

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Second Semester

Biomedical Engineering

BM3252 - Medical Physics

Regulations - 2021

Duration : 3 Hrs

Maximum : 100 Marks

PART - A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	Questions	BLT	CO	Marks
1.	Define refraction of index.	RE	1	2
2.	State the energy ranges of the electromagnetic spectrum which is used in nuclear radiation.	AP	1	2
3.	Give the primary criteria for β^- and β^+ decay.	RE	2	2
4.	Determine the decay constant of 1g of pure potassium 40 that is experimentally determined to emit about 10^5 beta rays per second (given Avogadro's number= 6.02×10^{23}).	AP	2	2
5.	Define Compton scattering.	AP	3	2
6.	Classify the types of neutrons based on their kinetic energy.	RE	3	2
7.	State inverse square law.	RE	4	2
8.	Distinguish between stochastic and non-stochastic effect.	UN	4	2
9.	Differentiate B scan and M scan.	UN	5	2
10.	What percentage of ultrasound beam is reflected from an interface between two medium with acoustic impedance value of 1.65 and 1.55?	AP	5	2

PART - B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No	Questions	BLT	CO	Marks
11.	a What are the limits of vision and describe about color vision with chromaticity diagram. Or	UN	1	16
	b i Explain in detail about high frequency effect of non-ionizing radiation.	UN	1	8
	ii Discuss in detail about applications of thermograph.	UN	1	8
12.	a i Compare any six radio isotopes used in medicine with their energy, half-life, method of production and their application.	UN	2	12
	ii Write a short note on isometric transition.	UN	2	4
	Or			
	b With neat diagram explain how Technetium - 99m is extracted from molybdenum generator.	UN	2	16

13.	a	Write in detail about the interaction of X ray with matter.	UN	3	16
Or					
	b	Derive an expression for the change in wavelength due to Compton effect.	UN	3	16
14.	a	Explain in detail about the relationship between the dosimetric quantities.	UN	4	16
Or					
	b i	Outline the concepts of LD50 and the threshold for toxicity?	UN	4	8
	ii	Write in detail about central nervous system syndrome.	UN	4	8
15.	a	Describe in detail about the interaction of ultrasound with matter.	UN	5	16
Or					
	b	Derive an expression for the change in frequency of sound waves that reflected from the moving blood cells in the radial artery.	UN	5	16