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SEAT No. _____

No. of Printed Pages: 02

[122]

SARDAR PATEL UNIVERSITY
M. Sc (Int.) Biotechnology: Semester IV Examination
Monday, 11th April, 2017
Time: 02:00 pm to 05:00 pm

PS04CIGB01: Bioenergetics

Total Marks: 70

Q-1 Give the answer by choosing appropriate option.

[8]

- In an endergonic reaction, ΔG^0 is positive then the direction of chemical reactions under standard conditions proceeds _____.
- (1) a. Forward b. Reverse c. Equilibrium d. None of these
- Which of this enzyme reaction is not reversible in catabolism of Glucose?
- (2) (a) Phosphofructokinase (b) Hexokinase (c) Pyruvate kinase (d) All of these
- Following is a regulatory enzyme in citric acid cycle.
- (3) (a) Isocitrate dehydrogenase (b) Malate dehydrogenase
(c) Succinate dehydrogenase (d) None of these
- The synthesis of glucose from non-carbohydrate compound is known as
- (4) _____
(a) HMP (b) Glycolysis (c) Gluconeogenesis (d) None of these
- Following is known as an open cycle.
- (5) (a) Glycolysis (b) TCA (c) HMP (d) All of these
- Following is an intermediate in the anabolism of Adenosine monophosphate
- (6) (a) XMP (b) Orotate (c) Adenylysuccinate (d) None of these
- Following enzyme is involved in the conversion of AMP to ADP.
- (7) (a) AMP kinase (b) ADP kinase (c) ATP kinase (d) None of these
- The amount of energy released after hydrolysis of PEP is _____
- (8) (a) -61.9.0 kJ/mol (b) -49.0 kJ/mol (c) 730 kcal (d) -30 kJ/mol

Q-2 Answer the following questions in short. (Any seven)

[7 X2]

- (1) Define the terms – Reducing equivalent and standard reduction potential.
- (2) Differentiate high energy and low energy compounds.
- (3) Discuss ATP production during glycolysis and TCA.
- (4) What is glyoxylate cycle?
- (5) Explain amphibolic nature of TCA cycle?
- (6) What is the importance of 2,3-bisphosphoglycerate?
- (7) What is Pasteur effect?
- (8) How TMP and CTP are synthesized from UTP?
- (9) Differentiate purines and pyrimidines.

(1)

- Q-3 (a) Write a detailed note on proton pump and its significance. [06]
(b) Explain biological oxidation-reduction reactions with suitable examples. [06]
OR
(b) What is the role of Mg^{+2} in ATP hydrolysis? Explain- The free energy change for ATP hydrolysis is large and negative. [06]
- Q-4 (a) Explain gluconeogenesis from the source pyruvate in detail. [06]
(b) Briefly discuss the oxidative phase of pentose phosphate pathway and its significance. [06]
OR
(b) Write a short note on glycogenesis. [06]
- Q-5 (a) Discuss irreversible reactions of TCA cycle [06]
(b) Discuss anaplerotic reactions of TCA cycle. [06]
OR
(b) Describe regulation of Krebs cycle in detail. [06]
- Q-6 (a) What is CPS? Discuss the role of CPS in the synthesis of pyrimidines and its regulation. [06]
(b) Draw the pathway for the synthesis of parent purine nucleotide from Ribose-5 phosphate with structures. [06]
OR
(b) Explain the pathway for the degradation AMP to uric acid. [06]

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Sardar Patel University

M. Sc. Integrated Biotechnology Examination, Fourth Semester

Thursday, 13th April, 2017

02:00 p.m. to 05:00 p.m.

