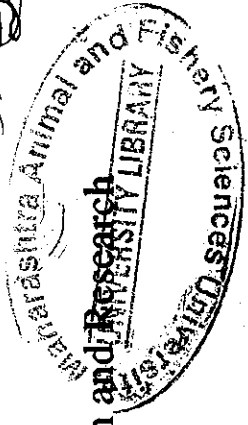


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Maharashtra Council of Agricultural Education and Research  
Semester-end Examination

**B.V. Sc. & A.H.**

SEMESTER : I  
COURSE NO. : BIO - 111  
CREDITS : 3(2+1)  
DAY & DATE : MONDAY  
17-1-94

ACADEMIC YEAR : 1993-94

TITLE : Bio-chemistry - I  
(General Bio-chemistry)

TIME : 12-00 to 14-00 hrs. TOTAL MARKS : 80

- Note :** 1) Solve ANY FIVE questions from question Nos. 1 to 7.  
2) Question Nos. 8, 9 and 10 are compulsory.  
3) All questions carry equal marks.

- Q.1. What are trace elements ? Name them and describe in detail absorption, excretion, physiological functions and symptoms.
- Q.2. Name the fat soluble vitamins and describe in detail, chemistry, physiological functions and symptoms of deficiency of Vitamin A.
- Q.3. What are nucleic acids ? Name them and describe in detail the structure of polynucleotides.
- Q.4. What are triacylglycerols ? Describe in detail oxidation, hydrogenation and saponification of the glycerides.
- Q.5. What are homoglycans ? Describe structure and properties of starch and animal starch in detail.
- Q.6. Define proteins and classify them with description of examples of each class.
- Q.7. Define dialysis and explain its physiological significance in detail.

Q.8. Match the pairs.

	'A'	'B'
1)	Lactic acid	a) Keto acid
2)	Linoleic acid	b) Essential fatty acid
3)	Oxalic acid	c) Dicarboxylic acid
4)	Bile acid	d) Zoosterol
5)	Mycosterol	e) Ergosterol
6)	Vit. A	f) Rhodopsin
7)	Vit. D	g) Cholecalciferol
8)	Vit. E	h) Antioxidant
9)	Vit. K	i) Blood clotting factor
10)	Methionine	j) Sulphur containing A.A.

P.T.O.

Q. 9. State True or False.

- 1) Protein is an amino acid.
- 2) Casein is a lipoprotein.
- 3) Casein is a milk protein.
- 4) Casein has an isoelectric pH 5.4.
- 5) Threonine contains two asymmetric carbon atoms.
- 6) Viscosity of blood at body temperature is 4.7 poise.
- 7) Cellulose is the structural element of the plant.
- 8) Dulcitol is a sugar alcohol.
- 9) Glyceraldehyde is the simplest and smallest monosaccharide.
- 10) Heparin is a heteroglycan.

Q. 10. Fill in the blanks.

- 1) ..... is a precursor of niacin.
- 2) ..... is a mineral involved in blood coagulation.
- 3) ..... is a mineral present in cobalamines.
- 4) ..... and ..... are two classes of polysaccharides.
- 5) ..... and ..... are two components of a starch grain.
- 6) ..... and ..... are the essential fatty acids.



Maharashtra Council of Agricultural Education  
Semester-end Examination  
(B. V. Sc. & A. H.)

SEMESTER : I  
COURSE NO. : BIO - 111  
CREDITS : 3 (2+1)  
DAY & DATE : WEDNESDAY  
21-12-1994

ACADEMIC YEAR : 1994-95

TITLE : Biochemistry - I

TIME : 12.00 to 14.00 hrs. TOTAL MARKS : 80

- Note :** 1) Question Nos. 1, 2 and 3 from Section 'A' are compulsory.  
2) Solve **ANY FIVE** questions from Section 'B'.  
3) All questions carry equal marks.

**SECTION 'A'**

- Q. 1. Fill in the blanks.

- 1) The size of particles of true solution is less than .....
- 2) Cell membrane is like sandwich of ..... between protein layers.
- 3) Vitamin D is known as .....
- 4) Casein is a .....
- 5) Niacin deficiency causes .....

Q. 2. State whether true or false.

- 1) Oil and water are miscible with each other.
- 2) Normal saline is isotonic to blood.
- 3) Lactose molecule is made of glucose and fructose.
- 4) Sulphur deficiency causes parakeratosis.
- 5) Hydrophilic colloids are solvent loving colloids.

Q. 3. Write short notes on :

- 1) Vitamin K
- 2) Mucopoly saccharides

**SECTION 'B'**

- Q. 4. Describe in detail the biologic oxidation and its importance in mitochondria.
- Q. 5. Classify the proteins. Describe the chemistry and functions of essential amino-acids.
- Q. 6. What are carbohydrates ? Classify carbohydrates giving suitable example of each group.
- Q. 7. Describe the chemistry and functions of DNA.
- Q. 8. Enumerate water soluble vitamins. Describe sources, deficiency symptoms and metabolic functions of Thiamine or Riboflavin.
- Q. 9. Classify the minerals. Describe the physiological functions and deficiency symptoms of copper.
- Q. 10. Describe chemistry and functions of steroids.

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Maharashtra Council of Agricultural Education & Research

Semester-end Examination of BVS

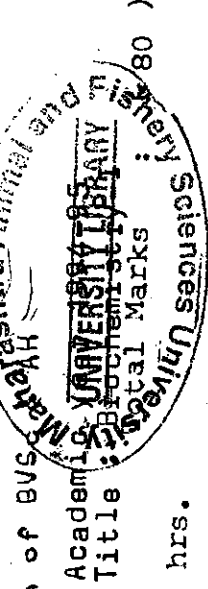
Semester-I (Repeat)

Course No. B10-111

Credits: 3 (2+1)

TIME :

Day & Date : Thursday: 9.00 to 11.00 hrs.  
: 1-6-1995



Note: 1. Answer any five questions from Questions 1 to 7.  
2. Questions 8, 9 and 10 are compulsory.

- Q.1 Define enzymes. Discuss the various factors affecting its activity.
- Q.2 What are nucleic acids ? Discuss their chemistry and biological significance.
- Q.3 Classify lipids giving suitable examples. Discuss in brief the chemistry and functions of phospholipids.
- Q.4 Discuss the source, absorption, transport and functions of iron in the body.
- Q.5 Mention the lipid soluble vitamins and describe the role of vit. A in the body.
- Q.6 Describe the chemistry and functions of RNA.
- Q.7 What are fatty acids ? Discuss the properties and functions of essential fatty acids.
- Q.8 Fill in the blanks with suitable words.
  - a) The simple proteins consist chiefly of.....
  - b) The hexoses are the most important class of.....
  - c) The deoxyribonucleic acids are found in the.....
  - d) Beriberi, a deficiency disease of.....
  - e) Vitamin E deficiency develops muscular lesions leading to..... *muscular dystrophy*
- Q.9 Write true or false.
  - a) Mucoproteins and glycoproteins contain carbohydrate.
  - b) The lipoproteins contain protein and phospholipid.
  - c) Phosphorus is a constituent of the phospholipids present in nervous tissues.
  - d) Riboflavin plays an important role in many enzyme systems.
  - e) Specific function of the chloride ion is in connection with the chloride shift in the blood during the carriage of carbon dioxide.
- Q.10 Write short notes on
  - a) Vitamin C
  - b) Essential fatty acids



Q.8 Fill in the blanks with suitable words.

- a) Random movement of colloidal particles is called as . . . . . movement.
- b) . . . . . are good emulsifying agents
- c) Essential minerals are classified in two groups  
i) . . . . . and ii) . . . . .
- d) Iodine is required for the formation of . . . . .
- e) Vitamin 'K' is concerned with . . . . . formatio

Q.9 Write true or false by words.

- a) All electrolyte solutions are iso-osmotic.
- b) The tocopherols ( Vitamin E ) are required by animals to maintain all types of muscle in proper condition.
- c) Vitamin A is essential for the maintenance of epithelial tissues in normal condition.
- d) Phosphorus deficiency causes lowered fertility.
- e) Milk fever is a case of temporary calcium deficiency in the blood.

