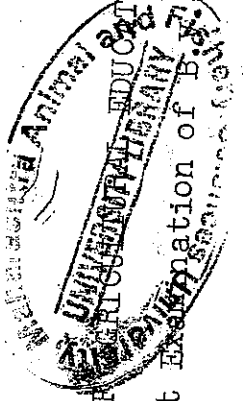


34



MAHARASHTRA COUNCIL OF UNIVERSITY EDUCATION AND RESEARCH
Semester-End Repeat Examination of B.Sc. & A.H.

Semester : II
Course No. : BIO-122
Credits : 3 (2+1)
Day & Date : Thursday,
30-12-93
Academic year : 1993-94
Title : Biochemistry II
Time : 09.00 to 11.00 hrs
Marks : 80

Note : 1) All questions carry equal marks
2) Question No.8, 9 and 10 are compulsory
3) Solve any five questions from Q.No.1 to No.7.

.....

- Q.1 Write in detail about the measurement of net energy yield of food.
- Q.2 Explain ureagenesis.
- Q.3 Describe different functions and deficiency symptoms of sodium and potassium.
- Q.4 Describe the factors affecting and regulating the blood glucose concentration.
- Q.5 Describe the steps involved in the synthesis of fatty acids in mitochondria.
- Q.6 Describe the types of deamination with suitable examples.
- Q.7 Answer the following questions in short (any five)
 - 1) What is the role of carnitine in betaoxidation of fatty acids ?
 - 2) What are chylomicrons ?
 - 3) Which are the metabolites produced from pyruvic acid ?
 - 4) Enlist the sources of blood glucose.
 - 5) Enlist the objectives of glucose metabolism.
 - 6) Enlist the intermediates of TCA cycle in their order of formation.

Q.8 State whether true or false :

- 1) Glucose-phosphatase is absent in muscles.
- 2) 18-C fatty acids give 9 moles of Acetyl Co.

- 4) Hexose monophosphate shunt is totally an oxidative pathway.
- 5) Lipoprotein lipase is called as 'clearing factor'.

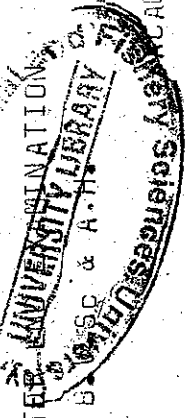
Q.9 Define the following terms :

- 1) B.M.R.
- 2) Calorie
- 3) Lipogenesis
- 4) Ketonurea
- 5) Hypoglycaemia

Q.10 Fill in the blanks :

- 1) _____ and _____ hormones affect Amino acid utilization.
- 2) Gluconeogenesis is defined as _____.
- 3) Insulin is Hypoglycemic because _____.
- 4) HMP shunt is an alternate pathway to _____.

00000



Semester : II
 COURSE : BIO-122
 CREDITS : 3 (2 + 1)
 DAY : THURSDAY, DATE : 15.12.94, TIME: 9.00 to 11.00
 TITLE : BIOCHEMISTRY-II
 TOTAL MARKS : 80
 ACADEMIC YEAR : 1994-95

NOTE : Section 'A' is compulsory. Answer any FIVE questions from Section 'B'.

..... A
SECTION 'A'

Q.1. Write Right or Wrong (10)

1. Ammonia is toxic to CNS
2. GTP is equivalent to one ATP
3. Lactose is synthesized by mammary glands
4. Reduced glutathione is required for the maintenance of normal R6Os structure
5. Carnitine transport is essential for β -oxidation
6. ATP contains more energy than ADP
7. All reactions of TCA cycle are irreversible
8. Glycolysis is a reversible process
9. Oils are primarily oxidized by ω -oxidation
10. Fluoride is a classical inhibitor of glycolysis

Q.2. Write appropriate pairs from the words in row A with those in row B (10)

<u>ROW 'A'</u>	<u>ROW 'B'</u>
1) Ketosis	a) Ketonuria
2) Diabetes	b) Thioclase
3) Thioclysis	c) Glycosuria
4) Anabolism	e) Growth
5) Catabolism	f) Starvation
6) Argininemia	g) Arginaze
7) Citrullinemia	h) Homogentisicacid
8) Alkaptonuria	i) Argininosuccinate synthetase
9) Hyperglycemia	j) Insulin
10) Hypoglycemia	k) Glucagon

Q.3. Fill up the blanks (10)

1. _____ deficiency causes diabetes
2. (a) _____ (b) _____ (c) _____ ATPs are produced from a molecule of glucose by glycolysis, oxidative decarboxylation and citricacid cycle respectively.
3. (a) _____ (b) _____ (c) _____ are the products of

SECTION 'B'

- Q.4. Name the methods of studying intermediary metabolism. Describe (1) Analysis of excretion, and (2) Surviving tissue slice technique. (10)
- Q.5. Describe chemical reactions and energetics of Embden-Meyerhof pathway. (10)
- Q.6. Describe carnitine transport, β -oxidation and its energetics. (10)
- Q.7. Describe in detail amino acid indispensability in farm animals. (10)
- Q.8. Describe in detail all types of transamination with suitable examples. (10)
- Q.9. Describe various forms of energies produced on oxidation of food-stuffs in the body. (10)
- Q.10. Write short notes (ON ANY TWO) (10)
1. Water metabolism
 2. Electrolyte metabolism
 3. Metabolism in starvation.

