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Reg. No. : .....

**Code No. : 11616 E      Sub. Code : SMBC 22**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

Second Semester

Biochemistry — Main

**ANALYTICAL BIOCHEMISTRY**

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The unloading of O<sub>2</sub> is accompanied by the uptake of protons by
  - (a) blood
  - (b) muscle
  - (c) haemoglobin
  - (d) bone
2. Which among these is a strong acid?
  - (a) NaOH
  - (b) HCl
  - (c) NH<sub>3</sub>
  - (d) CH<sub>3</sub>COOH

3. The ultracentrifuge was developed by
  - (a) Svedberg
  - (b) Curie
  - (c) Karl Neuberger
  - (d) All the above
4. Colloids do not have any attraction towards dispersion medium
  - (a) Lypophilic
  - (b) Hydrophilic
  - (c) Hydrophobic
  - (d) None of the above
5. Which gel is commonly used for separating proteins?
  - (a) Agarose
  - (b) Polyacrylamide
  - (c) Starch
  - (d) Silica
6. The stacking gel in page normally have pH of
  - (a) 6.8
  - (b) 7.0
  - (c) 8.7
  - (d) 9.6
7. In column chromatography the absorbent and the eluent are respectively
  - (a) Solid and solid
  - (b) Liquid and liquid
  - (c) Liquid and solid
  - (d) Solid and liquid

8. The total number of equivalents of replacable protons per unit volume of resin determines the
- (a) Exchange capacity of the resin
  - (b) Volume of the resin
  - (c) Molecular weight of the resin
  - (d) Atomic weight of the resin
9. The spectral shift is normally due to \_\_\_\_\_
- (a) Aggregation            (b) Concentration
  - (c) Polymerization        (d) Deviation
10. The number of collisions with the solvent molecules is a function of
- (a) The initial radiation energy
  - (b) The amount of light emitted
  - (c) The observed light
  - (d) Heat released

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Discuss about hydrogen bonding.

Or

- (b) Derive Henderson-Hasselbach equation.

12. (a) Give a short note on molality.

Or

(b) Write a note on molarity.

13. (a) Mention the applications of agarose gel electrophoresis.

Or

(b) How are proteins separated in a gel detected?

14. (a) Give an account on mobile phase.

Or

(b) Analyze the recent advances in gas chromatography.

15. (a) How is sample preparation done in IR spectroscopy?

Or

(b) Give a note on colorimeter.

## PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain the concepts of acids, base and buffers.

Or

- (b) Explain the concepts and applications of pH.

17. (a) Describe the principle and applications of ultra centrifugation.

Or

- (b) Explain in detail note on differential centrifugation.

18. (a) Write an essay on SDS-page.

Or

- (b) Write note on:

- (i) Principle of electrophoresis
- (ii) Slab gel
- (iii) Tube gel.

19. (a) Write in detail about HPLC.

Or

(b) Write the technique of thin layer chromatographer.

20. (a) Analyze the different types of detectors used in colorimeter and spectrophotometer.

Or

(b) Discuss the principle and instrumentation of NMR.

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Reg. No. : .....

**Code No. : 11330 E      Sub. Code : JMBC 22**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018

Second Semester

Biochemistry – Main

ANALYTICAL BIOCHEMISTRY

(For those who joined in July 2016 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Bond angle of  $H - O - H$  is
  - (a)  $104.5^\circ$
  - (b)  $105.4^\circ$
  - (c)  $104^\circ$
  - (d)  $105^\circ$

2. pH meter is standardized with
- (a) pH 7
  - (b) pH 0
  - (c) pH 14
  - (d) All of these can be used
3. Two solutions having the same osmotic pressure across a semi permeable membrane is called \_\_\_\_\_ solution.
- (a) Isotonic
  - (b) Hypotonic
  - (c) Hypertonic
  - (d) None of the above
4. An effective way of purifying liquids containing suspensious is
- (a) Crystallisation
  - (b) Decanting
  - (c) Centrifugation
  - (d) Separating funnel
5. Chromatography is used to separate
- (a) Solution
  - (b) Mixtures
  - (c) Molecules
  - (d) Atoms



6. Desalting process of the amino acids is done by
- (a) Ion exchange chromatography
  - (b) HPLC
  - (c) TLC
  - (d) Column chromatography
7. The electrophoretic technique for the separation of charged molecules was developed by
- (a) Tswett                      (b) Svedberg
  - (c) Tiselius                    (d) Sanger
8. In SDS – PAGE separation is based on
- (a) Molecules weight
  - (b) Shape
  - (c) Charge
  - (d) All the above
9. The wavelength of an absorption is 495 nm. In which part of the electromagnetic spectrum does this lie?
- (a) uv-visible                (b) Infra – red
  - (c) Radiowave                (d) Microwave

10. Isotopes of an element have nuclei with
- (a) Same number of protons but different numbers of neutrons
  - (b) Same number of protons and same number of neutrons
  - (c) A different number of protons and different number of neutrons
  - (d) A different number of protons and same number of neutrons

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Differentiate acids from bases with suitable examples.

Or

- (b) Explain the concept of pH and p<sup>OH</sup> and its calculations.

12. (a) Describe the components of a solutions.

Or

- (b) List out the applications of Donnan membrane equilibrium.

13. (a) Describe the principles and applications of paper chromatography.

Or

- (b) Describe the principle and applications of affinity chromatography.

14. (a) (i) What is called electrophoresis technique?  
(ii) Give a short note on factors affecting migration rate.

Or

- (b) Discuss the principle and applications of immuno electrophoresis.

15. (a) Explain the basic working principles of colorimeter and spectrophotometer.

Or

- (b) Enumerate the applications of radio isotopes in metabolic studies.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Describe the structure of hydrogen bonding and ionic product of water.

Or

(b) Discuss about biologically important buffer systems.

17. (a) Define the following :

(i) Mole fraction

(ii) Molality

(iii) Molarity

(iv) Mass percent

Or

(b) Describe the principle and applications of centrifugation techniques.

18. (a) Write a detailed note on Ion – exchange chromatography.

Or

(b) Give an elaborate note on GLC.

19. (a) Give a detailed account on the separation of DNA by electrophoresis.

Or

(b) Describe the separation of plasma proteins by electrophoresis.

20. (a) Describe the principles and applications of Atomic absorption spectrophotometer and flame photometer.

Or

- (b) Elaborate the measurement of radio activity using liquid scintillation counter.
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**Code No. : 11342 E      Sub. Code : JABC 21**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

Second/Fourth Semester

Biochemistry – Allied

**BIOCHEMISTRY**

(For those who joined in July 2016 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Fat is hydrolysed by the enzyme know as
  - (a) Trypsin
  - (b) Lipase
  - (c) Pepsin
  - (d) Amylase
  
2. Lock and key theory of enzyme action was proposed by
  - (a) Fischer
  - (b) Koshland
  - (c) Kunhe
  - (d) Arrhenius

3.  $k_m$  value of enzyme is substrate concentration at
- (a)  $\frac{1}{4}V_{\max}$                       (b)  $\frac{1}{2}V_{\max}$   
(c)  $2V_{\max}$                         (d)  $4V_{\max}$
4. The effect of reversible competitive inhibitor can be nullified by
- (a) increasing the product concentration  
(b) increasing the substrate concentration  
(c) increasing the temperature  
(d) increasing the pH
5. Two major product of pentose phosphate pathway are
- (a) NAD and ribose-5-phosphate  
(b) FAD and glucose-5-phosphate  
(c) NAD and COA  
(d) NAD and NADPH
6. The key enzyme in the regulation of Bathy acid synthesis is
- (a) acetyl CoA carboxylase  
(b) protein kinase  
(c) protein phosphatase  
(d) none of these

7. In electron transport chain, electrons ultimately pass to
- (a) ADP                      (b) Cytochrome  
(c) Oxygen                  (d) Hydrogen
8. Which of the following contributes nitrogen atoms to both purine and pyrimidine rings?
- (a) glutamate              (b) tetra hydro folate  
(c) aspartate                (d) methionine
9. Which of the following aminoacid is considered as both ketogenic and glucogenic?
- (a) Valine                    (b) Tryptophan  
(c) Lysine                    (d) Adutamate
10. DNA replication takes place in which direction?
- (a) 3' to 5'  
(b) 5' to 3'  
(c) randomly  
(d) vary form organism



## PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) List out the general characteristics of enzymes.

Or

- (b) Explain the role of any two cofactors in enzyme catalysed reactions.

12. (a) Illustrate glycolysis.

