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[20]

SARDAR PATEL UNIVERSITY

M. Sc (Int.) Biotechnology: Semester IV Examination

Thursday, 2nd November, 2017

Time: 10.00 am to 1.00 pm

Sub: PS04CIGB01: Bioenergetics

Total Marks: 70

Q-1 Give the answer by choosing appropriate option. **[8 X 1]**

(1) _____ is considered as lower energetic compound.
(a) PEP (b) Glucose 6-phosphate(c) Phosphocreatine (d) none of these

(2) Following enzyme show reversible reaction in glycolysis
(a) Pyruvate kinase (b)Phosphoglycerate kinase
(c) Hexokinase (d) None of these

(3) How many NADH are produced in TCA.
(a) 2 (b) 1 (c) 3 (d) None of these

(4) The major site for Electron Transport Chain is _____.
(a) Liver(b) Mitochondrial matrix (c) Chloroplast (d) None of these

(5) _____enzyme converts Fumarate to Malate.
(a) Aconitase(b) Fumerase (c) Malate dehydrogenase (d) hexokinase

(6) _____ is the major site for salvage pathway.
(a) Brain (b) liver (c) kidney (d) None of these

(7) How many ATPs are produced when 4 glucose molecules enter in glycolysis.
(a) 32 (b) (c) 8 (d) None of them

(8) The amount of energy released after hydrolysis of one phosphoenolpyruvate is_____
(a)7.3 kcal (b) 73 kcal (c) 730 kcal (d) None of these

Q-2 Answer the following questions in short. (Any seven) **[7 X 2]**

(1) Explain Gibb's free energy, Entropy, Enthalpy and its correlation.
(2) What is standard redox potential?
(3) Discuss ATP production during Tricarboxylic acid cycle.
(4) What is HMP? Explain importance of it.
(5) Why TCA cycle is known as an open cycle?

P.T.O.

(6) Differentiate TCA and glyoxylate cycle.
(7) Write thermodynamics laws.
(8) Differentiate purines and pyrimidines.
(9) What is salvage pathway?

Q-3 (a) Give a detailed account on chemiosmotic coupling. [06]

(b) Discuss the Electron Transport Chain in brief. [06]

OR

(b) Discuss hydrolysis of Adenosine triphosphate. [06]

Q-4 (a) Write a short note on glycolysis and discuss its energetics. [06]

(b) Discussthe steps of gluconeogenesis from pyruvate. [06]

OR

(b) Write a brief note on glycogenesis. [06]

Q-5 (a) Discuss regulation of Tricarboxylic acid cycle. [06]

(b) Describe the TCA cycle indetail. [06]

OR

(b) Write a detailed note on Glyoxylate cycle. [06]

Q-6 (a) Outline the denovo pathway for the synthesis of pyrimidine nucleotides. [06]

(b) Discuss the pathway for degradation of purine nucleotides. [06]

OR

(b) Explain the steps of ATP and GTP synthesis from parent purine nucleotide and its regulation. [06]

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[14]

SARDAR PATEL UNIVERSITY

M.Sc. (Integrated) Biotechnology, Fourth Semester Examination

Monday, 6th November 2017

10:00 A.M to 1:00 P.M

PS04CIGB02: Biochemistry-II

Total Marks: 70

Note: (1) Figures to the right indicate marks.
(2) Draw a neat and labeled diagram, wherever necessary.

Q. 1 Choose the most appropriate answer from the four alternatives given: **[8]**

(1) The breakdown reactions that takes place in cell are known as :
(a) Anabolism (b) Catabolism (c) Metabolism (d) none of them

(2) The energy currency of cell is :
(a) ATP (b) ADP (c) GTP (d) TMP

(3) Night Blindness is caused by deficiency of:
(a) Vitamin A (b) Vitamin B (c) Vitamin C (d) Vitamin K

(4) Fatty acid degradation is known as:
(a) A degradation (b) M degradation (c) P degradation (d) β degradation

(5) Which enzymes take part in Transamination reactions:
(a) Transferases (b) Lipase (c) Amylase (d) all of the above

(6) The _____ liberated in TCA cycle can be utilized in Urea cycle.
(a) Water (b) CO_2 (c) Hydrogen (d) Calcium

(7) Krabbe's disease caused by a hereditary deficiency of enzyme :
(a) β galactosidase (b) lLipase (c) Glucosidase (d) Carboxydase

(8) Lack of melanin pigment results in:
(a) Alkaptonuria (b) Leprosy (c) Bone diseases (d) Albinism

PTO

Q.2 **Answer any SEVEN from the following:** [14]

(1) Define holoenzymes and prosthetic groups.
(2) What is ATP and its role.
(3) Narrate biological significance of vitamin K.
(4) Functions of triacylgycerol.
(5) Disease related to vitamin D.
(6) Give deamination reaction.
(7) What is hyperammonemia and its symptoms.
(8) Enlist disorders of lipids..
(9) What is maple syrup disease.