27
Maharashtra Agricultural Universities Examination Board, Pune 5

ANNUAL EXAMINATION

B. V.Sc. & A.H.

YEAR : First
COURSE NO. : VBC-121 & 122
CREDITS : 5 (3+2)
DAY : Thursday
TIME : 10.00 to 12.00 hrs.
ACADEMIC YEAR : 1998-99
SUBJECT/TITLE : Biochemistry
(Paper - II)
DATE : 12-8-99
TOTAL MARKS : 75

- Note : 1) Solve any three questions from section 'A' of each course.
2) Section 'B' of each course is compulsory.
3) All questions carry equal marks.

COURSE NO. VBC - 121

MARKS : 50

SECTION 'A'

- Q. 1. Enumerate the major pathways of carbohydrate metabolism and explain in detail Embden Meyerhaf pathway. ✓
- Q. 2. Describe the process of B-oxidation of fatty acids with enzymes, coenzymes and energetics involved.
- Q. 3. Describe in detail the urea cycle.
- Q. 4. Name the fat soluble vitamins and explain in detail about physiological functions of Vitamin D.

SECTION 'B'

- Q. 5. a) Name the enzymes which catalize the following reactions.
- 1) Conversion of citrate to isocitrate.
 - 2) Fatty Acid to active fatty acid.
 - 3) Malate to oxaloacetate.
 - 4) Glucose 6 phosphate to fructose 6 phosphate.
- b) Fill in the blanks :
- 1) ~~Diabetes~~..... is caused due to the deficiency of insulin.
 - 2) The ketone bodies are &
 - 3) Iodine is required for synthesis of ~~thyroxine~~..... hormone.
 - 4) is the only site for urea synthesis in the body.

- Q. 6. Define the following terms :
- Glycogenesis, Ketosis, Transamination, Gluconeogenesis, Buffer, Osmosis, Lipogenesis, Basal metabolism, SDA, Respiratory chain.

(P. T. O.)

SECTION 'A'

- Q. 1. Define biotechnology and its application to Veterinary Science.
- Q. 2. Define fermentation and the microorganisms involved in it.
- Q. 3. What is prophylaxis ? Enlist the methods. Explain in brief the advantages of Subunit Vaccine.
- Q. 4. Describe the process of protein synthesis.

SECTION 'B'

- Q. 5. Explain the following terms :
- | | |
|------------|-----------------|
| 1) Meiosis | 2) Subculture |
| 3) IVF | 4) Genetic code |
| 5) PCR | |
- Q. 6. Check the following statements and correct if necessary.
- 1) DNA replication is semiconservative.
 - 2) Monoclonal antibodies offer an excellent tool for purification of antigens.
 - 3) Mitosis is a characteristic division of generative cells in which gametes are formed.
 - 4) Suspension culture is the best method when large yields are required.
 - 5) Golgi apparatus has independent synthetic function.

25

ANNUAL EXAMINATION

B.V.Sc. & A.H.

ANNUAL EXAMINATION

B.V.Sc. & A.H.

ANNUAL EXAMINATION BOARD, MUMBAI

YEAR	:	First	ACADEMIC YEAR	:	1999-2000
COURSE NO.	:	VBC- 121 & 122	SUBJECT/TITLE	:	Biochemistry (Paper-II)
CREDITS	:	3+2 = 5	DATE	:	18/8/2000
DAY	:	Friday	TOTAL MARKS	:	75
TIME	:	Hrs. 10.00 to 12.00			

- Note :
1. Solve any three questions from section 'A' of each course
 2. Section 'B' of each course is compulsory.
 3. All questions carry ten marks in course No. VBC 121 and five marks in Course No. VBC- 122.

COURSE No. VBC-121

Marks : 50

SECTION 'A'

- Q . 1. Classify vitamins. Explain in detail about Physiological functions of Vitamin A,D and C.
- Q . 2. Describe Kreb's Henseleit cycle of ureagenesis.
- Q . 3. Describe the factors affecting and regulating the blood glucose concentration.
- Q . 4. Name the methods of studying intermediary metabolism and describe Blood and Tissue Analysis.

SECTION 'B'

- Q . 5. Define the following terms.
Cori cycle, Metabolism, Ketosis, Gluconeogenesis, Glycolysis, Basal Metabolic Rate, R.Q., Hyperglycemia, Proteinuria, Steatorrhea.
- Q . 6. Fill in the blanks
 1. With advancing age, basal metabolic rate gradually _____.
 2. In metabolic disorders glucose appears in _____.
 3. _____ anzyme is absent in brid's liver.
 4. Serum calcium level in a cow is _____ mg/dl.
 5. _____ is a common metabolic pool for carbohydrates, proteins and fats.
 6. _____ and _____ hormones affect amino acid utilization.
 7. The ketone bodies are _____ and _____.
 8. _____ is caused due to deficiency of insulin.
 9. _____ and _____ condense together to form citric acid
 10. Fructose 1, 6 - diphosphate breaks up into 3-C compounds viz. _____ and _____.