Q.10 Write short notes on :

- a) Vitamin 'A'
- b) RNA

(4)

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# Maharashtra Agricultural Universities Examination Board, Pune 5

## ANNUAL EXAMINATION

B.V.Sc. & A.H.

YEAR : First  
 COURSE NO. : ~~60~~ 6000000000  
 CREDITS : 3 (2+1)  
 DAY : Wednesday  
 TIME : 10.00 to 12.00 hrs.

ACADEMIC YEAR : 1998-99

SUBJECT/TITLE : Biochemistry

(Paper-I)

DATE : 11-8-99

TOTAL MARKS : 50

- Note : 1) Solve any five questions from Section 'A'.  
 2) Section 'B' is compulsory.  
 3) Figures to the right indicate full marks.

### SECTION 'A'

- Q. 1. Enlist the physico-chemical processes and describe the mechanism and physiological importance of dialysis. (6)
- Q. 2. What are carbohydrates ? Classify them. Explain the significance of carbohydrates with suitable examples. (6)
- Q. 3. What are Nucleotides ? Classify them. Explain their functions with suitable examples. (6)
- Q. 4. Define and classify proteins. Explain their functions with suitable examples. (6)
- Q. 5. Write in brief.  
 1) Advantage of an amino acid as a Zwitterion  
 2) Chemical properties of lipids. (6)
- Q. 6. Give the structure and function of each.  
 1) Glycosidic linkage between two glucose units.  
 2) Linkage between glycerol and a fatty acid.  
 3) Peptide linkage  
 4) Steroid nucleus  
 5) Oleic acid  
 6) 2 Deoxy-ribose-5 phosphate (6)

### SECTION 'B'

- Q. 7. Define.  
 1) Racemization  
 2) Denaturation  
 3) Micelle  
 4) Saponification  
 5) Amino sugar (5)

Q. 8. Correct the following statements, if found incorrect, by changing the underlined term and rewrite the correct versions. (5)

- 1) All amino acids have equal number of amine and carboxyl groups.
- 2) Teichoic acid is present in animal cell wall.
- 3) Proteins form True solution when dissolved in water.
- 4) Cell membrane is permeable to all kinds of solutes.
- 5) Longer the fatty acid chain lower the melting point.

Q. 9. Name the building constituents of the followings. (5)

- 1) Lactose :- .....and .....
- 2) Heparin unit :- .....and .....as repeating unit
- 3) Haemoglobin :- .....and .....
- 4) Neutral fat :- .....and .....
- 5) Nucleoprotein :- .....and .....

Q. 10. Answer the following. (5)

- 1) Name the biomolecular forming blood group substances.
  - 2) Name the groups of monosaccharides responsible for reducing property.
  - 3) Name the two ends of a fatty acid defining affinity for water.
  - 4) How many isomers can exist for a monosaccharide with four asymmetric carbons ?
  - 5) Name the biomolecules imparting antigenic property to a bacterial cell.
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MAHARASHTRA VETERINARY COLLEGES EXAMINATION BOARD, MUMBAI  
ANNUAL EXAMINATION

B.V.Sc. & A.H.

YEAR	: First	ACADEMIC YEAR	: 1999-2000
COURSE NO.	: VBC- III	SUBJECT/TITLE	: Biochemistry ( Paper-I )
CREDITS	: 2+1 = 3	DATE	: 17/8/2000
DAY	: Thursday	TOTAL MARKS	: 50
TIME	: Hrs. 10.00 to 12.00		

Note : 1. Solve any five questions from Section 'A' 2. Section 'B' is compulsory.

SECTION 'A'

- Q . 1. Define isomerism. Enlist the different types of isomers applicable to glucose and describe anomers (06)
- Q . 2. Define carbohydrates. Classify them and describe the general properties of monosaccharides. (06)
- Q . 3. What are lipids ? Classify them and describe in short the saponification of fat. (06)
- Q . 4. Write short notes on  
1. Chemical properties of lipid 2. Classification of Amino acids. (06)
- Q . 5. Write in brief about classification of proteins with suitable examples and define denaturation of proteins. (06)
- Q . 6. Write in brief about  
a. Enolization b. Mitochondria (06)

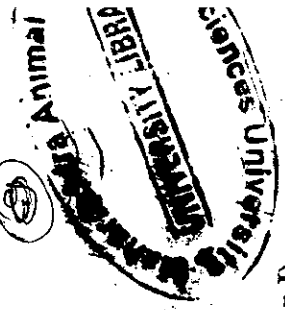
SECTION 'B'

- Q . 7. Match the following (10)
- |                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>A group</p> <ol style="list-style-type: none"> <li>1. Sucrose</li> <li>2. Colloids</li> <li>3. Milk fat</li> <li>4. Lactose</li> <li>5. Heteroglycans</li> <li>6. Homoglycans</li> <li>7. Derived lipids</li> <li>8. Histones</li> <li>9. Simple lipids</li> <li>10. Monosaccharides</li> </ol> | <p>B group</p> <ol style="list-style-type: none"> <li>a. Galactose</li> <li>b. Milk sugar</li> <li>c. Pectocellulose</li> <li>d. Starch</li> <li>e. Brownian movement</li> <li>f. Cane sugar</li> <li>g. Mucopolysaccharides</li> <li>h. Phytosterol</li> <li>i. True fats</li> <li>j. Surface tension</li> <li>k. Simple proteins</li> <li>l. Malt sugar</li> </ol> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
- Q . 8. Define the following (10)
1. Anode
  2. Oligosaccharides
  3. Diffusion
  4. mRNA
  5. Phagocytosis
  6. Isotopes
  7. Asymmetric carbon atom
  8. Starch
  9. Glucuronic acid
  10. Conjugated proteins.

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MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY,  
NACPUR  
ANNUAL BOARD THEORY EXAMINATION



YEAR : FIRST  
COURSE NO. : VBC-111  
CREDITS : 2 + 1  
DATE : 12/10/2002  
TIME : 10-12HRS

B.V.Sc. & A.H.  
ACADEMIC YEAR : 2001-2002  
SUBJECT: Biochemistry(Pap.I)  
TOTAL MARKS : 50  
DAY : SATURDAY

NOTE: 1) Solve any THREE questions from Section - A  
2) Section-B is Compulsory.  
3) All question carry equal marks.

COURSE NO. : VBC-111 (General Veterinary Biochemistry) MARKS : 50

SECTION 'A'

- Q.1 a) Define optical rotation and explain D and L isomerism in carbohydrates. (5)  
b) Describe the structure of DNA (5)
- Q.2 Describe different levels of organization of protein structure. (10)
- Q.3 Enlist essential fatty acids. Describe chemical properties of fats. (10)
- Q.4 Define carbohydrate and briefly discuss its classification. (10)
- Q.5 Differentiate between - (10)  
a) Lyophobic and Lyophilic sols. B) Osmosis and Diffusion

SECTION 'B'

- Q.6 Define the followings (10)  
a) Mutarotation b) Isoelectric pH c) Epimer d) Iodine number  
e) Nucleotide f) Coagulation g) Molality h) Saponification  
i) pH j) Adsorption
- Q.7 a) Write TRUE OR FALSE for each state with reasons (5)  
i) Ionic product of water ( $K_w$ ) is 14.  
ii) Heparin contains glucosamine.  
iii) Smaller proteins can be precipitated by half saturation.  
iv) Purine bases have two rings in its structure, whereas pyrimidine bases have three rings.  
v) Polanski number is used to determine water soluble fatty acids in a fat while R. M. value is used for water insoluble fatty acids.  
vi) Amino acids react with both acids and bases due to their amphoteric nature.  
vii) Molarity of a solution is unaffected by temperature.  
viii) Tyndall effect is due to scattering of light from surface of particles.  
ix) Invert sugar is mixture of lactose and fructose.  
x) In osmosis, movement of solvent through semi permeable membrane is result of higher vapour pressure.

