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SEAT No. _____

No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

M.Sc. Biotechnology (SEMESTER-II)

Paper: PS02CBIT03- Genetic Engineering and Bioinformatics

Saturday, 15th April, 2017. 10.00 a.m to 01.00 p.m

Marks: 70

Q1. Choose the most appropriate answer:

(8 marks)

- i) Which of the following is NOT true of type II restriction enzymes?
- Modification by methylation within the sequence prevents restriction
 - They are symmetrical made of 4-8 bases
 - They signal the attachment of RNA polymerase
 - They are often palindromic
- ii) A thionucleotide is used to improve site directed mutagenesis since it
- allows the restriction enzymes to cleave the mutant DNA strand
 - it protects the mutant DNA strand from being cleaved by a restriction enzyme
 - it enhances the binding of DNA polymerase
 - it reduces the non specific binding of primer
- iii) Eukaryotic genes may not be expressed properly when cloned into bacteria because of
- Lack of intron splicing mechanisms in bacteria
 - Destruction of the cloned DNA by native endonucleases
 - Promoters not being recognized by bacterial RNA polymerases
 - All of the above
- iv) The modified nucleotide used in Sanger's method of sequencing known is as _____
- Dideoxy ribonucleotide
 - methyl Adenine
 - methyl Guanine
 - deoxy ribonucleotide
- v) Which of the following is not a protein database
- PIR
 - SWISS PROT
 - DDBJ
 - TrEMBL
- vi) Which of the following is not a gene prediction method
- Chou-Fasman method
 - Homology Method
 - Ab initio* method
 - Comparative method
- vii) Which of the following is/are desirable characteristic of phylogenetic markers
- Event should occur in deep time
 - Gene should be highly conserved
 - Gene that changes very slowly
 - All of the above
- viii) What is meant by a lead compound in drug discovery?
- A drug containing the element lead
 - A leading drug in a particular area of medicine
 - A compound that acts as the starting point for drug design and development
 - A drug which is normally the first to be prescribed for a particular ailment

(1)

Q2. Answer **any seven** of the following questions in brief:

(14 marks)

1. Homopolymer tailing
2. Blue-white screening
3. Dideoxynucleotide
4. Taqman probe
5. Composite database
6. Dot Plot
7. ExPASy
8. CATH
9. 3D Viewing software

3. a) Explain the principles and most common methods for the removal of proteins from DNA samples. 06

b) Discuss the principle and advantages of modified PCR based method for site directed mutagenesis 06

OR

b) Write a note on the reaction parameters and significance of ligation in DNA cloning 06

4. a) Discuss the principle and procedure for the Sanger's method for DNA sequencing. Explain how this method is better than Maxam-Gilbert's method. 06

b) Outline the principle of Taqman probe method for real time PCR. What are the advantages and limitations of this method? 06

OR

b) Write notes on i) SCAR markers ii) AFLP 06

5. a) Enlist various databases and explain any two in details. 06

b) Explain various BLAST and their working in detail. 06

OR

b) Write notes on multiple sequence alignment (MSA)? Discuss how it is helpful to find out evolutionary relationship among organisms. 06

6. a) Discuss any two methods for the protein secondary structure prediction. 06

b) Discuss the mechanism of molecular phylogeny. Explain different types of phylogenetic tree. 06

OR

b) What are the different stages in drug discovery? Explain how bioinformatics plays a significant role in drug discovery. 06

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Sardar Patel University
M Sc II Semester Microbiology/Biotechnology
PSO2CMIC01/BIT01 Bioprocess and Biochemical Engineering
External Theory Examination

Date : 10th April, 2017

Max Marks : 70

Time: 10:00 am to 1:00 pm

Q. 1 Choose the correct answer: (08)

1. The cyclone column reactor is a type of
 - a) hydrodynamic system
 - b) air lift reactor
 - c) pneumatic system
 - d) All
2. The tube and shell are a type of
 - a) bioreactors
 - b) heat exchangers
 - c) filters
 - d) stirrer seals
3. Lyophilizers are used in
 - a) sterilization
 - b) culture preservation
 - c) Cell disruption
 - d) Cell separation
4. Which of these is a nitrogen source
 - a) Molasses
 - b) Corn starch
 - c) Corn steep liquor
 - d) vegetable oils
5. θ_m is associated with
 - a) agitation aeration
 - b) solvent extraction
 - c) cell disruption
 - d) filtration
6. PT-100 is a
 - a) biosensor
 - b) filter
 - c) controller
 - d) none of these
7. The mixing time is symbolized as
 - a) Del factor
 - b) $K_L a$
 - c) μ
 - d) θ_m
8. Dynamic gassing out technique is used for determination of
 - a) $K_L a$
 - b) mixing time
 - c) air flow rate
 - d) filtration rate