SECTION 'A'

- Q . 1. What is PCR ? Explain uses of this technique.
- Q . 2. Define tissue culture. What are the different types of tissue culture ?
- Q . 3. Draw a well labelled diagram of animal cell.
- Q . 4. What is a hybridoma ? Explain the technique of producing hybridoma cells.

SECTION 'B'

- Q . 1. Explain the following terms
1. IVF
 2. Gene
 3. Subculture
 4. Fermentation
 5. Prophylaxis.
- Q . 2. Check the following statements and correct if necessary.
1. Ribosomes are the power houses of cell.
 2. RNA contains pentose sugar.
 3. Subunit vaccines produce many types of antibodies.
 4. Oestrous synchronisation is essential for E.T.T.
 5. Cell membrane contains phospholipids.

25.12.2001
SENIOR FIRST
Course No. VBS-111
Credits: 3+2=5
Day Thursday
Date 9/12/2001
Time 10 to 12.30 hrs.

Acad. Year: 2000-2001
Subject/Title: Biochemistry
(Paper-II)

Total Marks: 75

- NOTES:- 1) Solve any three questions from Section 'A' of each course.
2) Section 'B' of each course is compulsory
3) Figures to the right indicate full marks. (if

Course No. VAC-121 Section 'A' Marks: 50

- Q.1. What is enzyme? Classify it. Describe the mechanism of action of the enzyme. (10)
- Q.2. What are the fates of pyruvate? Describe in detail the process of glycolysis along with the chain of reactions involved. Give its energetics. (10)
- Q.3. Describe in detail the urea cycle. (10)
- Q.4. Describe in detail Beta-oxidation of fatty acids. Give its energetics. (10)

SECTION 'B'

- Q.5. Fill in the blanks (10)
- 1) _____, _____, and _____ are the key enzymes of the gluconeogenesis. (10)
- 2) RQ of carbohydrate is _____.
- 3) Blood glucose level in ruminants ranges between _____.
- 4) Beri-Beri is caused due to the deficiency of _____.
- 5) Surplus glucose is converted into _____ by the process of _____ in liver and muscles. (10)
- 6) _____ is called as _____ debranching enzyme which is involved in glycogenolysis.
- 7) Purines and Pyrimidines in the diet are catabolised to _____.

OR

- Q.6. State true or false. (10)
- 1) More the concentration of product, lesser is the enzyme activity.
- 2) Removal of hydrogen or an electron is the process of reduction.
- 3) Glycogenolysis of muscle glycogen is impossible.
- 4) Glycogen synthetase D is the active form of glycogen synthetase-I.
- 5) Reduction in the level of blood calcium stimulates the release of parathormone.
- 6) Glucocorticoids stimulate gluconeogenesis.
- 7) Fructose is more readily and rapidly metabolised by the liver than glucose.
- 8) Carnitine is the carrier of acetylated form of fatty acids into mitochondrial matrix.
- 9) BMR in children is higher than in adults.

- Q.No.1. Define the term vaccine, enlist various types of vaccines and write in brief about sub unit vaccines. (5)
- Q.2. Describe in detail the process of protein synthesis. (5)
- Q.3. What do you mean by monoclonal antibodies? Describe in detail the hybridoma technique. (5)
- Q.4. Write short notes (any two) (5)

- 2) Differentiation between Active and Passive Immunity.
- Q.5. 1) Differentiation between DNA & RNA (5)
- 2) Differentiation between Active and Passive Immunity. (5)

- 3) Advantages of Embryo Transfer technology. (5)

- Q.6. 1) Cloning (2) Primary cultures (5)
- 3) Transfection (4) Transgenic animal (5) Bacteriophage (5)

- Q.6. State true or false. (5)

- 1) Protein synthesis occurs in mitochondria of animal cell.
- 2) RNA polymerase is required for replication of DNA.
- 3) PCR is used for production of monoclonal antibodies.
- 4) Extra chromosomal, small circular DNA molecules present in bacteria are plasmids.
- 5) Cell cultures are widely used for cultivation of viruses.

17

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

YEAR : FIRST
COURSE NO. : VBC-121 & 122
CREDITS : 3+2
DATE : 14/10/2002
TIME : 10-13HRS

ACADEMIC YEAR
SUBJECT: **Brochemistry**
Paper II
75/100 questions
MONDAY

- NOTE : 1) Use Separate answer book for each course
2) Solve any THREE questions from Section - A
3) Section-B is **Compulsory**.
4) All question carry equal marks.

