CHAPTER 4

FATS AND FATTY ACID METABOLISM

1. An example of a hydroxy fatty acid is

(A) Ricinoleic acid (B) Crotonic acid
(C) Butyric acid (D) Oleic acid

2. An example of a saturated fatty acid is

(A) Palmitic acid (B) Oleic acid
(C) Linoleic acid (D) Erucic acid

3. If the fatty acid is esterified with an alcohol of high molecular weight instead of glycerol, the resulting compound is

(A) Lipositol (B) Plasmalogen
(C) Wax (D) Cephalin

4. A fatty acid which is not synthesized in the body and has to be supplied in the diet is

(A) Palmitic acid (B) Lauric acid
(C) Linolenic acid (D) Palmitoleic acid

5. Essential fatty acid:

(A) Linoleic acid (B) Linolenic acid
(C) Arachidonic acid (D) All these

6. The fatty acid present in cerebrosides is

(A) Lignoceric acid (B) Valeric acid
(C) Caprylic acid (D) Behenic acid

7. The number of double bonds in arachidonic acid is

(A) 1 (B) 2
(C) 4 (D) 6

8. In humans, a dietary essential fatty acid is

(A) Palmitic acid (B) Stearic acid
(C) Oleic acid (D) Linoleic acid

9. A lipid containing alcoholic amine residue is

(A) Phosphatidic acid (B) Ganglioside
(C) Glucocerebroside (D) Sphingomyelin

10. Cephalin consists of

(A) Glycerol, fatty acids, phosphoric acid and choline
(B) Glycerol, fatty acids, phosphoric acid and ethanolamine
(C) Glycerol, fatty acids, phosphoric acid and inositol
(D) Glycerol, fatty acids, phosphoric acid and serine

11. In mammals, the major fat in adipose tissues is

(A) Phospholipid (B) Cholesterol
(C) Sphingolipids (D) Triacylglycerol

12. Glycosphingolipids are a combination of

(A) Ceramide with one or more sugar residues
(B) Glycerol with galactose
(C) Sphingosine with galactose
(D) Sphingosine with phosphoric acid

13. The importance of phospholipids as constituent of cell membrane is because they possess

(A) Fatty acids
(B) Both polar and nonpolar groups
(C) Glycerol
(D) Phosphoric acid

14. In neutral fats, the unsaponificable matter includes

(A) Hydrocarbons (B) Triacylglycerol
(C) Phospholipids (D) Cholsesterol

15. Higher alcohol present in waxes is

(A) Benzyl (B) Methyl
(C) Ethyl (D) Cetyl

16. Kerasin consists of

(A) Nervonic acid (B) Lignoceric acid
(C) Cervonic acid (D) Clupanodonic acid

17. Gangliosides are complex glycosphingolipids found in

(A) Liver (B) Brain
(C) Kidney (D) Muscle

18. Unsaturated fatty acid found in the cod liver oil and containing 5 double bonds is

(A) Clupanodonic acid
(B) Cervonic acid
(C) Elaidic acid
(D) Timnodonic acid

19. Phospholipid acting as surfactant is

(A) Cephalin (B) Phosphatidyl inositol
(C) Lecithin (D) Phosphatidyl serine

20. An oil which contains cyclic fatty acids and once used in the treatment of leprosy is

(A) Elaidic oil (B) Rapeseed oil
(C) Lanoline (D) Chaulmoogric oil

21. Unpleasant odours and taste in a fat (rancidity) can be delayed or prevented by the addition of

(A) Lead (B) Copper
(C) Tocopherol (D) Ergosterol

22. Gangliosides derived from glucosylceramide contain in addition one or more molecules of

(A) Sialic acid (B) Glycerol
(C) Diacylglycerol (D) Hyaluronic acid

23. 'Drying oil', oxidized spontaneously by atmospheric oxygen at ordinary temperature and forms a hard water proof material is

(A) Coconut oil (B) Peanut oil
(C) Rape seed oil (D) Linseed oil

24. Deterioration of food (rancidity) is due to presence of

(A) Cholesterol
(B) Vitamin E
(C) Peroxidation of lipids
(D) Phenolic compounds

25. The number of ml of N/10 KOH required to neutralize the fatty acids in the distillate from 5 gm of fat is called

(A) Reichert-Meissel number
(B) Polenske number
(C) Acetyl number
(D) Non volatile fatty acid number

26. Molecular formula of cholesterol is

(A) $C_{27}H_{45}OH$
(B) $C_{29}H_{47}OH$
(C) $C_{29}H_{47}OH$
(D) $C_{23}H_{41}OH$

27. The cholesterol molecule is

(A) Benzene derivative
(B) Quinoline derivative
(C) Steroid
(D) Straight chain acid

28. Salkowski test is performed to detect

(A) Glycerol (B) Cholesterol
(C) Fatty acids (D) Vitamin D

29. Palmitic, oleic or stearic acid ester of cholesterol used in manufacture of cosmetic creams is

(A) Elaidic oil (B) Lanoline
(C) Spermaceti (D) Chaulmoogric oil

30. Dietary fats after absorption appear in the circulation as

(A) HDL (B) VLDL
(C) LDL (D) Chylomicron

31. Free fatty acids are transported in the blood

(A) Combined with albumin
(B) Combined with fatty acid binding protein
(C) Combined with β-lipoprotein
(D) In unbound free salts

32. Long chain fatty acids are first activated to acetyl-CoA in

(A) Cytosol (B) Microsomes
(C) Nucleus (D) Mitochondria

33. The enzyme acyl-CoA synthase catalyses the conversion of a fatty acid of an active fatty acid in the presence of

(A) AMP (B) ADP
(C) ATP (D) GTP

34. Carnitine is synthesized from

(A) Lysine and methionine
(B) Glycine and arginine
(C) Aspartate and glutamate
(D) Proline and hydroxyproline

35. The enzymes of β-oxidation are found in

(A) Mitochondria (B) Cytosol
(C) Golgi apparatus (D) Nucleus

36. Long chain fatty acids penetrate the inner mitochondrial membrane

(A) Freely
(B) As acyl-CoA derivative
(C) As carnitine derivative
(D) Requiring Na dependent carrier

37. An important feature of Zellweger's syndrome is

(A) Hypoglycemia
(B) Accumulation of phytanic acid in tissues
(C) Skin eruptions
(D) Accumulation of C_{26}-C_{38} polyenoic acid in brain tissues

38. An important finding of Fabry's disease is

(A) Skin rash (B) Exophthalmos
(C) Hemolytic anemia (D) Mental retardation

39. Gaucher's disease is due to deficiency of the enzyme:

(A) Sphingomyelinase
(B) Glucocerebrosidase
(C) Galactocerbrosidase
(D) β-Galactosidase

40. Characteristic finding in Gaucher's disease is

(A) Night blindness
(B) Renal failure
(C) Hepatosplenomegaly
(D) Deafness

41. An important finding in Neimann-Pick disease is

(A) Leukopenia
(B) Cardiac enlargement
(C) Corneal opacity
(D) Hepatosplenomegaly

42. Fucosidosis is characterized by

(A) Muscle spasticity (B) Liver enlargement
(C) Skin rash (D) Kidney failure

43. Metachromatic leukodystrophy is due to deficiency of enzyme:

(A) α-Fucosidase (B) Arylsulphatase A
(C) Ceramidase (D) Hexosaminidase A

44. A significant feature of Tangier disease is

(A) Impairment of chylomicron formation
(B) Hypotriacylglycerolmia
(C) Absence of Apo-C-II
(D) Absence of Apo-C-I

45. A significant feature of Broad Beta disease is

(A) Hypocholesterolemia
(B) Hypotriacylglycerolemia
(C) Absence of Apo-D
(D) Abnormality of Apo-E

46. Neonatal tyrosinemia improves on administration of

(A) Thiamin (B) Riboflavin
(C) Pyridoxine (D) Ascorbic acid

47. Absence of phenylalanine hydroxylase causes

(A) Neonatal tyrosinemia
(B) Phenylketonuria
(C) Primary hyperoxaluria
(D) Albinism

48. Richner-Hanhart syndrome is due to defect in

(A) Tyrosinase
(B) Phenylalanine hydroxylase
(C) Hepatic tyrosine transaminase
(D) Fumarylacetoacetate hydrolase

49. Plasma tyrosine level in Richner-Hanhart syndrome is

(A) 1–2 mg/dL (B) 2–3 mg/dL
(C) 4–5 mg/dL (D) 8–10 mg/dL

50. Amount of phenylacetic acid excreted in the urine in phenylketonuria is

(A) 100–200 mg/dL (B) 200–280 mg/dL
(C) 290–550 mg/dL (D) 600–750 mg/dL

51. Tyrosinosis is due to defect in the enzyme:

(A) Fumarylacetoacetate hydrolase
(B) p-Hydroxyphenylpyruvate hydroxylase
(C) Tyrosine transaminase
(D) Tyrosine hydroxylase

52. An important finding in Histidinemia is

(A) Impairment of conversion of α-Glutamate to α-ketoglutarate
(B) Speech defect
(C) Decreased urinary histidine level
(D) Patients can not be treated by diet

53. An important finding in glycinuria is

(A) Excess excretion of oxalate in the urine
(B) Deficiency of enzyme glycinase
(C) Significantly increased serum glycine level
(D) Defect in renal tubular reabsorption of glycine

54. Increased urinary indole acetic acid is diagnostic of

(A) Maple syrup urine disease
(B) Hartnup disease
(C) Homocystinuia
(D) Phenylketonuria

55. In glycinuria daily urinary excretion of glycine ranges from

(A) 100–200 mg (B) 300–500 mg
(C) 600–1000 mg (D) 1100–1400 mg

56. An inborn error, maple syrup urine disease is due to deficiency of the enzyme:

(A) Isovaleryl-CoAhydrogenase
(B) Phenylalnine hydroxylase
(C) Adenosyl transferase
(D) α-Ketoacid decarboxylase

57. Maple syrup urine disease becomes evident in extra uterine life by the end of

(A) First week (B) Second week
(C) Third week (D) Fourth week

58. Alkaptonuria occurs due to deficiency of the enzyme:

(A) Maleylacetoacetate isomerase
(B) Homogentisate oxidase
(C) p-Hydroxyphenylpyruvate hydroxylase
(D) Fumarylacetoacetate hydrolase

59. An important feature of maple syrup urine disease is

(A) Patient can not be treated by dietary regulation
(B) Without treatment death, of patient may occur by the end of second year of life
(C) Blood levels of leucine, isoleucine and serine are increased
(D) Excessive brain damage

60. Ochronosis is an important finding of

(A) Tyrosinemia
(B) Tyrosinosis
(C) Alkaptonuria
(D) Richner Hanhart syndrome

61. Phrynoderma is a deficiency of

(A) Essential fatty acids (B) Proteins
(C) Amino acids (D) None of these

62. The percentage of linoleic acid in safflower oil is

(A) 73 (B) 57
(C) 40 (D) 15

63. The percentage of polyunsaturated fatty acids in soyabean oil is

(A) 62 (B) 10
(C) 3 (D) 2

64. The percentage of polyunsaturated fatty acids in butter is

(A) 60 (B) 37
(C) 25 (D) 3

65. Dietary fibre denotes

(A) Undigested proteins
(B) Plant cell components that cannot be digested by own enzymes
(C) All plant cell wall components
(D) All non digestible water insoluble polysaccharide

66. A high fibre diet is associated with reduced incidence of

(A) Cardiovascular disease
(B) C.N.S. disease
(C) Liver disease
(D) Skin disease

67. Dietary fibres are rich in

(A) Cellulose (B) Glycogen
(C) Starch (D) Proteoglycans

68. Minimum dietary fibre is found in

(A) Dried apricot (B) Peas
(C) Bran (D) Cornflakes

69. A bland diet is recommended in

(A) Peptic ulcer (B) Atherosclerosis
(C) Diabetes (D) Liver disease

70. A dietary deficiency in both the quantity and the quality of protein results in

(A) Kwashiorkar (B) Marasmus
(C) Xerophtalmia (D) Liver diseases

71. The deficiency of both energy and protein causes

(A) Marasmus (B) Kwashiorkar
(C) Diabetes (D) Beri-beri

72. Kwashiorkar is characterized by

(A) Night blindness (B) Edema
(C) Easy fracturability (D) Xerophthalmia

73. A characteristic feature of Kwashiorkar is

(A) Fatty liver
(B) Emaciation
(C) Low insulin lever
(D) Occurrence in less than 1 year infant

74. A characteristic feature of marasmus is

(A) Severe hypoalbuminemia
(B) Normal epinephrine level
(C) Mild muscle wasting
(D) Low insulin and high cortisol level

75. Obesity generally reflects excess intake of energy and is often associated with the development of

(A) Nervousness
(B) Non-insulin dependent diabetes mellitus
(C) Hepatitis
(D) Colon cancer

