

Module – 3

Q.5	a.	Discuss the representation of qubit and block sphere.	08	L2	CO2
	b.	Describe the working of SWAP gate mentioning its matrix representation and truth table.	08	L2	CO2
	c.	Apply the identity operator on the states $ 0\rangle$ and $ 1\rangle$ to show there is no change in states.	04	L2	CO2

OR

Q.6	a.	Explain Hadamard gate. Show that it is unitary.	08	L2	CO2
	b.	Describe the working of Toffoli gate, mentioning its matrix representation and truth table.	08	L2	CO2
	c.	Show that T gate is related to S gate is $T^2 = S$.	04	L2	CO2

Module – 4

Q.7	a.	Explain the failures of classical free electron theory of metals.	08	L2	CO3
	b.	Describe the evolution of High temperature super conductivity.	08	L2	CO3
	c.	Find the temperature at which there is 1.2 % probability that a state with an every 0.5 eV above Fermi energy is occupied.	04	L3	CO3

OR

Q.8	a.	Define Fermi factor. Discuss the variation of Fermi factor with energy and temperature and represent graphically.	08	L2	CO3
	b.	Briefly explain any 2 applications of super conduction in quantum computing.	08	L2	CO3
	c.	A superconductivity Tin has a critical temperature of 3.7 K at zero magnetic field and a critical field of 0.0306 T at 0 K. Find the critical field at 2 K.	04	L3	CO3

Module – 5

Q.9	a.	Discuss Taxonomy of physics based animation method.	08	L2	CO4
	b.	Distinguish between descriptive and inferential statistics.	08	L2	CO4
	c.	Given the base distance 1 m for the slow in. Calculate the distance between the following frames using odd rule multipliers : i) # 2 & # 3 ii) # 1 & # 4.	04	L3	CO4

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OR

Q.10	a.	Discuss the concept of line and scale in animation with suitable examples.	08	L2	CO4
	b.	Discuss the Monte-Carlo method of estimation of π .	08	L2	CO4
	c.	In an optical fiber experiment the LASER light propagating through the fiber made a spot diameter of 20 mm on the screen. If the distance between the fiber end and the screen is 2.2 cm, estimate the acceptance angle and numerical aperture of the fiber.	04	L3	CO5