COURSE NO. : VBC-121

(Physiological Chemistry)

MARKS : 50

SECTION 'A'

- Q.1 Write short notes on the following (ANY FOUR) (10)
a) V_{max} b) K_m c) Competitive inhibitor d) Basal metabolism
e) Deamination f) Trans amination.
- Q.2 Write the rhodopsin cycle. (10)
- Q.3 Describe TCA cycle in details. (10)
- Q.4 Answer the following. (10)
i) Biochemistry of plasma protein.
ii) Donnan's theory of membrane equilibrium.
iii) Chemistry of Bile.
iv) Chemistry of Hemoglobin.
- Q.5 Describe in detail β -Oxidation of fatty acids. Give its energetics. (10)

SECTION 'B'

- Q.6 Choose the correct answer and write the corresponding alphabet. (10)
- i) Carnitine is required for the transport of
a) Amino acids b) Volatile fatty acid c) Long chain fatty acid
d) All of the above.
- ii) Conversion of glucose to glucose 6 phosphate is mediated by
a) Phosphorylase b) Phosphatase c) Hexokinase d) None of the above.
- iii) Xanthine oxidase contains the element
a) Copper b) Iron c) Molybdenum d) None of the above.
- iv) RQ for fat oxidation is
a) 1.0 b) 0.7 c) 0.1 d) 0.84
- v) The vitamin having a significant role in the vision is,
a) Vitamin B complex b) Vitamin A c) Vitamin C d) None of the above
- vi) During synthesis of Vit. K the ring of the cholesterol opened is,
a) A ring b) B ring c) C ring d) None of the above.
- vii) The end product of aerobic glycolysis is
a) Acetyl CoA b) Lactic acid c) Pyruvic acid d) None of the above.
- viii) Net production of ATP in aerobic glycolysis is
a) 8 ATP b) 12 ATP c) 30 ATP d) None of the above.
- ix) The first product in citric acid cycle is,
a) Citric acid b) Acetyl CoA c) Isocytate d) None of the above.
- x) Fatty acids are oxidized by the process
a) β oxidation b) Glycolysis c) All of the above d) None of the above.

Q.7 Explain the following (10)

- a) Conversion of Phosphoenol pyruvate to pyruvate.
b) Calculate formation of ATP during complete oxidation of one molecule of glucose.
c) Role of niacin as co-enzyme.
d) Write the role of Vitamin K.
e) Conversion of succinate to fumarate.

SECTION 'A'

- Q.1 Explain the following (ANY FIVE) (5)
 a) ETL b) Transgenic animal c) Primary Cell culture
 d) Recombinant DNA Technology e) Cell line f) Super Ovulation.
- Q.2 Write short answer (ANY TWO) (5)
 a) Write function of DNA b protein during the process of DNA replication.
 b) Write the function of reverse transcriptase.
 c) Why combination of PMSG and PGF2 α is preferred for super ovulation? (5)
- Q.3 Define the term vaccine, enlist various types of vaccines and write in brief about Subunit vaccines. (5)
- Q.4 Draw and label various cellular component as revealed by electron microscopy. (5)
- Q.5 Define Bio-technology and give its application in veterinary science. (5)

SECTION 'B'

- Q.6 Choose the correct answer and write the corresponding alphabet. (10)
- The sequencing of a gene is done by
 a) Sanger's method b) Maxim Gilbert method
 c) By all of the methods d) None of the methods are applicable.
 - Transport of amino acids from cytoplasm to the site of protein synthesis are carried by
 a) tRNA b) rRNA c) mRNA d) SnRNA
 - A clone is derived
 a) Asexually b) Sexually c) All of the above d) None of the above
 - During monoclonal antibody production
 a) Myeloma cells are used for fusion with antibody production cell.
 b) Normal cells are used for fusion with antibody producing cells.
 c) All of the above statements are correct.
 d) None of the statements are correct.
 - Addition of nucleotides complementary to the template strand during prokaryotic DNA replication is mediated by
 a) DNA polymerase – I
 b) DNA polymerase – II
 c) DNA polymerase – III
 d) None of the above.
 - The factor responsible for termination of transcription is
 a) ϵ b) λ c) ρ d) ω
 - The medium used to select hybridoma is
 a) HAT b) Maconky agar c) HGPRT d) AMP buffer
 - The enzyme used for polymerization in PCR is
 a) Taq Polymerase b) RNA polymerase c) DNA Gyrase d) None of the above
 - Hormone(s) used to induce super ovulation in large animals is/are
 a) FSH b) Progesterone c) HCG d) All of the above.
 - Which one of the following antibiotic is structural analogue of aminoacyl RNA
 a) Streptomycin b) Puromycin c) Penicilline d) Erythromycin.

UNIVERSITY LIBRARY
VBC-121,122
Credits 2+1 = 3, 1+1 = 2
Date : Saturday, 03/06/2006

Academic Year : 2005-2006
Subject : Veterinary Biochemistry -II
Total Marks : 50+25=75
Time : 09.00 to 12.00 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) All questions carry equal marks.

