UNIVERSITY OF THE PUNJAB

First Prof. A/2015

Examination:- Doctor of Pharmacy (Pharm.D.)

Roll No. .....

Subject: Pharmaceutical Biochemistry

PAPER: 2 (Old & New Course)

TIME ALLOWED: 3 hrs.

MAX. MARKS: 100

NOTE: Attempt any FIVE questions. All questions carry equal marks.

QUESTION no. 1	a) Describe the reactions of hexose monophosthate shunt b) Define glycogenolysis and discuss in detail its significance.	10+10
QUESTION no. 2	a) Describe the difference between amylase, amylopectin and cellulose. b) Define the aerobic gylcolysis and calculate its energetics.	10+10
QUESTION no. 3	Describe the Sources, chemistry and biochemical role of vitamin" A" in detail.	20
QUESTION no. 4	Write note on following a)Classification of porphyrins b) Ribolfavin or vitamin B2	10+10
QUESTION no. 5	What are hormones? Discuss in detail the secretion of thyroid hormone and its disorders.	20
QUESTION no. 6	a) What are nucleic acids, draw the structure of nitrogen bases(Purine & Pyrimidine) b) Describe biosynthesis of fatty acids.	10+10
QUESTION no. 7	a) Dreive mathematical expression of Michaelis-Mentin Equation. b) What are important assumptions about Michaelis-Mentin Equation?.	10+10

UNIVERSITY OF THE PUNJAB

First Prof. A/2016
Examination:- Doctor of Pharmacy (Pharm.D.)

Roll No. .....

Subject: Pharmaceutical Chemistry-II (Biochemistry)
Pharmaceutical Biochemistry
PAPER: 2 (Old & New Course)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 100

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Q. No. 1: (20)

Write the introduction, chemistry, physiological functions, regulation and disorders of parathyroid hormone

Q.No.2: (20)

Write the introduction, chemistry, functions, regulations and disorders of adrenal medullary hormone

Q. No. 3: (20)

What is the process of gene expression? What happens during transcription? Write the major steps of translations

Q. No. 4: (10+10)

a) Draw the structure of purine and pyrimidine bases

b) What are the three types of RNA and describe their functions

Q.No.5: (10+10)

a) What are the assumptions of Mischaelis Menten equation?

b) What are the various types of inhibitions of enzyme activity and their medicinal importance?

Q.No.6: (10+10)

a) Describe the chemical reactions of monosaccharides

b) Describe the hexose monophosphate shunt and its significance

Q.No.7: (10+10)

Write a note on following

a) Vitamin E b) Haem

UNIVERSITY OF THE PUNJAB

First Prof. 2nd A/2016
Examination:- Doctor of Pharmacy (Pharm.D.)

Roll No. .....

Subject: Pharmaceutical Chemistry-II (Biochemistry)
Pharmaceutical Biochemistry
PAPER: 2 (Old & New Course)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 100

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Q.No.1: **10+10**

a) Define and classify hormones

b) Write the chemistry, physiological functions, regulations and metabolism of growth hormone

Q.No.2: **20**

Write the introduction, chemistry, functions, regulations and disorders of thyroid hormone

Q.No.3: **10+10**

a) What is nucleic acid, write the five differences between DNA and RNA, also differentiate between nucleotides and nucleosides

b) Write the process of DNA replication

Q.No.4: **10+10**

Write note on followings

a) Recombinant DNA technology b) Bioenergetics

Q.No.5: **10+10**

a) What are allosteric enzymes?

b) Describe the different factors affecting enzyme activity

Q.No.6: **10+10**

a) Classify carbohydrates in detail and describe their pharmaceutical and biological importance

b) Describe the types of glycolysis and biochemical steps involved in breakdown of glucose in cytoplasm

Q.No.7: **10+10**

Write a note on following

a) Vitamin K b) Porphyrins

UNIVERSITY OF THE PUNJAB

First Prof. A/2017
Examination:- Doctor of Pharmacy (Pharm.D.)

Roll No. .....

Subject: Pharmaceutical Chemistry-II (Biochemistry)
Pharmaceutical Biochemistry
PAPER: 2 (Old & New Course)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 100

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Q. No. 1: **(20)**

Write the introduction, chemistry, physiological functions, regulation and disorders of growth hormone

Q. No. 2: **(10+10)**

a) Classify the protein with examples

b) What are the various catabolic pathways in amino acid metabolism?

