KATHMANDU UNIVERSITY
End Semester Examination
February/March, 2018

Marks Scored:

Level : B. Tech.
Year : IV

Course : BIOT 410
Semester: I

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date : MAR 12 2018

SECTION "A"
[20 Q. × 0.75 = 15 marks]

Mark "X" in the most appropriate box.

1. The cancer having high mortality rate.
[ ] Testicular [ ] Pancreatic [ ] Ovarian [ ] Cervical

2. Synthetic estrogen that was prescribed to pregnant women in 1940s to prevent miscarriages.
[ ] Phenacetin [ ] Thiotepa [ ] Diethylstilbestrol [ ] Azathioprine

3. The molecule that are oxidized by cytochrome P450 into epoxide.
[ ] Benzidine [ ] Nickel oxide [ ] Asbestos [ ] Vinyl chloride

4. Aflatoxin forms epoxide by reacting with the following nitrogenous base in DNA.
[ ] Adenine [ ] Cytosine [ ] Guanine [ ] Thymine

5. Which of the following has the shortest wavelength?
[ ] Infrared [ ] UV-A [ ] UV-B [ ] UV-C

6. Cancer that is more prominent in radiologists.
[ ] Leukemia [ ] Osteosarcoma [ ] Skin [ ] Liver

7. The standard of reference for Relative biological effectiveness (RBE) is based on
[ ] Alpha particles [ ] Beta particles [ ] Gamma radiations [ ] X-rays

8. When radioactive atom of radon emits an alpha particle, the atom is converted into
[ ] Radium [ ] Plutonium [ ] Polonium [ ] Uranium

9. The protein to which EBV binds and enhance cancer cell motility thereby facilitate the ability of cancer cells to invade and metastasis is
[ ] Nm22-H1 [ ] Nm23-H1 [ ] Nm22-H2 [ ] Nm23-H2

10. About ____ percent of retinoblastoma cases are familial in origin.
[ ] 30 [ ] 40 [ ] 50 [ ] 60

11. The syndrome that arises due to loss of function mutation in gate keeper gene.
[ ] Cowden [ ] Bloom
[ ] Ataxia telangiectasia [ ] Fanconi anemia

12. The BLM gene, whose mutation causes Bloom syndrome, exhibits a recessive pattern of inheritance code for
[ ] Helicase [ ] DNA polymerase [ ] RNA polymerase [ ] Ligase

13. The gene that exhibits a dominant pattern of inheritance for familial breast cancer and a recessive pattern of inheritance for Fanconi anemia is
[ ] ATM [ ] BRCA1 [ ] BRCA2 [ ] RET

14. Anticancer drug called *Herceptin*, is designed to counteract the effects of the overactive _____ gene.
[ ] ERBB2 [ ] MYC [ ] RAS [ ] ABL

15. The oncoprotein that acts as transcription factor
[ ] Raf [ ] Src [ ] Jak [ ] Jun

16. The growth factor that stimulates the proliferation of connective tissue cells.
[ ] EGF [ ] PDGF [ ] FGF [ ] VEGF

17. Type of cancer with highest percentage of p53 mutation.
[ ] Brain [ ] Stomach [ ] Ovary [ ] Breast

18. Which of the following is an example of N-nitroso compounds?
[ ] 3-Methylcholanthrene [ ] Benzidine
[ ] Ethylene oxide [ ] Dimethylnitrosamine

19. The anticancer drug that has been approved against EGF receptor is
[ ] Herceptin [ ] Velcade [ ] Avastin [ ] Tarceva

20. Protein that regulates the activity of a specific group of genes during embryonic development.
[ ] KiSS1 [ ] Twist [ ] Mad [ ] Myc

SECTION "B"

[10 Q. × 0.5 = 5 marks]

Fill in the blanks:

21. The first synthetic dye discovered by Perkin is _____.

22. The immunosuppressive drug that has antibiotic activity and inhibits angiogenesis is _____.

23. Carcinogens that causes permanent mutation leading to damage of gene are referred to as _____.

24. _____ mimic the action of Diacylglycerol (DAG) by binding to and continually activating protein kinase C.

25. Type of skin cancer that accounts for major cancer fatalities is _____.

26. Most people suffered from _____ cancer in the Chernobyl nuclear plant disaster.

27. The retinoblastoma gene is located in chromosome number _____.

28. Proteins called _____ promotes apoptosis by binding to and inhibiting the action of apoptosis inhibitor Bcl2.

29. The phenomenon of chromosomal abnormality frequently observed in cancer cell where the whole chromosome is lost or gained is called_____.

30. A cancer that has not yet invaded through the basal lamina is called _____.

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SECTION "C"

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

Attempt *ANY THREE* questions:

1. What is loss of heterozygosity? Describe three mechanisms that leads to loss of heterozygosity. [1+6]

2. What are the warning signs that act as possible indicators of the presence of cancer? Elaborate on different imaging techniques used for the diagnosis of cancer. [2+5]

3. What are the different groups of oncogenes based on their protein function? Describe.

4. Describe with the help of figure the pathway for repairing double strand DNA break by homologous recombination.

SECTION "D"

(Short answer questions)

5. Write short notes on (*ANY FOUR*): [4 Q. × 3.5 = 14]
   a) Role of Retinoblastoma protein in cell cycle control.
   b) Wnt signaling pathway.
   c) Combination chemotherapy.
   d) Tumor growth depends on angiogenesis.
   e) Density-dependent inhibition of growth.

6. Write down *TWO* differences between (*ANY FOUR*): [4 Q. × 2 = 8]
   a) Antibiotics and Differentiating agents.
   b) Laser surgery and Cryosurgery.
   c) Ames test and Pap smear test.
   d) Radical mastectomy and Partial mastectomy.
   e) Benign tumor and Malignant tumor.

7. Give reasons why/ how? (*ANY FOUR*): [4 Q. × 3 =12]
   a) Angiostatin is not able to prevent the angiogenesis needed for growth of primary tumor.
   b) Cigarette smoke is radioactive.
   c) Strains of *H. pylori* producing CagA proteins are more efficient in causing cancer.
   d) The p53 protein is sometimes called the "guardian of the genome".
   e) The anaphase promoting complex is key to the spindle checkpoint.