VBC-121

Physiological Chemistry

Marks - 50

Section - A

- Q. 1 Describe Embden-Mayerhoff pathway. How many numbers of ATP molecules produced under aerobic conditions. (10)
- Q. 2 Describe the steps involved in β oxidation of fatty acids. Give net ATP production from complete oxidation of one molecule of palmitic acid. (10)
- Q. 3 Describe in detail Krebs's cycle. (10)
- Q. 4 Classify the enzymes & explain the factors affecting enzyme action. (10)
- Q. 5 Write short notes on
a) Urea cycle
b) Rhodopsin cycle (10)

Section - B

- Q. 6 Define the following (10)
- 1) SDA
 - 2) Hypocalcemia
 - 3) Transamination
 - 4) Ketosis
 - 5) BMR
 - 6) RQ
 - 7) Gluconeogenesis
 - 8) Cofactor
 - 9) Anabolism
 - 10) Vitamins
- Q. 7 Choose the most appropriate answer (10)
1. An example of extracellular enzyme is
(a) Glucokinase (b) Hexokinase
(c) Glucose 6 phosphatase (d) Pepsin
 2. Unit of enzyme is
(a) mg (b) gm
(c) IU (d) Katal
 3. Night blindness is caused due to deficiency of
(a) Vit A (b) Vit B
(c) Vit C (d) Vit D
 4. Panthothenic acid exist in tissuc as
(a) β mercaptoethanolamin (b) Co enzyme A
(c) Pantoic Acid (d) β alanine
 5. The active form of Vitamin D is
(a) Cholecalciferol (b) Ergosterol
(c) Dehydrocholesterol (d) Calcitriol
 6. The mineral required for Vit B₁₂ synthesis
(a) Fe (b) Cu

7. Gluconeogenesis is reversal of
(a) Glycogenesis
(c) Glycolysis
(b) Glycogenolysis
(d) None
8. The Coenzyme form of Riboflavin
(a) FMN
(c) NAD
(b) TPP
(d) ATP
9. The primary end product of de novo fatty acid synthesis in mammalian liver
(a) Oleate
(c) Lenoleate
(b) Vit A
(d) Palmitate
10. Synthesis of thyroxine requires
(a) Cu
(c) I
(b) Zn
(d) Fe

VBC-122 Introduction to Molecular Biology And Biotechnology

Marks - 25

Section - A

- Q. 1 Describe in detail the mechanism of protein biosynthesis. (05)
- Q. 2 Explain Maxam Gilbert method of gene sequencing. (05)
- Q. 3 What is PCR. Explain the principle, procedure & uses of PCR. (05)
- Q. 4 Describe in detail Invitro-fertilization. (05)
- Q. 5 Write short notes on
a) Sub unit vaccine (2.5)
b) Transgenic animals (2.5)

Section - B

- Q. 6 Define the following (05)
i) Plasmid
ii) Transcription
iii) Fermentation
iv) Superovulation
v) ETT
- Q. 7 Choose the most appropriate answer. (05)
1. DNA strands are uncoiled by breaking
(a) hydrogen bonds
(c) Disulphide bonds
(b) sulphide bonds
(d) None
2. The agent which serves as genetic transformation from bacteria to bacteria
(a) Nucleotides
(c) Nucleosides
(b) Plasmids
(d) None
3. The best cell culture method when larger yields are required
(a) Monolayer Culture
(c) Both
(b) Suspension Culture
(d) None
4. Introduction of r-DNA into host cell is called
(a) Transcription
(c) Initiation
(b) Transformation
(d) Translation
5. Embryo's are cryopreserved at - 196^o c in
(a) Liquid N.

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

17

Year : I
Course No. : VBC-121, 122
Credits : 2+1 = 3, 1+1 = 2
Day & Date : Saturday, 30/08/2008
Academic Year : 2007-2008
Subject : Veterinary Biochemistry (II)
Total Marks : 50+25 = 75
Time : 11.00 to 14.00 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) All questions carry equal marks.

VBC - 121

Physiological Chemistry

50 Marks

Section-'A'

- Q. 1 Explain the oxidation of C-16 fatty acid with energetics. (10)
- Q. 2 Describe in detail Kreb's Henselit cycle. (10)
- Q. 3 Define and classify enzymes. Explain in brief the factors affecting enzyme action. (10)
- Q. 4 Describe the EMP pathway. (10)
- Q. 5 Write notes on:
a) BMR
b) Vitamin 'C' (10)

Section-'B'

- Q. 6 Choose the correct alternative. (10)
- 1) Co-enzyme form of niacin is
a) NAD
b) FAD
c) GTP
d) ATP
 - 2) Trace element present in vit-B₁₂ is
a) Copper
b) Cobalt
c) Zinc
d) Selenium
 - 3) Ketone bodies are produced due to incomplete oxidation of
a) Nucleic acid
b) Amino acid
c) Fatty acid
d) None of above
 - 4) The main iron transporting protein is
a) Ferritin
b) Transferrin
c) Hemociderin
d) None of above
 - 5) In higher animals uric acid is the end product of
a) Amino acid
b) Nitrogenous bases
c) Fumaric acid
d) None of above
 - 6) Pyruvate is converted to acetyl CoA by the action of the enzyme
a) Pyruvate dehydrogenase complex
b) α -ketoglutarate dehydrogenase
c) Either of the above
d) None of above
 - 7) Deficiency of calcium in adult produces
a) Rickets
b) Osteomalacia
c) Pica
d) None of above
 - 8) Which of the following is a principal precursor of cholesterol
a) Propionate
b) Acetate
c) Lactate
d) Butyrate
 - 9) Which of the following is a major metabolic pathway in the erythrocyte
a) EMP
b) TCA
c) Gluconeogenesis
d) Cori's cycle
 - 10) Which of the following is not a volatile fatty acid
a) Acetic acid
b) Propionic acid
c) Butyric acid
d) Valeric acid