Q. No. 3: **(20)**

Write the introduction, chemistry, functions, regulations and disorders of glucagon

Q. No. 4: **(10+10)**

a) Describe the chemical reactions of monosaccharides

b) Describe the fate of pyruvic acid

Q.No.5: **(10+10)**

a) Define and classify phospholipids

b) Describe the biosynthesis of fatty acids

Q.No.6: **(10+10)**

a) Describe the electron transport chain

b) What are the applications of biotechnology?

Q.No.7: **(10+10)**

Write a note on following

a) Vitamin C

b) Porphyrins

UNIVERSITY OF THE PUNJAB

First Prof: 2nd Annual - 2017
Examination:- Doctor of Pharmacy (Pharm.D.)

Roll No. .....

Subject: Pharmaceutical Chemistry-II (Biochemistry)
Pharmaceutical Biochemistry
PAPER: 2 (Old & New Course)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 100

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Q. No. 1: **20**

Write the introduction, chemistry, physiological functions, regulations and disorders of thyroid hormone

Q. No. 2: **10+10**

a) Describe the cyclic structure of hexoses and anomeric forms

b) Describe the pathway of glycolysis

Q. No. 3: **20**

Write a detail note on vitamin A

Q. No. 4: **10+10**

a) Define saponification number, acetyl number, iodine number, Reichert-Meissl number and Polenske number

b) Describe the beta oxidation of even number carbon fatty acids

Q. No. 5: **20**

Write the introduction, chemistry, functions, regulations and disorders of insulin

Q. No. 6: **10+10**

a) What is nucleic acid? Describe the major differences between DNA and RNA

b) Write the process of recombinant DNA technology

Q. No. 7: **20**

Describe the Michaelis Menten equation. What are the basic assumptions of Michaelis Menten kinetics?

UNIVERSITY OF THE PUNJAB

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First Prof: Annual – 2018
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. .....

Subject: Pharmaceutical Chemistry-II (Biochemistry) (New Course)
Pharmaceutical Biochemistry (Old Course)
PAPER: 2 Part – II

TIME ALLOWED: 2 Hrs. & 30 min.
MAX. MARKS: 80

Attempt this Paper on Separate Answer Sheet provided.

Attempt any 4 questions. Each question carry equal marks.

Q No 2 (20)

Write the introduction, chemistry, physiological functions, regulations and disorders of T_3 and T_4 hormone.

Q No 3 (20)

Write the introduction, chemistry, physiological functions, regulations and disorders of insulin.

Q No 4 (15+5)

a) Write down the process of DNA replication
b) Enlist the five differences between DNA and RNA

Q No 5 (20)

Classify proteins. Write down about enzyme Kinetics. How inhibitors and activators affect enzyme kinetic.

Q No 6 (20)

Describe the fate of pyruvic acid

Q No 7 (20)

Write a note on vitamin A

UNIVERSITY OF THE PUNJAB

5

Roll No. .....

First Prof: Annual – 2018

Examination: Doctor of Pharmacy (Pharm.D.)

Subject: Pharmaceutical Chemistry-II (Biochemistry) (New Course)
Pharmaceutical Biochemistry (Old Course)

TIME ALLOWED: 30 min.
MAX. MARKS: 20

PAPER: 2 Part – I (Compulsory)

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Each MCQ carries 1 Mark. This Paper will be collected back after expiry of time limit mentioned above.

Q No 1

I. Chemically hormones fall into
   a. 2 categories
   b. 3 categories
   c. 4 categories
   d. 5 categories

II. Hyperthyroidism called as
   a. Thyrotoxicosis
   b. Grave's disease
   c. Both a and b
   d. None of above

III. Thyroid hormones are
   a. T_3
   b. T_4
   c. Both a and b
   d. None of above

IV. The extreme doses of thyroid hormone can
   a. Weaken the muscle
   b. Strengthen the muscle
   c. Both a and b
   d. None of above

V. The normal dietary iodine is
   a. 150mg
   b. 160mg
   c. 170mg
   d. 180mg

VI. What are primers?
   a. Primers are the short sequences at the end of the nucleotide sequences which are used for amplification
   b. Primers are the short sequences which are complementary to the nucleotides at the end of the sequence which is to be amplified
   c. Primers are the short sequences present anywhere in the nucleotide sequence to be amplified
   d. Primers are the short sequences which are complementary to the nucleotides anywhere in the sequence to be amplified

VII. The term 'endonuclease' refers to cutting the DNA sequence from:
   a. only within the polynucleotide chain, not at the ends
   b. the ends of the chain
   c. anywhere in the chain
   d. exactly in the middle of the chain