Choose the correct answer

- 1) Bases found in RNA are -
  - a) A.T.G.C.
  - b) A.T.G.U.
  - c) Both of the above
  - d) None.
- ii) The prosthetic group present in lecithin is-
  - a) Ethanolamine
  - b) Serine
  - c) Choline
  - d) None
- iii) Arachidonic acid has -
  - a) Four double bonds
  - b) Two double bonds
  - c) Three double bonds
  - d) One double bonds
- iv) Saponification number signifies about-
  - a) Number of double bonds present in fatty acids.
  - b) Average molecular size of fatty acids.
  - c) Number hydroxylated fatty acids.
  - d) None.
- v) After keeping long time, oils show a thin layer of film over it, which is due to-
  - a) Rancidity
  - b) Hydrolysis
  - c) Oxidation
  - d) None
- vi) Secondary structure of proteins is stabilized by mainly-
  - a) Peptic bond
  - b) Hydrogen bond
  - c) Covalent bond
  - d) None
- vii) The number of hydrogen bonds present in base pairing of two pyrimidines is-
  - a) 2
  - b) 3
  - c) 4
  - d) None
- viii) Percentage of nitrogen normally present in proteins -
  - a) 7
  - b) 50
  - c) 10
  - d) 16
- ix) Ribulose is an example of-
  - a) Ketose
  - b) Aldose
  - c) Homopolysaccharide
  - d) Heteropolysaccharides
- x) A hyper-tonic solution has -
  - a) Lower osmotic pressure
  - b) Equal osmotic pressure
  - c) Higher hydrostatic pressure
  - d) None

MAHARASHTRA ANIMAL & FISHERY SCIENCES UNIVERSITY, NAGPUR  
ANNUAL BOARD THEORY EXAMINATION, B. V. Sc. & A. H.

Year : I  
Course No. : VBC-111  
Credits : 2+1 = 3  
Day & Date : Tuesday, 08/07/2008

Academic Year : 2007-2008

Subject :

Terinary Biochemistry (I)

Time : 10.00 to 12.00 hrs.

Note: 1) Solve Any Three questions from Section - A  
2) All questions from Section - B are compulsory.  
3) All questions carry equal marks.

Section-'A'

- Q. 1 Define carbohydrates. Explain any four chemical properties of monosacchyrdes. (10)
- Q. 2 Define lipids and classify them giving one example of each class. (10)
- Q. 3 Define proteins and explain the structural organization of proteins. (10)
- Q. 4 Classify amino acids with two examples of each class. (10)
- Q. 5 Write short notes on:  
a) Diffusion (05)  
b) Steroids (05)

Section-'B'

- Q. 6 Answer in one line. (10)
- a) Which sugar is known as cane sugar?  
b) Which is the anomeric carbon in case of glucose?  
c) Which is the epimer of glucose differing at C-2?  
d) Which element of protein is not found in carbohydrate?  
e) How many double bonds are present in oleic acid?  
f) Which is the general test for proteins?  
g) Which is the sensitive test for glucose?  
h) How many amino acids contribute to form tripeptide?  
i) What are aldoses?  
j) Proteins are precipitated at what pH?

- Q. 7 A) Choose the correct answer from the multiple choice provided. (05)
- 1) Storage polysaccharide of plant.  
a) Glycogen  
b) Starch  
c) Cellulose  
d) Inulin
- 2) The repeating unit in glycogen is  
a) Glucose  
b) Fructose  
c) Mannose  
d) None of these
- 3) Heparin is a  
a) Mucopolysaccharide  
b) Glycoprotein  
c) Phosphoprotein  
d) None of these
- 4) pH of blood plasma  
a) 6.8  
b) 7.4  
c) 7.5  
d) 7.2
- 5) Casein of milk is a  
a) Phosphoprotein  
b) Sulphoprotein  
c) Mucoprotein  
d) None of these
- B) Define the following terms: (05)
- a) Buffer  
b) Zwitterion  
c) Isomerism  
d) Denaturation of protein  
e) Mutarotation

Year : I  
Course No. : VBC-111  
Credits : 2+1 = 3  
Day & Date : Friday, 29/08/2008

Academic Year : 2007-2008  
Subject : Veterinary Biochemistry (I)  
Marks : 50  
Time : 11.00 to 13.00 hrs.

- Note:** 1) Solve Any Three questions from Section - A.  
2) All questions from Section - B are compulsory.  
3) All questions carry equal marks.

**Section-'A'**

- Q. 1 Enlist the physicochemical laws as applicable to cell. Describe dialysis and diffusion with definition, principle and applications. (10)
- Q. 2 What are carbohydrates? Give the classification of carbohydrates with examples of each class. (10)
- Q. 3 What are amino acids? Give the classification of amino acids with examples of each class. Explain the properties of amino acids. (10)
- Q. 4 What are fatty acids? Give the classification and properties of lipids. (10)
- Q. 5 Write short notes on:  
a) Glycogen (05)  
b) Cholesterol (05)

**Section-'B'**

- Q. 6 Define the following:  
a) Osmosis b) Colloids c) pH d) Buffer (10)  
e) Pentosan f) Nucleoside g) Unsaturated fatty acids  
h) Tautomerization i) Sa ponification j) Isoelectric pH
- Q. 7 A) Choose the correct answer from the multiple choice provided. (05)  
1) Animal starch is  
a) Glycogen b) Cellulose  
c) Inulin d) Starch  
2) pH of blood plasma  
a) 7.1 b) 7.3  
c) 7.4 d) 7.5  
3) Storage polysaccharides of plant  
a) Insulin b) Starch  
c) Glycogen d) Cellulose  
4) Lactose is  
a) Monosaccharide b) Polysaccharide  
c) Reducing sugar d) Non reducing sugar  
5) Biuret test is positive for  
a) Starch b) Glycogen  
c) Protein d) Fats

**B) Give example of the following.**

- 1) Protein in egg white.  
2) Sugar involved in RNA.  
3) Number of hydrogen bonds between adenine and thymine.  
A) Essential fatty acids

(05)

(14)

**MAHARASHTRA ANIMAL & FISHERY SCIENCES UNIVERSITY, NAGPUR**  
**ANNUAL THEORY EXAMINATION, B.V.Sc. & A. H.**

Year : I  
Course No. : VBC-111  
Credits : 2+1 = 3  
Day & Date : Monday, 06/07/2009

Academic Year : 2008-2009  
Subjects : Veterinary Biochemistry - (I)  
Total Marks : 50  
Time : 10.00 to 12.00 hrs.

- Note :** 1) Solve Any Three questions from Section - A.  
2) All questions from Section - B are compulsory.  
3) All questions carry equal marks.

**VBC-111**

**General Veterinary Biochemistry**

**(50 Marks)**

**Section-A**

- Q. 1 Define nucleic acids and explain the structure of B-DNA. (10)
- Q. 2 Explain different structural organizations of protein along with the forces stabilizing them by giving figures and examples. (10)
- Q. 3 Classify the lipids, give examples of each class and write their biological importance. (10)
- Q. 4 What are polysaccharides and describe in detail the structure and function of starch and heparin. (10)
- Q. 5 Describe in detail the classification of amino-acids. (10)

**Section-B**

- Q. 6 Give two names to the followings: (10)
- 1) Epimers of glucose
  - 2) Types of endoplasmic reticulum
  - 3) Transport proteins
  - 4) Amino acids containing sulphur
  - 5) Essential amino acids
  - 6) Reagents for amino acid sequencing in protein
  - 7) Saturated fatty acids found in animal fat
  - 8) Unsaturated fatty acids in animal fat
  - 9) Grooves in DNA
  - 10) Essential Poly Unsaturated Fatty Acids (PUFA)

- Q. 7 Define the followings: (10)
- 1) Surface Tension
  - 2) Osmosis
  - 3) Adsorption
  - 4) Buffer
  - 5)  $IEp^H$

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MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITIES, NAGPUR  
ANNUAL THEORY EXAMINATION, B. V. Sc. & A. H.

Year : I (Old) Academic Year : 2009-2010  
Course No. : VBC-111 Subject : Veterinary Biochemistry - (I)  
Credits : 2+1 = 3 Total Marks : 50  
Day & Date : Monday, 14/06/2010 Time : 09.00 to 11.00 hrs.

- Note :** 1) Solve Any Three Questions from Section – 'A'.  
2) All Questions from Section – 'B' are compulsory.  
3) All Questions Carry Equal Marks.