Q. 7 A) Give one example of coenzyme derived from: (05)
a) Riboflavin
b) Thiamine
c) Pyridoxine
d) Niacinamide
e) Pantothenic acid

B) Define the following terms: (05)

- 1) Gluconeogenesis
- 2) Transamination
- 4) Glycogenesis
- 5) Ketonuria
- 3) Diabetes mellitus

VBC-122

Introduction to Molecular Biology & Biotechnology

25 Marks

Section-'A'

- Q. 1 Define the term tissue culture and explain in detail the different methods of culturing the tissue in vitro. (05)
- Q. 2 Draw a well-labelled structure of a typical animal cell and explain the functions of mitochondria, golgi bodies, rough endoplasmic reticulum and cell membrane. (05)
- Q. 3 What are monoclonal antibodies? Explain the technique involved in production of monoclonal antibodies. (05)
- Q. 4 What is PCR? Explain the technique and applications. (05)
- Q. 5 Write notes on: (05)
a) Transgenic animals
b) Vaccines

Section-'B'

- Q. 6 Define the following terms: (05)
a) Geonome
d) Fermentation
b) Sub-culture
e) Prophylaxis
c) In-vitro fertilization
- Q. 7 A) Choose the most appropriate answer: (2.5)
1) Cell lines are cryopreserved at -196°C in
a) Liquid O₂
c) Liquid ammonia
b) Liquid N₂
d) Liquid CO₂
- 2) Enzyme used for polymerization in PCR is
a) Taq polymerase
c) DNA ligase
b) RNA polymerase
d) None of above
- 3) The nitrogenous base not present in DNA structure
a) Adenine
c) Cytosine
b) Guanine
d) Uracil
- 4) Which of the following hormone is used for superovulation in cattle.
a) Progesterone
c) LH
b) FSH
d) Estradiol
- 5) Non-sense codons that cause termination of protein synthesis are
a) UAA
c) UGA
b) UAG
d) All of these

B) Rewrite the statement after making necessary corrections, if required. (2.5)

- 1) During ETT synchronization of estrus is essential.
- 2) Nonsense codon is essential for the initiation of protein synthesis.
- 3) Superovulation of animals is done by using PGF₂ α
- 4) High temperature gradients are essential for PCR.
- 5) Polyclonal antibodies offer excellent tool for purification of substances.

Year : I
Course No. : VBC-121, 122
Credits : 2+1 = 3, 1+1 = 2
Day & Date : Tuesday, 07/07/2009

Academic Year : 2008-2009
Subject : Veterinary Biochemistry - (II)
Total Marks : 50+25 = 75
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) All questions carry equal marks.

VBC - 121

Physiological Chemistry

(50 Marks)

Section - 'A'

- Q.1 Explain β - Oxidation with chemical reactions. (10)
- Q.2 Discuss Urea cycle with chemical reactions. (10)
- Q.3 Define Enzyme. Write the effect of substrate concentration on enzyme action. Describe the effect of competitive and non-competitive inhibitors on enzyme. (10)
- Q.4 Write the functional components of complex -I present in electron transport chain and discuss its functions. (10)
- Q.5 a) Define Vitamin. Write functions and symptoms of deficiency of vit A. (10)
b) Classify Minerals. Discuss the role of iron in Anemia.

Section - 'B'

- Q.6 Choose the most appropriate answer and rewrite. (10)
- 1) Within cells urea cycle takes place in
a) Mitochondria
b) Cytoplasm
c) In both the organelle
- 2) In aerobic glycolysis one molecule of glucose produces net
a) 8 ATP
b) 4 ATP
c) 10 ATP
d) None
- 3) Within cells TCA cycle takes place in
a) Cytoplasm
b) Mitochondria
c) Ribosome
- 4) The Vit-A having hormone like action is
a) Retinol
b) Retinal
c) Retionic acid
d) All
- 5) Condensation of oxaloacetate and acetyl-CoA in TCA cycle is catalyzed by
a) Fumarate dehydrogenase
b) Succinate dehydrogenase
c) Citrate synthase
- 6) The glycolytic enzyme inhibited by fluoride is
a) Enolase
b) Hexokinase
c) Aldolase

- 7) *Mammalian RBC* is unable to perform TCA cycle due to lack of
- a) Nucleous
 - b) Mitochondria
 - c) Endoplasmic reticulum
- 8) An odd chain fatty acid metabolized through β - oxidation yield
- a) Acetyl CoA and propionyl CoA
 - b) Acetyl CoA only
 - c) Acetyl CoA and butyryl CoA
- 9) In simple stomach animals ketone body is mainly synthesized in
- a) Liver
 - b) Heart
 - c) Skeletal muscle
- 10) Substrate level ATP in TCA is produced by the action of
- a) Succinate thiokinase
 - b) Succinate dehydrogenase
 - c) Fumerase
- Q.7 Define the following. (10)
- 1) B.M.R.
 - 2) Glycolysis
 - 3) Katal
 - 4) Substrate
 - 5) Transamination

