KUMARAGURU
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B.TECH DEGREE EXAMINATIONS: MAY 2017

(Regulation 2014)

Sixth Semester

BIOTECHNOLOGY

U14BTE203 : Cancer Biology

COURSE OUTCOMES

CO1: Understand the mechanism of proto-oncogene and oncogene and apoptosis

CO2: Describe the mechanism of cell cycle regulation in cancer

CO3: Attain the knowledge in the fundamentals of carcinogenesis and its role in cancer

CO4: Illustrate the mechanism of cancer metastasis and

CO5: Comprehend the basis of cancer diagnosis and therapy

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Match th following: CO1   [K_1]

Cell cycle system	Cyclin
A. Mammalian	i. Cyclin1,2,3
B. *S. pombae*	ii. cdc2
C. *S. cerevisiae*	iii. Restriction point
D. Start	iv. Cyclin D - cdk 4,6

	A	B	C	D
a)	iv	ii	i	iii
b)	ii	i	iii	iv
c)	iv	i	ii	iii
d)	ii	iii	i	iv

2. The following are example of proto-oncogenes except………..   CO1   [K_1]

   a) EGF   b) PDGF

   c) TGF   d) $_P$53

3. Which one of the following ionizing radiation have large mass and travel short distances   CO2   [K_1]

   distances

   a) X-Rays   b) Beta Particle

   c) Alpha Particles   d) Gamma Rays

4. One of the following chemical carcinogen is an intercalating agent   CO2   [K_2]

   a) Ethidum bromide   b) 5 Bromouracil

   c) Ethylnitosurea   d) Ethylmethylsulphonate

5. Which one of the following oncogenes is an example of EGFR family   CO3   [K_2]

   a) *IGF-1*   b) *c-kit*

   c) c-*erbB1*   d) *trk-B*

6. Find out correct process flow for EGF family activation: 1. Cell receptor 2. Growth   CO3   [K_1]

   factor 3. Cross autophosphoration 4. Receptor complex activation 5. Signal

   transduction

   a) 2,1,3, 4,5   b) 3,1,2,4,5

   c) 2,4,1,3,5   d) 3,1,4,2,5

7. **Assertion (A):** Senescence and apoptosis are essential for tissue homeostasis   CO$_4$ [K_3]

   Reason (R): Apoptosis is hallmark of cell necrosis and programmed cell death

   a) Both A and R are true and R is the correct   b) Both A and R are true and R is

       explanation of A   not correct explanation of A

   c) A true but R is is false   d) A is false but R is true

8. Which of the following statements are wrong?   CO$_4$ [K_2]

   P. Telomerase is reverse transcriptase   Q. Telomerase active and expressed in somatic

   cells R. Telomerase not expressed in stem cells   S. Telomerase re-expressed in cancer

   cells

   a) Q and R   b) P only

   c) S only   d) P and S

9. Which of the following enzyme may be used as biomarker to identify lung cancer?   CO5   [K_4]

   a) ACP   b) AST

   c) LDH   d) $\gamma - GT$

10. Which of the following molecular tools for diagnosis of cancer   CO5   [K_2]

    a) Transformation   b) Conjugation

    c) RT-PCR   d) Genomic hybridization

PART B (10 x 2 = 20 Marks)

(Answer not more than 40 words)

11.	Relate the check points in cell-cycle regulation	CO1	[K₂]
12.	List out 3 Pathways involved in p53 activation.	CO1	[K₃]
13.	Write the role of telomerase with respect to normal cell	CO2	[K₂]
14.	Relate the role of RTKs in signal transduction	CO2	[K₃]
15.	List out any four DNA tumor virus that cause cancer in human	CO3	[K₂]
16.	Differentiate direct acting and indirect acting carcinogens	CO3	[K₃]
17.	How will you distinguish sporadic cancer with familial Cancer?	CO4	[K₂]
18.	Enlist the properties of cancer cells	CO4	[K₂]
19.	Write short notes on: immunotherapy with suitable examples	CO5	[K₃]
20.	Comment on the role of tumor markers in diagnosing cancers	CO5	[K₁]

Answer any FIVE Questions:-
PART C (5 x 14 = 70 Marks)
(Answer not more than 300 words)

Q. No. 21 is Compulsory

21.	Relate the role of tumor suppressor gene in cell cycle regulation. Discuss the modulation of cell cycle in cancer	(7+7)	CO2	[K₄]
22.	Discuss FOUR techniques that commonly practiced to detect oncogenes in human cancer cells		CO2	[K₂]
23.	Describe EGF/PDGF and their role in RTKs stimulation and activation.	(7+7)	CO3	[K₃]
24.	Write detailed account on: etiology, risk factors and symptoms of breast and uterus cancer.	(5+5+4)	CO4	[K₄]
25.	Elaborate the mechanism of action of various chemotherapeutic drugs for cancer treatment		CO5	[K₄]
26.	Highlight any five MMP and their role in ECM disruption. add short notes on role of protease in basement membrane disruption		CO4	[K₃]
27.	Write detailed account on mammalian cell cycle and their regulation		CO1	[K₂]

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