VBC-111

General Veterinary Biochemistry

50 Marks

Section - 'A'

- Q.1 Classify Carbohydrates. Give one example along with structure for each class. (10)
- Q.2 Explain different structural organizations of protein. Describe the  $\alpha$ -helical and  $\beta$ -pleated structure of protein. (10)
- Q.3 Define amino acid. Name essential amino acids. Write the ninhydrin reaction of amino acids. (10)
- Q.4 Enlist different physico-chemical laws and describe buffer action in detail. (10)
- Q.5 A) What are fatty acids? Classify them with two examples along with structure for each class. (05)  
B) Discuss the numbering system of fatty acids in brief. (05)

Section - 'B'

- Q.6 Choose the most appropriate answer from the options given: (10)
- 1) Strong acid in dilute solution  
a) Dissociate completely b) Dissociate partially c) Do not dissociate d) None of these
- 2) Neutral pH is  
a) 7 b) 10 c) 4 d) None of these
- 3) The size of colloidal particle is  
a) More than 200 $\mu$  b) Less than 200 $\mu$  but more than 1 $\mu$  c) Cystine d) None of these
- c) Both of these d) None of these
- 4) An example of imino acid is  
a) Proline b) Arginine c) Cystine d) None of these
- 5) The amino acid having no optical isomer is  
a) Lysine b) Glycine c) Both of these d) None of these
- 6) At isoelectric pH net charge carried by an amino acid is  
a) Zero b) Positive c) Negative d) None of these
- 7) Osazone crystal of glucose and mannose are structurally  
a) Different b) Same c) None of these d) All of these
- 8) Galactose is epimer of glucose at  
a) C<sub>2</sub> b) C<sub>3</sub> c) C<sub>4</sub> d) All of these
- 9) Phosphatidic acid is made up of:  
a) One molecule of glycerol, two molecules of fatty acids and one group of phosphoric acid.  
b) One molecule of glycerol and Phosphoric acid  
c) Two molecule of Glycerol  
d) None of these
- 10) The precursor of Eicosanoids is:  
a) Arachidonic acid b) Palmitic acid c) Acetic acid d) None of these
- Q.7 A) Define the following terms. (05)  
1) Osmotic pressure 2) Viscosity 3) Asymmetric carbon 4) Isomerism  
5) Colloids

B) Differentiate Between:

(05)

MAHARASHTRA ANIMAL FISHERY SCIENCES UNIVERSITY, NAGPUR  
Annual Theory Examination of B. V. Sc. H. Degree Course

Year : I (New Course) Academic Year : 2009-2010  
Course No. : VPB-112, 122 : Veterinary Biochemistry - (I)  
Credits : 1+1 = 2, 2+1 = 3 : 30+30 = 60  
Day & Date : Thursday, 08/07/2010 Time : 10.00 to 13.00 hrs.

- Note :** 1) Use Separate Answer Book for each course.  
2) Solve Any Three Questions from Section -- 'A'.  
3) All Questions from Section -- 'B' are compulsory.  
4) Draw neat & well labeled diagram wherever necessary.

VPB-112

General Veterinary Biochemistry

30 Marks

Section - 'A'

- Q.1 A) Define and classify carbohydrates with suitable examples. (02)  
B) Write brief note on the functions of carbohydrates. (02)
- Q.2 A) Describe the structure and functions of phospholipids. (02)  
B) Explain the structure of steroids and discuss the functions of Cholesterol. (02)
- Q.3 Write short notes on the following: (04)  
1) Essential fatty acids 2) Rancidity
- Q.4 Give classification of proteins with suitable examples of each class. (04)
- Q.5 Explain the structure of DNA with suitable diagram. (04)

Section - 'B'

- Q.6 Choose the most appropriate answer from the options given: (06)  
1) One of the following is not an aldose  
a) Glucose b) Galactose c) Mannose d) Fructose  
2) The glycosaminoglycan that serves as an anticoagulant  
a) Heparin b) Hyaluronic acid c) Chondroitin sulphate d) Dermatin sulphate  
3) Ribose and deoxyribose differ in structure around a single carbon, namely  
a) C1 b) C2 c) C3 d) C4  
4) The carbon atom involved in the osazone formation  
a) 1 and 2 b) 2 and 3 c) 3 and 4 d) 5 and 6  
5) Which one is the aromatic amino acid?  
a) Alanine b) Glycine c) Tyrosine d) Methionine  
6) Esterification of fatty acids with cholesterol yields  
a) Simple lipid b) Wax c) Both a & b d) None of these

- Q.7 State True or False, Correct and rewrite the false sentences. (06)

- 1) Biuret is a compound formed by heating urea to 180 degree centigrade
- 2) Maltose and galactose are epimers of Glucose
- 3) Collagens are connective tissue protein.
- 4) Glutathione is a tripeptide, composed of amino acids.
- 5) Branching in glycogen occurs at C<sub>6</sub>
- 6) The average nitrogen content of protein is 20%

- Q.8 A) Write one line definitions for the followings: (Any Three) (03)

- 1) Fats and oils
- 2) Lipoproteins
- 3) Neutral lipids
- 4) Iodine number
- 5) Zwitter ion or dipolar ion
- 6) Asymmetric carbon



Q.8 B) Match the pairs.

**Group 'A'**

- 1) Glycoside
- 2) Kidney function test
- 3) Glycosaminoglycan
- 4) Cell membrane
- 5) Steroid
- 6) Sulphur containing amino acid

**Group 'B'**

- a) Aglycone
- b) Inulin
- c) Hyaluronic acid
- d) Phospholipid
- e) Methionine
- f) Cyclo pentanoperhydro phenanthrene nucleus

(03)

VPB-122

**Veterinary Intermediary Metabolism**

30 Marks

**Section - 'A'**

Q.1 A) Define oxidative phosphorylation.  
B) Explain the reactions of oxidative phosphorylation.

(02)  
(02)

Q.2 A) Give an account of glycogen synthesis.  
B) Explain citric acid cycle.

(02)  
(02)

Q.3 A) Discuss the Krebs-Hansleit cycle.  
B) Write short note on transamination **OR** deamination.

(02)  
(02)

Q.4 Give bioenergetics of lipid metabolism.

(04)

Q.5 Describe the mechanism of enzyme action.

(04)

**Section - 'B'**

Q.6 Choose the most appropriate answer from the options given:

(06)

- 1) Pepsin is an example for the class of enzymes namely
  - a) Oxidoreductases
  - b) Transferases
  - c) Hydrolases
  - d) Ligases
- 2) Fatty acids can be oxidized in body by
  - a)  $\alpha$ -oxidation
  - b)  $\beta$ -oxidation
  - c)  $\omega$ -oxidation
  - d) All of these
- 3) Name high energy compound in glycologenesis
  - a) ATP
  - b) GTP
  - c) UDPG
  - d) All of these
- 4) TCA cycle enzymes are localized in
  - a) Cytoplasm
  - b) Mitochondria
  - c) Golgi's apparatus
  - d) Nucleus
- 5) One of the following enzyme in glycolysis catalyses an irreversible reaction
  - a) Hexokinase
  - b) Phosphofructokinase
  - c) Pyruvate kinase
  - d) All of these
- 6) The number of ATP produced when a molecule of acetyl Co A is oxidized through citric acid cycle.
  - a) 12
  - b) 24
  - c) 38
  - d) 15
- 7) Hypercholesterolemia is observed in the disorder
  - a) Hypothyroidism
  - b) Diabetes mellitus
  - c) Both a and b
  - d) None of these
- 8) The two final products in beta oxidation of odd chain fatty acids are
  - a) Acetyl Co A and malonyl Co A
  - b) Acetyl Co A and Acetyl Co A
  - c) Acetyl Co A and propionyl Co A
  - d) Acetyl Co A and Succinyl Co A
- 9) The lipoprotein possessing the highest quantity of phospholipids
  - a) HDL
  - b) LDL
  - c) VLDL
  - d) Chylomicrons
- 10)  $\alpha$  ketoglutarate can be synthesized from
  - a) Serine
  - b) Methionine
  - c) Glutamate
  - d) Alanine
- 11) The amino acids are said to be ketogenic when the carbon skeleton is finally degraded to
  - a) Succinyl Co A
  - b) Fumarate
  - c) Acetyl Co A
  - d) Pyruvate
- 12) The amino acid that does not participate in transamination
  - a) Lysine
  - b) Glutamate
  - c) Alanine
  - d) Tryptophan



Q.7 Correct the statement, if incorrect.

