KATHMANDU UNIVERSITY
End Semester Examination
June/July, 2023

Marks Scored:

Level : B.Tech.
Year : II

Course : BIOT 205
Semester : I

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date 09 JUL 2023

SECTION "A"
[10 Q. × 0.5 = 5 marks]

Mark [**X**] appropriate answer from the given choices.

1. Glycoproteins function in cell recognition which depends on its
   [ ] carbohydrate portion [ ] protein portion
   [ ] carbohydrate and protein portion [ ] lipid portion

2. Transition from G_2 to M is during cell cycle brought about by activation of
   [ ] Cdc_2 / cyclin B is complex [ ] Chk1 /Cdc_2 complex
   [ ] Cdc_2 / phosphate complex [ ] Cdc_2 / p53

3. Half of all cancers involve mutations of the
   [ ] p53 gene [ ] p56 gene [ ] PDGF gene [ ] APC gene

4. A chromosome with terminal centromere is
   [ ] Telocentric [ ] Acrocentric [ ] Polycentric [ ] Metacentric

5. Integral proteins of cell membrane occur
   [ ] on the outer surface [ ] on the inner surface
   [ ] on the both surface [ ] in the phospholipid matrix

6. What is 'study of ageing' called?
   [ ] gerontology [ ] geriatrics [ ] anthropology [ ] ethnology

7. Which of the following is nonliving?
   [ ] Protoplasm [ ] Nucleus [ ] Cytoplasm [ ] Cell wall

8. Terminalisation occurs during
   [ ] Mitosis [ ] Meiosis [ ] Diakinesis [ ] Cytokinesis

9. Paired chromosomes in meiosis in immature amphibian eggs, in which the chromatin forms large stiff loops extending out from the linear axis of the chromosome is
   [ ] Polytene Chromosomes [ ] Mitotic Chromosome
   [ ] Lampbrush Chromosome [ ] Nucleosome

10. Hormonal stimulation of adenylyl cyclase requires
    [ ] GTP [ ] ATP [ ] cAMP [ ] NAD

SECTION "B"
[5Q. × 1 = 5 marks]

Fill in the blanks.

11. Calmodulin is a protein containing……residues.

12. Checkpoint in M phase, arrests mitosis if the daughter chromosomes are not properly aligned on.....

13. An octomer of four types of histone molecu les, complexed with DNA, is called.....

14. Proto-oncogenes can be converted into oncogenes by..... .....

15. .....help to inhibit free-radical production and thus protect cell from damage.

SECTION "C"

[10 Q. × 1 = 10 Marks]

Define in one sentence.

16. Synaptonemal complex

17. Gap junction

18. Autophagic vacuoles

19. Oxysomes

20. Karyotype

21. Glycocalyx

22. Grana

23. Maturation Promoting Factor

24. Telomere

25. Protein kinase A

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Level : B.Tech.
Year : II
Time : 2 hrs. 30 mins.

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Semester : I
F. M. : 55

SECTION "D"
(Long answer questions)
[3 Q. × 7 = 21 marks]

Attempt *ALL* questions.

1. Why meiotic cell division is necessary? Discuss the different stages and significance of meiosis.

2. What is cytoskeleton? Describe the structure and functions of different types of cytoskeletons.

3. What is cell signaling? Give the detail mechanism of intracellular signal transduction.

SECTION "E"
(Short answer questions)

4. Write short notes on: [6 Q. × 4 = 24 marks]
   a. Cilia and flagella
   b. Angiogenesis
   c. Cell cycle check points
   d. Chloroplast
   e. Free radical theory of ageing
   f. Ultrastructure of Nucleosome

5. Give *TWO* major differentiates between: [2 Q. × 2 = 4 marks]
   a. STAT and MAP kinase pathway
   b. Pinocytosis and phagocytosis

6. Explain why/how for the following: [3 Q. × 2 = 6 marks]
   a. Interphase chromosomes are long and uncoiled.
   b. Mitochondria and chloroplasts are semiautonomous.
   c. *p53* stops the cell cycle.