76. Atherosclerosis and coronary heart diseases are associated with the diet:

(A) High in total fat and saturated fat
(B) Low in protein
(C) High in protein
(D) High in carbohydrate

77. Cerebrovasular disease and hypertension is associated with

(A) High calcium intake
(B) High salt intake
(C) Low calcium intake
(D) Low salt intake

78. The normal range of total serum bilirubin is

(A) 0.2–1.2 mg/100 ml
(B) 1.5–1.8 mg/100 ml
(C) 2.0–4.0 mg/100 ml
(D) Above 7.0 mg/100 ml

79. The normal range of direct reacting (conjugated) serum bilirubin is

(A) 0–0.1 mg/100 ml
(B) 0.1–0.4 mg/100 ml
(C) 0.4–06 mg/100 ml
(D) 0.5–1 mg/100 ml

80. The normal range of indirect (unconjugated) bilirubin in serum is

(A) 0–0.1 mg/100 ml
(B) 0.1–0.2 mg/100 ml
(C) 0.2–0.7 mg/100 ml
(D) 0.8–1.0 mg/100 ml

81. Jaundice is visible when serum bilirubin exceeds

(A) 0.5 mg/100 ml (B) 0.8 mg/100 ml
(C) 1 mg/100 ml (D) 2.4 mg/100 ml

82. An increase in serum unconjugated bilirubin occurs in

(A) Hemolytic jaundice
(B) Obstructive jaundice
(C) Nephritis
(D) Glomerulonephritis

83. One of the causes of hemolytic jaundice is

(A) G-6 phosphatase deficiency
(B) Increased conjugated bilirubin
(C) Glucokinase deficiency
(D) Phosphoglucomutase deficiency

84. Increased urobilinogen in urine and absence of bilirubin in the urine suggests

(A) Obstructive jaundice
(B) Hemolytic jaundice
(C) Viral hepatitis
(D) Toxic jaundice

85. A jaundice in which serum alanine transaminase and alkaline phosphatase are normal is

(A) Hepatic jaundice
(B) Hemolytic jaundice
(C) Parenchymatous jaundice
(D) Obstructive Jaundice

86. Fecal stercobilinogen is increased in

(A) Hemolytic jaundice
(B) Hepatic jaundice
(C) Viral hepatitis
(D) Obstructive jaundice

87. Fecal urobilinogen is increased in

(A) Hemolytic jaundice
(B) Obstruction of biliary duct
(C) Extrahepatic gall stones
(D) Enlarged lymphnodes

88. A mixture of conjugated and unconjugated bilirubin is found in the circulation in

(A) Hemolytic jaundice
(B) Hepatic jaundice
(C) Obstructive jaundice
(D) Post hepatic jaundice

89. Hepatocellular jaundice as compared to pure obstructive type of jaundice is characterized by

(A) Increased serum alkaline phosphate, LDH and ALT
(B) Decreased serum alkaline phosphatase, LDH and ALT
(C) Increased serum alkaline phosphatase and decreased levels of LDH and ALT
(D) Decreased serum alkaline phosphatase and increased serum LDH and ALT

90. Icteric index of an normal adult varies between

(A) 1–2 (B) 2–4
(C) 4–6 (D) 10–15

91. Clinical jaundice is present with an icteric index above

(A) 4 (B) 8
(C) 10 (D) 15

92. Normal quantity of urobilinogen excreted in the feces per day is about

(A) 10–25 mg (B) 50–250 mg
(C) 300–500 mg (D) 700–800 mg

93. Fecal urobilinogen is decreased in

(A) Obstruction of biliary duct
(B) Hemolytic jaundice
(C) Excess fat intake
(D) Low fat intake

94. A complete absence of fecal urobilinogen is strongly suggestive of

(A) Obstruction of bile duct
(B) Hemolytic jaundice
(C) Intrahepatic cholestasis
(D) Malignant obstructive disease

95. Immediate direct Vanden Bergh reaction indicates

(A) Hemolytic jaundice
(B) Hepatic jaundice
(C) Obstructive jaundice
(D) Megalobastic anemia

96. The presence of bilirubin in the urine without urobilinogen suggests

(A) Obstructive jaundice
(B) Hemolytic jaundice
(C) Pernicious anemia
(D) Damage to the hepatic parenchyma

97. Impaired galactose tolerance test suggests

(A) Defect in glucose utilisation
(B) Liver cell injury
(C) Renal defect
(D) Muscle injury

98. Increased serum ornithine carabamoyl transferase activity is diagnostic of

(A) Myocardial infarction
(B) Hemolytic jaundice
(C) Bone disease
(D) Acute viral hepatitis

99. The best known and most frequently used test of the detoxicating functions of liver is

(A) Hippuric acid test
(B) Galactose tolerance test
(C) Epinephrine tolerance test
(D) Rose Bengal dye test

100. The ability of liver to remove a dye like BSP from the blood suggests a normal

(A) Excretory function
(B) Detoxification function
(C) Metabolic function
(D) Circulatory function

101. Removal of BSP dye by the liver involves conjugation with

(A) Thiosulphate
(B) Glutamine
(C) Cystein component of glutathione
(D) UDP glucuronate

102. Normal value of plasma total proteins varies between

(A) 3–4 gm/100ml (B) 6–8 gm/100ml
(C) 10–12 gm/100ml (D) 14–16 gm/100ml

103. A decrease in albumin with increased production of other unidentified proteins which migrate in β, γ region suggests

(A) Cirrhosis of liver
(B) Nephrotic syndrome
(C) Infection
(D) Chronic lymphatic leukemia

104. In increase in α_2-Globulin with loss of albumin in urine suggests

(A) Primary immune deficiency
(B) Nephrotic syndrome
(C) Cirrhosis of liver
(D) Multiple myeloma

105. The normal levels of prothrombin time is about

(A) 2 sec (B) 4 sec
(C) 14 sec (D) 10–16 sec

106. In obstructive jaundice prothrombin time

(A) Remains normal
(B) Decreases
(C) Responds to vit K and becomes normal
(D) Responds to vit K and increases

107. In parenhymatous liver disease the prothrombin time

(A) Remains normal (B) Increases
(C) Decreases (D) Responds to Vit K

108. Urea clearance test is used to determine the

(A) Glomerular filtration rate
(B) Renal plasma flow
(C) Ability of kidney to concentrate the urine
(D) Measurement of tubular mass

109. The formula to calculate maximum urea clearance is $\frac{U \times V}{B}$, where U denotes

(A) Concentration of urea in urine in gm/24 hr
(B) Concentration of urea in urine in mg/100 ml
(C) Concentration of urea in blood in mg/100 ml
(D) Volume of urine in ml/mt

110. Average maximum urea clearance is

(A) 30 ml (B) 50 ml
(C) 75 ml (D) 90 ml

111. The average normal value for standard urea clearance is

(A) 20 ml (B) 30 ml
(C) 40 ml (D) 54 ml

112. Urea clearance is lowered in

(A) Acute nephritis
(B) Pneumonia
(C) Early stage of nephritic syndrome
(D) Benign hypertension

113. Glomerular filtration rate can be measured by

(A) Endogenous creatinine clearance
(B) Para-aminohippurate test
(C) Addis test
(D) Mosenthal test

114. At normal levels of creatinine in the blood, this metabolite is

(A) Filtered at the glomerulus but not secreted nor reabsorbed by the tubule
(B) Secreted by the tubule
(C) Reabsorbed by the tubule
(D) Secreted and reabsorbed by tubule

115. The normal values for creatinine clearance varies from

(A) 20–40 ml/min (B) 40–60 ml/min
(C) 70–85 ml/min (D) 95–105 ml/min

116. Measurement of insulin clearance test is a measure of

(A) Glomerular filtration rate
(B) Filtration factor
(C) Renal plasma flow
(D) Tubular secretory mass

117. The polysaccharide insulin is

(A) Filtered at the glomerulus but neither secreted nor reabsorbed by the tubule
(B) Filtered at the glomerulus and secreted by the tubule
(C) Filtered at the glomerulus and reabsorbed by the tubule
(D) Filtered at the glomerulus, secreted and reabsorbed by the tubule

118. Normal insulin clearance is

(A) 40 ml/1.73 sqm (B) 60 ml/1.73 sqm
(C) 80 ml/1.73 sqm (D) 120 ml/1.73 sqm

119. Creatinine EDTA clearance is a test to measure

(A) Renal plasma flow
(B) Filtration fraction
(C) Glomerular filtration rate
(D) Tubular function

120. The end products of saponification:

(A) glycerol (B) acid
(C) soap (D) Both (A) and (C)

121. The normal PAH clearance for a surface area of 1.73 sqm. is

(A) 200 ml/min (B) 300 ml/min
(C) 400 ml/min (D) 574 ml/min

122. Para amino hippurate is

(A) Filtered at glomeruli and secreted by the tubules
(B) Filtered at glomeruli and not secreted by the tubules
(C) Filtered at glomeruli and reabsorbed completely
(D) Not removed completely during a single circulation of the blood through the kidney.

123. The Tm for PAH i.e the maximal secretory capacity of the tubule for PAH can be used to gavge the

(A) Extent of tubular damage

(B) Impairment of the capacity of the tubule to perform osmotic work
(C) Impairment of renal plasma flow
(D) Glomerular filtration rate

124. The normal Tm in mg/min/1.73 sqm for PAH is

(A) 20 (B) 40
(C) 60 (D) 80

125. The normal range of filtration factor in an adult is

(A) 0.10–0.15 (B) 0.16–0.21
(C) 0.25–0.30 (D) 0.35–0.40

126. The filtration factor tends to be normal in

(A) Early essential hypertension
(B) Malignant phase of hypertension
(C) Glomerulonephritis
(D) Acute nephritis

127. The filtration factor is increased in

(A) Glomerulonephritis
(B) Malignant phase of hypertension
(C) Early essential hypertension
(D) Acute nephritis

128. The filtration factor is decreased in

(A) Glomerulonephritis
(B) Early essential hypertension
(C) Malignant phase of hypertension
(D) Starvation

129. Excretion of phenolsulphanpthalein (PSP) reflects

(A) Glomerulonephritis
(B) Maximaltabular excretory capacity
(C) Filtration factor
(D) Renal plasma flow

130. Which of the following is a polyunsaturated fatty acid?

(A) Palmitic acid (B) Palmitoleic acid
(C) Linoleic acid (D) Oleic acid

131. Which of the following is omega-3 polyunsaturated fatty acid?

(A) Linoleic acid (B) α-Linolenic acid
(C) γ-Linolenic acid (D) Arachidonic acid

132. Triglycerides are

(A) Heavier than water
(B) Major constituents of membranes
(C) Non-polar
(D) Hydrophilic

133. Cerebronic acid is present in

(A) Glycerophospholipids
(B) Sphingophospholipids
(C) Galactosyl ceramide
(D) Gangliosides

134. Acylsphingosine is also known as

(A) Sphingomyelin (B) Ceramide
(C) Cerebroside (D) Sulphatide

135. The highest phospholipids content is found in

(A) Chylomicrons (B) VLDL
(C) LDL (D) HDL

136. The major lipid in chylomicrons is

(A) Triglycerides (B) Phospholipids
(C) Cholesterol (D) Free fatty acids

137. Number of carbon atoms in cholesterol is

(A) 17 (B) 19
(C) 27 (D) 30

138. The lipoprotein richest in cholesterol is

(A) Chylomicrons (B) VLDL
(C) LDL (D) HDL

139. The major storage form of lipids is

(A) Esterified cholesterol
(B) Glycerophospholipids
(C) Triglycerides
(D) Sphingolipids

140. Cerebonic acid is present in

(A) Triglycerides
(B) Cerebrosides
(C) Esterified cholestrol
(D) Sphingomyelin

141. The nitrogenous base in lecithin is

(A) Ethanolamine (B) Choline
(C) Serine (D) Betaine

142. All the following are omega-6-fatty acids except

(A) Linoleic acid (B) α-Linolenic acid
(C) γ-Linolenic acid (D) Arachidonic acid

143. All the following have 18 carbon atoms except

(A) Linoleic acid (B) Linolenic acid
(C) Arachidonic acid (D) Stearic acid

144. A 20-carbon fatty acid among the following is

(A) Linoleic acid (B) α-Linolenic acid
(C) β-Linolenic acid (D) Arachidonic acid

145. Triglycerides are transported from liver to extrahepatic tissues by

(A) Chylomicrons (B) VLDL
(C) HDL (D) LDL

146. Cholesterol is transported from liver to extrahepatic tissues by

(A) Chylomicrons (B) VLDL
(C) HDL (D) LDL

147. Elevated plasma level of the following projects against atherosclerosis:

(A) Chylomicrons (B) VLDL
(C) HDL (D) LDL

148. All the following amino acids are non-essential except

(A) Alanine (B) Histidine
(C) Cysteine (D) Proline

149. Sulphydryl group is present in

(A) Cysteine (B) Methionine
(C) Both (A) and (B) (D) None of these

150. Oligosaccharide-pyrophosphoryl dolichol is required for the synthesis of

(A) N-linked glycoproteins
(B) O-linked glycoproteins
(C) GPI-linked glycoproteins
(D) All of these