Q.3(a) Write a detail account on"OTHLIL"Give an example for each class. [6]

(b) What are energy rich molecules.Explain two in detail. [6]

OR

(b) What are Coenzymes,Cofactor and Apoenzyme. [6]

Q.4 (a) β –Oxidation. [6]

(b) Explain Vitamin A. [6]

OR

(b) Write a note on Fatty Acids. [6]

Q.5 (a) Explain Urea Cycle. [6]

(b) Explain transamination reaction and its significance. [6]

OR

(b) Draw structure of Alanine,Aspartic Acid,Proline and Lysine. [6]

Q.6 (a) Explain disorders of glycogen metabolism. [6]

(b) What is gout explain in brief. [6]

OR

(b) Define phenylketonuria and explain it in detail. [6]

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SARDAR PATEL UNIVERSITY

M. Sc Integrated Biotechnology (IGBT) - IVth (04) Semester

SubjectCode& Subject: PS04CIGB03- ENVIRONMENTAL BIOLOGY

Date: 08-11-2017, Wednesday Time: 10: 00A.M. TO 01: 00 P.M Total Marks: 70

Note: (1) All questions are compulsory. (2)Figure to right indicates marks.

Q-1. Answer the following objective questions. 01X08= 08

1. Pedology is a branch of ecology that deals with the study of.....
(A)Soil (B) Fossil (C) Rocks (D) Forest

2. .....is an organism that produces complex organic compounds from simple substances present inits surroundings.
(A) Autotrophs (B) Heterotrophs (C)Consumers (D) Decomposers

3.....is any relationship between organisms of different species in which one organism is inhibited.
(A)Amensalism (B) Predation (C) Competition (D) Parasitism

4. .....is the ratio of the number of births to the size of the population; birth rate.
(A) Natality(B) Mortality (C) Both (A) and (B) (D) None of them

5. Diurnal variation may be ..... as in fresh water sources.
(A). 4^0C (B). 1^0C (C). 34^0C (D). 37^0C

6. Range of temperature within which living organisms carry on their life activity is called.....
(A).Energy Zone (B). Biokinetic Zone(C). Heat Zone (D). Cold Zone

7. Radiation of wavelengths longer than 760 nm is considered to be ..... light.
(A). Visible (B). Infra-red (C). Ultra violet (D) None of them

8. Wavelengths shorter than 287um are absorbed by the .....in the earth atmosphere.
(A).Moisture (B) Gases (C). Clouds (D). None of them

Q-2. Answer the following (Any Seven). 02X07=14

1. Write the abiotic components of ecosystems.
2. Define food chain and Heterotrophs
3. Explain the mutualism with give suitable example.
4. What is a Survivorship curve?
5. Draw the figure of soil profile.
6. Justify-"Pond as an ecosystem".
7. Enlist the effect of light on animal.
8. Enlist the different type of adaptations.
9. Draw the nitrogen cycle

P.T.O

Q-3 (A) Define ecosystems. Enlist the biotic components of ecosystems. Explain any three components. (06)

(B) Discuss the ecological pyramid of numbers and pyramid biomass. (06)

OR

(B) Discuss the scope of ecology and its factors. (06)

Q-4 (A). What is biotic relationship? Discuss the inter-specific relationship. (06)

(B) Write a short note on Biological Clock. (06)

OR

(B) Define the population ecology. Discuss the Natality and Mortality. (06)

Q-5 (A). Discuss the effects of water on animals. (06)

(B) What are the aquatic ecosystems. Discuss any one ecosystem. (06)

OR

(B) Write a short note on Coniferous ecosystem. (06)

Q-6 (A). Discuss the effects of temperature on plants. (06)

(B) Write a short note on Fossorial adaptation. (06)

OR

(B) Discuss the effect of light on plants. (06)

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( ) SARDAR PATEL UNIVERSITY

M. Sc. Integrated Biotechnology, Fourth Semester Examination

Date: Monday, 13-11-2017

Time: 10:00 am to 1:00 pm

Paper Code and Subject: PS04CIGB05, Molecular Biology-II

Total Marks: 70

Q-1 Multiple choice questions (All are compulsory). [08]

(1) Which enzyme produces the primer synthesized in E. coli DNA replication?
a) DNA primase b) DNA polymerase (pol III)
c) DNA polymerase (pol I) d) DNA ligase

(2) Supercoiling of DNA is released by
a) Topoisomerase b) Helicase c) Polymerase d) DNA ligase

(3) RNA transcription process is carried out by..... enzyme
a) RNA polymerase b) DNA polymerase c) DNA ligase d) none

(4) Which enzyme is incorrectly matched to its function?
a) RNA polymerase – transcription
b) Aminoacyl-tRNA synthetase -attaches an amino acid to a mRNA
c) Peptidyl transferase – translation
d) DNA ligase -joins Okazaki fragments

(5) During elongation in the translation process the energy is supplied by
a) GTP b) CTP C) TTP d) None

(6) The action of ultraviolet radiation on DNA to induce mutation is the
a) Formation of thymidine dimers b) Methylation of base pairs
c) Deletion of base pairs d) Addition of base pairs

(7) The rate of transcription if decreased by
a) Activator b) promoter c) Repressor d) cAMP

(8) Which of the following is STOP codon.
a) UAA b) UAG c) UGA d) All

Q-2 Answer the following questions in short. (Any Seven) [14]

(1) What is origin? Explain.

