

**2016****M.Sc.****3rd Semester Examination****MICROBIOLOGY****PAPER—MCB-301***Full Marks : 40**Time : 2 Hours*

*The figures in the right-hand margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

*Illustrate the answers wherever necessary.*

**Separate answer scripts to be used for each groups.**

Answer any two questions from each group.

**Group — A****[Marks : 20]**

1. What are the types of genetic alterations you may find in cancer cell lines like HepG2 and HeLa? Describe the structures of HaSV and RSV? If you inject HaSV into rat, what type of changes may occur? "HIV virus is latent"—explain. What do you mean by AIDS? Describe the functions of two oncogenes, one tyrosine kinase and another transcription factor. 2+2+2+1+1+2

(Turn Over)

2. Define Quorum sensing? Describe the mechanisms Quorum sensing in Gram negative bacteria. Differ between totipotent and unipotent stem cells? Briefly state the applications of stem cells. 1+4+2+3
3. Write short notes on the following : 4×2½
- (a) Caspase 9 of and apoptotic pathways ;
  - (b) Colchicin and chromosome structure ;
  - (c) P<sub>53</sub> tumor supressor gene structure and function ;
  - (d) Necrosis ;
  - (e) Apoptosome ;
  - (f) CKIs.

### Group — B

[Marks : 20]

1. (a) What is q-PCR? In which respect, q-PCR is differed from normal PCR? 1+2
- (b) Write the name of the membranes used in Western blotting. 1
- (c) Compare C-DNA and genomic DNA library. 2
- (d) Briefly describe the application of genetic engineering in agriculture. 4

2. (a) Write the name of two vectors employed in human gene therapy. 1
- (b) Write the steps for isolation of gene codes for known specific protein through flow chart. 3
- (c) A linear DNA molecule of 1 Kb long is digested with Bam HI and ECoRI, producing the following results :  
Bam HI : 400 bp + 600bp  
ECoRI : 250 bp + 750 bp  
Bam HI + ECoRI : 250 bp + 350 bp + 400 bp  
Derive the restriction map. 2
- (d) Write in brief about the techniques applied for generation of transgenic animal. 4
3. Write short notes on the following (any four) :  $4 \times 2 \frac{1}{2}$
- (a) Ty vector ;
- (b) Molecular probe and its applications ;
- (c) Chromosome walking ;
- (d) Restriction modification system of bacteria ;
- (e) Blue-white selection ;
- (f) Hazards of genetic engineering.