This question paper contains 3 printed pages

6868 *Your Roll No.... ....*

M.Sc. / II Sem.

J

BIOMEDICAL SCIENCE

Paper - MBS - 202 Molecular Biology and Biotechnology

(New Course Admissions of 2009 and onwards)

Time 3 hours *Maximum Marks 70*

(Write your Roll No on the top immediately on receipt of this question paper)

Attempt total of five questions.
Question number one is compulsory.
All questions carry equal marks (14 x 5 =70)

1 Attempt any seven parts of the following Ans. briefly *2 x 7 = 14*

a) Define VNTPs

b) What is the role of Mg^{2+} in PCR reaction mixture ?

c) What is threshold cycle in real time PCR ?

d) What is a gene polymorphism

e) List out the main steps for preparing cDNA library

f) What is Isoshizomers ? Give 2 examples.

g) What is the energy source for Tu-DNA ligase and E coli ligase activity

h) Give the principle of electrophoretic mobility shift assay (EMSA).

i) What do you understand by blue/white selection in cloning

j) Write salient points of Zn finger motifs.

PTO

2 a) What are the common properties shared by cloning vectors ? What are the disadvantages using plasmids as cloning vector ? What are shuttle vectors ?

b) On what principles is real time PCR based ? Discuss advantages and disadvantages of real time PCR ? What is RT-PCR *7 x 2 = 14*

3 a) Define any three of the following describing their role in biotechnology.

(i) DNA ligase
(ii) DNA polymerase
(iii) Reverse transcriplase
(iv) Site directed mutagenesis.

b) Describe the general properties of restriciton enzymes and their use in biotechnology. Differentiate between type I & type II restriction endoucleases. Why the genome of organism that produces these endouucleases not cleaved by enzyme. *7 x 2 = 14*

4 a) You are interested in two human proteins Moe & Curly Moe is a nuclear protein and Curly has a Zn finger domain How would you check if there is any protein - protein interaction between Moe and Curly Give any one method & describe its principle. *06*

b) List out various chromatin remodelling complexes ? How do they differ from nucleosomes ? Give the mode of action of any two complexes *08*

5 a) Spl transcription factor has undergone mutation in the gene resulting in loss of its DNA binding activity Based on the concept of modular structure of proteins
(a) Which region may have got mutated
(b) How will you check & identify the mutation
Give the method & its principle

b) How is arabinose operon regulated in E coli. Discuss briefly the salient features *2 x 7 = 14*

6 a) Although our genome is same in all the cells, yet we see differential expression of genes in different tissues. List out the different ways (any 7) by which the expression of a gene may be regulated

b) 'Gain of function' of a proto-oncogene results in cancer. Is this a true statement Justify your answer by giving one example *2 x 7 = 14*

Write short notes on any four of the following :
i) Yeast artificial chromosome
ii) Designing of primers for PCR
iii) DNA finger printing in paternity dispute.
iv) Ex-vivo gene therapy
v) Difference between transformed cells & immortalized cells.
vi) Role of acetylation / deacetylation in gene regulation
2 x 7 = 14