VIII. A sequence is having two ends, 5' and 3'. Which of the following statements is correct regarding the nature of the ends?
   a. The 5' end is having hydroxyl group
   b. The 5' end is having phosphate group
   c. The 3' end is having phosphate group
   d. Any group can be present at any end

IX. ΔG° is defined as the
   a. Residual energy present in the reactants at equilibrium
   b. Residual energy present in the products at equilibrium
   c. Difference in the residual energy of reactants and products at equilibrium
   d. Energy required in converting one mole of reactants to one mole of products

X. The study of energy relationships and conversions in biological systems is called as
   a. Biophysics
   b. Biotechnology
   c. Bioenergetics

XI. Following are the types of Reversible Inhibitors:-
   a. Competitive
   b. Non Competitive
   c. Un Competitive
   d. All of the Above

XII. Non Competitive Inhibitors depend on:-
   a. Affinity for enzyme
   b. Concentration of Substrate
   c. Consontration of enzyme
   d. Structural Resemblance

XIII. Which of the following is correct for simple lipids?
   a. Esters of alcohols and fatty acids
   b. Esters of sphingosine and fatty acids
   c. Esters of alcohol and fatty acid-phosphoric acid
   d. Esters of alcohol and fatty acid-ethanolamine

XIV. Which of the following isomerism is found in unsaturated fatty acids?
   a. Functional group isomers
   b. Stereoisomers
   c. Isosteres
   d. Geometric isomers

XV. In plants, fatty acids are synthesized by which of the following pathway?
   a. Acetate pathway
   b. *Acetate*-malonate *pathway*
   c. Shikimic acid *pathways*
   d. *Acetate*-mevalonate pathway

XVI. Which of the following is not correct for cholesterol?
   a. Synthesized from acetyl Co-A
   b. Synthesized in animals
   c. Synthesized in plants
   d. Amphipathic in nature

XVII. Porphyrins holds metal ions
   a. Mg & Zn
   b. Fe & Ni
   c. Both a & b
   d. None of above

XVIII. Heme present in hemoglobin which is a carrier of
   a. Oxygen molecule in blood
   b. Nitrogen molecules
   c. Both a & b
   d. None of above

XIX. chlorophyll responsible of green pigment
   a. Mg^{2+} as its central atom
   b. A_g as central atom
   c. Both a & b
   d. None of above

XX. Oxidative product of vitamin A is known as
   a. Retinaldehyde or retinal
   b. Retinoic acid
   c. Carboxylic acid
   d. None of above

UNIVERSITY OF THE PUNJAB

First Prof: 2nd Annual – 2018

Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. .....

Subject: Pharmaceutical Chemistry-II (Biochemistry) (New Course)
Pharmaceutical Biochemistry (Old Course)

MAX. TIME: 2 Hrs. 30 Min.
MAX. MARKS: 80

PAPER: 2 Part – II

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

NOTE: *ATTEMPT ANY FOUR QUESTIONS. EACH QUESTION CARRIES EQUAL MARKS.*

Q No 2 (20)

Write the introduction, chemistry, physiological functions, regulations and disorders of growth hormone.

Q No 3 (20)

Write the introduction, chemistry, physiological functions, regulations and disorders of glucagon.

Q No 4 (20)

Explain how the electron transport chain works to produce ATP. Also be sure to describe chemiosmosis in your answer

Q No 5 (10+10)

a) Write Down Michaelis Menten Equation and assumptions of michaelis menten kinetics
b) What are allosteric enzymes. Explain with Examples

Q No 6 (20)

Describe the conversion of glucose into **pyruic acid** by **aerobic glycolysis** and calculate the number of ATPs produced

Q No 7 (20)

What is Haem and describe in detail haem biosynthesis pathway.

UNIVERSITY OF THE PUNJAB

First Prof: 2nd Annual – 2018

Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. in Fig. .....

Roll No. in Words. .....