Or

- (b) Write about the role of carnitine in  $\beta$ -oxidation.

13. (a) Explain Line Weaver – Burk plot and its significance.

Or

- (b) Explain competitive, non-competitive and uncompetitive inhibition with suitable examples.

14. (a) What is called electron transport chain? Where does it occur? Enlist the inhibitors of ETC.

Or

- (b) Describe thymidine degradation.

15. (a) Illustrate urea cycle.

Or

(b) Write a note on DNA replication.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Classify enzymes.

Or

(b) Define multienzyme complex. Explain about fatty acid synthase complex.

17. (a) Derive MM equation. Add a note on significances of  $K_m$ .

Or

(b) Write an elaborate note on isoenzymes and their medical applications.

18. (a) Illustrate TCA cycle. Add a note on its energetic.

Or

(b) Illustrate the synthesis of palmitic acid.

19. (a) Discuss in detail about oxidative phosphorylation.

Or

- (b) Discuss in detail about purine metabolism.

20. (a) Describe the metabolism of lysine and glycine.

Or

- (b) Illustrate DNA translation mechanism.
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(6 pages)

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**Code No. : 11336 E    Sub. Code : JMBC 5 B**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

Fifth Semester

Biochemistry – Main

*Elective* — BIOINFORMATICS

(For those who joined in July 2016 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The term used to refer something 'performed on computer or computer simulation'
  - (a) dry lab
  - (b) web lab
  - (c) in vitro
  - (d) insilico

2. The two main features of any phylogenetic tree are the
  - (a) Clades and the nodes
  - (b) Topology and the branch lengths
  - (c) Clades and the root
  - (d) Alignment and the bootstrap
  
3. The approach that can be used to predict the 3D structure of a protein which has no detectable sequence similarity with the available templates is
  - (a) Homology modeling
  - (b) Comparative modeling
  - (c) Fold recognition
  - (d) Ab initio modeling
  
4. What makes FASTA faster than NEEDLEMAN WUNSCH algorithm?
  - (a) The processor speed of the computer
  - (b) Hash table lookup
  - (c) Dynamic programming
  - (d) The scoring matrix used
  
5. How many edges meet at every branch node in a phylogenetic tree?
  - (a) 1
  - (b) 2
  - (c) 3
  - (d) 4

6. Which of the following terms does NOT refer to an example of a weak force of interaction between two biological molecules?
- (a) Covalent                      (b) Van der Waals  
(c) Hydrophobic                (d) Electrostatic
7. When light travels from one medium to another, the quantity that remains unaltered is
- (a) speed                        (b) wavelength  
(c) frequency                (d) intensity
8. A most recent and acceptable model for membrane structure, known as
- (a) Lipid bilayer model  
(b) Fluid membrane model  
(c) Unit membrane model  
(d) Semi-conservative model
9. Which of the following retains the information it's storing when the power to the system is turned off?
- (a) CPU                        (b) ROM  
(c) RAM                        (d) DIMM

10. USB is a device used to store data and it stands for
- (a) Unlimited Service Band
  - (b) Unlimited Serial Bus
  - (c) Universal Serial Bus
  - (d) Universal Service Bus

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Write short note on monitor.

Or

- (b) Describe the database management.

12. (a) What is DBGET? Discuss.

Or

- (b) Discuss the retrieval with entrex.

13. (a) Explain the pattern databases.

Or

- (b) Describe the sequence similarity of search tools.

14. (a) Discuss the phylogenetic interference.

Or

- (b) Write a note on recapitulation theory.

15. (a) Write a principle of genome.

Or

(b) Describe the 2D gel.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)

Each answer should not exceed 600 words.

16. (a) Write a detail note on DOS.

Or

(b) Describe the useful bioinformatics sites on WWW.

17. (a) Discuss the network and databases.

Or

(b) Describe the structure of biological data.

18. (a) Give a detail note on BLAST.

Or

(b) Elucidate the multi sequence alignment.

19. (a) Elaborately discuss phylogenetic tree.

Or

(b) Describe the evolution of macromolecular sequence.



20. (a) Write a detail note on visualization tools.

Or

(b) Explain the protein structure database.

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(6 pages)

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**Code No. : 11615 E      Sub. Code : SMBC 11**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

First Semester

Biochemistry — Main

**BIOMOLECULES**

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Mutarotation refers to change in
  - (a) pH
  - (b) Optical rotation
  - (c) Conductance
  - (d) Chemical properties

2. An L-isomer of monosaccharide formed in human body is
- (a) L-fructose                      (b) L-Erythrose  
(c) L-Xylose                        (d) L-Xylulose
3. Glucose on oxidation does not give
- (a) Glycoside  
(b) Glucosaccharic acid  
(c) Gluconic acid  
(d) Glucuronic acid
4. The smallest monosaccharide having furanose ring structure is
- (a) Erythrose                      (b) Ribose  
(c) Glucose                        (d) Fructose
5. An-OH group is present in the side chain of
- (a) Serine                         (b) Arginine  
(c) Lysine                         (d) Proline
6. The most abundant protein in mammals is
- (a) Albumin                        (b) Haemoglobin  
(c) Collagen                        (d) Elastin

7. A lipid containing alcoholic amine residue is
- (a) Phosphatidic acid
  - (b) Ganglioside
  - (c) Glucocerebroside
  - (d) Sphingomyelin
8. 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
9. The most abundant free nucleotide in mammalian cells is
- (a) ATP      (b) NAD
  - (c) GTP      (d) FAD
10. The nucleic acid base found in mRNA but not in DNA is
- (a) Adenine      (b) Cytosine
  - (c) Guanine      (d) Uracil

## PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Describe the importance of macro molecules.

Or

- (b) Write a basic concept of biomolecules.

12. (a) Give a note on mutarotation.

Or

- (b) Give an account on lactose.

13. (a) Illustrate about triacylglycerol.

Or

- (b) Describe the biological importance of cephalin.

14. (a) Discuss the denaturation of proteins.

Or

- (b) Elucidate the myoglobin.

15. (a) Write an note on uracil.

Or

- (b) Describe the thiamine.

## PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain the isomerism and its importance.

Or

- (b) Describe the amino group in organic molecules.

17. (a) Compare and differentiate between homo and hetero polysaccharides.

Or

- (b) Give a detail note on glucose.

18. (a) Enumerate the structure and functions of spingolipids.

Or

- (b) Explain the unsaturated fatty acids.

19. (a) Describe the various structures of proteins.

Or

- (b) Discuss the general classifications of amino acids.

20. (a) Write a types and biological importance of RNA.

Or

- (b) Discuss the structure and functions of DNA.
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Reg. No. : .....

**Code No. : 11335 E      Sub. Code : JMBC 5 A**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

Fifth Semester

Biochemistry — Main

Elective — BIOSTATISTICS

(For those who joined in July 2016 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which of the following is not an example for a primary data?
  - (a) Mailed questionnaire
  - (b) Local correspondents
  - (c) Indirect oral investigation
  - (d) Survey reports, in newspapers, journals



2. A statistical population may consists of
- (a) Infinite number of items
  - (b) Finite number of items
  - (c) Both (a) or (b)
  - (d) Neither (a) nor (b)
3. Find the combined arithmetic mean of two samples of sizes 6 and 4 respectively whose means are 15 and 25.
- (a) 20
  - (b) 19
  - (c) 40
  - (d) 21
4. What is the median of the following ungrouped data?
- |                  |     |     |    |     |     |
|------------------|-----|-----|----|-----|-----|
| Salary (in Rs) : | 150 | 100 | 80 | 200 | 130 |
| No.of workers :  | 24  | 70  | 40 | 15  | 10  |
- (a) 150
  - (b) 100
  - (c) 80
  - (d) 130
5. Calculate the standard deviation for the following data :
- 5, 8, 7, 11, 9, 10, 8, 2, 4, 6
- (a) 2
  - (b)  $\sqrt{5}$
  - (c)  $\sqrt{6}$
  - (d)  $\sqrt{7}$

6. \_\_\_\_\_ is used to compare the consistency of 2 or more sets of data.
- (a) Coefficient of Variation
  - (b) Coefficient of Correlation
  - (c) Coefficient of Kurtosis
  - (d) Coefficient of Skewness
7. If  $P(A) = 0.3, P(B) = 0.2, P(A \cap B) = 0.1$ , what is the probability that exactly one of the events occurs?
- (a) 0.3
  - (b) 0.4
  - (c) 0.6
  - (d) 1
8. If  $P(A) = 0.7, P(B) = 0.2, P(A \cap B) = 0.2$ , what is the probability that neither  $A$  nor  $B$  occurs?
- (a) 0.3
  - (b) 0.2
  - (c) 0.8
  - (d) 0.7
9. The null hypothesis for this analysis is
- (a) Not all the fish populations have the same mean
  - (b) At least one of the fish populations has a different mean
  - (c)  $\mu_1 = \mu_2 = \mu_3$
  - (d)  $\mu_1 = \mu_2 = \mu_3 = 0$

10. In ANOVA with 4 groups and a total sample size of 44, the computed F statistic is 2.33. In this case, the p-value is
- (a) exactly 0.05
  - (b) greater than 0.05
  - (c) less than 0.05
  - (d) cannot tell-it depends on what the SSE

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Give an account on secondary data.
- Or
- (b) Discuss the graphical representation.
12. (a) Find the median wage of the following persons :
- |                  |       |       |       |       |       |
|------------------|-------|-------|-------|-------|-------|
| Wage (in Rs.) :  | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 |
| No. of persons : | 3     | 5     | 20    | 10    | 5     |

Or

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- (b) Find the mean of the set of ages in the table below :

Age (years)	Frequency
10	0
11	8
12	3
13	2
14	7

13. (a) Write short note on range.