VBC - 122

Introduction to Molecular Biology and Biotechnology

(25 Marks)

Section - 'A'

- Q.1 Write a note on DNA replication. (05)
- Q.2 Write short note on PCR. (05)
- Q.3 Give an account of ETT. (05)
- Q.4 Define cell culture. Describe lymphocyte culture. (05)
- Q.5 Write a note on transgenic animal. (05)

Section - 'B'

- Q.6 Write the correct answer. (05)
- 1) Eukaryotic mRNAs are
- a) Polycistronic
 - b) Monocistronic
 - c) None
- 2) The nitrogenous base thymine is generally present in
- a) DNA
 - b) tRNA
 - c) mRNA
 - d) rRNA
- 3) Anticodon of AUG is
- a) TAC
 - b) AUC
 - c) UAC
 - d) CAT
- 4) The number of genetic codes (triplet codons) is
- a) 61
 - b) 62
 - c) 63
 - d) 64

- 5) Reverse transcriptase is used to form
- a) RNA from DNA
 - b) DNA from RNA
 - c) RNA from RNA
 - d) DNA from DNA

- Q.7 Give at least two differentiating points between the following terms. (05)

- 1) RNA & DNA
- 2) Antigen & Antibody
- 3) Nucleotides & nucleosides
- 4) Monoclonal & polyclonal antibodies
- 5) Eukaryotic & prokaryotic cells.

10 22

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

Year : I (Old)
Course No. : VBC-121, 122
Credits : 2+1 = 3, 1+1 = 2
Day & Date : Tuesday, 15/06/2010

Academic Year : 2009-2010
Subject : Veterinary Biochemistry - (II)
Total Marks : 50+25 = 75
Time : 09.00 to 12.00 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) All Questions Carry Equal Marks.

VBC-121

Physiological Chemistry

50 Marks

Section - 'A'

- Q.1 Describe in detail all steps of TCA cycle with structure and its energetics. (10)
- Q.2 Define enzymes, explain the mechanism of action, and write the factors affecting enzyme action. (10)
- Q.3 Describe formation and utilization of ketone bodies in ruminants. (10)
- Q.4 Describe the process of transamination, oxidative and non-oxidative deamination. (10)
- Q.5 A) Classify minerals. Enlist major minerals and describe their functions. (05)
B) Functions and deficiency symptoms of fat soluble vitamins. (05)

Section - 'B'

Q.6 Give one word answer for the followings:

- 1) Vitamin B₁ is also called as.
- 2) The common enzyme for ketone body and cholesterol synthesis in the body.
- 3) Vitamin concerned with blood clotting.
- 4) The characteristic red colour of haemoglobin is due to.
- 5) Methionine and cysteine contain the mineral.
- 6) The condition in which sodium levels falls below normal.
- 7) Inhibitor of enolase enzyme in glycolysis.
- 8) The product of anaerobic glycolysis.
- 9) Cell organelle where TCA cycle takes place.
- 10) The digestive secretion containing no digestive enzymes.

Q.7 A) Define the following:

- 1) Enzyme
- 2) Coenzyme
- 3) R.Q.
- 4) Gluconeogenesis
- 5) BMR

B) Match the followings:

Column 'A'

- 1) Iodine
- 2) Selenium
- 3) Vitamin-C
- 4) Vitamin-D
- 5) Phosphorous

Column 'B'

- a) Pica
- b) Scurvy
- c) Goitre
- d) Antioxidant
- e) Rickets

Section - 'A'

- Q.1 Describe different steps of ETT with its utility in Veterinary field. (05)
- Q.2 Illustrate Monoclonal Anti-body production with suitable diagram and state its utility. (05)
- Q.3 Write the general principles of cell culture technique and give the environmental conditions required for it. (05)
- Q.4 Write the principle of the followings: (05)
- a) Cryopreservation of cells.
 - b) Recombinant DNA
 - c) Polymerase Chain Reaction
 - d) Fermentation Technology for bio-mass production
 - e) Sub unit Vaccine
- Q.5 A) Explain the steps of recombinant DNA technology? (2.5)
B) Give its applications in Veterinary field. (2.5)

Section - 'B'

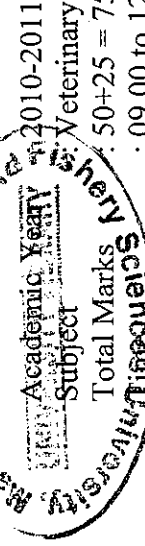
- Q.6 Choose the most appropriate answer among given choices: (5)
- 1) Restriction endonucleases can recognize
- a) Homopolymer sequences
 - b) Chimeric DNA
 - c) DNA-RNA hybrids
 - d) Palindromic sequences
- 2) All except the following can be used as expression vectors
- a) Plasmid
 - b) Bacteriophage
 - c) Baculovirus
 - d) *E-coli*
- 3) The first protein synthesized by rDNA technology is
- a) Streptokinase
 - b) Human growth hormone
 - c) Human insulin
 - d) Tissue plasminogen activator
- 4) The optimum temperature of DNA polymerase of *T. aquaticus* is
- a) 30° C
 - b) 37° C
 - c) 54° C
 - d) 72° C
- 5) Twenty cycles of PCR can amplify DNA into
- a) 2²⁰
 - b) 20²
 - c) 20 x 2
 - d) 20 fold