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Signature of Supdt.:

Subject: Pharmaceutical Chemistry-II(Biochemistry) (New Course)
Pharmaceutical Biochemistry (Old Course)

MAX. TIME: 30 Min.
MAX. MARKS: 20

PAPER: 2 Part – I (Compulsory)

Attempt this Paper on this Question Sheet only.
Please encircle the correct option. Division of marks is given in front of each question.
This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the right answer cutting and overwriting is not allowed. (20x1=20)

I. The hyperthyroidism is diagnosed on the basis of test given
   a. Protein bound iodine
   b. Basel metabolic rate
   c. Iodine uptake
   d. All of above

II. The metal present in the composition of insulin is
   a. Zinc
   b. Copper
   c. Calcium
   d. Magnesium

III. In structure of insulin chain A contains
   a. 21 amino acids
   b. 30 amino acids
   c. 22 amino acids
   d. 30 amino acids

IV. In hyperthyroidism blood flow and cardiac output are
   a. Decreased
   b. Increased
   c. Both
   d. None of above

V. Conjugated Proteins Enzyme composed of :-
   a. Proteins and Enzymes
   b. Proteins and Co Enzymes
   c. Co Enzymes and Holo Enzymes
   d. Holo Enzymes

VI. Proteins make up about body mass of average persons:-
   a. 20%
   b. 30%
   c. 15%
   d. 20% to 30%

VII. Which of the following is correct for oligosaccharides?
   a. Three to ten monosaccharides
   b. three to eleven monosaccharides
   c. Three to nine monosaccharides
   d. Three to sevenmonosaccharides

VIII. Which of the following is correct for mutarotation?
   a. Interchange of alpha and beta isomers
   b. Interchange of aldo and keto isomers
   c. Interchange of keto and enol isomers
   d. Interchange of cis and trans isomers

IX. Which of the following is correct when concentrated sulfuric acid is added in glucose solution?
   a. Furfural
   b. Hydroxymethyl furfural
   c. Hydroxy furfural
   d. Hydroxypropyl furfural

P.T.O.

X. Deficiency of vitamin K causes
   a. Night blindness
   b. Beri Beri
   c. Color blindness
   d. Bleeding

XI. Fat soluble vitamins **stored** in
   a. Liver
   b. Fat tissues
   c. Both a & b
   d. Other tissues

XII. Best source of vitamin C is
   a. Oranges
   b. Strawberries
   c. Pineapple
   d. Carrot

XIII. A porphyrin has other atoms than carbon
   a. Nitrogen atom
   b. Oxygen atoms
   c. Sulpher atoms
   d. Both b & c

XIV. Haem molecule holds a metal in center
   a. Iron (F_e)
   b. Magnesium
   c. Magnese
   d. Both b & c

XV. Identify the purine base of nucleic acids in the following
   a. Cytosine
   b. Thymine
   c. Uracil
   d. Adenine

XVI. Group of adjacent nucleotides are joined by
   a. Phosphodiester bond
   b. Peptide bond
   c. Ionic bond
   d. Covalent bond

XVII. Which of the following nucleotides is not present in DNA?
   a. AMP
   b. GMP
   c. CMP
   d. UMP

XVIII. Which of the following involves in carrying genetic information from DNA for protein synthesis?
   a. m-RNA
   b. t-RNA
   c. r-RNA
   d. sn-RNA

XIX. DNA replication is
   a. Conservative
   b. Non-conservative
   c. Semi-conservative
   d. None

XX. The reaction in DNA replication catalyzed by DNA ligase is
   a. Addition of new nucleotides to the leading strand
   b. Addition of new nucleotide to the lagging strand
   c. Formation of a phosphodiester bond between the 3'-OH of one Okazaki fragment and the 5'-phosphate of the next on the lagging strand
   d. Base pairing of the template and the newly formed DNA strand.

UNIVERSITY OF THE PUNJAB

Doctor of Pharmacy (Pharm.D.) First Prof: Annual – 2019

Subject: Pharmaceutical Chemistry-II (Biochemistry) (New Course)
Pharmaceutical Biochemistry (Old Course)

Paper: 2 Part – I (Compulsory) Time: 30 Min. Marks: 20

Roll No. in Fig. .....

Roll No. in Words. .....

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Signature of Supdt.:

ATTEMPT THIS PAPER ON THIS QUESTION SHEET ONLY.
Division of marks is given in front of each question.
This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the correct option. (20x1=20)