Or

- (b) Describe the quartile deviation.

14. (a) What is multiple theorem? Discuss.

Or

- (b) Explain the normal distribution.

15. (a) Write a note on population sample.

Or

- (b) Discuss the sampling distribution.

## PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Describe the bar diagram.  
Or  
(b) Explain the frequency distribution.
17. (a) Find the mean, median, mode, and range for the following list of values : 13, 18, 13, 14, 13, 16, 14, 21, 13.  
Or  
(b) What is the geometric mean of 4, 8, 3, 9 and 17?
18. (a) Discuss the standard deviation.  
Or  
(b) Explain the coefficient variation.
19. (a) Write a detail note on probability.  
Or  
(b) Discuss the biochemical distribution.
20. (a) Give a detail note on ANOVA.  
Or  
(b) Explain the student *t*-test.

(6 pages)

Reg. No. : .....

**Code No. : 11344 E      Sub. Code : JSBC 3 B/  
SSBC 3 B**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

Third Semester

Biochemistry — Main

Skill Base Subject — BLOOD BANKING

(For those who joined in July 2016 onwards)

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. What blood type is not possible for an offspring of AO and BO persons?
  - (a) AB
  - (b) A and B
  - (c) O
  - (d) All are possible

2. Which blood group is Universal donor?
  - (a) A
  - (b) B
  - (c) O
  - (d) AB
  
3. Which of the following viral tests is not required of each unit of donated blood according to the AABB Standards?
  - (a) HBsAg.
  - (b) Anti-HIV-1/2.
  - (c) Anti-HBs.
  - (d) Anti-HCV.
  
4. Which complication is seen in patients who have received a minor ABO-mismatched allogenic Hematopoietic Progenitor Cell ("stem cell") transplant?
  - (a) Delayed platelet engraftment
  - (b) Hemolysis 7–10 days after transplant
  - (c) Hemolysis 30–50 days after transplant
  - (d) Delayed neutrophil engraftment
  
5. The precursor of all lines of blood cells is the \_\_\_\_\_.
  - (a) myeloblast
  - (b) hemocytoblast
  - (c) proerythroblast
  - (d) progranulocyte

6. Which clotting factor is released from damaged tissue, and initiates a chain of clotting events?
- (a) prothrombin
  - (b) thrombin
  - (c) tissue thromboplastin
  - (d) fibrin
7. In most Rh negative individuals of European ancestry, the RH locus on chromosome 1 consists of:
- (a) one RH C/c gene, one RH E/e gene and one RH D/d gene
  - (b) one RHCE gene, no RHD gene
  - (c) one RHCE gene, one RHD gene
  - (d) no RHCE gene, no RHD gene
8. Our patient develops urticaria and mild dyspnea while receiving the second of two units of fresh frozen plasma. You should do all of the following except
- (a) discontinue the transfusion
  - (b) assess the patient
  - (c) order 25 mg diphenhydramine p.o.
  - (d) send an IgA level



9. A person with type AB blood would have \_\_\_\_\_ antigens on red blood cells, and antibodies carried in the plasma.
- (a) A and B; neither anti-A nor anti-B
  - (b) Neither A nor B; both anti-A and anti-B
  - (c) B; Anti A
  - (d) A; Anti B
10. Which of these cell types should not be grouped with the others?
- (a) neutrophil                      (b) basophil
  - (c) lymphocytes                      (d) eosinophil

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Write the composition of blood.
- Or
- (b) Give an account on hemolysis.
12. (a) Write about precaution of blood.
- Or
- (b) Explain about blood containers.

13. (a) Discuss the D factor system.

Or

(b) Enumerate the blood grouping interaction.

14. (a) Discuss the universal donor.

Or

(b) Elucidate the precaution followed by blood transfusion.

15. (a) Estimation of VDRL test.

Or

(b) Describe the screening procedure of HbsAg.

SECTION C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Describe the blood transfusion process.

Or

(b) Elucidate the vein puncture.

17. (a) Discuss the safety measures of blood bags.

Or

(b) Enumerate the anticoagulants in blood bank.

18. (a) Describe the human blood group system.

Or

(b) Explain the tube methods of Rh typing.

19. (a) Enumerate the major compatibility test.

Or

(b) Write an essay on identification of blood transfusion.

20. (a) Discuss the screening of HIV in ELISA test.

Or

(b) Describe the identification of malarial parasites in blood.

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(6 pages)

Reg. No. : .....

**Code No. : 11328 E    Sub. Code : JMBC 12/  
SMBC 12**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

First Semester

Biochemistry — Main

CELL BIOLOGY

(For those who joined in July 2016 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Peroxisomes are also known as
  - (a) Microbodies
  - (b) Nucleus
  - (c) Nuclear membrane
  - (d) Nucleoplasm

2. Passage of molecules through the membrane from higher concentration to lower concentration is called
  - (a) active transport
  - (b) passive transport
  - (c) active facilitated transport
  - (d) group translocation
  
3. The metabolites that can be transported in same direction is called
  - (a) Antiport
  - (b) Symport
  - (c) Uniport
  - (d) None of the above
  
4. Energy is not required for
  - (a) Passive transport
  - (b) Active transport
  - (c) Facilitated transport
  - (d) All the above
  
5. DNA replication occurs in
  - (a) G-phase
  - (b) S-phase
  - (c) G2 phase
  - (d) M-phase

6. Chromosomes were first studied in
- (a) Animals
  - (b) Plants
  - (c) Protozoa
  - (d) Prokaryotes
7. Causes of necrosis include
- (a) Injury
  - (b) Cancer
  - (c) Infection
  - (d) All the above
8. The chromosomes transmit
- (a) Autosomes
  - (b) Sex chromosomes
  - (c) X-chromosome
  - (d) Hereditary characters
9. Engulfing of bacteria by white blood cells is called
- (a) Phagocytosis
  - (b) Pinocytosis
  - (c) Exocytosis
  - (d) Endocytosis
10. During metaphase, mitotic chromosome
- (a) Undergo coiling
  - (b) Lineup at the equator
  - (c) Break and disintegrate
  - (d) Undergo unwinding

## PART B — (5 × 5 = 5 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Describe about lysosome and peroxysomes.

Or

- (b) Write brief note on simple diffusion.

12. (a) Write about nucleus.

Or

- (b) Write short notes on ER.

13. (a) Explain about cell cycle.

Or

- (b) Write a brief note on chromosomes.

14. (a) Describe about metaphase and telophase.

Or

- (b) Illustrate the mechanism of necrosis and apoptosis.

15. (a) Explain about golgi complex.

Or

- (b) Discuss about point mutations.

## PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Describe the models of biological membrane.

Or

- (b) Elaborately explain the prokaryotic and eukaryotic cells with illustrations.

17. (a) Describe cell junctions. Mention the necessities of tight and gap junctions.

Or

- (b) Give a detailed account on endocytosis.

18. (a) Explain the structure of DNA.

Or

- (b) How cells are divided by mitotic division?

19. (a) Give a detailed account on mitochondria.

Or

- (b) Discuss the structure of gene.



20. (a) Discuss different types of mutation.

Or

(b) Write an account on different types of transport.

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(6 pages)

Reg. No. : .....

**Code No. : 11617 E      Sub. Code : SABC 11**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

First/Third Semester

Biochemistry

**CHEMICAL BIOLOGY AND BIOPHYSICAL  
CHEMISTRY**

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL the questions.