Q. 2 Explain the terms in brief: **(any seven)** (14)

- a) Feedback systems
- b) Supercritical fluid extraction
- c) Imperfectly mixed bioreactors
- d) Scale up and scale down
- e) Mass transfer
- f) Dcrit
- g) Pneumatic systems
- h) Feed forward loop
- i) Holding time

Q. 3 A) Explain secondary screening (06)

B) Write a note (Any one) (06)

- a) Carbon sources
- b) Industrially important organism

Q. 4 A) Explain the kinetics of a batch sterilization process (06)

B) Discuss the design of a fixed laboratory scale fermentor (06)

OR

B) Discuss with a diagram the design pressure cycle reactor (06)

Q. 5 A) Explain microprocessor based control systems (06)

B) Write a note on (any one) (06)

- i) PID controllers
- ii) Fedbatch cultivation

Q. 6 A) Discuss downstream processing strategies (06)

B) Write a note on (any one) (06)

- i) Cross flow filtration
- ii) Cell disruption

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No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

M.Sc (II Semester) Biotechnology Examination (CBCS)

Wednesday, 19th April, 2017

Time - 10:00 am to 1:00 pm

PS02EBIT02 –Toxicology

TOTAL MARKS: 70

Q.1 Tick mark / select the correct answer for the following. (Only correct option against given question number needs to be written in provided answer book) (08 Marks)

1. Cycasin (methyl azoxy methanol glycoside) is a potent carcinogen only if it is exposed by
(a) Nasal route (b) Dermal route (c) Oral route (d) any route
2. Which of the following toxicant has maximum toxicity?
(a) Cyanide (b) Botulinum toxin (c) caffeine (d) Paraquat
3. If the toxic response of the two toxicants is greater than the individual response than this effect is known as
(a) Additive (b) Potentiation or Synergism (c) Antagonism (d) None
4. The toxic effect of a toxicant is affected by
(a) Dose of toxicant (b) frequency of exposure (c) route of exposure (d) all of the above
5. The larger the _____, the better the chemotherapeutic effect
(a) therapeutic index (c) toxic dose
(b) therapeutic dose (d) selective toxicity
6. Benzoic acid, a food additive, is used as
(a) Preservative (c) Flavouring agent
(b) Emulsifier (d) antioxidant
7. All are greenhouse gases except:
(a) Methane (c) Ozone
(b) Nitrous oxide (d) Nitrogen
8. Herbicides 2, 4 D and 2, 4 T are
(a) Photosynthetic inhibitors (c) Respiratory inhibitors
(b) Growth stimulators (d) Growth inhibitors

(1)

(P.T.O)

Q.2 Answer any seven from the following:

(14 marks)

- 1) Name the antidote used for toxicity caused by N-acetylbenzoquinoneimine, a phase I product of paracetamol.
- 2) Is cytochrome P450 enzyme polymorphic? Discuss in brief.
- 3) Where does phase II metabolism take place?
- 4) Enumerate the list of enzymes in phase I reactions involving xenobiotic metabolism?
- 5) Define the term rancidity. Which broad category of food additives are used to prevent rancidity?
- 6) Differentiate between acute and chronic toxicity.
- 7) What are the advantages of using *Drosophila* as a test organism in toxicology studies?
- 8) What is 'risk assessment' with reference to toxicology?
- 9) What is the importance of structure-activity relationship in pharmacodynamics?

Q.3 A: Draw a dose response curve and show NOEL, LD50 and maximum toxicity levels in the graph.

(6 marks)

Q.3 B: Explain the role of Cytochrome P450 enzymes in metabolism of toxicants.

(6 marks)

OR

Q.3 B: Differentiate between

(6 marks)

(i) Pharmacokinetics and Pharmacodynamics

(ii) Synergism and Antagonism.

Q.4 A: Explain the bacteria reversed mutation assay (Ames test) to detect mutagenic properties of test chemicals.

(6 marks)

Q.4 B: Give examples of any six toxicants with their toxic effects.

(6 marks)

OR

Q.4 B: What is fluctuation test? What is it used for?

(6 marks)

Q.5 A: Write short notes on: (6 marks)

1. General measures for management of poisoned patients
2. Methanol toxicity

Q.5 B: Explain the toxicity of organophosphorous insecticides with suitable examples.

(6 marks)

OR

Q.5 B: Write a note on various types of insecticides.