151. In N-linked glycoproteins, oligosaccharide is attached to protein through its

(A) Asparagine residue (B) Glutamine residue
(C) Arginine residue (D) Lysine residue

152. De hovo synthesis of fatty acids occurs in

(A) Cytosol (B) Mitochondria
(C) Microsomes (D) All of these

153. Acyl Carrier Protein contains the vitamin:

(A) Biotin (B) Lipoic acid
(C) Pantothenic acid (D) Folic acid

154. Which of the following is required as a reductant in fatty acid synthesis?

(A) NADH (B) NADPH
(C) $FADH_2$ (D) $FMNH_2$

155. Hepatic liponenesis is stimulated by:

(A) cAMP (B) Glucagon
(C) Epinephrine (D) Insulin

156. De novo synthesis of fatty acids requires all of the following except

(A) Biotin (B) NADH
(C) Panthothenic acid (D) ATP

157. Acetyl CoA carboxylase regulates fatty acid synthesis by which of the following mechanism?

(A) Allosteric regulation
(B) Covalent modification
(C) Induction and repression
(D) All of these

158. β-Oxidation of fatty acids requires all the following coenzymes except

(A) CoA (B) FAD
(C) NAD (D) NADP

159. Which of the following can be oxidized by β-oxidation pathway?

(A) Saturated fatty acids
(B) Monosaturated fatty acids
(C) Polyunsaturated fatty acids
(D) All of these

160. Propionyl CoA is formed on oxidation of

(A) Monounsaturated fatty acids
(B) Polyunsaturated fatty acids
(C) Fatty acids with odd number of carbon atoms
(D) None of these

161. An enzyme required for the synthesis of ketone bodies as well as cholesterol is

(A) Acetyl CoA carboxylase
(B) HMG CoA synthetase
(C) HMG CoA reductase
(D) HMG CoA lyase

162. Ketone bodies are synthesized in

(A) Adipose tissue (B) Liver
(C) Muscles (D) Brain

163. All the following statements about ketone bodies are true except

(A) Their synthesis increases in diabetes mellitus
(B) They are synthesized in mitchondria
(C) They can deplete the alkali reserve
(D) They can be oxidized in the liver

164. All the following statements about carnitine are true except

(A) It can be synthesised in the human body
(B) It can be synthesized from methionine and lysine
(C) It is required for transport of short chain fatty acids into mitochondria
(D) Its deficiency can occur due to haemodialysis

165. Which of the following can be synthesized in the human body if precurors are available?

(A) Oleic acid (B) Palmitoleic acid
(C) Arachidonic acid (D) All of these

166. All the following can be oxidized by β-oxidation except

(A) Palmitic acid
(B) Phytanic acid
(C) Linoleic acid
(D) Fatty acids having an odd number of carbon atoms

167. Anti-inflammatory corticosteroids inhibit the synthesis of

(A) Leukotrienes (B) Prostaglandins
(C) Thromboxanes (D) All of these

168. Diets having a high ratio of polyunsaturated: saturated fatty acids can cause

(A) Increase in serum triglycerides
(B) Decrease in serum cholesterol
(C) Decrease in serum HDL
(D) Skin lesions

169. Thromboxanes cause

(A) Vasodilation
(B) Bronchoconstriction
(C) Platelet aggregation
(D) All of these

170. Prostaglandins lower camp in

(A) Adipose tissue (B) Lungs
(C) Platelets (D) Adenohypophysis

171. Slow reacting Substance of Anaphylaxis is a mixture of

(A) Prostaglandins (B) Prostacyclins
(C) Thromboxanes (D) Leukotrienes

172. Dipalmitoyl lecithin acts as

(A) Platelet activating factor
(B) Second messenger for hormones
(C) Lung surfactant
(D) Anti-ketogenic compound

173. Reichert-Meissl number:

(A) 0.1 N KOH (B) 0.5 KOH
(C) 0.1 N NaOH (D) 0.5 NaOH

174. In glycerophospholipids, a polyunsaturated fatty acid is commonly attached to which of the following carbon atom of glycerol?

(A) Carbon 1 (B) Carbon 2
(C) Both (A) and (B) (D) None of these

175. Lysolecithin is formed from lecithin by removal of

(A) Fatty acid from position 1
(B) Fatty acid from position 2
(C) Phosphorylcholine
(D) Choline

176. Sphingosine is synthesized from

(A) Palmitoyl CoA and Choline
(B) Palmitoyl CoA and ethanolamine
(C) Palmitoyl CoA and serine
(D) Acetyl CoA and choline

177. For synthesis of sphingosine, all the following coenzymes are required except

(A) Pyridoxal phosphate
(B) NADPH
(C) FAD
(D) NAD

178. Cerebrosides contain all the following except

(A) Galactose (B) Sulphate
(C) Sphingosine (D) Fatty acid

179. Niemann-Pick disease results from deficiency of

(A) Ceramidase (B) Sphingomyelinase
(C) Arylsulphatase A (D) Hexosaminidase A

180. Chylomicron remnants are catabolised in

(A) Intestine (B) Adipose tissue
(C) Liver (D) Liver and intestine

181. VLDL remnant may be converted into

(A) VLDL (B) LDL
(C) HDL (D) Chylomicrons

182. Receptors for chylomicron remnants are

(A) Apo A specific (B) Apo B-48 specific
(C) Apo C specific (D) Apo E specific

183. LDL receptor is specific for

(A) Apo B-48 and Apo B 100
(B) Apo B-48 and Apo E
(C) Apo B-100 and Apo D
(D) Apo B-100 and apo D

184. Nascent HDL of intestinal origin lacks

(A) Apo A (B) Apo C
(C) Apo E (D) Apo C and Apo E

185. HDL is synthesized in

(A) Adipose tissue (B) Liver
(C) Intestine (D) Liver and intestine

186. Nascent HDL of intestinal origin acquires Apo C and Apo E from

(A) Chylomicrons
(B) VLDL
(C) LDL
(D) HDL of the hepatic origin

187. Heparin releasable hepatic lipase converts

(A) VLDL remnants into LDL
(B) Nascent HDL into HDL
(C) HDL_2 into HDL_3
(D) HDL_3 into HDL_2

188. Activated lecithin cholesterol acyl transferase is essential for the conversion of

(A) VLDL remnants into LDL
(B) Nascent HDL into HDL
(C) HDL_2 into HDL_3
(D) HDL_3 into HDL_2

189. Fatty liver may be caused by

(A) Deficiency of methionine
(B) Puromycin
(C) Chronic alcoholism
(D) All of these

190. Alcohol dehydrogenase converts ethanol into

(A) Acetyl CoA (B) Acetaldehyde
(C) Acetate (D) CO_2 and H_2O

191. Lipids are stored in the body mainly in the form of

(A) Phospholipids (B) Glycolipids
(C) Triglycerides (D) Fatty acids

192. Lipid stores are mainly present in

(A) Liver (B) Brain
(C) Muscles (D) Adipose tissue

193. Glycerol is converted into glycerol-3-phosphate by

(A) Thiokinase (B) Triokinase
(C) Glycerol kinase (D) All of these

194. In adipose tissue, glycerol-3-phosphate required for the synthesis of triglycerides comes mainly from

(A) Hydrolysis of pre-existing triglycerides
(B) Hydrolysis of phospholipids
(C) Dihydroxyacetone phosphate formed in glycolysis
(D) Free glycerol

195. Glycerol released from adipose tissue by hydrolysis of triglycerides is mainly

(A) Taken up by liver
(B) Taken up by extrahepatic tissues
(C) Reutilised in adipose tissue
(D) Excreted from the body

196. Free glycerol cannot be used for triglyceride synthesis in

(A) Liver (B) Kidney
(C) Intestine (D) Adipose tissue

197. Adipose tissue lacks

(A) Hormone-sensitive lipase
(B) Glycerol kinase
(C) cAMP-dependent protein kinase
(D) Glycerol-3-phosphate dehydrogenase

198. A digestive secretion that does not contain any digestive enzyme is

(A) Saliva (B) Gastric juice
(C) Pancreatic juice (D) Bile

199. Saliva contains a lipase which acts on triglycerides having

(A) Short chain fatty acids
(B) Medium chain fatty acids
(C) Long chain fatty acids
(D) All of these

200. Salivary lipase hydrolyses the ester bond at

(A) Position 1 of triglycerides
(B) Position 2 of triglycerides
(C) Position 3 of triglycerides
(D) All of these

201. Salivary lipase converts dietary triglycerides into

(A) Diglycerides and fatty acids
(B) Monoglycerides and fatty acids
(C) Glycerol and fatty acids
(D) All of these

202. Pancreatic lipase requires for its activity:

(A) Co-lipase (B) Bile salts
(C) Phospholipids (D) All of these

203. Pancreatic lipase converts triacylglycerols into

(A) 2, 3-Diacylglycerol
(B) 1-Monoacylglycerol
(C) 2-Monoacylglycerol
(D) 3-Monoacylglycerol

204. Oxidation of fatty acids occurs

(A) In the cytosol
(B) In the matrix of mitochondria
(C) On inner mitochondrial membrane
(D) On the microsomes

205. Activation of fatty acids requires all the following except

(A) ATP (B) Coenzyme A
(C) Thiokinase (D) Carnitine

206. Mitochondrial thiokinase acts on

(A) Short chain of fatty acids
(B) Medium chain fatty acids
(C) Long chain fatty acids
(D) All of these

207. Carnitine is required for the transport of

(A) Triglycerides out of liver
(B) Triglycerides into mitochondria
(C) Short chain fatty acids into mitochondria
(D) Long chain fatty acids into mitochondria

208. Carnitine acylcarnitine translocase is present

(A) In the inner mitochondrial membrane
(B) In the mitochondrial matrix
(C) On the outer surface of inner mitochondrial membrane
(D) On the inner surface of inner mitochondrial membrane

209. Net ATP generation on complete oxidation of stearic acid is

(A) 129 (B) 131
(C) 146 (D) 148

210. Propionyl CoA formed oxidation of fatty acids having an odd number of carbon atoms is converted into

(A) Acetyl CoA
(B) Acetoacetyl CoA
(C) D-Methylmalonyl CoA
(D) Butyryl CoA

211. α-Oxidation of fatty acids occurs mainly in

(A) Liver (B) Brain
(C) Muscles (D) Adipose tissue

212. Refsum's disease results from a defect in the following pathway except

(A) Alpha-oxidation of fatty acids
(B) Beta-oxidation of fatty acids
(C) Gamma-oxidation of fatty acids
(D) Omega-oxidation of fatty acids

213. The end product of omega-oxidation of fatty acids having an even number of carbon atoms is

(A) Adipic acid (B) Suberic acid
(C) Both (A) and (B) (D) None of these

214. De novo synthesis of fatty acids is catalysed by a multi-enzyme complex which contains

(A) One-SH group (B) Two-SH groups
(C) Three-SH groups (D) Four-SH groups

215. Fat depots are located in

(A) Intermuscular connective tissue
(B) Mesentary
(C) Omentum
(D) All of these

216. Salivary lipase is secreted by

(A) Parotid glands
(B) Sub-maxillary glands
(C) Dorsal surface of tongue
(D) None of these

217. Co-lipase is a

(A) Bile salt (B) Vitamin
(C) Protein (D) Phospholipid

218. Plasma becomes milky

(A) Due to high level of HDL
(B) Due to high level of LDL
(C) During fasting
(D) After a meal

219. Mitochondrial membrane is permeable to

(A) Short chain fatty acids
(B) Medium chain fatty acids
(C) Long chain fatty acids
(D) All of these

220. During each cycle of β-oxidation

(A) One carbon atom is removed from the carboxyl end of the fatty acid
(B) One carbon atom is removed from the methyl end of the fatty acid
(C) Two carbon atoms are removed from the carboxyl end of the fatty acid
(D) Two carbon atoms are removed from the methyl end of the fatty acid

221. Net generation of energy on complete oxidation of palmitic acid is

(A) 129 ATP equivalents
(B) 131 ATP equivalents
(C) 146 ATP equivalents
(D) 148 ATP equivalents

222. Net generation of energy on complete oxidation of a 17-carbon fatty acid is

(A) Equal to the energy generation from a 16-carbon fatty acid
(B) Equal to the energy generation from an 18-carbon fatty acid
(C) Less than the energy generation from a 16-carbon fatty acid
(D) In between the energy generation from a 16-carbon fatty acid and an 18-carbon fatty acid

223. Net energy generation on complete oxidation of linoleic acid is

(A) 148 ATP equivalents
(B) 146 ATP equivalents
(C) 144 ATP equivalents
(D) 142 ATP equivalents