Choose the correct answer :

1. The amino acid which gives yellow colour with Ninhydrin in paper chromatography is
  - (a) Tyrosine
  - (b) Proline
  - (c) Tryptophan
  - (d) Alanine

2. This technique takes the advantage of the fact that each protein has different pH at which it is electrically neutral i.e., its isoelectric pH :
- (a) Isoelectric focusing
  - (b) Immuno Electrophoresis
  - (c) Chromatography
  - (d) HPLC
3. Which of the following is a heteroglycan?
- (a) Dextrins                      (b) Agar
  - (c) Inulin                        (d) Chitin
4. Glucose on reduction with sodium amalgam forms
- (a) Dulcitol
  - (b) Sorbitol
  - (c) Mannitol
  - (d) Mannitol and sorbitol
5. The cholesterol molecule is
- (a) Benzene derivative
  - (b) Quinoline derivative
  - (c) Steroid
  - (d) Straight chain acid

6. Dietary fats after absorption appear in the circulation as
- (a) HDL                      (b) VLDL  
(c) LDL                      (d) Chylomicron
7. Each turn of  $\alpha$ -helix contains the amino acid residues (number) :
- (a) 3.6                      (b) 3.0  
(c) 4.2                      (d) 4.5
8. Tertiary structure of a protein describes
- (a) The order of amino acids  
(b) Location of disulphide bonds  
(c) Loop regions of proteins  
(d) The ways of protein folding
9. Why is it generally preferable to use absorbance as a measure of absorption rather than % transmittance?
- (a) Because %T cannot be measured as accurately as absorbance  
(b) Because %T is dependant on the power of the incident radiation  
(c) Because absorbance is proportional to the concentration of the analyte, whereas %T is not  
(d) None of the above



14. (a) Illustrate about buffer.

Or

(b) Mention the applications of centrifugations.

15. (a) Describe the Beer-Lambert's law.

Or

(b) Write a basic principles of electrophoresis.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Compare and differentiate between homo and hetero polysaccharides.

Or

(b) Describe the structure, functions and properties of lactose.

17. (a) Explain the structure and functions of cholesterol.

Or

(b) Explain the following

(i) Saponification number.

(ii) Iodine number.

18. (a) Write an essay on RNA.

Or

(b) Write a detail note on DNA.

19. (a) Derived the Henderson-Hassalbach equation.

Or

(b) Enumerates the principle and applications of gel filtration chromatography.

20. (a) Write a principle and applications of SDS PAGE electrophoresis.

Or

(b) Describe the principle and applications of UV spectroscopy.

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(6 pages)

Reg. No. : .....

**Code No. : 11341 E      Sub. Code : JABC 11**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

First/Third Semester

Biochemistry — Allied

**CHEMICAL BIOLOGY AND BIOPHYSICAL  
CHEMISTRY**

(For those who joined in July 2016 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Of the following which one is 5-carbon sugar.
  - (a) Ribose
  - (b) Glucose
  - (c) Fructose
  - (d) Galactose



2. The disaccharide present in milk is
- (a) Maltose                      (b) Sucrose  
(c) Lactose                      (d) Cellobiose
3. Which of the following is laevorotatory?
- (a) Glucose                      (b) Fructose  
(c) Sucrose                      (d) None of these
4. Lipids are
- (a) soluble in water  
(b) soluble in organic solvents  
(c) soluble in both  
(d) insoluble in both
5. Acids have a pH value
- (a)  $<7$                       (b) 7  
(c)  $>7$                       (d) 0
6. The  $R_f$  value of any solute is always
- (a) above 1                      (b) below 1  
(c) 1                      (d) between 1 and 10

7. Which among these is not a monochromator?
- (a) absorption filter
  - (b) grating
  - (c) prism
  - (d) phototube
8. Which among these is a strong acid?
- (a) NaOH
  - (b) HCl
  - (c) NH<sub>3</sub>
  - (d) CH<sub>3</sub>COOH
9. Which gel is commonly used for separating proteins?
- (a) agarose
  - (b) polyacrylamide
  - (c) starch
  - (d) silica
10. The matrix in column chromatography is
- (a) cellulose
  - (b) agar
  - (c) silica gel
  - (d) radium

## PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Discuss - Mutarotation.

Or

(b) Write notes on Lactose structure and function.

12. (a) Comment on saturated and unsaturated fatty acids.

Or

(b) Write short notes on :

(i) Epimers

(ii) Glycosidic bonds.

13. (a) Write notes on biological importance of nucleic acids.

Or

(b) Describe about purines.

14. (a) Explain the basic principles of sedimentation.

Or

(b) Define and explain various buffers.

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[P.T.O]

15. (a) Explain Beer-Lambert's law.

Or

(b) Write notes on agarose gel electrophoresis.

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Discuss the properties and functions of Disaccharides.

Or

(b) Explain the chemical reactions of monosaccharides.

17. (a) Explain the types of fatty acids.

Or

(b) Give an account on classification of lipids.

18. (a) Write notes on classification of aminoacids.

Or

(b) Explain the structure of DNA.

19. (a) Give a detailed account on paper chromatography.

Or

(b) Describe about gel filtration chromatography.

20. (a) Explain the principle and instrumentation of UV-Visible spectroscopy.

Or

(b) Explain about SDS-PAGE.

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(6 pages)

Reg. No. : .....

**Code No. : 11334 E      Sub. Code : JMBC 52**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

Fifth Semester

Biochemistry — Main

**CLINICAL BIOCHEMISTRY**

(For those who joined in July 2016 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Low Blood glucose is —————.  
(a) Hyperglycemia      (b) Hypoglycemia  
(c) Glucosuria      (d) None
2. The commonest cause of hyperglycemia in a nondiabetic is  
(a) Hepatic metastan's (b) Insulinoma  
(c) Malignancy      (d) Pancreatitis

3. Maple syrup urine disease is due to \_\_\_\_\_.
- (a) deficiency of decarboxylase
  - (b) amylase deficiency
  - (c) creatinine deficiency
  - (d) carboxylase deficiency
4. Cystinuria results from inability to
- (a) Convert cystine to cysteine
  - (b) Incorporate cystine into proteins
  - (c) Reabsorb cystine in renal tubules
  - (d) All of these
5. Normal value of bilirubin in blood is
- (a) 1 – 2 mg/dl
  - (b) 0.5 – 3.5 mg/dl
  - (c) 0.2 – 1 mg/dl
  - (d) 4 – 6 mg/dl
6. ALP is elevated in the following disorder?
- (a) Addison's disease
  - (b) Paget's disease
  - (c) Scleroderma
  - (d) Diabetes insipidus

7. Faeces gets its brown pigmentation from
- (a) Stercobilirubin      (b) Stercobilin  
(c) Stecobilin            (d) Stercobinogen
8. What is the percentage of type I diabetes?
- (a) > 20%  
(b) 5 – 10%  
(c) 16 – 20%  
(d) 11 – 15%
9. In diabetes mellitus, glucagon levels are
- (a) High                    (b) Low  
(c) Normal                (d) None
10. Keto acidosis is
- (a) associated with both type I and type II diabetes  
(b) not related to diabetes  
(c) associated with type II diabetes  
(d) associated with type I diabetes



## PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) List out the changes in metabolism of type I diabetes mellitus.

Or

- (b) Explain factors causing hypoglycemia.

12. (a) Write notes on Xanthomatosis.

Or

- (b) Give a brief account on hypercholesterolemia.

13. (a) Explain the following :

- (i) Hartnup disease  
(ii) Wilson's disease.

Or

- (b) Write notes on proteinuria.

14. (a) Write brief account on types of Jaundice.

Or

- (b) Explain about albinism and cystinuria.

15. (a) Give an account on choline esterase.

Or

(b) Write notes on role of isoenzymes in muscular disease.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Give a detailed account on type II diabetes mellitus.

Or

(b) Explain about glycogen storage diseases.

17. (a) Explain about fatty liver in detail.

Or

(b) Write an account on Atherosclerosis.

18. (a) Give a detailed notes on Phenylketonuria.

Or

(b) Write notes on :

- (i) Maple syrup urine disease
- (ii) A/G ratio.

19. (a) Give a detailed account on tests assessing kidneys function.

Or

- (b) Explain the following :
- (i) Test for urobilinogen
  - (ii) Hay's test
  - (iii) Fouchet's test
  - (iv) Vanden Berg test.

20. (a) Explain role of isoenzymes on myocardial infarction.