(2) What do you mean by processivity of an enzyme?

(3) Give diagrammatic representation of D- loop replication.

(4) Write a note on promoter region

(5) Give difference between DNA replication and RNA transcription.

(6) Draw structure of tRNA.

(7) Give steps of charging of tRNA.

(8) Give a short account of transposon.

(9) What do you mean by frame shift mutation?

Q-3	(A)	Enlist different enzymes and proteins utilized in prokaryotic replication and give roles of each.	[06]
	(B)	Explain rolling circle model of replication with diagram.	[06]
		OR	
	(B)	Write experiment showing mode of replication is semi conservative.	[06]
Q-4	(A)	Explain different modes of transcription termination with diagram.	[06]
	(B)	Describe the mechanism of prokaryotic transcription elongation.	[06]
		OR	
	(B)	Give significance of promoters and pre initiation complex formation in prokaryotic transcription in detail.	[06]
Q-5	(A)	Explain the mechanism of initiation of translation in prokaryotes.	[06]
	(B)	Describe roles of elongation factors in detail.	[06]
		OR	
	(B)	Give an account of peptide bond formation and translocation events of translation elongation in detail.	[06]
Q-6	(A)	Write a detail note on lac operon.	[06]
	(B)	Explain the mechanism of Trp operon.	[06]
		OR	
	(B)	Write a short note on Mutation.	[06]

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[501] **Sardar Patel University**

M.Sc. Integrated Biotechnology, Fourth Semester Examination

Wednesday, 15th November, 2017

10:00 a.m. to 01:00 p.m.

PS04CIGB06: Virology

Total Marks: 70

Note:

1. Figures to the right indicate marks.
2. Draw neat and labeled diagram, wherever necessary.

Q.1 Attempt the following [8]

i. Genetic material of ___ bacteriophage is directly used as mRNA template for further translation event.
(a) MS2 (b) Φx174 (c) Mu (d) T7

ii. H and G genes in Φx174 encode for____ proteins.
(a) tail (b) early (c) capsid (d) spike

iii. Icosahedral capsids have ____vertices.
(a) 8 (b) 10 (c) 12 (d)14

iv. _____established decisively the existence of bacterial viruses.
(a) Herelle (b) Stanley (c) Wendell (d) Ellermann

v. Which single stranded DNA bacteriophage is used for sequencing using Sanger's Method?
(a) MS2 (b) M13 (c) φ6 (d) ΦX 174

vi. The process by which phage reproduction is initiated in lysogenized culture is called___.
(a) Induction (b) Infection (c) Integration (d) Repression

vii. _____is an example of complementation.
(a) TMV (b) HIV (c) SV40 (d) RSV

viii. Cosmid can carry inserts of _____size.
(a) 5kb (b) 10kb (c) 15kb (d) 28kb

Q.2 Answer the following questions. (**Any Seven**) [14]

i. Diagrammatically explain 'one step growth curve' of bacteriophages.
ii. Explain the genetic map of bacteriophage MS2.
iii. Give full form of ICTV.
iv. Mention 2 methods of virus purification.
v. Viruses are connecting link between living organisms and particulate matter. Comment.
vi. What is Eclipse period?
vii. What is lysogeny? Write advantages of lysogeny.
viii. What are Coliphages
ix. What is replacement λ vector?

Q.3	A	Discuss multiplication and life cycle of Φx174 bacteriophage.	[6]
	B	Explain Baltimore System of virus classification.	[6]
		OR	
	B	Explain various stages of infection and replication in T7 bacteriophage.	[6]
Q.4	A	Explain hemagglutination assay.	[6]
	B	How are viruses similar to cellular organisms? How do they differ?	[6]
		OR	
	B	What is 'transposition'? Discuss the process of transposition in Mu phages.	[6]
Q.5	A	Write a note genome of dsDNA phage T7.	[6]
	B	Explain the genome organization of ΦX 174.	[6]
		OR	
	B	Write a note on ssRNA phage MS2.	[6]
Q.6	A	Write a short note on host induced modification in bacteriophage.	[6]
	B	State salient features of viral vector? Give and example of lambda phage vector.	[6]
		OR	
	B	Give an account on phage M13 vectors.	[6]

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