224. Extramitochondrial synthesis of fatty acids occurs in

(A) Mammary glands (B) Lungs
(C) Brain (D) All of these

225. One functional sub-unit of multi-enzyme complex for de novo synthesis of fatty acids contains

(A) One —SH group
(B) Two —SH groups
(C) Three —SH groups
(D) Four —SH groups

226. NADPH required for fatty acid synthesis can come from

(A) Hexose monophosphate shunt
(B) Oxidative decarboxylation of malate
(C) Extramitochondrial oxidation of isocitrate
(D) All of these

227. Fatty liver may be prevented by all of the following except

(A) Choline (B) Betaine
(C) Methionine (D) Ethionine

228. Human desaturase enzyme system cannot introduce a double bond in a fatty acid beyond

(A) Carbon 9 (B) Carbon 6
(C) Carbon 5 (D) Carbon 3

229. Which of the following lipid is absorbed actively from intestines?

(A) Glycerol
(B) Cholesterol
(C) Monoacylglycerol
(D) None of these

230. C_{22} and C_{24}, fatty acids required for the synthesis of sphingolipids in brain are formed by

(A) De novo synthesis
(B) Microsomal chain elongation
(C) Mitochondrial chain elongation
(D) All of these

231. Sphingomyelins:

(A) Phospholipids (B) Nitrolipids
(C) Alcohols (D) None of these

232. All of the following statements about hypoglycin are true except

(A) It is a plant toxin
(B) It causes hypoglycaemia
(C) It inhibits oxidation of short chain fatty acids
(D) It inhibits oxidation of long chain fatty acids

233. Synthesis of prostaglandins is inhibited by

(A) Glucocorticoids (B) Aspirin
(C) Indomethacin (D) All of these

234. Lipo-oxygenase is required for the synthesis of

(A) Prostaglandins (B) Leukotrienes
(C) Thromboxanes (D) All of these

235. All of the following statements about multiple sclerosis are true except

(A) There is loss of phospholipids from white matter
(B) There is loss of sphingolipids from white matter
(C) There is loss of esterified cholesterol from white matter
(D) White matter resembles gray matter in composition

236. After entering cytosol, free fatty acids are bound to

(A) Albumin (B) Globulin
(C) Z-protein (D) None of these

237. Release of free fatty acids from adipose tissue is increased by all of the following except

(A) Glucagon (B) Epinephrine
(C) Growth hormone (D) Insulin

238. All the following statements about brown adipose tissue are true except

(A) It is rich in cytochromes
(B) It oxidizes glucose and fatty acids
(C) Oxidation and phosphorylation are tightly coupled in it
(D) Dinitrophenol has no effect on it

239. Lovastatin and mevastatin lower

(A) Serum triglycerides
(B) Serum cholesterol
(C) Serum phospholipids
(D) All of these

240. Lovastatin is a

(A) Competitive inhibitor of acetyl CoA carboxylase
(B) Competitive inhibitor of HMG CoA synthetase
(C) Non-competitive inhibitor of HMG CoA reductase
(D) Competitive inhibitor of HMG CoA reductase

241. Abetalipoproteinaemia occurs due to a block in the synthesis of

(A) Apoprotein A (B) Apoprotein B
(C) Apoprotein C (D) Cholesterol

242. All of the following statements about Tangier disease are true except

(A) It is a disorder of HDL metabolism
(B) Its inheritance is autosomal recessive
(C) Apoproteins A-I and A-II are not synthesised
(D) Plasma HDL is increased

243. Genetic deficiency of lipoprotein lipase causes hyperlipoproteinaemia of following type:

(A) Type I (B) Type IIa
(C) Type IIb (D) Type V

244. Chylomicrons are present in fasting blood samples in hyperlipoproteinaemia of following types:

(A) Types I and IIa (B) Types IIa and IIb
(C) Types I and V (D) Types IV and V

245. Glutathione is a constituent of

(A) Leukotriene A_4 (B) Thromboxane A_1
(C) Leukotriene C_4 (D) None of these

246. Prostaglandins are inactivated by

(A) 15-Hydroxyprostaglandin dehydrogenase
(B) Cyclo-oxygenase
(C) Lipo-oxygenase
(D) None of these

247. Phenylbutazone and indomethacin inhibit

(A) Phospholipase A_1 (B) Phospholipase A_2
(C) Cyclo-oxygenase (D) Lipo-oxygenase

248. Prostaglandins stimulate

(A) Aggregation of platelets
(B) Lipolysis in adipose tissue
(C) Bronchodilatation
(D) Gastric acid secretion

249. For extramitochondrial fatty acid synthesis, acetyl CoA may be obtained from

(A) Citrate (B) Isocitrate
(C) Oxaloacetate (D) Succinate

250. Fluidity of membranes is increased by the following constituent except

(A) Polyunsaturated fatty acids
(B) Saturated fatty acids
(C) Integral proteins
(D) Cholesterol

251. Transition temperature of membranes may be affected by the following constituent of membranes:

(A) Peripheral proteins (B) Integral proteins
(C) Cholesterol (D) Oligosachharides

252. Acetyl CoA formed from pyruvate can be used for the synthesis of all the following except

(A) Glucose (B) Fatty acids
(C) Cholesterol (D) Steroid hormones

253. Which of the following can be used as a source of energy in extrahepatic tissues?

(A) Acetoacetate (B) Acetone
(C) Both (A) and (B) (D) None of these

254. Anti-inflammatory corticosteroids inhibit

(A) Phospholipase A_1 (B) Phospholipase A_2
(C) Cyclo-oxygenase (D) Lipo-oxygenase

255. Cyclo-oxygenase is involved in the synthesis of

(A) Prostaglandins (B) Thromboxanes
(C) Both (A) and (B) (D) None of these

256. Leukotrienes cause

(A) Increase in capillary permeability
(B) Aggregation of platelets
(C) Bronchodilatation
(D) None of these

257. Prostaglandins decrease all of the following except

(A) Gastric acid secretion
(B) Blood pressure
(C) Uterine contraction
(D) Platelet aggregation

258. Hypocholesterolaemia can occur in

(A) Hyperthyroidism
(B) Nephrotic syndrome
(C) Obstructive jaundice
(D) Diabetes mellitus

259. De novo synthesis and oxidation of fatty acids differ in the following respect:

(A) Synthesis occurs in cytosol and oxidation in mitochondria
(B) Synthesis is decreased and oxidation increased by insulin
(C) NADH is required in synthesis and FAD in oxidation
(D) Malonyl CoA is formed during oxidation but not during synthesis

260. Free fatty acids released from adipose tissue are transported in blood by

(A) Albumin (B) VLDL
(C) LDL (D) HDL

261. β -Galactosidase is deficient in

(A) Fabry's disease
(B) Krabbe's disease
(C) Gaucher's disease
(D) Metachromatic leukodystrophy

262. The enzyme deficient in metachromatic leukodystrophy is

(A) Arylsulphatase A (B) Hexosaminidase A
(C) Ceramidase (D) Sphingomyelinase

263. All of the following statements about generalized gangliosidosis are true except

(A) It results from deficiency of G_{M1}-β-Gangliosidase
(B) Breakdown of G_{M1} ganglioside is impaired
(C) G_{M2} ganglioside accumulates in liver and elsewhere
(D) It leads to mental retardation

264. Hexosaminidase A is deficient in

(A) Tay-Sachs disease
(B) Gaucher's disease
(C) Niemann-Pick disease
(D) Fabry's disease

265. Mental retardation occurs in

(A) Tay-Sachs disease
(B) Gaucher's disease
(C) Niemann-Pick disease
(D) All of these

266. The enzyme deficient in Fabry's disease is

(A) α-Galactosidase (B) β-Galactosidase
(C) α-Glucosidase (D) β-Glucosidase

267. Highest protein content amongst the following is present in

(A) Wheat (B) Rice
(C) Pulses (D) Soyabean

268. Daily protein requirement of an adult man is

(A) 0.5 gm/kg of body weight
(B) 0.8 gm/kg of body weight
(C) 1.0 gm/kg of body weight
(D) 1.5 gm/kg of body weight

269. Daily protein requirement of an adult woman is

(A) 0.5 gm/kg of body weight
(B) 0.8 gm/kg of body weight
(C) 1.0 gm/kg of body weight
(D) 1.5 gm/kg of body weight

270. Cysteine can partially meet the requirement of

(A) Phenylalanine (B) Threonine
(C) Methionine (D) None of these

271. Invisible fat is present in

(A) Milk (B) Coconut oil
(C) Groundnut oil (D) Hydrogenated oils

272. Visible fat is present in

(A) Milk (B) Pulses
(C) Coconut oil (D) Egg yolk

273. Fat content of eggs is about

(A) 7% (B) 10%
(C) 13% (D) 16%

274. Fat content of pulses is about

(A) 5% (B) 10%
(C) 15% (D) 20%

275. Predominant fatty acids in meat are

(A) Saturated
(B) Monounsaturated
(C) Polyunsaturated
(D) Mono and poly-unsaturated

276. Oils having more than 50 % polyunsaturated fatty acids include all of the following except

(A) Groundnut oil (B) Soyabean oil
(C) Sunflower oil (D) Safflower oil

277. Cholesterol is present in all of the following except

(A) Egg (B) Fish
(C) Milk (D) Pulses

278. Which of the following has the highest cholesterol content?

(A) Meat (B) Fish
(C) Butter (D) Milk

279. Which of the following has the highest cholesterol content?

(A) Egg yolk (B) Egg white
(C) Meat (D) Fish

280. The following contains the least cholesterol:

(A) Milk (B) Meat
(C) Butter (D) Cheese

281. Which of the following constitutes fibre or roughage in food?

(A) Cellulose (B) Pectin
(C) Inulin (D) All of these

282. The starch content of wheat is about

(A) 50% (B) 60%
(C) 70% (D) 80%

283. The starch content of pulses is about

(A) 50% (B) 60%
(C) 70% (D) 80%

284. A significant source of starch among vegetables is

(A) Radish (B) Spinach
(C) Potato (D) Cauliflower

285. The cyclic ring present in all the steroids:

(A) Cyclopentano perhydrophenanthrene
(B) Nitropentano
(C) both (A) and (B)
(D) None of these

286. In Ames' assay, addition of a carcinogen to the culture medium allows S. typhimurium to grow

(A) In the presence of histidine
(B) In the presence of arginine
(C) In the absence of histidine
(D) In the absence of arginine

287. In Ames' assay, liver homogenate is included in the culture medium because

(A) It converts pro-carcinogens into carcinogens
(B) Liver can metabolise histidine
(C) *Salmonella* mainly infects liver
(D) Liver is very susceptible to cancer

288. Bile pigments are present and urobilinogen absent in urine in

(A) Haemolytic jaundice
(B) Hepatocellular jaundice
(C) Obstructive jaundice
(D) Crigler-Najjar syndrome

289. Bile pigments are absent and urobilinogen increased in urine in

(A) Haemolytic jaundice
(B) Hepatocellular jaundice
(C) Obstructive jaundice
(D) Rotor's syndrome

290. In obstructive jaundice, urine shows

(A) Absence of bile pigments and urobilinogen
(B) Presence of bile pigments and urobilinogen
(C) Absence of bile pigments and presence of urobilinogen
(D) Presence of bile pigments and absence of urobilinogen

291. In haemolytic jaundice, urine shows

(A) Absence of bile pigments and urobilinogen
(B) Presence of bile pigments and urobilinogen
(C) Absence of bile pigments and presence of urobilinogen
(D) Presence of bile pigments and absence of urobilinogen

292. Serum albumin may be decreased in

(A) Haemolytic jaundice
(B) Hepatocellular jaundice
(C) Obstructive jaundice
(D) All of these

293. Normal range of serum albumin is

(A) 2.0–3.6 gm/dl (B) 2.0–3.6 mg/dl
(C) 3.5–5.5 gm/dl (D) 3.5–5.5 mg/dl

294. Normal range of serum globulin is

(A) 2.0–3.6 mg/dl (B) 2.0–3.6 gm/dl
(C) 3.5–5.5 mg/dl (D) 3.5–5.5 gm/dl

295. Serum albumin: globulin ratio is altered in

(A) Gilbert's disease (B) Haemolytic jaundice
(C) Viral hepatitis (D) Stones in bile duct

296. Esterification of cholesterol occurs mainly in

(A) Adipose tissue (B) Liver
(C) Muscles (D) Kidneys

297. Galactose intolerance can occur in

(A) Haemolytic jaundice
(B) Hepatocellular jaundice
(C) Obstructive jaundice
(D) None of these

298. Prothrombin is synthesised in

(A) Erythrocytes
(B) Reticulo-endothelial cells
(C) Liver
(D) Kidneys

299. Prothrombin time remains prolonged even after parenterals administration of vitamin K in

(A) Haemolytic jaundice
(B) Liver damage
(C) Biliary obstruction
(D) Steatorrhoea

300. All the following statements about obstructive jaundice are true except

(A) Conjugated bilirubin in serum is normal
(B) Total bilirubin in serum is raised
(C) Bile salts are present in urine
(D) Serum alkaline phosphatase is raised