Or

- (b) Illustrate the role of isoenzymes in bone and muscle disorders.
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(6 pages)

Reg. No. : .....

**Code No. : 11337 E      Sub. Code : JMBC 5 C**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018

Fifth Semester

Biochemistry – Main

Elective — DIAGNOSTIC BIOCHEMISTRY

(For those who joined in July 2016 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. During blood coagulation, thromboplastin is released by
  - (a) Erythrocytes
  - (b) Plasma
  - (c) Leucocytes
  - (d) Platelets
  
2. Normal blood pressure is
  - (a) 120/100
  - (b) 110/90
  - (c) 120/80
  - (d) 120/90

3. Which is the largest immunoglobulin
- (a) IgG                      (b) IgM  
(c) IgA                      (d) IgD
4. The ideal clinical specimen for pulmonary TB diagnosis is
- (a) Blood                    (b) Sputum  
(c) Urine                    (d) Tissue
5. TB cannot occur in the
- (a) Upper lobes            (b) Lower lobes  
(c) Lingula                (d) None
6. In normal urine composition, urea content is
- (a) 7.7 g/L                (b) 8.7 g/L  
(c) 9.3 g/L                (d) 10.2 g/L
7. Cessation of urine flow is defined as
- (a) Azotemia                (b) Dysikia  
(c) Diuresis                (d) Anuria

8. Antidiuretic hormone regulates the reabsorption of
- (a) Water                      (b) Glucose
- (c) Calcium                    (d) None
9. Which of the following reagents is used to react with ketones in the urine
- (a) Acetone
- (b)  $\beta$  - hydroxybutric acid
- (c) Aceto acetic acid
- (d) Sodium nitroprusside
10. Urinary calculi most often consist of
- (a) Calcium                    (b) Uric acid
- (c) Leucine                    (d) Cystine

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Describe about glycosylated haemoglobin.

Or

- (b) Write notes on uric acid.

12. (a) Write notes on  
(i)  $\alpha$  – amylase  
(ii) LDH

Or

- (b) Explain about acid phosphatases.

13. (a) Comment on precipitation tests.

Or

- (b) Write notes on Brucella agglutination test.

14. (a) Explain composition of urine.

Or

- (b) Describe about semen analysis.

15. (a) Describe the following :

- (i) Coomb's test  
(ii) Prothrombin test.

Or

- (b) Write the diagnostic test for phenylketonuria.

## PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain GTT in detail.

Or

- (b) Explain about CSF analysis.

17. (a) Give a detailed account on Immunoglobulins.

Or

- (b) Write an account on LH.

18. (a) Write notes on the following :

(i) VDRL test

(ii) VIDAL test

Or

- (b) Explain the following :

(i) Monaux test

(ii) Lepramin test.



19. (a) Write an account on Urine analysis.

Or

(b) Describe the following :

(i) Semen analysis

(ii) Haemogram.

20. (a) Explain about blood clotting.

Or

(b) Give an account on

(i) Cystinuria

(ii) Rh factor.

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(6 pages)

Reg. No. : .....

**Code No. : 11331 E      Sub. Code : JMBC 31/  
SMBC 31**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

Third Semester

Biochemistry — Main

ENZYMOLGY

(For those who joined in July 2016 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Example of an extracellular enzyme is
  - (a) Lactate dehydrogenase
  - (b) Cytochrome oxidase
  - (c) Pancreatic lipase
  - (d) Hexokinase

2. The enzyme which can add water to a carbon-carbon double bond or remove water to create a double bond without breaking the bond is
  - (a) Hydratase
  - (b) Hydroxylase
  - (c) Hydrolase
  - (d) Esterase
  
3. In competitive enzyme inhibition
  - (a) Apparent  $K_m$  is decreased
  - (b) Apparent  $K_m$  is increased
  - (c)  $V_{max}$  is increased
  - (d)  $V_{max}$  is decreased
  
4. In non competitive enzyme inhibition,
  - (a) Increases  $K_m$
  - (b) Decreases  $K_m$
  - (c) Does not effect  $K_m$
  - (d) All the above
  
5. Factors affecting enzyme activity:
  - (a) Concentration
  - (b) pH
  - (c) Temperature
  - (d) All of these
  
6. Line weaver - Burk double reciprocal plot is related to
  - (a) Substrate concentration
  - (b) Enzyme activity
  - (c) Temperature
  - (d) Both (a) and (b)

7. Which one of the following regulatory actions involves a reversible covalent modification of the enzyme?
- (a) Phosphorylation of ser-OH on the enzyme
  - (b) Allosteric modulation
  - (c) Competitive inhibition
  - (d) Non-competitive inhibition
8. Coenzymes FMN and FAD are derived from vitamin
- (a) C
  - (b) B6
  - (c) B1
  - (d) B2
9. An enzyme brings about
- (a) Decrease in reaction time
  - (b) Increase in reaction time
  - (c) Increase in activation energy
  - (d) Reduction in activation energy
10. A specific inhibitor for succinate dehydrogenase is
- (a) Arsenite
  - (b) Malonate
  - (c) Citrate
  - (d) Fluoride

## PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Answer should not exceed 250 words.

11. (a) Write a note on holo enzymes.

Or

- (b) Give an account on co enzymes.

12. (a) Write the significance of  $K_m$  value.

Or

- (b) Explain enzyme concentration.

13. (a) Discuss the allosteric enzymes.

Or

- (b) Describe the irreversible inhibition.

14. (a) Write a note on pyridoxal phosphate.

Or

- (b) Write a role of cofactors in enzyme catalysis.

15. (a) Explain the general mechanism of feedback regulation.

Or

- (b) Mention the industrial applications of immobilized enzymes.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Answer should not exceed 600 words.

16. (a) Write a general characteristics of enzymes.

Or

- (b) Illustrate about active site.

17. (a) Derive the Michaelis Menton equation.

Or

- (b) Explain the Line weaver Burk plot.

18. (a) Enumerate the competitive inhibition.

Or

- (b) Describe the reversible inhibition.

19. (a) Elucidate the multienzyme complexes.

Or

- (b) Discuss coenzyme A.

20. (a) Explain the reversible covalent modification with examples.

Or

(b) Elaborately discuss isoenzymes and their medical applications.

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(6 pages)

Reg. No. : .....

**Code No. : 11333 E      Sub. Code : JMBC 51**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

Fifth Semester

Biochemistry – Main

**IMMUNOCHEMISTRY**

(For those who joined in July 2016 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which of the following describes an activated dendritic cell upon arriving in a lymph node?
  - (a) Located in follicles and medulla of the lymph node
  - (b) Associated mainly with antigen uptake and processing
  - (c) Bears highly elaborated finger-like processes called dendrites
  - (d) Expresses low levels of MHC class II molecules



2. The area of contact between membranes of a T cell and an antigen-presenting cell where a clustering of protein—protein interactions occur is called a(n)
- (a) immunoreceptor tyrosine-based activation motif (ITAM)
  - (b) polarization
  - (c) cross-presentation center
  - (d) granuloma
3. Which of the following is not produced by cytotoxic T cells?
- (a)  $\text{IFN-}\gamma$
  - (b) CD40 ligand
  - (c)  $\text{TNF-}\alpha$
  - (d) lymph
4. Which of the following is the first stage of T-cell receptor gene rearrangement in  $\alpha : \beta T$  cells?
- (a)  $V\alpha \rightarrow D\alpha$
  - (b)  $D\alpha \rightarrow J\alpha$
  - (c)  $V\beta \rightarrow D\beta$
  - (d)  $D\beta \rightarrow J\beta$
5. \_\_\_\_\_ of thymocytes is necessary to produce a T-cell repertoire capable of interacting with self-MHC molecules.
- (a) Positive selection
  - (b) Negative selection
  - (c) Apoptosis
  - (d) Receptor editing

6. The antibody present in secretions like tears, saliva, colostrum is
- (a) IgM                                      (b) IgG  
(c) IgA                                      (d) IgE
7. Which is the largest Ig
- (a) IgM                                      (b) IgG  
(c) IgA                                      (d) IgE
8. Which of the following molecule(s) can be detected by ELISA?
- (a) proteins                               (b) hormones  
(c) antibodies                           (d) all of the above
9. What does a weak color signal in competitive ELISA represent?
- (a) more antigen in the sample  
(b) less antigen in the sample  
(c) less antigen retained on the well  
(d) both (a) and (c)
10. Humoral immunity is mediated by
- (a) B cells                               (b) Macrophages  
(c) Both (a) and (b)                  (d) Phagocytes

## PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Write a source of infectious agents.

Or

- (b) Give a properties of immune system.

