

**M.Sc. Examination, 2017**  
**Semester – IV**  
**Zoology**  
**Paper – MZET – 401**  
**(Molecular Cell Biology & Genetics)**

**Time: 4 hours**

**Full Marks: 80**

Questions are of value as indicated in the margin.  
Answer any *eight* questions

1. Describe the role of cyclin B-CDK complex during progression to metaphase in mitotic cell division. How cells proceed to Anaphase and complete mitosis?  
6+4 = 10
  2. Describe the different phases of cell cycle. How are these phases regulated by different cyclin-CDK complexes?  
3+7 = 10
  3. Describe the molecular events involved in the establishment and maintenance of lysogeny in the lambda phage.  
5+5 = 10
  4. Define attenuation and antitermination. Elaborate their respective role in the regulation of gene expression giving suitable examples.  
(1+1)+(4+4) = 10
  5. What do you mean by RNAi? How do the microRNAs mediate gene silencing?  
2+8 = 10
  6. What are caspases? How do the caspases function in intrinsic and extrinsic pathways of apoptosis?  
2+(4+4) = 10
  7. How cells communicate with each other? Describe the role of G-protein coupled receptors (GPCRs) in signal transduction of cells.  
2+8 = 10
  8. a) How do *cadherins* differ from *integrins* in structure and function?  
b) What is the role of *selectin* in cell adhesion?  
8+2 = 10
  9. How do cancer cells differ from normal cells? Describe virus induced transformation of normal cell into cancer cell.  
2+8 = 10
  10. Write short notes on the following (*any four*) :  
2½x4 = 10
    - a) Synaptic transmission
    - b) Difference between necrosis and apoptosis
    - c) Eukaryotic mediator complex
    - d) Role of p53 in cell cycle arrest
    - e) NF-kB signaling
    - f) Diplotene arrest in meiosis
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