(06)

- 1)  ATP donates phosphate, adenosine and adenosine monophosphate (AMP) moieties.
- 2)  Ligase is the class of enzymes involved in synthesis reactions.
- 3)  Specificity of enzyme is mostly dependent on the apoenzyme and not on the coenzyme
- 4)  One Kat denotes the conversion of one molecule substrate per second (Mol/sec)
- 5)  1 IU = 60 U Katal or 1 nkatal = 1.67 IU
- 6)  Streptokinase is useful for clearing the blood clots.
- 7)  The enzyme asparaginase is used for treatment of leukemia
- 8)  Glucose is the central molecule in carbohydrate metabolism.
- 9)  Under anaerobic conditions, 2ATP are synthesized. While, under aerobic condition, 8 or 6 ATP are synthesized depending on the shuttle pathway that operate.
- 10)  Muscle glycogen does not directly contribute to blood glucose due to absence of glucose 6- phosphatase
- 11) Cachexia is exactly opposite of what is seen in obesity.
- 12) Main source of energy for metabolic activities in ruminants is volatile fatty acids.

Q.8 A) Match the pairs.

(03)

- |                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Group 'A'</b><br>1) <input checked="" type="checkbox"/> Coenzyme<br>2) Prosthetic group<br>3) <input checked="" type="checkbox"/> Cobalt<br>4) <input checked="" type="checkbox"/> $\beta$ -hydroxy butyrate<br>5) <input checked="" type="checkbox"/> Tyrosine<br>6) FAD | <b>Group 'B'</b><br>a) <input checked="" type="checkbox"/> Vitamin B <sub>12</sub><br>b) Melanin<br>c) <input checked="" type="checkbox"/> NADP +<br>d) Riboflavin<br>e) haem.<br>f) <input checked="" type="checkbox"/> Ketone body |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

B) Write one line definition for the following:

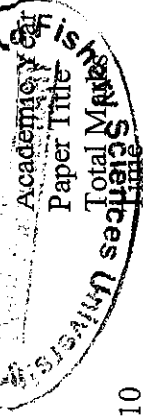
(03)

- 1) Enzyme
- 2) Oxidoreductase
- 3) Prosthetic group
- 4) Metallo enzymes
- 5) Antimetabolites
- 6) Coenzymes

*Handwritten note:* match the pairs  
\*\*\*\*\*

Year : 1 (New Course)  
Course No. : VPB-112, 122  
Credits : 1+1=2, 2+1=3  
Day & Date : Monday, 16/08/2010

: 2009-2010  
: Veterinary Biochemistry – I  
: 30+30 = 60  
: 10.00 to 13.00 hrs.



Note: 1) Use Separate Answer Book for each course.

- 2) Solve Any Three Questions from Section – 'A' of each course.  
3) All Questions from Section – 'B' of each course are compulsory.  
4) Draw neat & well labeled diagram wherever necessary.

VPB-112

General Veterinary Biochemistry

30 Marks

Section - 'A'

- Q.1 A) Write in detail about the properties and significance of amino acids. (02)  
B) Give classification of amino acids. (02)
- Q.2 A) Give the classification of lipids along with examples of each class. (02)  
B) Write the chemistry of bile salts. (02)
- Q.3 A) Biological significance of nucleotides. (02)  
B) Draw a labeled diagram of t-RNA. (02)
- Q.4 Describe the structure of biological membranes and transport mechanism across the membrane. (04)
- Q.5 Write short notes on the following: (04)  
1) Henderson-Hasselbalch equation.  
2) Bacterial cell wall polysaccharides.  
3) Donnan's membrane equilibrium  
4) Functions of prostaglandins.

Section - 'B'

- Q.6 Choose the most appropriate answer from the options given: (06)  
1) Not a disaccharide.  
a) Sucrose b) Maltose c) Lactose d) Erythrose  
2) Sulphur containing amino acid  
a) Methionine b) Cysteine c) Both a & b d) None of these  
3) Aromatic amino acid.  
a) Phenyl alanine b) Tyrosine c) Tryptophan d) All of these  
4) Degradation of haem produce.  
a) Iron b) Bilirubin c) Both a & b d) None of these  
5) Initiation codon is  
a) CCG b) AUG c) Both a & b d) None of these  
6) Ripe fruits are rich in  
a) Glucose b) Fructose c) Maltose d) Ribose
- Q.7 Match the pairs. (06)
- | Group 'A'      | Group 'B'                  |
|----------------|----------------------------|
| 1) Purine      | a) Blue colour with iodine |
| 2) Sucrose     | b) Biuret test             |
| 3) Histone     | c) Nitrogenous base        |
| 4) Starch      | d) Mitochondria            |
| 5) Protein     | e) Invert sugar            |
| 6) Cardiolipin | f) Basic protein           |

Q.8 Define the following terms. (Any Six)

- 1) Codon  
2) Anomeric carbon  
3) Acid number  
4) Nucleotide  
5) Optical activity  
6) Inversion of sugar

(06)

Section - 'A'

- Q.1 A) Define oxidative phosphorylation and enlist inhibitors of ETC. (02)  
B) Explain all the complexes of electron transport chain. (02)
- Q.2 A) Diagrammatic representation of DNA replication in prokaryotes. (02)  
B) Write elongation step of translation process. (02)
- Q.3 A) Write the factors affecting enzyme action. (02)  
B) What is enzyme? Give their classification. (02)
- Q.4 Write short notes on the followings: (Any Two) (04)  
1) Coenzymes of Vitamin B complex.  
2) Ketosis  
3) Glycolysis
- Q.5 Give an account of TCA cycle. (04)

Section - 'B'

- Q.6 Rewrite the statement after making necessary corrections of underlined phrases, if required. (06)
- 1) Catalase use hydrogen peroxide as electron donor and electron acceptor.
  - 2) Liver tissue regulates the blood glucose after meal.
  - 3)  $\beta$ -oxidation of fat leads to the formation of NADPH and ribose.
  - 4)  $\beta$ -carotene is the precursor of Vitamin-A
  - 5) Glycogen biosynthesis involves ATP nucleotide.
  - 6) In absence of oxygen glucose is converted to lactic acid in muscle.
  - 7) Vitamin K helps in blood clotting
  - 8) Albumin is osmotically more active than globulin.
  - 9) Deficiency of iodine leads to Goitre.
  - 10) Pellegra is caused by deficiency of niacin
  - 11) Staggers disease is caused by deficiency of calcium.
  - 12) Ammonia is detoxified to urea in birds.

Q.7 Match the pairs.

Group 'A'

- 1) Okazaki
- 2) Rifampicin
- 3) Iron
- 4) SGPT
- 5) Phosphorus
- 6) Enzymes
- 7) Glucose-6-phosphate
- 8) Beriberi
- 9) Carbamoyl phosphate
- 10) ATP
- 11) Sodium fluoride
- 12) Scurvy

Group 'B'

- a) Inhibit transcription
- b) Liver
- c) Replication
- d) Biological catalyst
- e) Cytochrome
- f) Pica
- g) Adenylate cyclase
- h) Glycolysis inhibitor
- i) Vitamin C
- j) Urea cycle
- k) Thiamine
- l) Hexokinase

(06)

Q.8 A) Choose the most appropriate answer from the options given: (03)

- 1) Complex of DNA and Histone.
  - a) Nucleosome
  - b) Ribosome
  - c) Nucleotide
  - d) None of these
- 2) Major role in protecting tissue against oxidative damage.
  - a) Cobalt
  - b) Calcium
  - c) Phosphorus
  - d) Selenium
- 3) Vitamins of TCA cycle
  - a) Riboflavin
  - b) Niacin
  - c) Thiamine
  - d) All of these
- 4) The coenzyme present at catalytic site of aminotransferase
  - a) Pyridoxal phosphate
  - b) Flavoprotein
  - c) Co A
  - d) None of these
- 5) Bacterial protein synthesis initiated by
  - a) Methionine
  - b) Formyl methionine
  - c) Cysteine
  - d) None of these
- 6) Pace maker of urea cycle
  - a) Arginase
  - b) Carbomoyl phosphate synthase
  - c) Arginosuccinase
  - d) Fumarase

B) Define the following terms: (Any Six) (03)

- 1) Nucleoside
- 2) Xerophthalmia
- 3) Isoelectric pH
- 4) Acetonemia
- 5) Transamination
- 6) Transcription
- 7) Rickets
- 8) Katal
- 9) Substrate phosphorylation
- 10) Gluconeogenesis
- 11) Deamination

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7

**MAHARASHTRA ANIMAL & FISHERY SCIENCES UNIVERSITY, NAGPUR**  
**ANNUAL THEORY EXAMINATION, B.V.Sc. & A.H.**

Year : I (Old) Academic Year : 2010-2011  
Course No. : VBC-111 Subject : Veterinary Biochemistry-I  
Credits : 2+1 = 3 Total Marks : 50  
Day & Date : Monday, 13/06/2011 Time : 09.00 to 11.00 hrs.

