Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

USN | | | | | | | | | | |

Fifth Semester B.E. Degree Examination

QUANTUM MECHANICS & SIMULATION TECHNIQUES

TIME: 03 Hours **Max. Marks: 100**

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.
02.
03.

Module – 1

Q.1	(a)	Explain Summary of principal experiments and inferences.	8M
	(b)	Discuss about the Experimental Background of Quantum Mechanics	8 M
	(c)	Write a note on Uncertainty Principle and Complementarity	4M
		OR	
Q.2	(a)	Derive an expression of Schrödinger's wave equation for a freely moving particle in one dimension.	12M
	(b)	Write a note on wave packets	04M
	(c)	Give expression for wave packets in space and wave packets in time	04M
		Module – 2	
Q.3	(a)	Explain the fundamental postulates of quantum mechanics	10M
	(b)	Explain Poisson brackets and Commutator brackets along with the properties.	6M
	(c)	Describe the Explicit representation of operators	4M
		OR	
Q.4	(a)	Explain Schrodinger, Heisenberg pictures in detail.	4M
	(b)	Discuss Expectation values in detail.	8M
	(c)	Explain Quantum operators and Observables in detail.	8M
		Module – 3	
Q.5	(a)	What are Turing machines? Explain working with one example	10M

	(b)	Differentiate between reversible and irreversible computation.	6M
	(c)	Describe Moore's law in detail.	4M
		OR	
Q.6	(a)	Explain Quantum bits with illustration.	8M
	(b)	Define Quantum Computation. Add a note on properties of Quantum computation.	6M
	(c)	Write a short on natural phenomena as computing processes.	6M
		Module – 4	
Q.7	(a)	Write a note on need and technology of surgical simulation.	8M
	(b)	Describe Virtual environment (VE) technology in detail.	8M
	(c)	Write a short note on Telesurgery	4M
		OR	
Q.8	(a)	Give the applications of Virtual environment (VE) technology	6M
	(b)	Give a note on advantages of simulators	6M
	(c)	Write a note on Endoscopy	8 M
		Module – 5	
Q.9	(a)	Briefly discuss Monte Carlo method in detail.	8M
	(b)	Explain peptides in detail	8M
	(c)	Discuss about Beta Sheet in detail	4M
		OR	
Q.10	(a)	Discuss Protein Data Bank in detail.	8M
	(b)	Discuss Heme in detail with neat sketch.	8M
	(c)	Write a short note on alpha Helix	4M

Table showing the Bloom's Taxonomy Level, Course Outcome and Programme Outcome

Question		Bloom's Taxonomy Level attached	Course Outcome	Programme Outcome
Q.1	(a)	L_1	1	1,12
	(b)	L_2	1	1,12
	(c)	L_3	1	1,12
Q.2	(a)	L_1	1	1,12
	(b)	L_2	1	1,12
	(c)	L_3	1	1,12
Q.3	(a)	L_1	2	1,12
	(b)	L_2	2	1,12
	(c)	L_3	2	1,12
Q.4	(a)	L_1	2	1,12
	(b)	L_2	2	1,12
	(c)	L_3	2	1,12
Q.5	(a)	L_1	3	1,12
	(b)	L_2	3	1,12
	(c)	L_3	3	1,12
Q.6	(a)	L_1	3	1,12
	(b)	L_2	3	1,12
	(c)	L_3	3	1,12
Q.7	(a)	L_1	4	1,12
	(b)	L_2	4	1,12
	(c)	L_3	4	1,12
Q.8	(a)	L_1	4	1,12
	(b)	L_2	4	1,12
	(c)	L_3	4	1,12
Q.9	(a)	L_1	5	1,12
	(b)	L_2	5	1,12
	(c)	L_3	5	1,12
Q.10	(a)	L_1	5	1,12
	(b)	L_2	5	1,12
	(c)	L_3	5	1,12

Bloom's Taxonomy Levels	**Lower order thinking skills**		
	Remembering(knowledge):L_1	Understanding Comprehension): L_2	Applying (Application): L_3
	Higher order thinking skills		
	Analyzing (Analysis): L_4	Valuating (Evaluation): L_5	Creating (Synthesis): L_6

Model Question Paper-2 with effect from 2019-20 (CBCS Scheme)

USN | | | | | | | | | | |

Fifth Semester B.E. Degree Examination

QUANTUM MECHANICS & SIMULATION TECHNIQUES

TIME: 03 Hours **Max. Marks: 100**

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.
02.
03.