(6 marks)

Q.6 A: Explain the metabolism and chronic toxicity of paracetamol.

(6 marks)

Q.6 B: What is Therapeutic Drug Monitoring (TDM)? What are the major criteria for valid therapeutic drug monitoring?

(6 marks)

OR

Q.6 B: Explain any two manifestations of plumbism.

(6 marks)

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[] SARDAR PATEL UNIVERSITY
M.Sc. (IV & II Semester- CBCS) Examination
Subject: Biotechnology/Microbiology/Biochemistry
PS04EBIT01/PS02EMICO1/PS02EBIC01;
Phytoresource Utilization & Conservation
Monday, April 18, 2017; Time: 10.00 a.m. to 1.00 p.m.

Total Marks: 70

Note: Figures in brackets indicate marks

Answer all the questions in the given answer book

- Q1. Choose the appropriate answer for the following multiple choice questions: (8x1=8)
- Habitat diversity over a large landscape or geographical area is referred as:
(a) Alfa diversity (b) Beta diversity
(c) Gamma diversity (d) Bio diversity
 - The credit of popularizing the concept of Biodiversity mainly goes to:
(a) G.J. Martin (b) Earnest Heckel
(c) John Harshberger (d) E.O. Wilson
 - Conifer wood is mostly composed of:
(a) Vessel elements (b) Tracheids (c) parenchyma (d) Fiber
 - Ethnobotany deals with our:
(a) Economic uses of Biodiveristy (b) Ethnic uses of biodiversity
(c) Ethnic uses of phytoresources (d) Ethnic relations with phytoresources
 - Cultivation of traditional crop varieties in local agricultural lands is:
(a) Ex-situ conservation (b) In situ conservation
(c) Combination of ex-situ and in-situ conservation
(d) Neither ex-situ nor in-situ conservation
 - Dicotyledon wood is known as:
(a) Porus wood (b) Hard wood
(c) Both (a) and (b) (d) Neither (a) nor (b)
 - Which of the following trees is known for calcium rich fruits?
(a) *Moringa olifera* (Drumstick)
(b) *Phyllanthus emblica* (Indian goose berry)
(c) Both A and B
(d) Neither A nor B
 - Growth rings are distinctly seen in the trees of:
(a) Monocots (b) Dicots (c) Conifers (d) None of these
- Q2. Answer any SEVEN of the following in brief: (7x2=14)
- What are wild relatives? How are they important?
 - What is reaction wood? What are its salient features? What is its significance?
 - Giving any two suitable examples to justify how ethnobotany differs from economic botany.
 - How does heart wood differs from sapwood? Which of these two more economically important? Why?
 - Name any two Indian Ethnobotanists? What is their major contribution?
 - What are bordered pits? What is their significance?
 - List any two plant conservation centres of national importance. Where are they located?
 - Give botanical names of any four gum yielding plants.
 - What are botanical pesticides? What are their advantages? Give botanical names of two sources of such pesticides.

Contd. Page 2

- Q3. (A) "Define Ethnobotany. Why is that it is said to be multidisciplinary subject? Justify your answer with reasons. (6)
- (B) Give a comprehensive account on ethnomedicobotanical data collection. (6)

OR

- (B) (i) The concept of Sacred Groves is a proved lesson on phytorsource conservation. Justify the statement. (3)
- (ii) What is the botanical source of Indian saffron? What are its uses? (3)
- Q4 (A) Listing botanical names, recommend any six avenue trees of your choice for an urban area. Give a brief note on each of their salient features. (6)
- (B) "We obtain around 95% of our daily requirement of energy from a wide diversity of phytoresources available to us. Do you agree with the statement? Justify your answer in either the case giving suitable examples. (6)

OR

- (B) Name any four little known phytoresources, having scope for wider usage for their merits. Offer your innovative ideas for making them popular. (6)
- Q5 (A) "Describe the origin, cultivation, useful products and uses of any two oil yielding crops studied by you. (6)
- (B) What are the important criteria used for determination of the botanical source and quality of wood? (6)

OR

- (B) Write notes on:
- (i) Fiber yielding plants (3)
- (ii) Gene banks (3)
- Q6 (A) Write short notes on:
- (i) Role of Botanical gardens in conservation of threatened phytoresources. (3)
- (ii) Major threats to agribiodiversity (3)
- (B) Justify any two of the following statements with suitable examples:
- (i) "Many of the phytoresources can be potential alternatives for conservation of fossil fuels. (3)
- (ii) "Palms and Fruit yielding trees are not good choice for plantations along highways" (3)
- (iii) "Traditional knowledge on phytoresources is more threatened than the phytoresources." (3)

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