

## M.Sc. Sem.-1 Examination

403

Cancer Biology

January-2024

Time : 2-30 Hours]

[Max. Marks : 70

## Instructions:

All Questions are compulsory  
Draw neat and labeled diagram  
wherever necessary

- Q-1 Write the following 14**
- (i) Write a note on oncogenes which code for growth factors and its receptors. 7
- (ii) Describe the major mutations that cause genetic and genomic instability. 7
- OR**
- (i) Explain the normal function of RAS and what happens when RAS get mutated. 7
- (ii) Explain the intrinsic apoptotic pathway. 7
- Q-2 Write the following 14**
- (i) What is tumor suppressor gene? Explain it using P53 as example. 7
- (ii) Describe the role of cyclins and cyclin dependent kinases in different phases of cell cycle. 7
- OR**
- (i) Write a short note on small molecular second messengers. 7
- (ii) Write a note on 'Cell cycle in cancer therapy'. 7
- Q-3 Write the following 14**
- (i) Describe the problem occurs at the end of each replication cycle and explain its consequences. 7
- (ii) How cancer develops? Describe hereditary, familial and sporadic cancers. 7
- OR**
- (i) What is shelterin complex? Explain its role in telomere maintenance. 7
- (ii) How genomic instability can be prevented? 7
- Q-4 Write the following 14**
- (i) Explain structure and functions of telomerase. 7
- (ii) What are microsatellites in DNA? How they gets repaired and what happens if it remains defective? 7
- OR**

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- (i) Write a note on telomerase targeted cancer immunotherapy. 7  
 (ii) How DNA double stranded breaks can be repaired with homology search? 7

Q-5

**Multiple Choice Questions (Any seven out of twelve).**

14

- 1 \_\_\_\_\_ split the signal and route them to multiple outputs.  
 a Node  
 b Junction  
 c Second messenger  
 d Receptor
- 2 Receptors for estradiol hormone are found on \_\_\_\_\_.  
 a Cell surface  
 b Nucleus  
 c Cytoplasm  
 d Mitochondria
- 3 Which of the following enzyme is involved in termination of signaling pathway?  
 a Phosphatase  
 b Kinase  
 c Ligase  
 d Dehydrogenase
- 4 What is the apoptosome complex constructed from?  
 a cytochrome c, Apaf-1 and procaspase-8  
 b cytochrome c, Bcl-2 and procaspase-9  
 c FasL, CD95 and FADD  
 d Apaf-1, cytochrome c and procaspase-9
- 5 CDKs are totally activated by \_\_\_\_\_.  
 a Phosphorylation by a tyrosine kinase  
 b Binding to cyclins  
 c Phosphorylation by Cdk activating protein kinase  
 d Binding to cyclin, and phosphorylation by a Cdk activating protein kinase
- 6 In anaphase of mitosis, \_\_\_\_\_.  
 a Chromosomes line up  
 b Chromosomes form  
 c Two nuclei form  
 d Chromosomes separate
- 7 \_\_\_\_\_ gene is located on chromosome 5.  
 a hTR  
 b hTERT  
 c TRF1  
 d hTP
- 8 Sheltin complex comprise majorly \_\_\_\_\_ proteins.  
 a 5  
 b 9  
 c 6  
 d 4
- 9 The major mechanism of telomerase regulation in human cell is \_\_\_\_\_.  
 a Transcriptional regulation of hTR  
 b Transcriptional regulation of hTERT  
 c Transcriptional regulation of hTP  
 d Transcriptional regulation of hTP and hTERT
- 10 \_\_\_\_\_ is a marker of senescent cells.  
 a Ki-67  
 b Caspase-3  
 c PCNA  
 d SA-Bgal
- 11 \_\_\_\_\_ can occur during any phase of the cell cycle, although it primarily occurs during G1 phase of cell cycle.  
 a Mismatch repair  
 b Base pair excision repair  
 c Homologous recombination  
 d Non-homologous recombination
- 12 Melanomas show gain of \_\_\_\_\_.  
 a Chromosome 7  
 b Chromosome 8  
 c Chromosome 10  
 d Chromosome 22