Module – 1

Q.1	**(a)**	Explain the origin of quantum mechanics	**8M**
	(b)	Discuss about the summary of principle experiments and inferences.	**8 M**
	(c)	Explain the Uncertainty Principle.	**4M**

OR

Q.2	**(a)**	Obtain an expression of Schrödinger's wave equation for a freely moving particle in one dimension.	**12M**
	(b)	Give expression for wave packets in space and wave packets in time	**4M**
	(c)	Write a note on Complementarity.	**4 M**

Module – 2

Q.3	**(a)**	Give the fundamental postulates of quantum mechanics.	**10M**
	(b)	Explain Poisson brackets and Commutator brackets	**6M**
	(c)	Describe the Explicit representation of operators	**4M**

OR

Q.4	**(a)**	Explain Schrodinger in detail.	**4M**
	(b)	Explain about the Expectation values	**8M**
	(c)	Discuss about Quantum operators and Observables in detail.	**8M**

Module – 3

Q.5	**(a)**	Define Turing machine? Explain working with one example	**10M**

	(b)	Explain any 3 major differences between reversible and irreversible computation.	**6 M**
	(c)	Explain Moore's law in detail.	**4M**
		OR	
	(a)	With illustration Explain Quantum bits	**8 M**
	(b)	Define Quantum Computation. Add a note on properties of Quantum computation.	**6 M**
Q.6	**(c)**	Explain the natural phenomena as computing processes.	**6 M**
		Module – 4	
	(a)	Describe Virtual environment (VE) technology in detail.	**8M**
	(b)	Explain the need and technology of surgical simulation.	**8M**
Q.7	**(c)**	Write a short note on Telesurgery	**4M**
		OR	
	(a)	List & Explain the applications of Virtual environment (VE) technology	**8M**
Q.8	**(b)**	Write the benefits of simulators.	**6M**
	(c)	Write a short note on Endoscopy	**6M**
		Module – 5	
	(a)	Discuss about the Monte Carlo method in detail.	**8M**
	(b)	Explain peptides in detail	**8M**
Q.9	**(c)**	Discuss about Beta Sheet in detail.	**4M**
		OR	
	(a)	Explain Protein Data Bank in detail.	**8M**
	(b)	Discuss about Heme in detail with neat sketch.	**8M**
Q.10	**(c)**	Write a short note on alpha Helix	**4M**

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Question		**Bloom's Taxonomy Level attached**	**Course Outcome**	**Programme Outcome**
Q.1	(a)	L_1	1	1,12
	(b)	L_2	1	1,12
	(c)	L_3	1	1,12
Q.2	(a)	L_1	1	1,12
	(b)	L_2	1	1,12
	(c)	L_3	1	1,12
Q.3	(a)	L_1	2	1,12
	(b)	L_2	2	1,12
	(c)	L_3	2	1,12
Q.4	(a)	L_1	2	1,12
	(b)	L_2	2	1,12
	(c)	L_3	2	1,12
Q.5	(a)	L_1	3	1,12
	(b)	L_2	3	1,12
	(c)	L_3	3	1,12
Q.6	(a)	L_1	3	1,12
	(b)	L_2	3	1,12
	(c)	L_3	3	1,12
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	(b)	L_2	4	1,12
	(c)	L_3	4	1,12
Q.8	(a)	L_1	4	1,12
	(b)	L_2	4	1,12
	(c)	L_3	4	1,12
Q.9	(a)	L_1	5	1,12
	(b)	L_2	5	1,12
	(c)	L_3	5	1,12
Q.10	(a)	L_1	5	1,12
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