B.V.Sc. & A.H. (Second Professional) Examination – 2024
Veterinary Biochemistry Paper -I

Time: Three Hours **Maximum Marks: 100**
Weightage: 20

Unit-1 (General Veterinary Biochemistry)
Unit-3 (Veterinary Analytical Biochemistry)

Instructions:
1) Attempt all questions
2) Answer of all questions is to be written in the space provided along with the question in question-booklet.
3) Overwriting is not allowed in the objective type question.

Q.1 Fill in the blanks. **(20x0.5 = 10)**

1.1 .... is also called as "power house" of the cell.

1.2 A carbon attached to 4 different atoms or groups is called........................

1.3 Fats provide .... Kcal/g energy.

1.4 .... is referred to as animal starch.

1.5 The milk sugar lactose is composed of .... glycosidic bond.

1.6 .... is a structural polysaccharide, found in exoskeleton of insects.

1.7 .... is the Edman's reagent used for protein sequencing.

1.8 Disorganization of native protein structure is known as..........................

1.9 .... is the most acidic amino acid.

1.10 .... is the 22nd amino acid.

1.11 The deoxynucleotides in DNA are held together by .... bond.

1.12 Normal blood glucose levels in sheep and goat is .... mg/dL.

1.13 The process of formation of RNA from DNA is called as ....

1.14 RNA with a catalytic activity is called as ....

1.15 Thyroid hormones are derivative of .... amino acid.

1.16 .... discovered the nucleus of the cell.

1.17 ....is a precursor to histamine.

1.18 .... is the sweetest of all naturally occurring carbohydrates.

1.19 Besides Nucleus, DNA is also present in ....of animal cells.

1.20 .... in alpha helices tend to cause a kink in the helix structure.

Q.2 Choose the most suitable answer and write the number of the correct answer 1 or 2 or 3 or 4 in the space given against each sub question: (20x0.5 = 10)

2.1 The cytoplasmic filaments are made up of........... ( )
1. Microtubules
2. Actin filaments
3. Intermediate filaments
4. All of the above

2.2 Sucrose is made up of.......... ( )
1. α-D-glucose and β-D-fructose.
2. α-D-glucose and α-D-fructose.
3. β-D-glucose and α-D-fructose.
4. β-D-glucose and β-D-fructose.

2.3 Which of the following is not found as a polymer: ( )
1. Carbohydrates.
2. Proteins.
3. Lipids.
4. Nucleic Acids.

2.4 Which of the following lipid is not found in plasma membrane: ( )
1. Lecithin
2. Cephalin
3. Cholesterol.
4. Triglycerides.

2.5 Which of the following sterol is present in plant cells: ( )
1. Ergosterol.
2. Stigmasterol.
3. Sitosterol.
4. All of the above.

2.6 Which of the following is an omega fatty acid: ( )
1. Linoleic acid.
2. Linolenic acid.
3. Arachidonic acid.
4. Palmitoleic acid.

2.7 The number of peptide bonds present in decapiptide: ( )
1. 8.
2. 9.
3. 10.
4. 11.

Donot write across this line

2.8 The number of peptide bonds present in tripeptide: ( )

1. Three.
2. Four.
3. Five.
4. None of the above.

2.9 Which of the following is not a nanopeptide: ( )

1. Oxytocin.
2. Vasopressin.
3. Thyrotropin releasing Hormone.
4. All of the above.

2.10 Which of the following is a colour reaction of proteins/AA: ( )

1. Biuret reaction.
2. Ninhydrin reaction.
3. Barfoed's reaction.
4. Sakaguchi reaction.

2.11 Method that cannot determine protein structure: ( )

1. X-ray crystallography.
2. NMR.
3. HPLC.
4. None of the above.

2.12 Each turn of α Helix contains : ( )

1. 3.6 Amino acids.
2. 3.6 nucleotides.
3. 3.4 Amino acids.
4. 3.4 nucleotides.

2.13 Guanidino group is present in which of the following amino acid: ( )

1. Tryptophan.
2. Tyrosine.
3. Arginine.
4. Proline

2.14 Indole group is present in which of the following amino acid: ( )

1. Proline.
2. Tryptophan.
3. Tyrosine.
4. Arginine..

2.15 Which anticoagulant should be used for estimation of plasma glucose: ( )

1. EDTA.
2. Sodium Citrate.
3. Sodium Fluoride.
4. None of the above.

2.16 Which of the following may help prevent heart diseases: ( )

1. LDL.
2. VLDL.
3. HDL.
4. None of the above.

2.17 Which of the following is involved in protein synthesis: ( )

1. m-RNA.
2. t-RNA.
3. r-RNA.
4. All of the above.

