KATHMANDU UNIVERSITY
End Semester Examination [C]
May/June, 2019

Marks Scored:

Level : B.Tech.
Year : II

Course : BIOT 205
Semester: I

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date 07 JUN 2019

SECTION "A"

[10Q. × 0.5 = 5 marks]

Choose and tick [✓]the most appropriate answer.

1. Organisms that need oxygen for cellular respiration are
   [ ] facultative aerobes [ ] obligate aerobes
   [ ] facultative anaerobes [ ] obligate anaerobes

2. Which coat protein are labelled on vesicles when they are transported from Endoplasmic reticulum to Golgi apparatus?
   [ ] Clathrin [ ] COP I
   [ ] COP II [ ] Phosphoinositide

3. Which of the cell junction found in vertebrate epithelial cell anchors intermediate filaments to the extracellular matrix?
   [ ] Adheren junction [ ] Desmosome
   [ ] Tight junction [ ] Hemidesmosome

4. In vertebrates, the sequence of telomere is
   [ ] AATTCC [ ] ATATGC
   [ ] TTAGGC [ ] CTACTA

5. Which of the following is a catastrophe factors that bind to microtubule ends and open them apart, thereby promoting depolymerization of microtubule
   [ ] kinesin 1 [ ] kinesin 5
   [ ] kinesin 13 [ ] kinesin 14

6. Chromosome duplication occurs at
   [ ] G0 phase [ ] G1 phase
   [ ] S phase [ ] G2 phase

7. During cell cycle checkpoints, errors associated with unreplicated DNA is mediated by
   [ ] S cyclin-Cdk complex [ ] M cyclin-Cdk complex
   [ ] APC/C complex [ ] G1/S cyclin-Cdk complex

8. Hormones are released into the blood which signal only the specific target cells; this is an example of
   [ ] endocrine signaling [ ] autocrine signaling
   [ ] synaptic signaling [ ] allosteric signaling

9. Phosphatidylinositol 3,4,5 - triphosphate acts as a docking site for
   [ ] SH2 domain [ ] SH3 domain
   [ ] PH domain [ ] EGF domain

10. Carcinogens disturb nucleotide sequence of DNA and alter genetic makeup which transforms normal cells into malignant cells falls under

[ ] Irritation hypothesis
[ ] Microbial hypothesis
[ ] Somatic mutation hypothesis
[ ] Oncogenic hypothesis

SECTION "B"

[10Q. × 1 = 10 marks]

Fill in the blanks.

11. Retroviruses integrate DNA fragments into host cells; those DNA fragments are synthesized by the enzyme _____.

12. Glyoxylate and _____ are produced from the action of isocitrate lyase on isocitrate.

13. _____ connects actin filament bundle in one cell with the next.

14. The central point of polytene chromosome is called as _____.

15. Z discs, at each end of the sarcomere, are attachment sites for the plus ends of _____.

16. G1 cyclins are also called as _____.

17. An example of anti-apoptotic BCL2 family protein is _____.

18. GPCR is desensitized by receptor phsophorylation and the binding of _____.

19. _____inhibits endothelial cells from responding to multiple angiogenic proteins.

20. _____ protein is also known as the guardian of the genome.

KATHMANDU UNIVERSITY
End Semester Examination [C]
May/June, 2019

07 JUN 2019

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

Course : BIOT 205
Semester : I
F. M. : 55

SECTION "C"

[5Q. × 7 = 35 marks]

Attempt *ANY FIVE* questions.

1. a. Explain the strategies used for the expression of viral genetic material into proteins from the different genetic makeups. [4]
   b. Explain the processing of oligosaccharide through Golgi apparatus. [3]

2. a. Describe the electron transport chain embedded in the inner membrane of Mitochondria. [4]
   b. How did ATP synthesis by chemiosmosis might have evolved in the stages? [3]

3. a. Explain the conformational changes of Glucose transporter fueled by the Sodium gradient. [4]
   b. Explain the various types of chromosome on basis of centromere location. [3]

4. a. Write short note on Smooth Muscle cell contraction. [4]
   b. How does Mitogen stimulate cell cycle entry? [3]

5. a. How does DNA damage induce p21; a Cdk inhibitor protein, ultimately leading into cell cycle arrest? [4]
   b. Explain the four different forms of intercellular signaling. [3]

6. a. How does cytokine receptors activate JAK-STAT signaling pathway? [4]
   b. Describe the extrinsic pathway of apoptosis activated through Fas death receptors. [3]

7. a. How does the behavior of receptor tyrosine kinase changes from normal to abnormal conditions of mutated receptor or amplified receptor? [4]
   b. Explain random epigenetic drift responsible in aging phenotypes. [3]

SECTION "D"

8. Differentiate between: (*ANY FIVE*) [5 × 2 = 10]
   a. Prokaryotic and Eukaryotic cell
   b. Pinocytosis and Phagocytosis
   c. Arrangement of ATP synthase in mitochondria & chloroplast
   d. Polyploidy and Aneuploidy
   e. Cytokinesis in animal and plant cell
   f. Microbial and Irritation hypothesis of oncogenesis

9. Explain How/Why for: (*ANY FIVE*) [5 × 2 = 10]
   a. Compartmentalization offers advantages to eukaryotic cells.
   b. Peroxisomes are important sites for hydrogen peroxide metabolism.
   c. APC complex facilitates chromatin separation during Anaphase.
   d. Secondary messengers and enzymatic cascades amplify signals.
   e. Telomere shortening leads to aging.
   f. Fimbrin creates parallel bundle with actin, but α.-actinin creates contractile bundle.