- Note:** 1) Solve Any Three questions from Section – 'A'.  
2) All questions from Section – 'B' are compulsory.  
3) Draw well-labelled diagram wherever necessary.

**VBC-111**

**General Veterinary Biochemistry-I**

**(Marks - 50)**

**SECTION – 'A'**

- Q. 1. What are nucleic acids? Give the structural difference between nucleic acids and explain Watson and Crick model of DNA with figure. (10)
- Q. 2 Explain different structural organization of protein along with the forces stabilizing them by giving figures and examples. (10)
- Q. 3 Classify the fatty acids from different angles and write the physical and chemical properties of saturated fatty acids. (10)
- Q. 4 What are carbohydrates? Classify them with suitable examples. Write the biological importance of any four sugars. (10)
- Q. 5 Give the relations of following  
a) Ninhydrin with alpha amino acids  
b) Osazone with glucose (10)
- Q. 6 Give two examples of the following  
i) Types of RNA  
ii) Acidic amino acids  
iii) Homopolysaccharides  
iv) Reducing disaccharides  
v) Sulfur containing amino acids  
vi) Two reaction of proteins  
vii) Unsaturated fatty acids  
viii) Bile salts  
ix) Metalloproteins  
x) Mono-amino monocarboxylic acids (10)

**SECTION – 'B'**

- Q. 7 Define the followings. (10)
- i) Heteropolysaccharides
  - ii) Fibrous protein
  - iii) Diffusion
  - iv) Acid number
  - v) Palindromes

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3  
MAHARASHTRA ANIMAL & FISHERY SCIENCES UNIVERSITY, NAGPUR  
ANNUAL THEORY EXAMINATION B.M.Sc. & A.H.

Year : I (New Course)  
Course No. : VPB-112, 122  
Credits : 1+1 = 2, 2+1 = 3  
Day & Date : Saturday, 30/07/2011

Academic Year : 2010-2011  
Subject/Paper Title : Veterinary Biochemistry-I  
Total Marks : 30 + 30  
Time : 10.00 to 13.00 hrs.

Note : 1) Use Separate Answer Book for each course.

- 2) Solve Any Three questions from Section – 'A' of each course.  
3) All questions from Section – 'B' of each course are compulsory.  
4) Draw neat and well labeled diagram wherever necessary.

VPB- 112 (1+1)

General Veterinary Biochemistry

(Marks - 30)

SECTION – 'A'

- Q. 1. Do as directed. (02)  
a) Differentiate between DNA and RNA. (02)  
b) Classify polysaccharides with examples.
- Q. 2 Write short notes on following. (02)  
a) Importance of biochemistry. (02)  
b) Donnan's membrane equilibrium.
- Q. 3 Give biological significance of : (02)  
a) Proteins (02)  
b) Lipids
- Q. 4 Give chemistry and importance of cholesterol. (04)
- Q. 5 Give the classification of amino acids with suitable example of each class. (04)

SECTION – 'B'

- Q. 6 State True or False. If false, correct the statement by changing underlined word(s), only. (06)  
i) Structurally glycine is largest amino acid. .  
ii) Hyaluronic acid is homopolysaccharide.  
iii) Cholesterol is the major component of wool fat.  
iv) Incomplete hydrolysis of glycogen yields glucose.  
v) The systemic name for palmitic acid is hexanoic acid.  
vi)  $\alpha$  helix and  $\beta$  pleated sheets are examples of primary structure level of proteins.
- Q. 7 Choose the correct answer from the options given below. (06)  
i) Which of the following is the example of glycolipids.....  
a) Cerebroside c) Sphingosine  
b) Glycerol d) All of the above
- ii) Hemoglobin is an example of.....  
a) Glycoprotein c) Chromoprotein  
b) Nucleoprotein d) All of the above
- iii) The backbone of protein is.....  
a) Ionic acid c) Disulphide bond  
b) Peptide bond d) Hydrogen bond
- iv) Two sugars differing only in the configuration around one specific carbon atom are called as.....  
a) Racimer c) Levomer  
b) Epimer d) Dextromer
- v) Which of the following is not an example of aromatic amino acid.....  
a) Threonine c) Tyrosine  
b) Phenylalanine d) Tryptophan

vi) Which of the following is a pyrimidine .....

- a) Adenine
- b) Tyrosine
- c) Guanine
- d) Cytosine

Q. 8 (A) Match the following.

(03)

**Column "A"**

- i) Metaloprotein
- ii) Aromatic amino acid
- iii) Unsaturated fatty acid
- iv) Guanine
- v) Homopolysaccharide
- vi) Methionine

**Column "B"**

- a) Purines
- b) Sulfur containing amino acid
- c) Siderophilin
- d) Chitin
- e) Lenoleic acid
- f) Tyrosine

(B) Define the following.

(03)

- a) Oligosaccharides
- b) Diffusion
- c) Saturated fatty acid
- d) Isomerism
- e) Buffer
- f) pH

**VPB- 122 (2+1)**

**Veterinary Intermediary Metabolism**

(Marks - 30)

**SECTION - 'A'**

Q. 1 A) Give energetics of TCA cycle.

(02)

B) Explain biosynthesis of fatty acids.

(02)

Q. 2 Write short notes on following.

a) Gluconeogenesis

(02)

b) Classification of enzymes

(02)

Q. 3 Give biological significance of

a) Fat soluble vitamins.

(02)

b) Enlist factors affecting enzyme activity.

(02)

Q. 4 Write in detail different steps of Glycolytic pathway along with enzymes, cofactor and energetics.

(04)

Q. 5 Explain urea cycle in detail along with enzymes, cofactor and energetics.

(04)

**SECTION - 'B'**

Q. 6 State True or False. If false, correct the statement by changing underlined word(s), only.

(06)

i) Lyases are also called as synthetases.

ii) Glutathione peroxidase contains six selenium atoms.

iii)  $\beta$ - carotene can yield upto two molecules of vitamin B in the body.

iv) The coenzyme form of folic acid is thiamine pyrophosphate.

v)  $\omega$ - oxidation of fatty acids occurs in peroxisome.

vi) The chemiosmotic model is proposed by F. Sanger.

vii) Rods are responsible for photoptic vision.

viii) In glycolysis the cleavage reaction is catalyzed by enzyme transketolase.

ix) Oxidation of acetaldehyde to ethanol by NADH is catalyzed by alcohol dehydrogenase.

x) The glyoxylate cycle occurs in mitochondria.

xi) Glucose 6 phosphate enzyme is present in liver.



