KUMARAGURU
college of technology
character is life

B.TECH DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Seventh Semester

BIOTECHNOLOGY

U18BTE0006: Molecular Diagnostics

COURSE OUTCOMES

CO1: Define the significance of molecular diagnostics and enlist the type of diseases and infections.
CO2: Evaluate the diagnostic tools available for identifying the infections caused by micro-organisms
CO3: Relate the biomarkers as diagnostic tools and infer the biochemical diagnostics for metabolic disorders.
CO4: Comprehend the techniques for the pre-natal testing of inherited genetic disorders.
CO5: Apply the methods available for the diagnosis of cancer.
CO6: Outline the genetic disorders and the tools employed for the detection of neo-natal diseases.

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

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	What do you mean by inherited disease? Give one example of inherited disease.	CO1	[K$_2$]
2.	Draw a neat sketch on mode of transmission of malaria parasite.	CO1	[K$_3$]
3.	Elucidate the role of Reverse transcriptase in detection of RNA viruses.	CO2	[K$_4$]
4.	List any two molecular diagnostic technique for detection of Hepatitis Viruses and comment its specificity.	CO2	[K$_2$]
5.	What does positive strand of Retrovirus indicate?	CO3	[K$_2$]
6.	Differentiate between diagnostic value and predictive value of an infectious disease.	CO3	[K$_3$]
7.	Evaluate the importance of spectral karyotyping of human chromosomes for disease diagnosis.	CO4	[K$_4$]
8.	What is Chorionic Villi Sampling?	CO4	[K$_3$]
9.	What are monoclonal antibodies? Comment on its usage in pregnancy test kits.	CO6	[K$_3$]
10.	What is Ultrasonography? Explain its application during Antenatal care	CO5	[K$_2$]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11	a)	What is FISH technique? Explain its importance in analyzing the locus of disease-causing genes in human chromosome	8	CO5	[K5]
	b)	Define genetic counselling. Explain how erythroblastosis fetalis can be prevented by genetic counselling.	8	CO5	[K4]
12.	a)	Draw a clear sketch on a genome of any one of RNA virus and explain its detection using commercially available biomarkers.	10	CO6	[K4]
	b)	What is microbial pathogenicity? Give an account on factors predisposing microbial pathogenicity.	6	CO6	[K3]
13.	a)	Critically evaluate the mode of action of peptide vaccines. In addition, discuss with an example where peptides can be used as a vaccine to prevent infectious diseases.	8	CO2	[K3]
	b)	Provide a neat sketch on FDA organization chart and regulatory measures to perform clinical trials on humans to commercialize a newly invented drug.	8	CO2	[K_L]
14.	a)	Comment on various advances in cancer detection and diagnosis and elucidate the mechanism of cancer metastasis.	10	CO3	[K3]
	b)	Identify an appropriate technique to analyze the expression levels of multiple genes (at least 10 genes) of interest. In addition, discuss on various steps involved in analysis of expression profiles of disease-causing genes using microarray technique.	6	CO3	[K2]
15.	a)	Elaborate on the process involved in obtaining FDA approval for newly developed diagnostic markers.	10	CO1	[K2]
	b)	Differentiate between radiation therapy and chemotherapy for treatment of cancers.	6	CO1	[K2]
16.	a)	What is sickle cell anaemia? Analyze the underlying genetic factors responsible for its symptoms and suggest appropriate diagnostic procedures.	8	CO4	[K4]
	b)	Elaborate in detail about the medical complications of cystic fibrosis by carefully evaluating the symptoms of cystic fibrosis.	8	CO4	[K3]

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