12. (a) Write short note on haptens.

Or

- (b) Illustrate about antigenicity.

13. (a) Describe the immunological memory.

Or

- (b) Write short note on lymphokines.

14. (a) Discuss the prevention of graft rejection.

Or

- (b) What is T cell? Discuss.

15. (a) Describe the immunodiffusion.

Or

- (b) Explain the agglutination test.

## PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Describe the mechanism of innate immunity.

Or

- (b) Explain the structure and functions of lymphoid organs.

17. (a) Discuss the various types of antigens.

Or

- (b) Give a detail note on immunoglobulin.

18. (a) Enumerate the complement system.

Or

- (b) Discuss the mechanism of antigen antibody binding.

19. (a) Elaborately discuss MHC class.

Or

- (b) Explain the mechanism of passive immunization.

20. (a) Write a detail note on ELISA tests.

Or

(b) Describe the production of monoclonal antibodies.

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(6 pages)

Reg. No. : .....

**Code No. : 10352 E      Sub. Code : GMBC 51**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

Fifth Semester

Biochemistry – Main

**IMMUNOCHEMISTRY**

(For those who joined in July 2012-2015)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer:

1. Epitope
  - (a) Antigenic determinant
  - (b) T-Lymphocyte
  - (c) B-Lymphocyte
  - (d) None of the above

2. The major function of the lymphoid system is
  - (a) Innate immunity
  - (b) Inflammation
  - (c) Phagocytosis
  - (d) Acquired immunity
  
3. Most abundant class of immunoglobulin in the body is
  - (a) Ig G
  - (b) Ig M
  - (c) Ig D
  - (d) Ig E
  
4. To which of the following diseases immunity is not long-lasting?
  - (a) Diphtheria
  - (b) Influenza
  - (c) Whooping cough
  - (d) Mumps
  
5. The secondary immune response is also termed as
  - (a) memory
  - (b) immunization
  - (c) antigen processing
  - (d) none of the above
  
6. Cell mediated immune responses are
  - (a) Enhanced by depletion of complements
  - (b) Supposed by cortisone
  - (c) Enhanced by depletion of T-cells
  - (d) Suppressed by antihistamine

7. Which of the following does not involve cell mediated immunity?
- (a) Rejection of liver graft
  - (b) Tuberculin reaction
  - (c) Serum sickness
  - (d) Immunity to chicken pox
8. CD8<sup>+</sup> T cells recognize antigen that is combined with
- (a) Class II MHC
  - (b) Class I MHC
  - (c) Helper cells
  - (d) Macrophages
9. Primary interactions between antigen and antibody involve all of the following except
- (a) Covalent bonds
  - (b) Vander Waal's force
  - (c) Hydrophobic force
  - (d) Electrostatic force
10. Which Ig is rich in colostrum?
- (a) Ig D
  - (b) Ig A
  - (c) Ig M
  - (d) Ig E



## PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Enumerate the properties of epitopes.

Or

- (b) Explain clonal selection theory.

12. (a) List the primary lymphoid organs and explain thymus in detail.

Or

- (b) Explain the structure of T-cell receptor.

13. (a) Describe the biological consequences of complement activation.

Or

- (b) Explain Toxoid vaccines.

14. (a) Explain the phases of secondary immune response.

Or

- (b) Write short notes on Haptens.

15. (a) Explain Active immunization in detail.

Or

(b) How will you treat autoimmune diseases?

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain primary and secondary immune deficiency disorders.

Or

(b) Write an essay on immunity.

17. (a) Explain classical pathway of complements.

Or

(b) Describe the various types of cells involved in cell mediated immune response.

18. (a) Write notes on

(i) Lymph node.

(ii) Bone marrow.

Or

(b) Elaborate the structure of class I MHC with diagram.

19. (a) Discuss the principle and applications of agglutination reactions with suitable examples.

Or

- (b) Explain graft rejection.

20. (a) Write notes on delayed hypersensitivity with examples.

Or

- (b) Write the principle and applications of immunodiffusion.
-

(6 pages)

Reg. No. : .....

Code No. : 11332 E      Sub. Code : JMBC 41

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

Fourth Semester

Biochemistry — Main

INTERMEDIARY METABOLISM

(For those who joined in July 2016 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer.

1. Lipoproteins are classified into \_\_\_\_\_ types.
- |       |       |
|-------|-------|
| (a) 1 | (b) 2 |
| (c) 3 | (d) 4 |

2. The pentose phosphate pathway occurs in the  
(a) Mitochondria (b) Peroxisomes  
(c) Cytosol (d) Lysosomes
3. \_\_\_\_\_ is the major lipids in fat deposits and in food.  
(a) Triacyl glycerol (b) Cardiolipin  
(c) Cholesterol (d) Sphingolipids
4. Which of the following is called as NEFA?  
(a) Free fatty acids (b) Cholesterol  
(c) Phospholipids (d) Triglycerides
5. \_\_\_\_\_ discovered a group of intracellular haemoprotein enzymes.  
(a) Bloor (b) Sorensen  
(c) Keilin (d) Neuberg
6. Cytochrome  $\alpha_3$  is also called as  
(a) Peroxidase  
(b) Catalase  
(c) Cytochrome oxidase  
(d) Ligase

7. \_\_\_\_\_ is the site of formation of urea.
- (a) Liver                      (b) Lungs  
(c) Intestine                (d) Kidney
8. Ammonia is converted into
- (a) Nitric acid                (b) Xanthine  
(c) Urea                        (d) Uric acid
9. Which of the following enzyme is lack in humans?
- (a) Uricase  
(b) Glucokinase  
(c) Sucrase  
(d) Lactase
10. Which of the following is a required substrate for purine biosynthesis?
- (a) 5 methyl thymidine  
(b) Ara-C  
(c) Ribose phosphate  
(d) PRPP

## PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Briefly explain about Cori's cycle.

Or

- (b) Discuss about glycogen metabolism.

12. (a) Write about the synthesis of linoleic acid.

Or

- (b) Discuss about the biosynthesis of phospholipid.

13. (a) Explain about ATP and its significance.

Or

- (b) Give a brief account on inhibitors of Electron transport chain.

14. (a) Briefly explain about deamination of amino acids.

Or

- (b) Write notes on integration of carbohydrate.

15. (a) Write short notes on purine degradation.

Or

(b) Write notes on pyrimidine degradation.

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Write a general introduction to metabolism.

Or

(b) Explain the formation of ATP.

17. (a) Write the biosynthesis of triacyl glycerol.

Or

(b) Describe the synthesis of palmito oleic acid.

18. (a) Explain the significance of ETC.

Or

(b) Explain the inhibition and uncouplers of oxidative phosphorylation.



19. (a) Discuss the metabolism of amino acid.

Or

(b) Describe urea cycle.

20. (a) Elucidate the biosynthesis of purine.

Or

(b) Elaborate the biosynthesis of pyrimidine.

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(6 pages)

Reg. No. : .....

**Code No. : 10351 E      Sub. Code : GMBC 41**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

Fourth Semester

Biochemistry

INTERMEDIARY METABOLISM

(For those who joined in July 2012-2015)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. \_\_\_\_\_ is the most frequently used reducing agent for biosynthesis.
  - (a) NADPH
  - (b) NAD
  - (c) FADH
  - (d) FAD

2. TCA cycle catabolizes acetyl CoA to \_\_\_\_\_.
- (a) O<sub>2</sub>
  - (b) H<sub>2</sub>O<sub>2</sub>
  - (c) H<sub>2</sub>O
  - (d) CO<sub>2</sub>
3. In fatty acid biosynthesis enzyme complexes occur in the \_\_\_\_\_ of animal cell.
- (a) Endoplasmic reticulum
  - (b) Nucleus
  - (c) Mitochondria
  - (d) Cytosol
4. Tryptophan is degraded to \_\_\_\_\_ and acetoacetate.
- (a) Alanine
  - (b) Valine
  - (c) Threonine
  - (d) Glycine
5. Cholesterol molecule is
- (a) Benzene derivative
  - (b) Quinoline derivative
  - (c) Steriod
  - (d) Straight chain acid

6. An example of saturated fatty acid is  
(a) Palmitic acid            (b) Linoleic acid  
(c) Erucic acid            (d) Oleic acid
7. Cytochrome 'a<sub>3</sub>' is also called as  
(a) Peroxidase            (b) Cytochrome oxidase  
(c) Catalase            (d) Ligase
8. Ketone bodies are synthesized in  
(a) Heart            (b) Intestine  
(c) Liver            (d) Spleen
9. Greens involved in nitrogen fixation are called as \_\_\_\_\_.  
(a) Hip genes  
(b) nif genes  
(c) lif genes  
(d) None
10. Name of the pentose used in purine biosynthesis.  
(a) Erythrose 4-phosphate  
(b) Erythrose  
(c) Ribose 5-phosphate  
(d) Ribulose

## PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Describe about Cori's cycle.

Or

- (b) Explain about glyoxylate pathway.