2.18 Which of the following statement is true for DNA structure: ( )

1. A pairs with T.
2. A pairs with G.
3. A pairs with C.
4. G pairs with T.

2.19 Which of the following is not an aromatic amino acid: ( )

1. Tryptophan.
2. Tyrosine.
3. Threonine.
4. Phenylalanine.

2.20 The major LDH isoenzymes of skeletal muscle and liver: ( )

1. LDH 1.
2. LDH 2.
3. LDH 4.
4. LDH 5.

Q.3 Attempt any <u>ten</u> out of the following twelve questions. Answer of each question should be in 2 to 3 lines. (10x2.0= 20)

3.1 Define Isoelectric pH

3.2 Define Tautomerization

3.3 What is a racemic mixture?

3.4 What is a cell theory?

3.5 Define PUFA with a suitable example

3.6 Explain briefly hypoglycaemia in baby pigs

3.7 What is facilitated diffusion?

3.8 Define non-essential amino acids with example

3.9 What is Arrhenius concept of Acid and Bases?

3.10 What is a buffer ?

3.11 Define membrane asymmetry

3.12 Define mutarotation

Q.4 Attempt any six out of the following eight questions. Answer of each question should be in 8 to 10 lines. **(6 x 6.0 = 36)**

4.1 Donnan Membrane Equilibrium.

Donot write across this line

4.2 Enlist the biochemical tests of liver function.

4.3 Functions of RNAs

4.4 Write short notes on non-standard amino acids

4.5 Acute Phase Proteins

4.6 Pregnancy Toxaemia

4.7 Cytochrome p450 system of enzymes

4.8 Secondary structure of a protein

Q.5 Answer the following question in 1-2 pages (attempt any two).

(2x12.0 = 24)

5.1 Classify carbohydrates with suitable examples (8 marks) and enlist important biological functions of carbohydrates (4 marks).

5.2 What are the chemical properties of lipids (6 marks)? Enlist test to check purity of fats and oils (6 marks).

5.3 Explain the diagnostic importance of non-functional plasma enzymes (8 marks) and isoenzymes (4 marks) with suitable examples.

Please write your Roll Number above this line

B.V.Sc. & A.H. (Second Professional) Examination – 2024

Veterinary Biochemistry Paper -II

Time: Three Hours **Maximum Marks: 100**

Weightage: 20

Unit-2 (Intermediary Metabolism)

Instructions:

1) Attempt all questions
2) Answer of all questions is to be written in the space provided along with the question in question-booklet.
3) Overwriting is not allowed in the objective type question.

Q.1 Fill in the blanks. **(20x0.5 = 10)**

1.1 ____________________ pathway is the main source of reducing equivalents for lipogenesis.

1.2 The ratio k_{cat}/K_m is referred to as ____________________.

1.3 As per Michaelis and Menten, $Vo = V_{max}$ [S]/______________ + [S].

1.4 ____________________ serves as coenzyme for the enzyme transketolase

1.5 ____________________ organ is extremely sensitive to ammonia toxicity.

1.6 The net ATP gain in anaerobic glycolysis is ________________ (no.).

1.7 Allopurinol is the competitive of ____________________ enzyme.

1.8 ____________________ (organ) is the major site for synthesis of Urea.

1.9 The excretion of ketone bodies in urine is known as ________________

1.10 Purines can be directly converted to corresponding nucleotides by____________________ pathway.

1.11 Substrate concentration at which the reaction velocity is half of the maximum possible is referred to as ____________________ constant.

1.12 Oxidative decarboxylation product of pyruvate is __________________.

1.13 ________________ molecule helps to transport long chain fatty acids into the mitochondria for oxidation.

1.14 ____________________ enzyme is responsible for formation of glucose-6-phosphate from glucose in the liver.

1.15 Urea cycle was proposed/discovered by ______________ and ______________

1.16 SGPT stands for____________________________________

1.17 Fatty acids synthesis and chain elongation takes place in ________________ and ____________________ respectively.

Donot write across this line

1.18 ____________ (Low/high) insulin to glucagon ratio promotes ketogenesis.

1.19 Ascorbic acid is not synthesized in primate due to deficiency of the enzyme ____________.

1.20 Glucose 6 Phosphatase enzyme absent in ____________ (name of tissue).

Q.2 Choose the most suitable answer and write the number of the correct answer 1 or 2 or 3 or 4 in the space given against each sub question:
(20x0.5 = 10)

2.1 The number of substrate molecules transformed per unit time by a single enzyme molecule is referred as ( )
1. Specific activity
2. Turnover number
3. Unit
4. Activity

2.2 The example of only ketogenic amino acid is ( )
1. Leucine
2. Valine
3. Isoleucine
4. Tyrosine

2.3 The parent compound for the biosynthesis of purine nucleotides is ( )
1. AMP
2. GMP
3. XMP
4. IMP

2.4 The precursor for the synthesis of ketone bodies is ( )
1. Acetyl CoA
2. Malonyl CoA
3. Propionyl CoA
4. Acetate

2.5 All of the following are true for competitive enzyme inhibition except ( )
1. Increased Km value
2. Decreased Vmax value
3. Change in slope
4. None

2.6 One of the following derivatives of fat is a precursor for gluconeogenesis ( )
1. Fatty acids
2. Acetyl CoA
3. Propionyl CoA
4. Aceto acetyl CoA

