

**SARDAR PATEL UNIVERSITY**  
**FOOD BIOTECHNOLOGY (HOME SCIENCE)**  
**M.Sc. IInd Semester Examination**  
**Tuesday, December 04, 2012**  
**10:30 AM to 1:30 PM**  
**PH02CFBT01 R-DNA Technology**

**Max. Marks: 70**

- Note:** 1. Figures to the right indicate marks  
 2. All questions are compulsory

- Q1** Choose the most appropriate answer. **(8 x 01)**
- (i) The matrix generally used to separate eukaryotic mRNA from total RNA preparation contain  
 (a) poly A (b) poly T (c) poly G (d) DEAE
- (ii) Washing of DNA pellet is carried out with 70% ethanol mainly to  
 (a) remove salt  
 (b) remove contaminants  
 (c) dissolve DNA  
 (d) remove chloroform-isoamyl alcohol
- (iii) Which one of the following is least stable  
 (a) protein (b) DNA (c) tRNA (d) mRNA
- (iv) All of the following except one are common vectors used in R-DNA technology  
 (a) plasmid (b) satellite DNA  
 (c) BAC (d) cosmid
- (v) An analysis of chromosomal DNA using Southern blot technique involves following processes except  
 (a) electrophoresis (b) blotting  
 (c) autoradiography (d) PCR amplification
- (vi) 'Cap' is a structural feature of the following nucleic acid molecules.  
 (a) tRNA (b) DNA (c) mRNA (d) rRNA
- (vii) Following is a non-Watson-Crick base pair:  
 (a) A=T (b) G=U (c) T=A (d) G=C
- (viii) All of the following enzymes except one are used in rDNA technology.  
 (a) Restriction endonuclease (b) DNA ligase  
 (c) alkaline phosphatase (d) cytochrome oxidase

- Q2** Attempt any **SEVEN** of the following **(2 x 07)**
- (a) Define genomic and cDNA library.  
 (b) Explain electroporation.  
 (c) Briefly explain microprojectile bombardment.  
 (d) Draw neat and labeled diagram of pBR322.  
 (e) What is phage display?  
 (f) What are molecular probe?  
 (g) Define reporter gene.  
 (h) What are polylinkers?  
 (i) Explain gene abundance?

**Cont.**

- Q3 (A) Explain Southern blotting and hybridization with suitable example, pointing out the significance of each step? (06)
- (B) Discuss salient features as well as applications of alkaline phosphatase and DNA ligases in R-DNA Technology. (06)
- OR**
- (B) Explain in step wise different stages involved in PCR reactions pointing out their importance. (06)
- Q4 (A) Why solid-phase DNA synthesis is preferred over solution phase synthesis? Describe the significance of capping in DNA synthesis. Also explain with suitable example, role of capping efficiency of each cycle on over all yield of DNA. (06)
- (B) Write a note on HRT and HART. (06)
- OR**
- (B) Discuss the salient features of YAC and cosmid vectors. (06)
- Q5 (A) What a note on molecular markers. (06)
- (B) Write a note on site directed mutagenesis. (06)
- OR**
- (B) Write in detail on Type II restriction endonucleases. (06)
- Q6 (A) Describe different method of cDNA preparation pointing out advantages and limitations of each method. (06)
- (B) Write a note on recombinant DNA vaccine. (06)
- OR**
- (B) Explain with suitable examples the use of regulatable promoter for expression of eukaryotic gene in prokaryotic system. (06)

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