12. (a) Explain the biosynthesis of phospholipids with examples.

Or

- (b) Elucidate how cholesterol is converted to bile salts.

13. (a) Explain about the concept of free energy.

Or

- (b) Describe about the laws of thermodynamics.

14. (a) Write notes on transamination.

Or

- (b) Explain about ketogenesis.

15. (a) Discuss about nitrogen fixation.

Or

(b) Write short notes on pyrimidine degradation.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain in detail about glucuronic acid pathway.

Or

(b) Explain the metabolism of glycogen.

17. (a) Give an account on cholesterol biosynthesis.

Or

(b) Elaborately explain the  $\beta$  and  $w$  oxidation of fatty acids.

18. (a) Write an essay on biological oxidation.

Or

(b) Give a brief account on exergonic and endergonic reactions with suitable examples.

19. (a) Elucidate the biosynthesis of Purine.

Or

(b) Elaborate the biosynthesis of pyrimidine.

20. (a) Explain the biosynthesis of phenylalanine, tyrosine and tryptophan.

Or

(b) Write an essay on urea cycle.

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(6 pages)

Reg. No. : .....

**Code No. : 11349 E      Sub. Code : JNBC 4 A**

U.G. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

Fourth Semester

Biochemistry

Non Major Elective – NUTRITIONAL BIOCHEMISTRY

(For those who joined in July 2016 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer:

1. Which among the following is an essential amino acid?
  - (a) Alanine
  - (b) Serine
  - (c) Valine
  - (d) Glutamic acid



2. Which among the following has least amount of carbohydrates?
  - (a) Wheat
  - (b) Sugarcane
  - (c) Meat
  - (d) Milk
3. Which one of the Vitamin A function as steroid hormone?
  - (a) Retinal
  - (b) Retinol
  - (c) Provitamin A
  - (d)  $\beta$  Carotene
4. Person with hypertension should restrict the intake of
  - (a) sodium
  - (b) potassium
  - (c) calcium
  - (d) magnesium
5. Iodine deficiency leads to
  - (a) Marasmus
  - (b) Goiter
  - (c) Anemia
  - (d) Osteomalacia
6. Vitamin C is
  - (a) D ascorbic acid
  - (b) L ascorbic acid
  - (c) Either of the two
  - (d) None of the above

7. Rice polishing contain the vitamin
  - (a) Riboflavin
  - (b) Niacin
  - (c) Thiamine
  - (d) Vitamin B<sub>12</sub>
  
8. The energy requirement of an adult is
  - (a) 1000 – 2000 calories
  - (b) 3000 – 4000 calories
  - (c) 2000 – 3000 calories
  - (d) 4000 – 5000 calories
  
9. Vegetable oils are fortified with
  - (a) Vitamin A
  - (b) Vitamin B
  - (c) Vitamin E
  - (d) Vitamin K
  
10. Important functions of lipids are
  - (a) to provide energy
  - (b) to act as vehicles for certain vitamins
  - (c) all the above
  - (d) none

## PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Explain the nutritive value of food proteins.

Or

- (b) What are the signs of poor nutritional status?

12. (a) Explain the role of iodine in our body.

Or

- (b) Describe the physiological functions of cobalt.

13. (a) List out the host resistance factors in human milk.

Or

- (b) What are the functions of Vitamin E?

14. (a) Write notes on the nutritional significance and calorific value of fat.

Or

- (b) What is basal metabolism?

15. (a) Define hygiene. Explain the food hygiene standards.

Or

- (b) Comment on high fat food.

## PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Give a detailed account on food groups.

Or

- (b) What are the functions of food.

17. (a) Give a detailed account on Kwashiorkor.

Or

- (b) Write in detail the biochemical functions of potassium.

18. (a) Explain the RDA for infants and children.

Or

- (b) Write the sources, absorption, daily requirements, nutritional significance and deficiency of thiamine and riboflavin.

19. (a) Discuss the energy requirement of the human body.

Or

- (b) Describe energy metabolism.

20. (a) Explain about the new fat foods and new protein foods and its functions.

Or

- (b) Explain the effects of food adulteration.
-

Reg. No. : .....

**Code No. : 11339 E    Sub. Code : JMBC 5 E**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

Fifth Semester

Biochemistry — Main

Elective — NUTRITIONAL BIOCHEMISTRY

(For those who joined in July 2016 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which among the following is an essential amino acid.  
(a) Alanine                      (b) Serine  
(c) Valine                        (d) Glutamic acid
2. Which of the following is an essential fatty acid in Human?  
(a) Palmitic acid                (b) Oleic acid  
(c) Linoleic acid                (d) Lignoceric acid

3. The term kwashiorkor was introduced by
  - (a) Raman
  - (b) Wobble
  - (c) Kreh
  - (d) Cicely Williams
4. Phosphorus deficiency causes
  - (a) Rickets
  - (b) Osteomalacia
  - (c) Both (a) and (b)
  - (d) Night blindness
5. Which of the following if taken excessively can accumulate in blood and cause toxicity?
  - (a) Vitamin B<sub>6</sub>
  - (b) Vitamin B<sub>5</sub>
  - (c) Vitamin C
  - (d) Vitamin D
6. The active form of Folic acid is
  - (a) Tetrahydrofolate
  - (b) Dihydrofolate
  - (c) Monohydrofolate
  - (d) None of the above
7. B.M.R. is expressed as
  - (a) Cal/sq.m/hr
  - (b) Sq.m/hr
  - (c) Sq.mm/mm
  - (d) All the above
8. Respiratory quotient of carbohydrate
  - (a) 0.8
  - (b) 1
  - (c) 0.7
  - (d) 0.6
9. Sot bran contain ————— inhibitors.
  - (a) Tryptophan oxidase
  - (b) Trypsin
  - (c) Cytochrome oxidase
  - (d) All the above

10. Milk powder is adulterated with
- (a) Starch
  - (b) Dextrin
  - (c) Both (a) and (b)
  - (d) Skim milk

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Write about Food habits.
- Or
- (b) Give the ICMR classification of food groups with examples.
12. (a) Comment on rickets and Osteomalacia.
- Or
- (b) Write short note on anemia and the causes.
13. (a) Explain the sources of RDA for women.
- Or
- (b) Explain the classification of vitamins.
14. (a) Write notes on the nutritional significance and calorific value of fat.
- Or
- (b) Compare the biological value of plant and animal proteins.



15. (a) List the principles of food preservation.

Or

- (b) Explain about new protein foods.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain the analysis of Food composition.

Or

- (b) Explain the function of food.

17. (a) Discuss the nutritional significance of iron.

Or

- (b) Explain the sources functions and deficiency of potassium in our body.

18. (a) Give an elaborate note on BMR.

Or

- (b) Write briefly about bomb calorimeter.

19. (a) Explain the effects of food adulteration.

Or

- (b) Discuss the role of refrigerator in storage of food.

20. (a) Write in elaborate notes on vitamins.

Or

- (b) Explain about the RDA for all ages.

(6 pages)

Reg. No. : .....

