct answer:

1- The dietary fats are transported in blood as:
a) Micelles
b) Chylomicrons
c) Fatty acid – Albumin complex
d) Liposomes

2- Pancreatic lipase does not require _____ for its activity:
a) Co-lipase
b) Bile salts
c) Phospholipids
d) Apo C-II

3- De novo fatty acid synthesis occurs in the:
a) Mitochondria
b) Perioxosome
c) Endoplasmic reticulum
d) Cytosol

4-What is the precursor for fatty acid synthesis
a) Acetyl CoA
b) Propionyl CoA
c) Succinyl CoA
d) Acetoacetyl CoA

5- A cofactor of lipoprotein lipase is:
a) Apo B-48
b) Apo-A
c) Apo c-II
d) Apo E

6-What is the source of NADPH required for fatty acid synthesis
a) Pentose phosphate pathway
b) Malic enzyme
c) Both
d) None

7- One of the following is not correct as regards acetyl-CoA carboxylase:
a) It is stimulated by insulin
b) It is required for de novo synthesis of fatty acids
c) It is inhibited by glucagon
d) It is inhibited by insulin

8-What is the enzyme responsible for breakdown of triglycerides into 2 fatty acids and mono-acylglycerol in the adipose tissue
a) Pancreatic lipase
b) Lipoprotein lipase
c) Hormone sensitive lipase
d) Phospholipase

9-The key enzyme of lipolysis is:
a) Pancreatic lipase
b) Lipoprotein lipase
c) Phospholipase
d) Hormone sensitive lipase

10-A patient with a history of recurring appearance of excessive amount of fat in stool and loss of weight, most likely has a deficiency in
a) Pancreatic lipase
b) Lipoprotein lipase
c) Gastric lipase
d) Hormone sensitive lipase

11- Acetyl Co-A required for de novo synthesis of fatty acid is obtained from:
a) Fatty acid oxidation
b) Acetate
c) Pyruvate
d) Ketone bodies

12- Adipose tissue lacks:
a)Hormone sensitive lipase
b) Glycerol kinase
c) cAMP-dependent protein kinase
d) Glycerol-3-phosphate dehydrogenase

13-Key enzyme of fatty acid denovo system
a) Acetyl CoA Carboxylase
b) Hormone sensitive lipase
c) Acyl CoA synthetase
d) ATP citrate lyase

14- β-oxidation of fatty acids occurs in:
a) The cytosol
b) The matrix of the mitochondria
c) The inner mitochondrial membrane
d) The microsomes

15-Carnitine is required for the transport of:
a) Short chain fatty acids into the mitochondria
b) Triglycerides out of the liver
c) Triglycerides into the mitochondria
d) Long chain fatty acids into the mitochondria

16-A fatty acid with 14 carbon atoms will undergo how many cycles of beta oxidation?

a) 7
b) 4
c) 6
d) 5

17- One of the following inhibits β-oxidation of fatty acids:

a) AMP
b) ATP
c) Glucagon
d) Adrenaline

18- When palmitoyl CoA is oxidised, how many Acetyl coA are produced?

a) 1
b) 10
c) 6
d) 8

19- In Zellweger's syndrome, one of the following is incorrect:

a) Long chain fatty acids accumulate in the brain, liver, and kidneys.
b) It is due to absence of peroxisomes in all tissues.
c) There is liver and kidney dysfunction with severe neurological defects.
d) Patients may survive beyond 5 years.

20- A 4 month -old infant presents with a convulsions. His mother reports that her infant has been irritable and lethargic over the past several days. The infant is found to have a profoundly low serum glucose and ketone body level. The infant is diagnosed with medium chain acyl co A dehydrogenase deficiency. What is the biochemical basis of infant's symptoms?

a) Beta oxidation of fatty acid is impaired
b) Fatty acid synthesis is impaired
c) Adipolysis is inhibited
d) TCA cycle is inhibited

21- A 5-year-old boy presents with altered mental status, heart failure, and muscle weakness. His serum level of ketones and glucose are abnormally low. He is diagnosed with primary carnitine deficiency. In which of the following is carnitine directly involved?

a) Activation of fatty acids
b) Transport of fatty acyl CoA
c) β-Oxidation
d) ω- Oxidation

22-Regulation of ketolysis is determined by the availability of?
a) Acetyl COA
b) Oxaloacetate
c) Free fatty acid
d) Malonyl COA

23- Ketogenesis occurs in mitochondria of liver because of the presence of:
a) HMG-CoA synthase and HMG-CoA lyase
b) Thiopherase and ketothiolase
c) HMG CoA reductase and HMG CoA lyase
d) HMG-CoA synthase and HMG CoA reductase

24-Which of the following statements about Refsum's disease is incorrect?
a) It is due to deficiency of enzyme system of α-oxidation
b) It leads to accumulation of phytanic acid in CNS
c) There is deafness, blindness and polyneuritis
d) It is due to absence of peroxisomes in all tissues

MCQ Answers

1-b	2-d	3-d	4-a	5-c	6-c	7-d	8-c	9-d	10-a
11-c	12-b	13-a	14-b	15-d	16-c	17-b	18-d	19-d	20-a
21-b	22-b	23-a	24-d						

II- Match the disease in column A with its metabolic defect in column B

Column (A) Disease	Column (B) Metabolic defect
1.Steatorrhea	a. α- hydroxylase deficiency
2. Zellweger's syndrome	b. Pancreatic lipase deficiency
3.Refsum's disease	c. Carnitine deficiency
	d. Absence of peroxisomes in all tissues
	e. MCAD (medium chain acyl-Co-A dehydrogenase) deficiency

Matching Answers

1.b	2. d	3.a