1) A sweetener used in sugar less candies is
   a. Ribitol
   b. Xylitol
   c. Inositol
   d. Mannitol
2) Maltose is a disaccharide of
   a. Glucose and galactose
   b. Glucose and glucose
   c. Glucose and lactose
   d. Fructose and lactose
3) Which of the following statement is not correct for cholesterol?
   a- Synthesized from acetyl Co-A
   b- Synthesized in animals
   c- Synthesized in plants
   d- Amphipathic in nature
4) Which of the following is correct for polysaccharides?
   a- More than ten monosaccharides
   b- More than eleven monosaccharides
   c- Less than ten monosaccharides
   d- More than three monosaccharides
5) Which of the following is correct for alpha and beta isomers of glucose?
   a- Anomerism
   b- Tautomerism
   c- Mesomerism
   d- Cis-trans isomerism
6) Which of the following forms of vitamin A is required for vision?
   a. All cis retinal
   b. All trans retinal
   c. 11 cis – retinal
   d. Any of the above
7) Which of the following vitamins is required as a coenzyme for the activity of di hydro folate reductase?
   a. Vitamin C
   b. Vitamin B_{12}
   c. Niacin
   d. Folic acid
8) Which of the following compounds is recipient of the one carbon fragments that tetra hydro folate receives and transfers?
   a. Serine
   b. Formaldehyde
   c. Glycine
   d. Tryptophan
9) Hormones are needed in
   a. Small amount
   b. Large amount
   c. Both a and b
   d. None of above
10) Hormones can affect the metabolic activity
   a. Inhibit the metabolic activity
   b. Accelerate the metabolic activity
   c. Both a and b
   d. None of above

P.T.O.

11) Insulin is the example of
   a. Protein hormone
   b. Steroidal hormone
   c. Amino acid hormone
   d. All of above
12) Chemically hormones fall into ..... categories
   a. 3
   b. 4
   c. 5
   d. 6
13) Hyperthyroidism is also called as
   a. Thyrotoxicosis
   b. Grave's disease
   c. Both a and b
   d. None of above
14) The fastest enzyme is
   a. Pepsin
   b. carbonic anhydrase
   c. DNA gyrase
   d. DNA polymerase
15) The term apoenzyme is applicable to
   a. simple enzyme
   b. protein part of conjugate enzyme
   c. organic co factor of a conjugate enzyme
   d. Inorganic cofactor of a conjugate enzyme
16) Allosteric enzyme possesses
   a. active site and allosteric site
   b. active site and two types of allosteric sites
   c. active site and three types of allosteric sites
   d. three types of allosteric sites
17) Which of the following is correct for triglycerides?
   a. Esters of glycerol and 3 fatty acids
   b. Esters of sphingosine and 3 fatty acids
   c. Esters of alcohol and fatty acid-phosphoric acid
   d. Esters of alcohol and fatty acid-ethanolamine
18) E and Z isomerism is found in which types of isomers?
   a. Functional group isomers
   b. Anomers
   c. Tautomers
   d. Geometric isomers
19) Enzymes
   a. Do not require activation energy
   b. Do not change requirement of activation energy
   c. increase requirement of activation energy
   d. lowest requirement of activation energy
20) In hyperthyroidism blood flow and cardiac output are
   a. Decreased
   b. Increased
   c. Both a and b
   d. None of above

UNIVERSITY OF THE PUNJAB

Doctor of Pharmacy (Pharm.D.) First Prof: Annual – 2019

Roll No. .....

Subject: Pharmaceutical Chemistry-II (Biochemistry) (New Course)
Pharmaceutical Biochemistry (Old Course)

Time: 2 Hrs. 30 Min. Marks: 80

Paper: 2 Part – II

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Note: Attempt any *FOUR* questions. Each question carries equal marks.

Q. 2: What are the different stages of DNA technology along with its pharmaceutical applications? (20marks)

Q. 3: a. Describe phospholipids (10 marks)

b. Describe beta-oxidation of saturated and mono un-saturated fatty acids (10 marks)

Q. 4: Describe chemistry and medicinal uses of Vitamin D (20 marks)

Q. 5: Describe biosynthesis of haem (20 marks)

Q. 6: Write down the introduction, chemistry, physiological functions, regulations and disorders of T_3 and T_4 hormone.(20 marks)

Q. 7: Write down the introduction, chemistry, physiological functions, regulations and disorders of glucagon. (20 marks)

UNIVERSITY OF THE PUNJAB

Doctor of Pharmacy (Pharm.D.) 1st Prof: Annual – 2021

Roll No. .....

Subject: Pharmaceutical Chemistry-II (Biochemistry) (New Course)
Pharmaceutical Biochemistry (Old Course)

Time: 2 Hrs. 30 Min. Marks: 80

Paper: 2 Part – II

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Note: Attempt any *FOUR* questions. Each question carries equal marks.