**Code No. : 11329 E      Sub. Code : JMBC 21/  
SMBC 21**

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

Second Semester

Biochemistry — Main

PHYSIOLOGY

(For those who joined in July 2016 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Plasma proteins are separated by
  - (a) Salt precipitation
  - (b) Electrophoresis
  - (c) Immuno electrophoresis
  - (d) All of these

2. Plasma is
- (a) The liquid portion of blood containing clotting factors
  - (b) Blood that has no red blood cells
  - (c) Proteins of blood
  - (d) The liquid portion of blood only
3. Dissociation of Oxyhaemoglobin is caused by
- (a) Acid pH
  - (b) High temperature
  - (c) High  $\text{CO}_2$  tension and low  $\text{O}_2$  tension
  - (d) All the above
4. White blood cells are formed in
- (a) Bone Marrow
  - (b) Heart
  - (c) Kidneys
  - (d) Pancreas
5. The metal found in the centre of hemoglobin is
- (a) Magnesium
  - (b) Manganese
  - (c) Iron
  - (d) Zinc

6. Under normal circumstances, the kidneys produce about \_\_\_\_\_ litres of glomerular filtrate per day.
- (a) 120 L                      (b) 180 L  
(c) 200 L                      (d) 1.5 L
7. Maximum reabsorption of Nat occurs in
- (a) Loop of Henb              (b) Distal tubule  
(c) Proximal tubule        (d) Collecting duet
8. Carbonic anhydrase contains \_\_\_\_\_.
- (a) Copper                      (b) Zinc  
(c) Potassium                (d) None
9. Human salvia contains all of the following except
- (a) Amylase                      (b) Glycoprotein  
(c) Albumin                      (d) Pepsin
10. The absorption of glucose in small itestine involves
- (a) Transport of glucose with sodium ions  
(b) Lymph system  
(c) The breakdown of glycogen into glucose  
(d) The action of bile salts

## PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Discuss about ABO blood grouping.
- Or
- (b) Explain composition of blood.
12. (a) Explain the diffusion of O<sub>2</sub> and CO<sub>2</sub> in lungs.
- Or
- (b) Explain about Hill-plot.
13. (a) Draw the structure of nephron and label its parts.
- Or
- (b) Describe about glomerular filtration rate.
14. (a) Enumerate the functions of Salvia.
- Or
- (b) State the roles of bile in digestion.
15. (a) Explain the structure of neuron in detail.
- Or
- (b) Enumerate different types of neurotransmitters.

## PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain the structure of heart in detail.

Or

- (b) Explain elaborately about mechanism of blood clotting.

17. (a) Illustrate the structure of lungs with diagram.

Or

- (b) Discuss the role of lungs in maintaining acid-base balance.

18. (a) Explain about formation of urine.

Or

- (b) Discuss the role of kidneys in regulation acid-base balance.

19. (a) Give the composition, functions and regulation of gastric secretion.

Or

- (b) Give an account on lipid digestion.

20. (a) Explain in detail about muscle contraction and relaxation.

Or

(b) Illustrate structure of ear with diagram.

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(6 pages)

Reg. No. : .....

**Code No. : 11620 E      Sub. Code : SNBC 3 B**

U.G. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

Third Semester

Biochemistry

Non-Major Elective — VACCINOLOGY

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Pertusis vaccine is
  - (a) Formalin killed pertusis
  - (b) Ethylene killed pertusis
  - (c) Acetyl killed pertusis
  - (d) All of the above



2. The chemical composition of endotoxin is
  - (a) protein
  - (b) carbohydrate complex
  - (c) lipo polysaccharide complex
  - (d) all the above
  
3. BCG is
  - (a) live attenuated bacterial vaccine
  - (b) live attenuated viral vaccine
  - (c) both (a) and (b)
  - (d) none of the above
  
4. The vaccine for rabies was first discovered by
  - (a) Pasteur                      (b) Edward Jenner
  - (c) Galmette                    (d) Rappie
  
5. The cell line used for the production of polio vaccine
  - (a) pig kidney cell line
  - (b) mouse kidney cell line
  - (c) monkey kidney cell line
  - (d) all of these

6. Example of killed vaccine
- (a) cholera                      (b) pertusis  
(c) plague                      (d) all of these
7. The other name for subunit vaccine
- (a) live virus vaccine  
(b) biopharmaceutical vaccine  
(c) toxoid  
(d) multiple vaccine
8. Hepatitis B vaccine is available in the trade name of
- (a) Recombivax BH      (b) Recombivax HB  
(c) Recombivax BA      (d) Recombivax AB
9. Tetanus toxoid was induced by
- (a) endotoxin                      (b) exotoxin  
(c) heterotoxin                      (d) homotoxin
10. Rabies vaccine was prepared from
- (a) free living organisms  
(b) closed living organisms  
(c) (a) and (b)  
(d) none of the above

## PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Explain innate immunity.  
Or  
(b) Write the historical aspects of vaccines.
12. (a) Write short notes on adjuvants.  
Or  
(b) Give an account on anti-idiotypic vaccine.
13. (a) Explain national immunization.  
Or  
(b) List out new approaches to immunization.
14. (a) Explain about polynucleotide vaccine.  
Or  
(b) Explain subunit vaccine with examples.
15. (a) Give an account on toxoids.  
Or  
(b) Write notes on  
(i) Pertussis vaccine  
(ii) BCG vaccine.

## PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Illustrate the sources of infection and infectious diseases.

Or

- (b) Write an essay on immunity.

17. (a) Explain in detail about types of vaccines.

Or

- (b) Write notes on currently licensed vaccines.

18. (a) Explain national immunization for neonates.

Or

- (b) Write the maternal immunization in detail.

19. (a) Write an account on chemically synthesized vaccine.

Or

- (b) Explain in detail about recombinant vaccines.

20. (a) Write an essay on EPI vaccines.

Or

(b) Write notes on rabies vaccine and AIDS vaccines.

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(6 pages)

Reg. No. : .....

**Code No. : 11348 E      Sub. Code : JNBC 3 B**

U.G. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2018.

Third Semester

Biochemistry

Non Major Elective — VACCINOLOGY

(For those who joined in July 2016 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL the questions.

Choose the correct answer :

1. This might be one of the disadvantages of inactivated vaccines
  - (a) Risk of reversion to a pathogenic form
  - (b) Requirement of booster
  - (c) High immune reactions
  - (d) All of these

2. Inactivated vaccines
  - (a) Live
  - (b) Killed
  - (c) Subunit
  - (d) Pathogenic
  
3. For vaccination against mycobacterial diseases such as tuberculosis, the most important facet of the immune response to be stimulated is
  - (a) A high titer of antibody
  - (b) Macrophage-activating cell-mediated immunity
  - (c) Cytotoxic T-cells
  - (d) Antibody in the gut lumen
  
4. From this list, the most effective vaccine is against
  - (a) Staphylococci
  - (b) Tuberculosis
  - (c) Tetanus
  - (d) Adenovirus
  
5. A feature of a Salmonella-based vaccine expressing antigens from other infectious agents is that
  - (a) Immunity is limited to the gut
  - (b) Only secretory IgA is elicited
  - (c) It does not invade the mucosal lining of the gut
  - (d) It provokes both oral and systemic immunity

6. To which one of the following groups would it be acceptable to give a live attenuated viral vaccine?
- (a) Children under 8 years of age
  - (b) Patients treated with steroids
  - (c) Pregnant mothers
  - (d) Patients with leukemia
7. The Gardasil vaccine has been recently licensed to prevent infection with four strains of human papilloma virus (HPV). The vaccine does not use any live virus or a killed virus so it cannot cause disease. Which type of vaccine meets this criteria and would be effective against the virus?
- (a) Carrier vaccine
  - (b) Toxoid vaccine
  - (c) Subunit vaccine
  - (d) Inactivated virus vaccine
8. Through his unethical experiment Edward Jenner made the first smallpox vaccine. The material that he used to inoculate his patients was
- (a) A carrier vaccine
  - (b) A subunit vaccine
  - (c) An inactivated virus vaccine
  - (d) A live attenuated virus vaccine



9. Tetracycline are used in treatment of
- (a) infection of urinary tract
  - (b) bronchitis
  - (c) tonsillitis
  - (d) pneumonia
10. It is believed that the early forms of vaccination was first developed in
- (a) 200 BC in China
  - (b) 1000 AD in India
  - (c) 1875 in the United States
  - (d) 1910 in France

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Write a concept of immunity.
- Or
- (b) Give an account on cow pox.
12. (a) Illustrate about anti-idiotypic vaccines.
- Or
- (b) Describe the antitoxins vaccines.

13. (a) Write a practices of immunization.

Or

(b) Write short note important material immunization.

14. (a) Give a note on micro encapsulation.

Or

(b) Enumerate the subunit vaccines.

15. (a) Explain the testing of diphtheria toxoids.

Or

(b) Write a note on production of pertussis vaccines.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Describe the vaccines against diphtheria.

Or

(b) Elaborately discuss anti rabies vaccines.

17. (a) Describe the new approaches for better vaccines.

Or

(b) Elucidate the killed vaccines.

18. (a) Write a detail note on maternal immunization.

Or

(b) Explain the national immunization schedule for children.

19. (a) Discuss the polynucleotide vaccines.

Or

(b) Describe the chemically synthesized vaccines.

20. (a) Explain the tissue culture derived rabies vaccines.

Or

(b) Enumerate the research on AIDS vaccines.

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