Q. 7 Choose the correct answer from the options given below. (06)

- i) In urea cycle, enzyme absent in bird is.....
  - a) Argininosuccinate lyase
  - b) Arginase
  - c) Ornithine transcarbamylase
  - d) Aldolase
- ii) For bone formation following element is required.....
  - a) Iron
  - b) Cobalt
  - c) Zinc
  - d) Calcium
- iii) Niacin is synthesized from.....
  - a) Tyrosine
  - b) Tryptophan
  - c) Threonine
  - d) Glutamine
- iv) Enzyme of protein metabolism requires pyridoxal phosphate as cofactor.....
  - a) Dehydrases
  - b) Desulphydrases
  - c) Transaminases
  - d) None of the above
- v) Which of the following is not the cofactor of  $\alpha$ -keto glutarate dehydrogenase complex.....
  - a) Coenzyme A
  - b) FAD
  - c) Lipoic acid
  - d) Coenzyme B<sub>12</sub>
- vi) Thymidine kinase is known to contain element is
  - a) Zinc
  - b) Magnesium
  - c) Manganese
  - d) Iodine
- vii) Gluconeogenesis takes place in.....
  - a) Liver
  - b) Kidney
  - c) Both a & b
  - d) Liver, kidney and muscle
- viii) Deficiency of phosphorus in cattle causes.....
  - a) Anemia
  - b) Pica
  - c) Jaundice
  - d) Ketosis
- ix) For storage of energy following is used.....
  - a) Calcium
  - b) Magnesium
  - c) Selenium
  - d) Phosphorus
- x) In extra hepatic tissues D- $\beta$ -hydroxy butyrate is oxidized to aceto-acetate by an enzyme.....
  - a) D- $\beta$ -hydroxy butyrate DH
  - b) Thiolase
  - c) Ketolase
  - d) Aldolase
- xi) Fatty acids synthesis is stimulated by.....
  - a) Citrate
  - b) Acetate
  - c) Malonyl CoA
  - d) All of the above
- xii) Rickets is due to deficiency of.....
  - a) Vitamin K
  - b) Vitamin E
  - c) Vitamin D
  - d) Vitamin B

Q. 8 (A) Match the following.

(03)

**Column "A"**

- i) Folic acid
- ii) Ascorbic acid
- iii) Pyridoxine
- iv) Antixerophthalmic factor
- v) Antihemorrhagic factor
- vi) Vitamin E

**Column "B"**

- a) Haematopoiesis
- b) Antisterility factor
- c) Visual cycle
- d) Hemorrhage in infants
- e) Scurvy
- f) Acrodynia in rats

(B) Define the following.

(03)

- a) Metabolism
- b) Active site
- c) Apoenzyme

- d) Glycogenolysis
- e) Substrate
- f) Osteoporosis

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MAHARASHTRA ANIMAL & FISHERY SCIENCES UNIVERSITY, NAGPUR  
COMPARTMENT ANNUAL THEORY EXAMINATION, B.V.Sc. & A.H. ①

Year : I (New Course) Academic Year : 2010-2011  
Course No. : VPB-112, 122 Subject/Paper Title : Veterinary Biochemistry-I  
Credits : 1+1 = 2, 2+1 = 3 Total Marks : 30 + 30  
Day & Date : Saturday, 17/09/2011 Time : 10.00 to 13.00 hrs.

- Note :** 1) Use Separate Answer Book for each course.  
2) Solve **Any Three** questions from **Section – ‘A’** of each course.  
3) All questions from **Section – ‘B’** of each course are compulsory.  
4) Draw neat and well labeled diagram wherever necessary.

**VPB- 112 (1+1) General Veterinary Biochemistry (Marks - 30)**

**SECTION – ‘A’**

- Q. 1. A) Write different structural organization of protein. (02)  
B) Write a note on functions of protein. (02)
- Q. 2 A) Write a note on Donnan’s membrane equilibrium. (02)  
B) Role of Buffers in body (02)
- Q. 3 A) Write structure and biological significance of nucleotide. (02)  
B) Classify the lipids with suitable examples of each class. (02)
- Q. 4 Define carbohydrate. Classify carbohydrate and give one example of each. (04)
- Q. 5 Draw a well labeled diagram of fluid mosaic model of biological membrane and give the functions in detail. (04)

**SECTION – ‘B’**

- Q. 6 Choose the correct answer from the options given below. (06)
- i) In buffer system strong acid have .....
- a) Strong conjugate base b) Weak conjugate base  
c) None of the above d) Both a) and b)
- ii) Structural rigidity of biological membrane is provided by presence of .....
- a) Cholesterol b) Phospholipids  
c) Glycolipid d) Cerebrosides
- iii) Pentose sugar present in RNA is .....
- a) Glucose b) Ribose  
c) Deoxy ribose d) Sucrose
- iv) Epimer of glucose at 4<sup>th</sup> carbon is .....
- a) Galactose b) Mannose  
c) Fructose d) Ribose
- v) The guanidine group is present in .....
- a) Lysine b) Arginine  
c) Both of the above d) None of these
- vi) The amino acid which have no optical isomer is .....
- a) Lysine b) Glycine  
c) None of the above d) Both a) and b)

- Q. 7 Write short answer (06)
- i) Write the name of the ring present in cholesterol.
- ii) Why glucose and fructose gives the same Osazone crystal?
- iii) In which amino acid imidazole group is present?
- iv) Write the different secondary protein structure present in our body proteins.

- Q. 8 (A) Read the following statement and correct the underlined word(s) only, if necessary. (03)
- i) Arginine is an acidic amino acid.
  - ii) Sucrose is a reducing sugar.
  - iii) Lactose is the milk sugar.
  - iv) Deoxyribose is deoxygenated at its second carbon.
  - v) Starch is the storage form of carbohydrate in animal.
  - vi) Prostaglandin is synthesized from arachidonic acid
- (B) Define the following. (03)
- i) pH
  - ii) Ketose
  - iii) Nucleoside

**VPB- 122 (2+1)**

**Veterinary Intermediary Metabolism**

(Marks - 30)

**SECTION - 'A'**

- Q. 1 A) Write the effect of substrate concentration and temperature on enzyme activity. (02)  
B) What are enzyme inhibitors? Write about the modern concept of active centre of an enzyme. (02)
- Q. 2 A) Give metabolic functions of macronutrients. (02)  
B) Write the importance of pentose phosphate pathway. (02)
- Q. 3 A) Write the steps in protein synthesis. (02)  
B) Explain deamination. (02)
- Q. 4 Give the B-oxidation of palmitic acid with its energetics. (04)
- Q. 5 Explain the glycolysis in aerobic conditions along with enzymes, coenzymes, cofactors and energetics. (04)

**SECTION - 'B'**

- Q. 6 Choose the correct answer from the options given below. (06)
- i) An Intermediate of TCA cycle found in the reaction of urea cycle is .....
    - a)  $\alpha$ -keto glutaric acid
    - b) Succinyl CoA
    - c) Fumaric acid
    - d) Oxaloacetate
  - ii) The water soluble vitamin involved in carboxylation process is .....
    - a) Thiamin
    - b) Biotin
    - c) Ascorbic acid
    - d) Pyridoxal phosphate
  - iii) Pyruvate is converted to Acetyl-CoA by the action of the enzyme .....
    - a) Pyruvate dehydrogenase complex
    - b)  $\alpha$ -Keto glutarate dehydrogenase
    - c) None of the above
    - d) Succinate dehydrogenase
  - iv) Coenzyme form of the Niacin is .....
    - a) NAD
    - b) FAD
    - c) GTP
    - d) ATP
  - v) Trace element present in Vitamin B12 is .....
    - a) Copper
    - b) Cobalt
    - c) Zinc
    - d) Selenium
  - vi) Primer is a small stretch of .....
    - a) RNA
    - b) DNA
    - c) None of these
    - d) Both a) and b)

- vii) **Tocopherol** is .....
  - a) Antioxidant
  - b) Free radical
  - c) Sanger reagent
  - d) None of the above
- viii) The enzyme present in TCA cycle is integral part of ETC is .....
  - a) Succinate dehydrogenase
  - b) Lactate dehydrogenase
  - c) Pyruvate dehydrogenase
  - d)  $\alpha$ -Keto dehydrogenase
- ix) On complete oxidation of palmitic acid net ATP yields.
  - a) 100
  - b) 106
  - c) 129
  - d) 102
- x) The competitive inhibitor .....
  - a) Increases the  $V_{max}$  and  $K_m$  of the reaction.
  - b) Increases the  $V_{max}$  but  $K_m$  is constant.
  - c) Increases  $K_m$  but  $V_{max}$  is constant
  - d) All the above statement is correct
- xi) Eukaryotic mRNAs are .....
  - a) Polycistronic
  - b) Monocistronic
  - c) Both
  - d) None
- xii) Site of TCA cycle is at
  - a) Golgi apparatus
  - b) Mitochondria
  - c) Endoplasmic Reticulum
  - d) Lysosome

Q. 7 Read the following statement and correct the underlined word(s) only, if necessary. (06)

- i) The double helical structure of DNA is held together by Glycosidic bonds.
- ii) Vitamin-D is responsible for absorption of iron from the intestine.
- iii) Cardiac tissue is the main store of triacylglycerol in body.
- iv) Bile pigment increases the surface tension.
- v) L-glutamate dehydrogenase is important in nitrogen metabolism in mammals.
- vi) The nitrogen atoms of purine ring are derived from glycine.
- vii) 1,25-dihydroxy cholecalciferol is formed in the skeletal muscle only.
- viii) Phosphorylation reaction does not require ATP.
- ix) B-Oxidation of palmitic acid gives 12 molecules of acetyl-CoA.
- x) Urea cycle is obtained in the cell cytosol.
- xi) AUG is the initiation codon.
- xii) Prokaryotic DNA polymerase II is responsible for the synthesis on the leading strand of DNA.