301. All the following statements about obstructive jaundice are true except

(A) Prothrombin time may be prolonged due to impaired absorption of vitamin K
(B) Serum alkaline phosphatase may be raised due to increased release of the enzyme from liver cells
(C) Bile salts may enter systemic circulation due to biliary obstruction
(D) There is no defect in conjugation of bilirubin

302. A test to evaluate detoxifying function of liver is

(A) Serum albumin: globulin ratio
(B) Galactose tolerance test
(C) Hippuric acid test
(D) Prothrombin time

303. Hippuric acid is formed from

(A) Benzoic acid and alanine
(B) Benzoic acid glycine
(C) Glucuronic acid and alanine
(D) Glucuronic acid and glycine

304. An enzyme which is excreted in urine is

(A) Lactase dehydrogenase
(B) Amylase
(C) Ornithine transcarbamoylase
(D) None of these

305. Serum gamma glutamyl transpeptidase is raised in

(A) Haemolytic jaundice
(B) Myocardial infarction
(C) Alcoholic hepatitis
(D) Acute cholecystitis

306. Oliguria can occur in

(A) Diabetes mellitus
(B) Diabetes insipidus
(C) Acute glomerulonephritis
(D) Chronic glomerulonephritis

307. Urea clearance is the

(A) Amount of urea excreted per minute
(B) Amount of urea present in 100 ml of urine
(C) Volume of blood cleared of urea in one minute
(D) Amount of urea filtered by glomeruli in one minute

308. Inulin clearance is a measure of

(A) Glomerular filtration rate
(B) Tubular secretion flow
(C) Tubular reabsorption rate
(D) Renal plasma flow

309. Phenolsulphonephthalein excretion test is an indicator of

(A) Glomerular filtration
(B) Tubular secretion
(C) Tubular reabsorption
(D) Renal blood low

310. Para-amino hippurate excretion test is an indicator of

(A) Glomerular filtration
(B) Tubular secretion
(C) Tubular reabsorption
(D) Renal plasma flow

311. Renal plasma flow of an average adult man is

(A) 120–130 ml/minute
(B) 325–350 ml/minute
(C) 480–52 ml/minute
(D) 560–830 ml/minute

312. Filtration fraction can be calculated from

(A) Standard urea clearance and PSP excretion
(B) Maximum urea clearance and PSP excretion
(C) Maximum urea clearance and PAH clearance
(D) Inulin clearance and PAH clearance

313. Normal filtration fraction is about

(A) 0.2 (B) 0.4
(C) 0.6 (D) 0.8

314. Filtration fraction is increased in

(A) Acute glomerulonephritis
(B) Chronic glomerulonephritis
(C) Hypertension
(D) Hypotension

315. Among the following, a test of Glomerular function is

(A) Urea clearance
(B) PSP excretion test
(C) PAH clearance
(D) Hippuric acid excretion test

316. Esters of fatty acids with higher alcohols other than glycerol are said to be

(A) Waxes (B) Fats
(C) Both (A) and (B) (D) None of these

317. The combination of an amino alcohol, fatty acid and sialic acid form

(A) Phospholipids (B) Sulpholipids
(C) Glycolipids (D) Aminolipids

318. Hydrolysis of fats by alkali is called

(A) Saponification number
(B) Saponification
(C) Both (A) and (B)
(D) None of these

319. The number of milliliters of 0.1 N KOH required to neutralize the insoluble fatty acids from 5 gms of fat is called

(A) Acid number (B) Acetyl number
(C) Halogenation (D) Polenske number

320. The rate of fatty acid oxidation is increased by

(A) Phospholipids (B) Glycolipids
(C) Aminolipids (D) All of these

321. Lecithin contains a nitrogenous base named as

(A) Ethanolamine (B) Choline
(C) Inositol (D) All of these

322. Lecithins contain an unsaturated fatty acid at position:

(A) α (B) α and β
(C) β (D) None of these

323. Lecithins are soluble in ordinary solvents except

(A) Benzene (B) Ethyl alcohol
(C) Methyl alcohol (D) Acetone

324. Lecithins combine with protein to form

(A) Phosphoprotein (B) Mucoprotein
(C) Lipoprotein (D) Glycoprotein

325. Instead of ester link plasmalogens possess an other link in position:

(A) α (B) β
(C) γ (D) None of these

326. The alkyl radical in plasmalogen is an alcohol:

(A) Saturated (B) Unsaturated
(C) Both (A) and (B) (D) None of these

327. The concentration of sphingomyelins are increased in

(A) Gaucher's disease
(B) Fabry's disease
(C) Fabrile disease
(D) Niemann-Pick disease

328. Sphingomyelins contain a complex amino alcohol named as

(A) Serine (B) Lysolecithin
(C) Sphingosine (D) Glycol

329. The types of sphingomyelins are

(A) 1 (B) 3
(C) 4 (D) 5

330. Glycolipids contain an amino alcohol:

(A) Sphingosine (B) Iso-sphingosine
(C) Both (A) and (B) (D) None of these

331. Cerebrosides may also be classified as

(A) Sphingolipids (B) Sulpholipids
(C) Aminolipids (D) Glycolipids

332. Gaucher's disease is characterized specially by the increase in

(A) Lignoceric acid
(B) Nervonic acid
(C) Cerebomic acid
(D) Hydroxynervonic acid

333. Gangliosides are the glycolipids occurring in

(A) Brain (B) Liver
(C) Kidney (D) Muscle

334. Lipoprotein present in cell membrane is by nature:

(A) Hydrophilic (B) Hydrophobic
(C) Both (A) and (B) (D) None of these

335. The density of lipoproteins increases as the protein content

(A) Increases
(B) Decreases
(C) Highly decreases
(D) Slightly and promptly decreases

336. Lipoprotiens may be identified more accurately by means of

(A) Electrophoresis
(B) Ultra centrifugation
(C) Centrifugation
(D) Immunoelectrophoresis

337. Very low density lipoproteins are also known as

(A) β-lipoproteins (B) Pre β–lipoproteins
(C) α-lipoproteins (D) None of these

338. The protein moiety of lipoprotein is known as

(A) Apoprotein (B) Pre-protein
(C) Post-protein (D) Pseudoprotein

339. The β-lipoprotein fraction increases in severe

(A) Diabetes Mellitus (B) Uremia
(C) Nephritis (D) Muscular dystrophy

340. Δ^9 indicates a double bond between carbon atoms of the fatty acids:

(A) 8 and 9 (B) 9 and 10
(C) 9 and 11 (D) 9 and 12

341. The number of carbon atoms in decanoic acid present in butter:

(A) 6 (B) 8
(C) 10 (D) 12

342. Arachidonic acid contains the number of double bonds:

(A) 2 (B) 3
(C) 4 (D) 5

343. The prostaglandins are synthesized from

(A) Arachidonic acid (B) Oleic acid
(C) Linoleic acid (D) Linolenic acid

344. The Iodine number of essential fatty acids of vegetable oils:

(A) High (B) Very high
(C) Very low (D) Low

345. Cholesterol is a

(A) Animal sterol (B) M.F. $C_{27}H_{46}O$
(C) 5 methyl groups (D) All of these

346. Waxes contain higher alcohols named as

(A) Methyl (B) Ethyl
(C) Phytyl (D) Cetyl

347. Lieberman-Burchard reaction is performed to detect

(A) Cholesterol (B) Glycerol
(C) Fatty acid (D) Vitamin D

348. Lipose present in the stomach cannot hydrolyze fats owing to

(A) Alkalinity (B) Acidity
(C) High acidity (D) Neutrality

349. Fatty acids are oxidized by

(A) α-oxidation (B) β-oxidation
(C) ω-oxidation (D) All of these

350. The fatty acids containing even number and odd number of carbon atoms as well as the unsaturated fatty acids are oxidized by

(A) α-oxidation (B) β-oxidation
(C) ω-oxidation (D) All of these

351. Long chain fatty acids are first activated to acyl CoA in the

(A) Cytosol (B) Mitochodria
(C) Ribosomes (D) Microsome

352. Long chain acyl CoA penetrates mitochondria in the presence of

(A) Palmitate (B) Carnitine
(C) Sorbitol (D) DNP

353. Acyl-CoA dehydrogenase converts Acyl CoA to α-β unsaturated acyl-CoA in presence of the coenzyme:

(A) NAD^+ (B) $NADP^+$
(C) ATP (D) FAD

354. For the activation of long chain fatty acids the enzyme thiokinase requires the cofactor:

(A) Mg^{++} (B) Ca^{++}
(C) Mn^{++} (D) K^+

355. ω-oxidation takes place by the hydroxylase in microsomes involving

(A) Cytochrome b (B) Cytochrome c
(C) Cytochrome p-4500 (D) Cytochrome a_3

356. Carboxylation of acetyl—CoA to malonyl — CoA takes place in presence of

(A) FAD^+ (B) Biotin
(C) NAD^+ (D) $NADP^+$

357. Malonyl-CoA reacts with the central

(A) —SH group (B) $—NH_2$ group
(C) —COOH group (D) $—CH_2OH$ group

358. Fatty acid synthesis takes place in the presence of the coenzyme:

(A) NAD^+ (B) Reduced NAD
(C) $NADP^+$ (D) Reduced NADP

359. Fatty acids are activated to acyl CoA by the enzyme thiokinase:

(A) NAD^+ (B) $NADP^+$
(C) CoA (D) FAD^+

360. Phospholipids help the oxidation of

(A) Glycerol (B) Fatty acids
(C) Glycerophosphates (D) None of these

361. The desaturation and chain elongation system of polyunsaturated fatty acids are greatly diminished in the absence of

(A) Insulin (B) Glycagon
(C) Epinephrine (D) Thyroxine

362. Prostaglandins are liberated in the circulation by the stimulation of

(A) Anterior pituitary glands
(B) Posterior pituitary glands
(C) Adrenal gland
(D) Thyroid gland

363. Prostaglandins have a common structure based on prostanoic acid which contains carbon atoms:

(A) 12 (B) 16
(C) 18 (D) 20

364. The carbon chains of prostanoic acid are bonded at the middle of the chain by a

(A) 5-membered ring (B) 6-membered ring
(C) 8-membered ring (D) None of these

365. All active prostaglandins have atleast one double bond between positions:

(A) 7 and 8 (B) 9 and 10
(C) 11 and 12 (D) 13 and 14

366. The enzyme systems for lengthening and shortening for saturating and desaturating of fatty acids occur in

(A) Intestine (B) Muscle
(C) Kidney (D) Liver

367. Which of the following are classified as essential fatty acids?

(A) Arachidonic acid (B) Oleic acid
(C) Acetic acid (D) Butyric acid

368. Prostaglandins are synthesized in the body from

(A) Myristic acid (B) Arachidonic acid
(C) Stearic acid (D) Lignoceric acid

369. All the following saturated fatty acids are present in buffer except

(A) Butyric acid (B) Capryllic acid
(C) Caproic acid (D) Capric acid

370. Biological functions of lipids include

(A) Source of energy
(B) Insulating material
(C) Maintenance of cellular integrity
(D) All of these

371. Saponification number is

(A) mg of KOH required to saponify one gm of fat or oil
(B) mg of KOH required to neutralize free fatty acids of one gms of fat
(C) mg of KOH required to neutralize the acetic acid obtained by saponification of one gm of fat after it has been acetylated
(D) None of these

372. Lipids have the following properties:

(A) Insoluble in water and soluble in fat solvent
(B) High energy content
(C) Structural component of cell membrane
(D) All of these

373. Carbohydrate moiety in cerebrosides is

(A) Glucose (B) Sucrose
(C) Galactose (D) Maltose

374. Which of the following is not an unsaturated fatty acid?

(A) Oleic acid (B) Stearic acid
(C) Linaoleic acid (D) Palmitic acid

375. All the following are functions of prostaglandins except

(A) Lowering of B.P
(B) Introduction of labour
(C) Anti inflammatory
(D) Prevention of myocardial infraction

376. Calorific value of lipids per gm is

(A) 4 Kcal (B) 8 Kcal
(C) 9 Kcal (D) None of these

377. Fatty acid present in kerotin is

(A) Lignoceric acid (B) Cerebromic acid
(C) Nervonic acid (D) Hydroxynervonic acid

378. All the following are ketones except

(A) Xylulose (B) Ribolose
(C) Erythrose (D) Fructose

379. Saponification:

(A) Hydrolysis of fats by alkali
(B) Hydrolysis of glycerol by liposes
(C) Esterification
(D) Reduction

380. Number of ml of 0.1 N KOH required to neutralize fatty acids from 5 gms of fat:

(A) Iodine number
(B) Polenske number
(C) Reichert-Miessl number
(D) None of these