PS04CIGB02: Biochemistry – II

Total Marks: 70

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

Q.1 Choose the Correct Answers of the Following. [08]

- Enzymes increases the rate of reactions by _____.
(a) Increasing the free energy of activation
(b) Decreasing the energy of activation
(c) Changing the equilibrium constant of the reaction
(d) Increasing the free energy change of the reaction
- A protein part of an enzyme is known as _____.
(a) Apoenzyme (b) Prosthetic (c) Holoenzyme (d) Cofactor
- _____ is involved in biosynthesis of malonyl-CoA from acetyl-CoA.
(a) Acetyl-CoA reductase (b) Acetyl-CoA carboxylase
(c) Malonyl -CoA reductase (d) Malonyl -CoA carboxylase
- Biotin is involved in which of the following types of reactions?
(a) Deamination (b) Caboxylation (c) Oxidation (d) Reduction
- Epinephrine is synthesise from _____ amino acid.
(a) Glycine (b) tryptophan (c) tyrosine (d) Methionine
- _____ is a sulfur containing amino acid, plays a key role in transmethylation reaction.
(a) Methionine (b) cysteine (c) cystine (d) proline
- _____ is an autosomal recessive disorder affecting approximately 1 in 10000 infants, detected by the Guthrie test.
(a) Alkaptouria (b) Phenylketonuria (c) Gout (d) Homocystinuria
- The most toxic compounds among following is _____.
(a) tyrosine (b) phenylpyruvate (c) phenylalanine (d) lysine

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

- What is enzyme? Write about active site of enzymes.
- Define: Holoenzyme and Co-enzyme.
- What is Hypervitaminosis?
- Write down the importance of triglycerol.
- What are the metabolic roles of pantothenic acid?
- How can a cell distinguish proteins that are meant for degradation?
- How pyridoxal phosphate (PLP) is useful in transamination reaction?
- Write the diagnosis and treat of fructose intolerance.
- Narrate the signs and symptoms of Tay-Sach's Disease.

- Q.3 (A) What is the central role of ATP in metabolism? [06]
(B) Explain energy coupling reaction in detail. [06]
OR
(B) Explain the Classification for Oxidoreductases enzyme with examples. [06]
- Q.4 (A) Explain the steps of activation, transport and β -oxidation of saturated fatty acid. [06]
(B) Write down a detail note on Vitamin B₁₂. [06]
OR
(B) Describe chemistry, functions and deficiency manifestations of Vitamin C. [06]
- Q.5 (A) Discuss the metabolism of ammonia containing end product of protein metabolism. [06]
(B) Explain the involvement of deamination reactions in amino acid metabolism. [06]
OR
(B) Explain the metabolism of aromatic amino acid tyrosine for biosynthesis of melanin. [06]
- Q.6 (A) Write an Explanatory note on Maple Syrup Urine Disease and Galactosemia. [06]
(B) Write an explanatory note on GOUT. [06]
OR
(B) Enlist various glycogen storage diseases. Discuss any two in detail. [06]

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SARDAR PATEL UNIVERSITY

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

Subject Code & Subject: PS04CIGB03- ENVIRONMENTAL BIOLOGY

Date: 17-04-2017, Monday Time: 02: 00 P.M. TO 05: 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.....is the other nourishing components and consumes the product of the autotrophs.
(A)Heterotrophic components(B)Autotrophic components(C)Homotrophic components(D)Hetro-auto components
 - 2.....are the largest ecosystems and their productivity varies in different climatic regions.
(A)Pond (B) Oceans (C) Lakes (D) River
 3. Commensalism benefit to the two associating species is
(A)Mutualism (B) Neutralism (C) Commensalism (D) Mutation
 - 4.....is an ecological concept that is based on the number of offspring produced during a period of time.
(A) Natality (B) Fecundity (C) Mortality (D) Fertility
 5. Xeric habitats the living organisms have to face
(A)Water and temperature (B)Water and light (C)Water and heat (D)Water and salt
 6.is applied to the amount of water that plants can absorb out of holarid.
(A) Echard (B) Chresard (C) Holard (D) Combined water
 7. Very low temperature and alpine vegetation being dominant in
(A)Hekistotherms (B) Megatherms (C) Mesotherms (D) Microthermus
 8. Frequency of wave lengths in visible light ranges from.....
(A) 400 to 600 nm (B) 390 to 760 nm (C) 500 to 600 nm (D) 800 to 900 nm
- Q-2. Answer the following (Any Seven). 02X07=14**
1. Define productivity and gross productivity of ecosystem.
 2. Write the scope of ecology.
 3. Write a short note on Biological clock.
 4. What is survivorship curve?
 5. Write the difference between sandy and clay soils.
 6. Draw the figure of soil profile.
 7. Define photokinesis and phototropism.
 8. Enlist examples of desert flora and fauna.
 9. What is adaptation? Enlist the animals show the different types of adaptations.