Q.2: a. Describe biosynthesis of fatty acids. (10 marks)

b. Describe oxidation and reduction of glucose. (10 marks)

Q.3: a. Describe different mechanisms of pH regulation in the body? (12 marks)

b. What are the exogenous and endogenous sources of uric acid? (8 marks)

Q.4: a. Write down sources, chemistry, physiological functions and deficiency disorders of vitamin B_6. (10 marks)

b. Write a note on enzyme specificity. (10 marks)

Q.5: a. Describe ketogenesis and ketolysis. (10 marks)

b. Describe structure and types of mRNA. (10 marks)

Q.6: a. Write down chemistry, physiological functions and deficiency disorders of insulin. (10 marks)

b. Describe reactions involved in aerobic glycolysis. (10 marks)

Q. 7: a. Write down the steps involved in biosynthesis of hemoglobin. (12 marks)

b. Describe the basic principles of bioenergetics. (8 marks)

UNIVERSITY OF THE PUNJAB

Roll No. in Fig. .....

Roll No. in Words. .....

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Signature of Supdt.:

Doctor of Pharmacy (Pharm.D.) 1st Prof: Annual – 2021

Subject: Pharmaceutical Chemistry-II (Biochemistry) (New Course)
Pharmaceutical Biochemistry (Old Course)

Paper: 2 Part – I (Compulsory) **Time: 30 Min. Marks: 20**

Attempt this Paper on this Question Sheet only.
Division of marks is given in front of each question.
This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the right answer cutting and overwriting is not allowed. (20x1=20)

1) Retention of sodium in the body leads to a retention of
   a. Potassium
   b. Water
   c. Calcium
   d. Potassium and water

2) Genetic engineering requires enzyme
   a. DNA ase
   b. Amylase
   c. Lipase
   d. Restriction endonuclease

3) Deficiency of vitamin A causes
   a. Xeropthalmia
   b. Megaloblastic anemia
   c. Pernicious anemia
   d. Berry berry

4) Which of the following is correct for cocoa butter?
   a. Oil
   b. Fat
   c. Wax
   d. Cholesterol

5) Fructose also gives positive result with Fehling solution due to which of the following factor?
   a. Acidic conditions
   b. Alkaline condition
   c. Neutral conditions
   d. Amphoteric conditions

6) Which of the following is correct for alpha and beta glucose?
   a. Anomers
   b. Tautomers
   c. Mesomers
   d. Geometric isomers

7) Oxidation of heme ring due to oxygen and NADPH takes place between;
   a. I and II pyrrole ring
   b. II and III pyrrole ring
   c. III and IV pyrrole ring
   d. II and IV pyrrole ring

8) Phosphocreatine is converted to creatinine through _____;
   a. Conjugation
   b. Isomerization
   c. Dehydration
   d. Dehalogenation

9) Which of the following is not true for a cholesterol molecule?
   a. Has an -OH group at C1
   b. A double bond b/w C5 and C6
   c. Two CH3 groups at C10 and 13
   d. An eight-carbon side

10) Molecular mass of human insulin is
   a. 5805 Da
   b. 5806 Da
   c. 5807 Da
   d. 5808 Da

11) How many times of T3 is more active than T4
   a. 4 times
   b. 5 times
   c. 6 times
   d. 7 times

12) Beri beri is the disease caused by the deficiency of vitamin
   a. B1
   b. B2
   c. B3
   d. B6

P.T.O.

13) Scurvy is a state due to deficiency of vitamin

a. Nicotinic acid
b. Ascorbic acid
c. Riboflavin
d. Thiamine

14) The other name for vitamin B6 is

a. Pyridoxine
b. Ascorbic acid
c. Folic acid
d. Nicotinic acid

15) Action of urease in cleaving urea to ammonia and carbon dioxide is an example of;

a. Relative substrate specificity
b. Bond specificity
c. Absolute substrate specificity
d. Group specificity

16) Plateau phase in the plot between substrate concentration and velocity indicates;

a. Zero order reaction
b. First order reaction
c. Pseudo first order reaction
d. Second order reaction

17) Demethylation of lanosterol produces;

a. Cholesterol
b. 7-dehydrocholesterol
c. Squalene
d. Squalene epoxide

18) Which of the following ion is required for stability of ATP molecule?

a. Ca^{++}
b. K^{+}
c. Mg^{++}
d. Zn^{++}

19) Five-member ring in uric acid is

a. Thiazole
b. Furan
c. Thiophene
d. Imidazole

20) Oils are classified into which of the following?

a. Simple lipids
b. Compound lipids
c. Derived lipids
d. Cyclic lipids