381. Hydrated density of HD lipoproteins is

(A) 0.94 gm/ml
(B) 0.94–1.006 gm/ml
(C) 1.006–1.063 gm/ml
(D) 1.063–1.21 gm/ml

382. Saponification number indicates

(A) Unsaturation in fat
(B) Average M.W of fatty acid
(C) Acetyl number
(D) Acid number

383. Acrolein Test is positive for

(A) Glycerol (B) Prostaglandins
(C) Carbohydrates (D) Proteins

384. Iodine number denotes

(A) Degree of unsaturation
(B) Saponification number
(C) Acid number
(D) Acetyl number

385. Maximum energy produced by

(A) Fats (B) Carbohydrates
(C) Proteins (D) Nucleic acids

386. Lecithins are composed of

(A) Glycerol + Fatty acids + Phosphoric acid + Choline
(B) Glycerol + Fatty acids + Phosphoric acid + Ethanolamine
(C) Glycerol + Fatty acids + Phosphoric acid + Serine
(D) Glycerol + Fatty acids + Phosphoric acid + Beaine

387. Sphingomyelins are composed of fatty acids, phosphoric acid and

(A) Sphingosine and choline
(B) Glycerol and sphingosine
(C) Glycerol and Serine
(D) Glycerol and Choline

388. Depot fats of mammalian cells comprise mostly of

(A) Cholesterol (B) Cholesterol esters
(C) Triacyl glycerol (D) Phospholipids

389. When choline of lecithine is replaced by ethanolamine the product is

(A) Sphingomyelin (B) Cephalin
(C) Plasmalogens (D) Lysolecithine

390. Which of the following is a hydroxy fatty acid?

(A) Oleic acid (B) Ricinoleic acid
(C) Caproic acid (D) Stearic acid

391. Acrolein test is answered by

(A) Cholesterol (B) Glycerol
(C) Glycosides (D) Sphingol

392. The smell of fat turned rancid is due to

(A) Presence of vit E (B) Presence of quinones
(C) Phenols (D) Volatile fatty acids

393. Phospholipids are important cell membrane components because

(A) They have glycerol
(B) They can form bilayers in water
(C) They have both polar and non polar potions
(D) They combine covalently with proteins

394. Which one of the following is not a phospholipid?

(A) Lecithin (B) Plasmalogen
(C) Lysolecithin (D) Gangliosides

395. A fatty acid which is not synthesized in human body and has to be supplied in the diet:

(A) Palmitic acid (B) Oleic acid
(C) Linoleic acid (D) Stearic acid

396. In cephalin, choline is replaced by

(A) Serine (B) Ethanolamine
(C) Betaine (D) Sphingosine

397. The triacyl glycerol present in plasma lipoproteins are hydrolyzed by

(A) Linqual lipase (B) Pancreatic lipase
(C) Colipase (D) Lipoprotein lipase

398. Amphiphatic lipids are

(A) Hydrophilic (B) Hydrophobic
(C) Both (A) and (B) (D) Lipophilic

399. Which of the following is not essential fatty acid?

(A) Oleic acid (B) Linoleic acid
(C) Arachidonic acid (D) Linolenic acid

400. The calorific value of lipid is

(A) 4.0 Kcal/gm (B) 6.0 Kcal/gm
(C) 9.0 Kcal/gm (D) 15 Kcal/gm

401. Rancidity of butter is prevented by the addition of

(A) Vitamin D (B) Tocopherols
(C) Presence of priotin (D) Presence of 'Cu'

402. Sphingomyelins on hydrolysis yields

(A) Glycerol, fatty acids, phosphoric acid and choline
(B) Glycerol, sphingosine, choline and fatty acids
(C) Sphingosine, phosphoric acid, Glycerol and inositol
(D) Sphingosine, fatty acids, phosphoric acid and choline

403. Inherited deficiency of enzyme *cerebrosidase* produces

(A) Fabry's disease
(B) Niemann pick disease
(C) Gaucher's disease
(D) Tay-sach's disease

404. Phosphatidic acid on hydrolysis yields

(A) Glycerol, fatty acids, phosphoric acid, choline
(B) Glycerol, fatty acids, phosphoric acid
(C) Glycerol, fatty acids, phosphoric acid, Glucose
(D) Sphingol, fatty acids, phosphoric acid

405. The maximum number of double bonds present in essential fatty acid is

(A) 1 (B) 2
(C) 3 (D) 4

406. Cerebrosides are composed of

(A) Sphingosine, fatty acids, glycerol and phosphoric acid
(B) Sphingosine, fatty acids, galactose
(C) Glycerol, fatty acids, galactose
(D) Glycerol, fatty acids, galactose, sphingol

407. Acetoacetic acid and β-OH butyric acid are formed as

(A) Kidneys (B) Heart
(C) Liver (D) Intestine

408. Which amino acid is a lipotropic factor?

(A) Lysine (B) Leucine
(C) Tryptophan (D) Methionine

409. The class of lipoproteins having a beneficial effect in atherosclerosis is

(A) Low density of lipoproteins
(B) very low density lipoproteins
(C) High density lipoproteins
(D) Chylomicrons

410. Cholesterol is the precursor for the biosynthesis of

(A) fatty acid (B) prostaglandins
(C) bile acids (D) sphingmyelin

411. Which of the following condition is characterized by ketonuria but without glycosuria?

(A) Diabetes mellitus
(B) Diabetes insipidus
(C) Prolonged starvation
(D) Addison's disease

412. Ketone bodies are formed in

(A) Kidney (B) Liver
(C) Heart (D) Intestines

413. Changes in serum high density lipoproteins (HDL) are more truly reflected by those of

(A) HDL-1 (B) HDL-2
(C) HDL-3 (D) HDL_C

414. Mitochondrial lipogenesis requires

(A) bicarbonate
(B) biotin
(C) acetyl CoA carboxylase
(D) NADPH

415. Fatty acids having chain length of 10 carbon atoms enter the

(A) Portal ciruclation (B) Lacteals
(C) Systemic circulation (D) Colon

416. A soluble system for synthesis of fatty acids have been isolated from avian liver, required for the formation of long chain fatty acids by this system is

(A) ATP (B) Acetyl CoA
(C) NADPH (D) All of these

417. Most animal tissues contain appreciable amounts of lipid, when in the form of depot fat it consists largely of

(A) Cholesterol ester (B) Phosphatides
(C) Chylomicrons (D) Triacylglycerol

418. A fatty acid not synthesized in man is

(A) Oleic (B) Palmitic
(C) Linoleic (D) Stearic

419. The 'free fatty acids' (FFA) of plasma:

(A) metabolically inert
(B) mainly bound to β-lipoproteins
(C) stored in the fat
(D) mainly bound to serum albumin

420. Adipose tissue which is a store house for triacyl glycerol synthesis the same using

(A) The glycerol released by hydrolysis of triacyl glycerol
(B) The glycerol-3-phosphate obtained in the metabolism of glucose
(C) 2-phosphoglycerate
(D) 3-phosphoglycerate

421. Increase in blood of this class of lipoproteins is beneficial to ward off coronary heart disease:

(A) HDL (B) LDL
(C) VLDL (D) IDL

422. In the extra mitochondrial synthesis of fatty acids, CO_2 is utilized

(A) To keep the system anaerobic and prevent regeneration of acetyl CoA
(B) In the conversion of malonyl to CoA hydroxybutyryl CoA
(C) In the conversion of acetyl CoA to malonyl CoA
(D) In the formation of acetyl CoA from 1 carbon intermediates

423. Current concepts concerning the intestinal absorption of triacylglycerols are that

(A) They must be completely hydrolysed before the constituent fatty acids can be absorbed
(B) They are hydrolysed partially and the material absorbed consists of free fatty acids, mono and diacyl glycerols and unchanged triacyl glycerols
(C) Fatty acids with less than 10 carbon atoms are absorbed about equally via lymph and via portal blood
(D) In the absence of bile the hydrolysis of triacyl glycerols is absorbed

424. Main metabolic end product of cholesterol:

(A) Coprosterol (B) 5-pregnenolone
(C) Bile acid (D) Glycine

425. In the type II (a) hyper lipoproteinemia there is increase in

(A) Chylomicron bond (B) β
(C) Pre beta (D) α

426. Normal fat content of liver is about _____ gms %.

(A) 5 (B) 8
(C) 10 (D) 15

427. Obesity is accumulation of _____ in the body.

(A) Water (B) NaCl
(C) Fat (D) Proteins

428. The first lipoprotein to be secreted by the liver is

(A) VLDL (B) nascent VLDL
(C) LDL (D) IDL

429. This lipoprotein removes cholesterol from the body

(A) HDL (B) VLDL
(C) IDL (D) Chylomicrons

430. When the stired triacylglycerol is lipolysed in the adipose tissue blood levels of _____ increased.

(A) FFA only
(B) Glycerol only
(C) Free fatty acids (FFA) and Glycerol
(D) Triacyl glycero

431. All long chain fatty acids with even number of carbon atoms are oxidized to a pool of _____ by β-oxidation.

(A) CO_2 (B) Propionic acid
(C) Acetic acid (D) Acetyl CoA

432. The level of free fatty acids in plasma is increased by

(A) Insulin (B) Caffeine
(C) Glucose (D) Niacin

433. Cholesterol is excreted as such into _____.

(A) Urine (B) Faeces
(C) Bile (D) Tears

434. LCAT is

(A) Lactose choline alamine transferse
(B) Lecithin cholesterol acyl transferase
(C) Lecithin carnitine acyl transferase
(D) Lanoleate carbamoyl acyl transferase

435. Cholesterol molecule has _____ carbon atoms.

(A) 27 (B) 21
(C) 15 (D) 12

436. A hydrocarbon formed in cholesterol synthesis is

(A) Mevalonate (B) HMG CoA
(C) Squalene (D) Zymosterol

437. While citrate is converted to isocitrate in the mitochondria, it is converted to _____ in the cytosol.

(A) Acetyl CoA + oxaloacetate
(B) Acetyl CoA + malonyl CoA
(C) Acetyl CoA + Pyruvate
(D) Acetyl CoA + acetoacetyl CoA

438. Avidin is antigonistic to

(A) Niacin (B) PABA
(C) Biotin (D) Pantothenic acid

439. CTP is required for the synthesis of

(A) Fatty acids (B) Proteins
(C) Phospholipids (D) Cholesterol

440. Lysolecithin is formed from lecithin by the action of

(A) Phospholipase A_1 (B) Phospholipase A_2
(C) Phospholipase C (D) Phospholipase D

441. Fatty acids can not be converted into carbohydrates in the body, as the following reaction is not possible:

(A) Conversion of glucose-6-phosphate into glucose
(B) Fructose 1, 6 diphosphate to fructose-6-phosphate
(C) Transformation of acetyl CoA to pyruvate
(D) Formation of acetyl CoA from fatty acids

442. Cholesterol circulates in blood stream chiefly as

(A) Free cholesterol
(B) Ester cholesterol
(C) Low density lipoproteins
(D) Low density lipoproteins and high density lipoproteins

443. What is the sub cellular site for the β-oxidation of fatty acids?

(A) Nucleus (B) Mitochondria
(C) Lysosome (D) Cytosol

444. A diet containing this fat is helpful in lowering the blood cholesterol level.

(A) Unsaturated (B) Saturated
(C) Vitamin enriched (D) Refined

445. Phospholipase A_2 is an enzyme which removes a fatty acid residue from lecithin to form

(A) Lecithin fragments
(B) Phosphotidic acid
(C) Glyceryl phosphate
(D) Lysolecithin

446. Pancreatic lipose is an enzyme which hydrolyzes facts. It acts as a/an

(A) peptidase (B) hydrolase
(C) carbohydrates (D) dehydrogenase

447. This interferes with cholesterol absorption

(A) Lipoprotein lipase
(B) Creatinase
(C) 7-dehydrocholesterol
(D) β-sitosterol

448. The carbon chain of fatty acids is shortened by 2 carbon atoms at a time. This involves successive reactions catalysed by 4-enzymes. These act the following order:

(A) Acetyl CoA dehydrogenase, β-OH acyl CoA dehydrogenase, enoyl hydrase, thiolose
(B) Acyl CoA dehydrogenase, thiolase, enoyl hydrase, β-OH acyl CoA dehydrogenase
(C) Acyl CoA dehydrogenase, thiolose, enoyl hydrase, β-OH acyl CoA dehydrogenase
(D) Enoyl hydrase, β-OH acyl CoA dehydrogenase, acyl CoA dehydrogenase, thiolose,

449. Acyl carrier protein is involved in the synthesis of

(A) protein
(B) glycogen
(C) fatty acid outside the mitochondria
(D) fatty acid in the mitochondria

450. 1 molecule of palmitic acid on total oxidation to CO_2 will yield molecules of ATP (as high energy bonds):

(A) 129 (B) 154
(C) 83 (D) 25

451. HMG CoA is formed in the metabolism of

(A) Cholesterol, ketones and leucine
(B) Cholesterol, fatty acid and Leucine
(C) Lysine, Lecuine and Isoleucine
(D) Ketones, Leucine and Lysine