Q.7 A) Match the followings:

- | | |
|--|---|
| <p>Group 'A'</p> <ul style="list-style-type: none">1) Northern blot2) DNA sequencing3) Oestrus synchronization4) Primer5) Hybridoma | <p>Group 'B'</p> <ul style="list-style-type: none">a) HAT mediumb) 10-20 base DNA fragmentc) Sanger's methodd) PGF_{2α}e) RNA/DNA hybridizationf) Endoplasmic reticulum |
|--|---|
- B) Define the following terms: (2.5)
- 1) Subunit Vaccine
 - 2) Cell line
 - 3) Gene
 - 4) Hybridoma
 - 5) Plasmid

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

Year : I (Old)
Course No.(s) : VBC-121, 122
Credits : 2+1 = 3, 1+1 = 2
Day & Date : Tuesday, 14/06/2011



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 well-labelled diagram wherever necessary.

VBC-121 (2+1)

Physiological Chemistry

(Marks - 50)

SECTION – ‘A’

- Q. 1. What are enzymes? Give the classification of enzymes with suitable examples of each class. (10)
- Q. 2. Describe the common metabolic pathway of carbohydrate, lipids and proteins with its energetics. (10)
- Q. 3. Describe urea cycle in mammals. (10)
- Q. 4. Explain the β -oxidation of fatty acids along with energetics. (10)
- Q. 5. Write short note on:
a) Gluconeogenesis (10)
b) Donnan's theory of membrane equilibrium (10)

SECTION – ‘B’

- Q. 6. Answer/explain in one line. (10)
- Hyperglycemia
 - To which condition gout is associated?
 - Which Vitamin is associated with blood clotting?
 - The hormones regulating blood glucose level.
 - R.Q. 0.7 is indicative of what types of metabolism?
 - Which is the site of urea formation in body?
 - Give the term to indicate removal of amino group.
 - Name the different ketone bodies.
 - Which is the catabolic end product of purine?
 - Which is the site of electron transport chain system?
- Q. 7. A) Define the following. (05)
- Anabolism
 - Glycogenesis
 - Lipogenesis
 - Anaerobic glycolysis
 - Proteinuria

- D}** Choose the correct answer from the options given below. (05)
- i) Net Production of ATP in aerobic glycolysis is
a) 2 ATP b) 8 ATP
c) 30 ATP d) 38 ATP
- ii) Carnitine is required for the transport of
a) Amino acid b) Volatile fatty acid
c) Long chain fatty acid d) All of the above
- iii) The BMR of young animal is
a) More than the BMR of an adult animal of same species. b) Less than the BMR of an adult animal of same species.
c) Equal to the BMR of an adult animal. d) None of these
- iv) The coenzyme form of riboflavin is
a) FMN b) TPP
c) NAD d) ATP
- v) Deficiency of calcium in adult animals
a) Pica b) Rickets
c) Osteomalacia d) None of these

VBC-122 (1+1)

Molecular Biology and Biotechnology

(Marks - 25)

SECTION - 'A'

- Q. 1 Define biotechnology and give its application in veterinary science. (05)
- Q. 2 Draw a well-labeled diagram of animal cell and explain in brief the functions of its sub-cellular components. (05)
- Q. 3 Give an account of embryo transfer technology and its advantages (05)
- Q. 4 Give the stages involved in protein biosynthesis. (05)
- Q. 5 Write short note on:
a) Monoclonal antibody production technique and application. (05)
b) Fermentation technology (05)

SECTION - 'B'

- Q. 6 Define the following: (05)
- i) Plasmid
ii) Cryopreservation
iii) Transgenesis
iv) Subculture
v) Chromosome
- Q. 7 A) Choose the correct answer from the options given below. (2.5)
- i) The enzyme used for polymerization in PCR is
a) Taq polymerase b) RNA polymerase
c) DNA gyrase d) None of these
- ii) The medium used to select hybridoma is
a) AMP buffer b) HGPRT
c) HAT

- iii) A clone is derived
 - a) Sexually
 - b) Asexually
 - c) All of the above
 - d) None of the above
- iv) The Sequencing of a gene is done by
 - a) Sangar's method
 - b) Maxim Gilbert method
 - c) By both method
 - d) None of these methods
- v) Screening of monoclonal antibody production is done by
 - a) ELISA
 - b) Western blot
 - c) Southern blot
 - d) All of the above
- B) Rewrite the statement after making necessary corrections, if required (2.5)
 - i) Adjuvants are added to antigens to stimulate the immune response.
 - ii) Cultivation of cells in vitro is termed as "cell culture".
 - iii) Double Helical DNA structure was proposed by Chargoff.
 - iv) Mitosis is a characteristics division of generative cells in which gametes are formed.
 - v) Bacterial cells is an example of eukaryotic cell.
