

KATHMANDU UNIVERSITY
End Semester Examination
February/March, 2019

Marks Scored:

Level : B. Tech.
Year : IV

Course : BIOT 410
Semester: I

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date **11: MAR 2019**

SECTION "A"

[20 Q. × 0.75 = 15 marks]

Mark "X" in the most appropriate box.

- 1) Which of the following is NOT a component of exonuclease complex formed for the repair of double strand break in DNA?
 ATM BRCA1 Rad50 Rad51
- 2) Protein released into the bloodstream by ovarian cancer.
 CEA CA 125 Alpha-fetoprotein PSA
- 3) An analog of the gonadotropin releasing hormone that controls the release of gonadotropins.
 Leuprolide Flutamide Bicalutamide Testosterone
- 4) The source of natural chemicals called hydrazines which is found in fruit and vegetables and is carcinogenic when tested in animals is
 Mango Apple Pineapple Mushroom
- 5) The most prominent cancer in China is?
 Stomach Oesophagus Liver Lung
- 6) The degradation of mitotic cyclin takes place in
 M phase G1 phase S phase G2 phase
- 7) Chlorambucil is a proven human carcinogen responsible for causing _____ cancer.
 Liver Bladder Leukemia Lung
- 8) The cancer seen in factory employees working with 2-naphthylamine
 Bladder Scrotal Lung Liver
- 9) Which of the following falls under the in natural products among the classes of carcinogenic chemicals?
 Benzidine Vinyl chloride Asbestos Safrole
- 10) The radiation that exhibits no mass or charge.
 Alpha Beta Gamma X-ray
- 11) Hepatitis C virus belongs to the following family.
 Retroviruses Flaviviruses Herpesviruses Hepadnaviruses
- 12) Which of the following genes exhibits a recessive pattern of inheritance?
 PTEN APC ATM BRCA1
- 13) The activation of gene that led to the failure of gene therapy for severe combined immunodeficiency (SCID)
 CagA NF-kappa B MYC LMO2

- 14) Chromosomal translocation that leads to the formation of Philadelphia chromosome is created by translocation between chromosomes?
 8 and 14 8 and 16 9 and 20 9 and 22
- 15) The oncoprotein that acts as cell cycle or cell death regulators?
 ErbB2 Ras Mdm2 Jun
- 16) The enzyme that degrades the cohesin proteins that holds duplicated chromosomes together.
 Mad Bub Separase Cdc20
- 17) Antibiotics that is used as anticancer drug and causes DNA crosslinking is
 Doxorubicin Daunorubicin Bleomycin Mitomycin
- 18) The presence of Reed-Sternberg cells are seen in person's suffering from this disease
 Burkitt's lymphoma Hodgkin's disease
 Kaposi's sarcoma Nasopharyngeal carcinoma
- 19) Basic unit of radiation energy which express the total amount of energy present
 sieverts RBE gray electronvolt
- 20) The drug used in treatment of breast cancer that resembles in structure with estrogen is
 Bleomycin Teniposide Tamoxifen Mitomycin

SECTION "B"

[10 Q. × 0.5 = 5 marks]

Fill in the blanks:

- 21) Chromosomal abnormality frequently observed in cancer cell is the tendency for whole chromosome to be lost or gained is called _____.
- 22) A procedure, in which a physician administers liquid containing barium through the anus into the rectum and colon for screening of colorectal cancer, is called _____.
- 23) Cancer that originates in the supporting tissues such as bone, cartilage, blood vessels, fat, fibrous tissue and muscle are called _____.
- 24) The term used to refer to the inhibition of cell division that takes place when culture conditions become crowded is _____.
- 25) The enzyme responsible for activating mitotic Cdk-cyclin complex is _____.
- 26) Deaminated bases are detected by enzymes called _____.
- 27) Protein produced by embryonic liver cells is _____.
- 28) The disease caused by "needles of death" is called _____.
- 29) The reaction catalyzed by cytochrome P450 is called _____ reaction.
- 30) The first step in the double-strand DNA repair pathway by homologous recombination is the formation of _____ complex.

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SECTION "C"

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

Attempt *ANY THREE* questions:

1. Describe the various classes of drugs used in chemotherapy with examples and their mode of action.
2. What are pathogens? Describe the mechanism employed by DNA and RNA viruses to latently infect cells. [2+5]
3. How receptor tyrosine kinase behaves under normal and abnormal conditions? Describe the Jak-STAT signaling pathway. [3+4]
4. Describe how p53 protein responds to DNA damage. Also describe the role of ubiquitin in targeting proteins for degradation. [3.5+3.5]

SECTION "D"

(Short answer questions)

5. Write short notes on (*ANY FOUR*): [4 Q. × 3.5 = 14]
 - a) Experiments showing that tumor growth are dependent on angiogenesis.
 - b) Mechanism of action of phorbol esters.
 - c) *Helicobacter pylori* and stomach cancer.
 - d) Origin of the TRK oncogene.
 - e) Imaging techniques used for cancer diagnostics.
6. Write down **TWO** differences between (*ANY FOUR*): [4 Q. × 2 = 8]
 - a) Virtual colonoscopy and Conventional colonoscopy.
 - b) Staurosporine and Camptothecin.
 - c) Cancer initiation and Cancer promotion.
 - d) Epstein-Barr virus and Human papillomavirus.
 - e) Risk of genetic testing and Benefits of genetic testing.
7. Give reasons why/ how? (*Any FOUR*): [4 Q. × 3 = 12]
 - a) Anoikis is an important safeguard for maintaining tissue integrity.
 - b) Mutation in a single copy of p53 gene is enough to disrupt the formation of functional p53 protein.
 - c) Tumor progression is an effective way to evade destruction by the immune system.
 - d) When Japanese people move to the United States, their stomach and colon cancer rates change and resemble more closely the rates for these cancers in the United States.
 - e) Stem cell transplantation is generally done after high dose chemotherapy.