452. NADPH is produced when this enzyme acts

(A) Pyruvate dehydrogenase
(B) Malic enzyme
(C) Succinate dehydrogenase
(D) Malate dehydrogenase

453. As a result of each oxidation a long chain fatty acid is cleaved to give

(A) An acid with 3-carbon less and propionyl CoA
(B) An acid with 2-carbon less and acetyl CoA
(C) An acid with 2-carbon less and acetyl CoA
(D) An acid with 4-carbon and butyryl CoA

454. Liposomes are

(A) Lipid bilayered (B) Water in the middle
(C) Carriers of drugs (D) All of these

455. Long chain fatty acyl CoA esters are transported across the mitochondrial membrane by

(A) cAMP (B) Prostaglandin
(C) Carnitine (D) Choline

456. The acetyl CoA formed on β-oxidation of all long chain fatty acids is metabolized under normal circumstances to

(A) CO_2 and water (B) Cholesterol
(C) Fatty acids (D) Ketone bodies

457. Very low density lipoproteins are relatively rich in

(A) Cholesterol (B) Triacyl glycerol
(C) Free fatty acids (D) Phospholipids

458. Neutral fat is stored in

(A) Liver (B) Pancreas
(C) Adipose tissue (D) Brain

459. A pathway that requires NADPH as a cofactor is

(A) Fatty acid oxidation
(B) Extra mitochondrial denovo fatty acid synthesis
(C) Ketone bodies formation
(D) Glycogenesis

460. The 'Committed step' in the biosynthesis of cholesterol from acetyl CoA is

(A) Formation of acetoacetyl CoA from acetyl CoA
(B) Formation of mevalonate from HMG CoA
(C) Formation of HMG CoA from acetyl CoA and acetoacetyl CoA
(D) Formation of squalene by *squalene synthetase*

461. In β-Oxidation of fatty acids, which of the following are utilized as coenzymes?

(A) NAD^+ and $NADP^+$
(B) $FADH_2$ and $NADH + H^+$
(C) FAD and FMN
(D) FAD and NAD^+

462. The most important source of reducing equivalents for FA synthesis on the liver is

(A) Glycolysis
(B) HMP-Shunt
(C) TCA cycle
(D) Uronic acid pathway

463. All of the following tissue are capable of using ketone bodies except

(A) Brain (B) Renal cortex
(C) R.B.C. (D) Cardiac muscle

464. The major source of cholesterol in arterial smooth muscle cells is from

(A) IDL (B) LDL
(C) HDL (D) Chylomicrons

465. Ketone bodies are synthesized from fatty acid oxidation products by which of the following organs?

(A) Liver (B) Skeletal muscles
(C) Kidney (D) Brain

466. Chain elongation of fatty acids occurring in mammalian liver takes place in which of the following subcellular fractions of the cell?

(A) Nucleus (B) Ribosomes
(C) Lysosomes (D) Microsomes

467. Which of the following cofactors or their derivatives must be present for the conversion of acetyl CoA to malonyl CoA extramitochondrial fatty acid synthesis?

(A) Biotin (B) FAD
(C) FMN (D) ACP

468. Which of the following statement regarding β-oxidation is true?

(A) Requires β-ketoacyl CoA as a substrate
(B) Forms CoA thioesters
(C) Requires GTP for its activity
(D) Yields acetyl CoA as a product

469. All statements regarding 3-OH-3 methyl glutaryl CoA are true except

(A) It is formed in the cytoplasm
(B) Required in ketogenesis
(C) Involved in synthesis of Fatty acid
(D) An intermediate in cholesterol biosynthesis

470. Which of the following lipoproteins would contribute to a measurement of plasma cholesterol in a normal individual following a 12 hr fast?

(A) Chylomicrons
(B) VLDL
(C) Both VLDL and LDL
(D) LDL

471. All the following statements regarding ketone bodies are true except

(A) They may result from starvation
(B) They are formed in kidneys
(C) They include acetoacetic acid and acetone
(D) They may be excreted in urine

472. In synthesis of Triglyceride from α-Glycero phosphate and acetyl CoA, the first intermediate formed is

(A) β-diacyl glycerol (B) Acyl carnitine
(C) Monoacyl glycerol (D) Phosphatidic acid

473. During each cycle of β-oxidation of fatty acid, all the following compounds are generated except

(A) NADH (B) H_2O
(C) FAD (D) Acyl CoA

474. The energy yield from complete oxidation of products generated by second reaction cycle of β-oxidation of palmitoyl CoA will be

(A) 5 ATP (B) 12 ATP
(C) 17 ATP (D) 34 ATP

475. β-Oxidation of odd-carbon fatty acid chain produces

(A) Succinyl CoA (B) Propionyl CoA
(C) Acetyl CoA (D) Malonyl CoA

476. Brown adipose tissue is characterized by which of the following?

(A) Present in large quantities in adult humans
(B) Mitochondrial content higher than white adipose tissue
(C) Oxidation and phosphorylation are tightly coupled
(D) Absent in hibernating animals

477. Ketosis in partly ascribed to

(A) Over production and Glucose
(B) Under production of Glucose
(C) Increased carbohydrate utilization
(D) Increased fat utilization

478. The free fatty acids in blood are

(A) Stored in fat depots
(B) Mainly bound to β-lipoproteins
(C) Mainly bound to serum albumin
(D) Metabolically most inactive

479. Carnitine is synthesized from

(A) Lysine (B) Serine
(C) Choline (D) Arginine

480. A metabolite which is common to pathways of cholesterol biosynthesis from acetyl-CoA and cholecalciferol formation from cholesterol is

(A) Zymosterol
(B) Lumisterol
(C) Ergosterol
(D) 7 Dehydrocholesterol

481. Acetyl CoA required for extra mitochondrial fatty acid synthesis is produced by

(A) Pyruvate dehydrogenase complex
(B) Citrate lyase
(C) Thiolase
(D) Carnitine-acyl transferase

482. Biosynthesis of Triglyceride and Lecithine both require an intermediate:

(A) Monoacyl glycerol phosphate
(B) Phosphatidic acid
(C) Phosphatidyl ethanol amine
(D) Phosphatidyl cytidylate

483. The rage limiting step cholesterol biosynthesis is

(A) Squalene synthetase
(B) Mevalonate kinase
(C) HMG CoA synthetase
(D) HMG CoA reductase

484. All the following are constituents of ganglioside molecule except

(A) Glycerol (B) Sialic acid
(C) Hexose sugar (D) Sphingosine

485. An alcoholic amine residue is present in which of the following lipids?

(A) Phosphatidic acid (B) Cholesterol
(C) Sphingomyelin (D) Ganglioside

486. Sphingosine is the backbone of all the following except

(A) Cerebroside (B) Ceramide
(C) Sphingomyelin (D) Lecithine

487. Chylomicron, intermediate density lipoproteins (IDL), low density lipoproteins (LDL) and very low density lipoproteins (VLDL) all are serum lipoproteins. What is the correct ordering of these particles from the lowest to the greatest density?

(A) LDL, IDL, VLDL, Chylomicron
(B) Chylomicron, VLDL, IDL, LDL
(C) VLDL, IDL, LDL, Chylomicron
(D) Chylomicron, IDL, VLDL, LDL

488. A compound normally used to conjugate bile acids is

(A) Serine (B) Glycine
(C) Glucoronic acid (D) Fatty acid

489. Which of the following lipoproteins would contribute to a measurement of plasma cholesterol in a normal person following a 12 hr fast?

(A) High density lipoprotiens
(B) Low density lipoproteins
(C) Chylomicron
(D) Chylomicron remnants

490. Which of the following products of triacylglycerol breakdown and subsequent β-Oxidation may undergo gluconeogenesis?

(A) Acetyl CoA (B) Porpionyl CoA
(C) All ketone bodies (D) Some amino acids

491. Which of the following regulates lipolysis in adipocytes?

(A) Activation of fatty acid synthesis mediated by CAMP
(B) Glycerol phosphorylation to prevent futile esterification of fatty acids
(C) Activation of triglyceride lipase as a result of hormone stimulated increases in CAMP levels
(D) Activation of CAMP production by Insulin

492. Which one of the following compounds is a key intermediate in the synthesis of both triacyl glycerols and phospholipids?

(A) CDP Choline (B) Phosphatidase
(C) Triacyl glyceride (D) Phosphatidyl serine

493. During each cycle of on going fatty acid oxidation, all the following compounds are generated except

(A) H_2O (B) Acetyl CoA
(C) Fatty acyl CoA (D) NADH

494. All the following statements describing lipids are true except

(A) They usually associate by covalent interactions

(B) They are structurally components of membranes

(C) They are an intracellular energy source

(D) They are poorly soluble in H_2O

495. All the following statements correctly describe ketone bodies except

(A) They may result from starvation

(B) They are present at high levels in uncontrolled diabetes

(C) They include—OH β-butyrate and acetone

(D) They are utilized by the liver during long term starvation

496. Which of the following features is predicted by the Nicolson–Singer fluid mosaic model of biological membranes?

(A) Membrane lipids do not diffuse laterally

(B) Membrane lipid is primarily in a monolayer form

(C) Membrane lipids freely flip-flop

(D) Membrane proteins may diffuse laterally

497. Oxidative degradation of acetyl CoA in the citric acid cycle gives a net yield of all the following except

(A) $FADH_2$ (B) 3 NADH

(C) 2 ATP (D) $2CO_2$

498. All the following correctly describe the intermediate 3-OH-3-methyl glutaryl CoA except

(A) It is generated enzymatically in the mitochondrial matrix

(B) It is formed in the cytoplasm

(C) It inhibits the first step in cholesterol synthesis

(D) It is involved in the synthesis of ketone bodies

499. Intermediate in the denovo synthesis of triacyl glycerols include all the following except

(A) Fatty acyl CoA

(B) CDP diacyl glycerol

(C) Glycerol-3-phosphate

(D) Lysophosphatidic acid

500. Mitochondrial α-ketoglutarate dehydrogenase complex requires all the following to function except

(A) CoA (B) FAD

(C) NAD^+ (D) $NADP^+$

501. Each of the following can be an intermediate in the synthesis of phosphatidyl choline except

(A) Phosphatidyl inositol

(B) CDP-choline

(C) Phosphatidyl ethanolamine

(D) Diacylglycerol

502. High iodine value of a lipid indicates

(A) Polymerization (B) Carboxyl groups

(C) Hydroxyl groups (D) Unsaturation

503. Cholesterol, bile salts, vitamin D and sex hormones are

(A) Mucolipids (B) Glycolipids

(C) Phospholipids (D) Isoprenoid lipids

504. Water soluble molecular aggregates of lipids are known as

(A) Micelle (B) Colloids

(C) Sphingol (D) Mucin

505. Hypoglycemia depresses insulin secretion and thus increases the rate of

(A) Hydrolysis (B) Reduction

(C) Gluconeogenesis (D) Respiratory acidosis

506. The process of breakdown of glycogen to glucose in the liver and pyruvate and lacate in the muscle is known as

(A) Glyogenesis (B) Glycogenolysis

(C) Gluconeogenesis (D) Cellular degradation

507. Across a membrane phospholipids act as carrier of

(A) Organic compounds

(B) Inorganic ions

(C) Nucleic acids

(D) Food materials

508. Osteomalacia can be prevented by the administration of calcium and a vitamin:

(A) A (B) B

(C) C (D) D

509. Milk sugar is known as

(A) Fructose (B) Glucose
(C) Sucrose (D) Lactose

510. The Instrinisic Factor (HCl and mucoproteins) present in the gastric juice help in the absorption of

(A) Vitamin B_2 (B) Tocopherols
(C) Folic acid (D) Vitmain B_{12}

511. Lipase can act only at pH:

(A) 2.5–4 (B) 3.5–5
(C) 4 to 5 (D) 5–7

512. Bile is produced by

(A) Liver (B) Gall-bladder
(C) Pancreas (D) Intestine

513. Non-protein part of rhodopsin is

(A) Retinal (B) Retinol
(C) Carotene (D) Repsin

514. A pathway that requires NADPH as a co-factor is

(A) Extramitochondrial folic acid synthesis
(B) Ketone body formation
(C) Glycogenesis
(D) Gluconeogenesis

515. LCAT activity is associated with which of the lipo-protein complex?

(A) VLDL (B) Chylomicrones
(C) IDL (D) HDL

516. In β–oxidation of fatty acids which of the following are utilized as co-enzymes?

(A) NAD^+ and $NADP^+$
(B) FAD H_2 and NADH + H^+
(C) FAD and FMN
(D) FAD and NAD^+