P.T.O

Q-3 (A) Define Ecosystem. What are the abiotic components? Discuss any two components. (06)

(B) What is food web? Explain with suitable flow chart. (06)

OR

(B) What are the ecological pyramids? Discuss the pyramid of biomass and pyramid energy. (06)

Q-4 (A). What are different types of biotic relationship on ecosystem? Discuss any two biotic relationships. (06)

(B) Write a note on age structure with suitable diagram. (06)

OR

(B) Define community ecology. Explain any two theory of climax concept. (06)

Q-5 (A). Justify – “Pond as an ecosystem”. (06)

(B) What are the different types of terrestrial ecosystem? Discuss any one ecosystem. (06)

OR

(B) Write a short note on weathering of soil. (06)

Q-5 (A). Discuss the effect of light on animals. (06)

(B) Discuss the effect of temperature on Range and tolerance. (06)

OR

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

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SARDAR PATEL UNIVERSITY
M. Sc. -Integrated Biotechnology – Fourth Semester Examination
Wednesday, 19th April, 2017
Time: 02:00 pm to 05:00 pm

PS04CIGB04: DEVELOPMENTAL BIOLOGY

*Note: (i) Figures to the right indicate marks.
(ii) Draw neat and labeled diagram, wherever necessary.*

Total Marks - 70
[08]

Q-1 Choose the correct option and answer.

- (1) Which one of the following is advanced?
 - a. Tap root system b. Fibrous root system c. Prop root system d. None of these
- (2) Name of the telome which ends with sporangia is called _____.
 - a. Sterile telome b. Fertile telome c. Telome truss d. All of these
- (3) Microsporangium in Angiosperm produces _____.
 - a. Ovules b. Pollen grains c. Megaspores d. All of these
- (4) Formation of fruit without fertilization is called _____.
 - a. Parthenocarpy b. Apomixis c. Polyembryony d. All of these
- (5) Number of polar bodies formed at the end of Oogenesis in mammals is _____.
 - a. One b. Two c. Three d. Four
- (6) The structure responsible for the formation of tail in sperm is _____.
 - a. Mitochondria b. Ribosome c. Centrioles d. None of these
- (7) Outward movement of cells during gastrulation is called _____.
 - a. Epiboly b. Blastulation c. Emboly d. Invagination
- (8) Rapid mitotic cell division after zygote formation is called _____.
 - a. Fission b. Budding c. Parthenogenesis d. Cleavage.

Q-2 Answer the following. (Any seven)

[14]

- (1) Write the characters of dicot plants.
- (2) Justify 'compound leaf is advanced than simple leaf'.
- (3) Write a note on telome truss.
- (4) What is double fertilization? Give example.
- (5) Define apomixis. Write the importance.
- (6) Draw and label the structure of sperm.
- (7) Give a note on Oogenesis in insects.
- (8) Define the terms morula and blastula.
- (9) Draw and label: Blastula stage in frog.