Q. 8 (A) Match the pairs.

(03)

Column "A"	Column "B"
i) Transcription	a) DNA
ii) RNA polymerase	b) Protein synthesis
iii) Deoxy ribose	c) mRNA
iv) De novo path way	d) Taq-polymerase
v) PCR	e) Purine and pyrimidine synthesis
vi) Glycinamide ribonucleotide transformylase	f) Purine synthesis

(B) Define the following.

(03)

- i) Glycogenolysis
- ii) Lyases
- iii) Transamination

MAHARASHTRA ANIMAL & FISHERY SCIENCES UNIVERSITY, NAGPUR

ANNUAL THEORY EXAMINATION

Year : I (New Course)

Course No. : VPB-112, 122

Credits : 1+1 = 2, 2+1 = 3

Day & Date : Tuesday, 24/07/2012

Academic Year : 2011-2012

Subject/Paper Title : Veterinary Biochemistry-I

Total Marks : 30 + 30

Time : 10.00 to 13.00 hrs.

Note : 1) Use Separate Answer Book for each course.

2) Solve Any Three questions from Section – ‘A’ of each course.

3) All questions from Section – ‘B’ of each course are compulsory.

4) Draw neat and well-labelled diagram wherever necessary.

VPB-112 (1+1)

General Veterinary Biochemistry

(Marks – 30)

SECTION – ‘A’

- Q. 1. A) Explain the salient features of ‘Fluid Mosaic Model’ of cell membrane. (02)  
B) Write two functions of cell membrane in detail. (02)
- Q. 2 A) Explain the structure of transfer-RNA with appropriate diagram. (02)  
B) Explain osazone reaction. (02)
- Q. 3 A) Give the classification of lipid with at least one example of each class. (02)  
B) Mention two important functions of lipid. (02)
- Q. 4 What are polysaccharides? Explain structure and function of any two homopolysaccharides. (04)
- Q. 5 Explain properties of proteins. (04)

SECTION – ‘B’

- Q. 6 Define / explain the following. (06)
- i) Epimer  
ii) Anomer  
iii) Nucleotide  
iv) Conjugated proteins  
v) pH  
vi) Buffer
- Q. 7 Choose the most appropriate answer from the options given below. (06)
- i) Which of the following is not aldose?  
a) Glucose  
b) Galactose  
c) Mannose  
d) Fructose
- ii) The nitrogenous base not present in DNA is .....  
a) Adenine  
b) Thymine  
c) Guanine  
d) Uracil
- iii) Which of the following is a sulphur containing amino acid?  
a) Tyrosine  
b) Serine  
c) Methionine  
d) Alanine
- iv) Which of the following polysaccharide is composed of  $\beta$ -glycosidic bonds?  
a) Starch  
b) Glycogen  
c) Dextrin  
d) Cellulose

v) Which of the following is a purine base?

- a) Adenine
- b) Thymine
- c) Cytosine
- d) Uracil

vi) Which of the following is a not essential fatty acid?

- a) Linoleic acid
- b) Linolenic acid
- c) Arachidonic acid
- d) Acetic acid

Q. 8 A) Match the pairs.

(03)

**Column 'A'**

- i) Stored Polysaccharide in animal
- ii) Isoelectric point
- iii) Invert sugar
- iv) Primary structure of protein
- v) Heteropolysaccharide
- vi) Plasmalogens

**Column 'B'**

- a) Net charge zero
- b) Sucrose
- c) Glycogen
- d) Heparin
- e) Glycosphingolipid
- f) Peptide bond

B) Answer the following.

(03)

- i) Name two reducing sugars.
- ii) Name two aromatic amino acids.
- iii) Name two eicosanoids.

**VPB-122 (2+1)**

**Veterinary Intermediary Metabolism**

(Marks – 30)

**SECTION – 'A'**

Q. 1 A) Write the energetics of glycolysis.

(02)

B) What is HMP shunt and give its biological significance.

(02)

Q. 2 A) Explain the transamination.

(02)

B) Explain the deamination reaction with suitable example.

(02)

Q. 3 A) Write the steps during  $\beta$ -oxidation of fatty acids.

(02)

B) Explain the role of carnitine during  $\beta$ -oxidation of fatty acids.

(02)

Q. 4 Enlist the fat soluble vitamins and explain metabolic functions of any two.

(04)

Q. 5 Explain the induced fit model for mechanism of action of enzyme.

(04)

**SECTION – 'B'**

Q. 6 Define / explain the following.

(06)

i) Apoenzyme

ii) Gluconeogenesis

iii) Co-factor

iv) Transcription

v) Anaerobic glycolysis

vi) Oxidation

vii) Cori cycle

viii) Glycogenesis

ix) Ketone bodies

x) Electron transport chain reaction

xi) Decarboxylation

xii) Katal

Q. 7 Choose the most appropriate answer from the options given below. (06)

- i) Trace element present in Vitamin B<sub>12</sub> is .....
  - a) Copper
  - b) Cobalt
  - c) Cadmium
  - d) Calcium
  
- ii) Which of the followings is not a ketone body?
  - a) Acetone
  - b) Aceto-acetic acid
  - c)  $\beta$ -OH-Butyric acid
  - d) Propionic acid
  
- iii) The principal organ for cholesterol synthesis is .....
  - a) Liver
  - b) Heart
  - c) Adipose tissue
  - d) Kidney
  
- iv) The amino acid present in folic acid is .....
  - a) Glutamic acid
  - b) Aspartic acid
  - c) Lysine
  - d) Tyrosine
  
- v) One of the following enzymes in glycolysis catalyzes an irreversible reaction.
  - a) Hexokinase
  - b) Phosphofructokinase
  - c) Pyruvate kinase
  - d) All of these
  
- vi) In uricotelic organisms, nitrogen of amino acid is removed as .....
  - a) Ammonia
  - b) Urea
  - c) Uric acid
  - d) Allantoin
  
- vii) Macro element essential for bone formation.
  - a) Calcium
  - b) Magnesium
  - c) Iron
  - d) Zinc
  
- viii) Site for citric acid cycle.
  - a) Cytoplasm
  - b) Nucleus
  - c) Mitochondria
  - d) Ribosomes
  
- ix) Name the hypoglycemic hormone.
  - a) Glucagon
  - b) Insulin
  - c) Cortisol
  - d) Growth hormone
  
- x) Number of ATPs produced from 1 molecule of glucose in TCA cycle are .....
  - a) 2
  - b) 8
  - c) 38
  - d) 12
  
- xi) Vitamin related with blood clotting.
  - a) Vitamin A
  - b) Vitamin B
  - c) Vitamin E
  - d) Vitamin K
  
- xii) Trace element found in haemoglobin.
  - a) Iron
  - b) Copper
  - c) Cobalt
  - d) Selenium



Q. 8 A) Match the pairs.

(03)

**Column 'A'**

- i) Pyridoxal Phosphate
- ii) Enolase
- iii) Niacin
- iv) Porphyrin
- v) Carnitine
- vi) Succinate dehydrogenase

**Column 'B'**

- a) Pellagra
- b) Heme
- c) Lipolysis
- d) Transamination
- e) Fluoride
- f) Malonate

B) Answer the following.

(03)

- i) Name two enzymes of TCA cycle.
- ii) Name two water soluble vitamins.
- iii) Name two ketogenic amino acids.
- iv) Give two examples of oxidoreductase.
- v) Give two factors influencing enzyme action.
- vi) Name two sites for glycogen distribution in body.

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