517. The lipoprotein with the fastest electrophoretic mobility and lowest TG content are

(A) VLDL (B) LDL
(C) HDL (D) Chylomicrones

518. The essential fatty acids retard

(A) Atherosclerosis (B) Diabetes mellitus
(C) Nepritis (D) Oedema

519. The majority of absorbed fat appears in the forms of

(A) HDL (B) Chylomicrone
(C) VLDL (D) LDL

520. Daily output of urea in grams is

(A) 10 to 20 (B) 15 to 25
(C) 20 to 30 (D) 35 to 45

521. Uremia occurs in

(A) Cirrohsis of liver (B) Nephritis
(C) Diabetes mellitus (D) Coronary thrombosis

522. Carboxyhemoglobin is formed by

(A) CO (B) CO_2
(C) HCO_3 (D) HCN

523. Methemoglobin is formed as a result of the oxidation of haemoglobin by oxidation agent:

(A) Oxygen of Air (B) H_2O_2
(C) $K_4Fe(CN)_6$ (D) $KMnO_4$

524. Methemoglobin can be reduced to haemoglobin by

(A) Removal of hydrogen
(B) Vitamin C
(C) Glutathione
(D) Creatinine

525. Fats are solids at

(A) 10°C (B) 20°C
(C) 30°C (D) 40°C

526. Esters of fatty acids with higher alcohol other than glycerol are called as

(A) Oils (B) Polyesters
(C) Waxes (D) Terpenoids

527. The main physiological buffer in the blood is

(A) Haemoglobin buffer
(B) Acetate
(C) Phosphate
(D) Bicarbonate

528. All of the following substances have been used to estimate GFR except

(A) Inulin (B) Creatinine
(C) Phenol red (D) Mannitol

529. Relationship between GFR and seum creatinine concentration is

(A) Non-existent (B) Inverse
(C) Direct (D) Indirect

530. Urine turbidity may be caused by any of the following except

(A) Phosphates (B) Protein
(C) RBC (D) WBC

531. Urine specific gravity of 1.054 indicates

(A) Excellent renal function
(B) Inappropriate secretion of ADH
(C) Extreme dehydration
(D) Presence of glucose or protein

532. In hemolytic jaundice, the urinary bilirubin is

(A) Normal
(B) Absent
(C) More than normal
(D) Small amount is present

533. In obstructive jaundice, urinary bilirubin is

(A) Absent
(B) Increased
(C) Present
(D) Present in small amount

534. In hemolytic jaundice, bilirubin in urine is

(A) Usually absent
(B) Usually present
(C) Increased very much
(D) Very low

535. The pH of gastric juice of infants is

(A) 2.0 (B) 4.0
(C) 4.5 (D) 5.0

536. The pH of blood is about 7.4 when the ratio between ($NaHCO_3$) and (H_2CO_3) is

(A) 10 : 1 (B) 20 : 1
(C) 25 : 1 (D) 30 : 1

537. The absorption of glucose is decreased by the deficiency of

(A) Vitamin A (B) Vitamin D
(C) Thiamine (D) Vitamin B_{12}

538. For the activity of amylase which of the following is required as co-factor?

(A) HCO_3 (B) Na^+
(C) K^+ (D) Cl

539. Which of the following hormone increases the absorption of glucose from G.I.T?

(A) Insulin (B) Throid hormones
(C) Glucagon (D) FSH

540. Predominant form of storage:

(A) Carbohydrates (B) Fats
(C) Lipids (D) Both (B) and (C)

541. Degradations of Hb takes place in

(A) Mitochondrion (B) Erythrocytes
(C) Cytosol of cell (D) R.E. cells

542. Biluveridin is converted to bilirubin by the process of

(A) Oxidation (B) Reduction
(C) Conjugation (D) Decarboxylation

543. Amylase present in saliva is

(A) α-Amylase (B) β-Amylae
(C) γ -Amylase (D) All of these

544. Phospholipids are important cell membrane components since

(A) They have glycerol
(B) Form bilayers in water
(C) Have polar and non-polar portions
(D) Combine covalently with proteins

545. Which of the following is not a phospholipids?

(A) Lecithin (B) Plasmalogen
(C) Lysolecithin (D) Gangliosides

546. A fatty acid which is not synthesized in human body and has to be supplied in the diet is

(A) Palmitic acid (B) Oleic acid
(C) Linoleic acid (D) Stearic acid

547. Phospholipids occur in

(A) Myelin sheath
(B) Stabilizes chylomicrans
(C) Erythrocyte membrane
(D) All of these

548. Which of the following is not essential fatty acids?

(A) Oleic acid (B) Linoleic acid
(C) Arachidonic acid (D) Linolenic acid

549. The caloric value of lipids is

(A) 6.0 Kcal/g (B) 9.0 Kcal/g
(C) 15.0 Kcal/g (D) 12.0 Kcal/g

550. The maximum number of double bonds present in essential fatty acid is

(A) 2 (B) 3
(C) 4 (D) 5

551. Prostaglandin synfhesis is increased by activating phospholipases by

(A) Mepacrine (B) Angiotensin II
(C) Glucocorticoids (D) Indomenthacin

552. Selwanof's test is positive in

(A) Glucose (B) Fructose
(C) Galactose (D) Mannose

553. Spermatozoa in seminal fluid utilises the following sugar for metabolism:

(A) Galactose (B) Glucose
(C) Sucrose (D) Fructose

554. Depot fats of mammalian cells comprise mostly of

(A) Cholesterol (B) Phospholipid
(C) Cerebrosides (D) Triglycerol

555. When choline of lecithin is replaced by ethanolamine, the product is

(A) Spingomyelin (B) Cephalin
(C) Plasmalogens (D) Lysolecithin

556. Which of the following is a hydroxyl fatty acid?

(A) Oleic Acid (B) Ricinoleic acid
(C) Caproic acid (D) Arachidonic acid

557. Acroleic test is given by

(A) Cholesterol (B) Glycerol
(C) Glycosides (D) Sphingol

ANSWERS

1. A	2. A	3. C	4. C	5. D	6. A
7. C	8. D	9. D	10. B	11. D	12. A
13. B	14. A	15. D	16. B	17. B	18. D
19. C	20. D	21. C	22. A	23. D	24. C
25. A	26. A	27. C	28. B	29. B	30. D
31. A	32. A	33. C	34. A	35. A	36. C
37. D	38. A	39. B	40. C	41. D	42. A
43. B	44. C	45. D	46. A	47. D	48. B
49. C	50. C	51. A	52. B	53. D	54. B
55. C	56. D	57. A	58. B	59. D	60. C
61. A	62. A	63. A	64. D	65. B	66. A
67. A	68. B	69. A	70. A	71. A	72. B
73. A	74. D	75. B	76. A	77. B	78. A
79. B	80. C	81. C	82. A	83. A	84. A
85. B	86. B	87. A	88. B	89. D	90. C
91. D	92. B	93. A	94. D	95. B	96. A
97. B	98. D	99. A	100. A	101. C	102. B
103. A	104. B	105. C	106. C	107. B	108. A
109. B	110. C	111. D	112. A	113. A	114. A
115. D	116. A	117. A	118. D	119. C	120. D
121. D	122. A	123. A	124. D	125. B	126. A
127. B	128. A	129. B	130. C	131. B	132. C
133. C	134. B	135. D	136. A	137. C	138. C
139. C	140. B	141. B	142. B	143. C	144. D
145. B	146. D	147. C	148. B	149. A	150. A
151. A	152. A	153. C	154. B	155. D	156. D
157. D	158. D	159. D	160. C	161. B	162. B
163. D	164. C	165. D	166. B	167. D	168. B
169. C	170. A	171. D	172. C	173. A	174. B
175. B	176. C	177. D	178. B	179. B	180. C
181. C	182. B	183. C	184. D	185. D	186. D
187. C	188. B	189. D	190. B	191. C	192. D
193. C	194. C	195. A	196. D	197. B	198. D
199. A	200. C	201. A	202. D	203. C	204. B
205. D	206. A	207. D	208. A	209. C	210. C
211. B	212. A	213. C	214. D	215. D	216. C
217. C	218. D	219. A	220. C	221. D	222. C
223. D	224. D	225. B	226. D	227. D	228. A
229. D	230. B	231. A	232. A	233. D	234. B
235. C	236. C	237. D	238. C	239. B	240. D
241. B	242. D	243. A	244. C	245. C	246. A

247. C	248. C	249. A	250. A	251. C	252. A
253. A	254. B	255. C	256. A	257. C	258. A
259. A	260. A	261. B	262. A	263. C	264. A
265. D	266. A	267. D	268. C	269. C	270. C
271. A	272. C	273. C	274. A	275. A	276. A
277. D	278. C	279. A	280. A	281. D	282. C
283. B	284. C	285. A	286. C	287. A	288. C
289. A	290. D	291. C	292. B	293. C	294. B
295. C	296. B	297. B	298. C	299. B	300. A
301. B	302. C	303. B	304. C	305. C	306. A
307. A	308. B	309. D	310. D	311. D	312. A
313. C	314. A	315. D	316. A	317. C	318. B
319. D	320. A	321. B	322. C	323. D	324. C
325. B	326. A	327. B	328. C	329. B	330. C
331. A	332. C	333. A	334. A	335. A	336. D
337. B	338. A	339. A	340. B	341. C	342. C
343. A	344. D	345. D	346. D	347. A	348. C
349. D	350. B	351. A	352. B	353. D	354. B
355. C	356. C	357. A	358. D	359. C	360. B
361. A	362. C	363. D	364. B	365. A	366. D
367. A	368. D	369. C	370. D	371. C	372. D
373. B	374. B	375. D	376. C	377. A	378. C
379. A	380. B	381. D	382. B	383. A	384. A
385. A	386. A	387. A	388. C	389. B	390. B
391. B	392. D	393. C	394. D	395. C	396. B
397. D	398. C	399. A	400. C	401. B	402. D
403. C	404. B	405. D	406. B	407. C	408. D
409. C	410. C	411. C	412. B	413. B	414. D
415. A	416. D	417. D	418. C	419. D	420. B
421. A	422. C	423. B	424. C	425. B	426. A
427. C	428. B	429. A	430. C	431. D	432. B
433. C	434. B	435. A	436. C	437. A	438. C
439. C	440. B	441. C	442. D	443. B	444. A
445. D	446. B	447. D	448. B	449. C	450. A
451. A	452. B	453. B	454. D	455. C	456. A
457. B	458. C	459. B	460. B	461. D	462. B
463. C	464. B	465. A	466. D	467. A	468. A
469. B	470. D	471. B	472. D	473. B	474. D
475. D	476. B	477. D	478. C	479. A	480. D
481. B	482. B	483. D	484. A	485. C	486. D
487. B	488. B	489. A	490. B	491. C	492. B
493. A	494. A	495. D	496. D	497. C	498. C

499. B	500. D	501. A	502. D	503. D	504. A
505. C	506. B	507. B	508. D	509. D	510. D
511. D	512. A	513. A	514. A	515. D	516. D
517. C	518. A	519. B	520. C	521. B	522. A
523. C	524. B	525. B	526. C	527. D	528. C
529. B	530. B	531. D	532. C	533. B	534. A
535. D	536. B	537. C	538. D	539. B	540. D
541. D	542. B	543. A	544. C	545. D	546. C
547. D	548. A	549. B	550. C	551. B	552. B
553. D	554. D	555. B	556. B	557. B	

EXPLANATIONS FOR THE ANSWERS

5. D The fatty acids that cannot be synthesized by the body and therefore should be supplied through the diet are referred to as essential fatty acids (EFA). Linoleic acid and linolenic acid are essential. Some workers regard arachidonic acid as an EFA although it can be synthesized from linoleic acid.

61. A Phrynoderma (toad skin) is an essential fatty acid deficiency disorder. It is characterized by the presence of horny eruptions on the posterior and the lateral parts of the limbs, on the back and buttocks.

120. D The hydrolysis of triacylglycerols by alkali to produce glycerol and soaps is known as saponification.

173. A Reichert-Meissl number is defined as the number of moles of 0.1 N KOH required to completely neutralize the soluble volatile fatty acids distilled from 5 g fat.

231. A Sphingomyelins (sphingophospholipids) are a group of phospholipids containing sphingosine as the alcohol (in place of glycerol in other phospholipids).

285. A Cyclopentanoperhydrophenanthrene (CPPP), it consists of a phenanthrene nucleus to which a cyclopentene ring is attached.

345. D Cholesterol is an animal sterol with a molecular formula $C_{27}H_{46}O$. it has one hydroxyl group at C_3 and a double bond between C_5 and C_6. An 8 carbon aliphatic side chain is attached to C_{17}, Cholesterol contains of total 5 methyl groups.

398. C The lipids which possess both hydrophobic and hydrophilic groups are known as amphipathic lipids (Greek: amphi- both; pathos- passion).

454. D Liposomes have an intermittent aqueous phase in lipid bilayer. They are produced when amphipathic lipids in aqueous medium are subjected to sonification. Liposomes are used as carriers of drugs to target tissues.

540. D Fats (triacyglycerols) are the most predominant storage form of energy, since they are highly concentrated form of energy (9 Cal/g) and can be stored in an anhydrous form (no association with water).