- Q-3 (A) With neat and labeled diagram, explain the life cycle of Angiosperms showing alternation of generation. [6]
- (B) Write note on evolution of Angiosperm leaf through Telome theory and add a note on the evolutionary processes. [6]
- OR**
- (B) Enlist various methods to overcome sexual incompatibility? Write any four in detail. [6]
- Q-4 (A) What are haploids? Write a note on haploid production in plants and its importance. [6]
- (B) Define endosperm. Write a note on its types and importance [6]
- OR**
- (B) Describe the structure and development of anther and male gametophyte. [6]
- Q-5 (A) Give a detail account on the types of eggs. [6]
- (B) Define gametogenesis. Explain Oogenesis with suitable diagram in mammals. [6]
- OR**
- (B) Write an essay on artificial parthenogenesis. Add a note on its significance. [6]
- Q-6 (A) Write a note on the types of cleavage with diagram. [6]
- (B) Write an essay on morphogenetic movements in animal development. [6]
- OR**
- (B) Enlist various genetical disorders during development and explain any two in detail. [6]

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

Day and Date: Friday, 21-04-2017

Time: 2:00 pm to 5:00 pm

Paper Code and Subject: PS04CIGB05, Molecular Biology-II

Total Marks: 70

- Q-1** Multiple choice questions (All are compulsory). [08]
- (1) In nucleic acids, the free hydroxyl group is attached to the _____ carbon of the sugar?
a) 4' b) 3' c) 2' d) 1'
 - (2) In replication of DNA, the helix is opened and untwisted by
a) Ligase b) DNA primase c) DNA helicase d) DNA polymerase
 - (3) The termination of RNA transcription is done by Rho protein which has
a) Helicase activity b) ATPase activity c) both a and b c) None
 - (4) Which sequence enhances the affinity of RNA polymerase with promoter site by interacting with it's CTD tail?
a) TATA box b) UBF c) Up element d) None of the above
 - (5) The inducer for lac operon is :
a) lactose b) allolactose c) β -galactosidase d) galactose
 - (6) Ribosome translocation requires elongation factor.
a) EF-Tu b) EF-Ts c) EF-G d) All of the above
 - (7) Ribosomal Recycling factor (RRF) mimic tRNA for removing tRNA by
a) EF-G-GTP b) EF-G-GDP c) RF-3 GDP d) RF-3 GTP
 - (8) In Nucleotide excision repair (NER) the new DNA is synthesized in gaps regions of DNA by
a) DNA pol I b) DNA pol II c) DNA pol III d) None

- Q-2** Answer the following questions in short. (Any Seven) [14]
- (1) Write a note on role of DNA Gyrase in replication.
 - (2) What do you mean by proofreading and polymerizing activity of polymerase enzyme?
 - (3) Write a note on hemi-methylated DNA.
 - (4) Write a note on structure of mRNA.
 - (5) Write a short note on operator region.
 - (6) What is the role of Puromycin in translation?
 - (7) What do you mean by charging of tRNA?
 - (8) Write a note on base excision repair.
 - (9) Write a note on retrotransposons.

- Q-3** (A) Discuss the process of initiation and enlist the enzymes and proteins involved with their functions in DNA replication. [06]
- (B) Explain β -clamp mechanism for synthesis of continuous and discontinuous strand in DNA replication. [06]

OR

- (B) Explain Meselson and Stahl experiment to prove that DNA replicates by semi-conservative mode. [06]

P.T.O

- Q-4 (A) Discuss the role of Sigma and Nus A cycle for initiation of RNA transcription. [06]
(B) Explain the structure of RNA polymerase and the steps of elongation in transcription. [06]

OR

- (B) Discuss rho dependent and rho independent mechanism of termination in prokaryotic termination. [06]
- Q-5 (A) Explain giving the diagrammatic representation how the peptide bond formation and the Elongation factor EF-G drive translocation of the tRNAs and mRNA during translation? [06]
(B) Discuss how the release factors terminate translation in response to stop codons. [06]

OR

- (B) Discuss the role of Initiation factors direct the assembly of an initiation complex that contains mRNA and Initiator tRNA. [06]
- Q-6 (A) Discuss positive and negative regulation and explain negative inducible regulation in detail with an example. [06]
(B) Discuss a method for detection of mutation and explain physical and chemical mutagens in detail. [06]

OR

- (B) Explain the mechanism of attenuation in trp operon in detail. [06]

****Best of luck*****