Rough work

Donot write across this line

2.7 The macromolecule regarded as the reserve bank of genetic information ( )

1. Protein
2. DNA
3. RNA
4. Enzyme

2.8 Pyruvate dehydrogenase complex requires the following coenzymes ( )

1. TPP, lipoamide, FAD, coenzyme A and NADP
2. TPP, lipoamide, FAD, biotin and NAD
3. TPP, lipoamide, FMN, coenzyme A and NAD
4. TPP, lipoamide, FAD, coenzyme A and NAD

2.9 One of the following amino acid cannot undergo transamination ( )

1. Arginine
2. Alanine
3. Lysine
4. Glutamate

2.10 Mammalian RNA polymerase III synthesises ( )

1. rRNA
2. mRNA
3. tRNA
4. hn RNA

2.11 For an enzyme catalyzed reaction, when substrate concentration is plotted against reaction velocity, following type of curve is obtained ( )

1. Hyperbola
2. Sigmoidal
3. Straight line
4. None

2.12 Which of the following is a mobile electron carrier in ETC ( )

1. NADH
2. Ubiquinone
3. Cytochrome C
4. All

2.13 The lipoproteins that are synthesized in the intestine and transport triacylglycerols to various tissues is ( )

1. Chylomicrons
2. VLDL
3. LDL
4. HDL

2.14 . Phenylketonuria is due to a defect/deficiency of the following enzyme ( )

1. Tyrosine hydroxylase
2. Phenylalanine hydroxylase
3. Tyrosinase
4. None

2.15 The organ that consumes the highest quantity of glucose at rest for its energy demands is ( )

1. Heart
2. Brain
3. Skeletal muscles
4. Adipose tissue

2.16 Ketosis is the characteristic finding of ( )

1. Prolonged fasting
2. Diabetes Mellitus
3. Pregnancy toxaemia
4. All

2.17 The liver cannot utilize ketone bodies due to a lack of the enzyme ( )

1. Thiolase
2. Thiophorase
3. HMG CoA lyase
4. β-hydroxybutyrate dehydrogenase

2.18 The fatty acids in the body are mainly oxidized by ( )

1. α-oxidation
2. β-oxidation
3. λ- o xidation
4. ω- oxidation

2.19 Hexose monophosphate shunt is characterized by all of the following **EXCEPT** ( )

1. Direct oxidation of glucose to CO_2
2. Occurs in cytosolic fraction of the cell
3. Produces NADPH and Pentoses
4. Generates 38 ATPs

2.20 Which of the following is not a glycolytic enzyme? ( )

1. Enolase
2. Aldolase
3. PFK-1
4. Glucose oxidase

Q.3 Attempt any <u>ten</u> out of the following twelve questions. Answer of each question should be in 2 to 3 lines. **(10x2.0= 20)**

3.1 Glucose is the final product of glycogenolysis in liver but not in muscles, explain

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Donot write across this line

Donot write across this line

3.2 Allopurinol is used for the treatment of gout, justify.

3.3 Why the deficiency of glucose-6-phosphatase may lead to gout

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3.4 Hyperammonemia lead to neurotoxicity, explain

3.5 Why HDL cholesterol is referred to as good cholesterol

3.6 What do you understand by anaplerotic reactions? Give two examples

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3.7 Differentiate between CPS-I and CPS-II

For Library Use

3.8 Define Km

3.9 The net ATP production in Glycolysis is less in the absence of oxygen, why?

3.10 What are allosteric enzymes? Give examples

3.11 What do you understand by substrate level phosphorylation? Give two examples.

For Library use

3.12 What do you understand by cellular energy charge?

Q.4 Attempt any six out of the following eight questions. Answer of each question should be in 8 to 10 lines. **(6 x 6.0 = 36)**

4.1 Discuss the chemiosmotic theory of oxidative phosphorylation in detail.

Donot write across this line

4.2 Write a brief note on the significance of the HMP shunt.

For Library use

4.3 Discuss the salvage pathway of nucleotide biosynthesis. Write its significance.

4.4 Discuss the transamination reactions in detail

For Library use

4.5 Discuss the process of gluconeogenesis in ruminants.

4.6 Write a note on Cori cycle

For Library Use

4.7 Write a detailed note on various shuttle systems existing in a cell.

Donot write across this line

4.8 Write a short note on Gout

For Library use

Q.5 Answer the following question in 1-2 pages (attempt any two).

(2x12.0 = 24)

5.1 (a) What are mechanism based inhibitors?

(2)

(b) Discuss various types of reversible enzyme inhibitions along-with the examples and kinetics of each class.

(10)

5.2 (a) Write in detail the process of replication in prokaryotes.

(10)

(b) Discuss how it is different from eukaryotes.

(2)

5.3 (a) Draw a neat and clean, diagram of TCA cycle.

(8)

(b) Explain various regulatory steps of the cycle, in details.

(2)

(c) Discuss its energetics.

(2)