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| Internal Assessment Test 3 – June 2024 |
| Sub: | Physics for CSE stream | Sub Code: | BPHYS202 | Branch: | CSE & CSE (AIDS) |
| Date: | 25/06/2024 | Duration: | 90 mins | Max Marks: | 50 | Sem/Sec: | II Sem/ I,J,K & L | OBE |
| **Answer any FIVE FULL Questions****Given: c = 3 × 108 m/s; h = 6.625 × 10 -34Js; k = 1.38 × 10 -23 J/K; me = 9.1 × 10-31kg; e = 1.6 × 10-19C** | MARKS | CO | RBT |
| 1 (a) | Explain orthogonality and orthonormality with an example for each. | [06] | CO1 | L2 |
|  (b) | Show that a Hadamard gate is unitary. | [04] | CO1 | L2 |
| 2 (a) | Explain the working of a phase gate with the help of its matrix representation and truth table. | [06] | CO1 | L2 |
|  (b)  | Mention the differences between classical and quantum computing. | [04] | CO1 | L2 |
| 3 (a)  | State Pauli’s X, Y and Z matrices and apply them on |0⟩ and |1⟩ states. | [06] | CO1 | L2 |
|  (b) | Check if the matrix A = $\left[\begin{matrix}2i&1-4i\\1+4i&4\end{matrix}\right]$ is Hermitian. | [04] | CO1 | L3 |

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| 4 (a) | Discuss the CNOT gate with truth table and matrix and show its operation on four different input states. | [6] | CO1 | L2 |
|  (b)  | A linear operator ’A’ operates such that A |0⟩ = i|1⟩ and A |1⟩ = -i|0⟩. Find the matrix representation of ’A’. | [4] | CO1 | L3 |
| 5 (a) | Illustrate odd rule and discuss the various odd rule scenarios with examples. | [6] | CO3 | L2 |
|  (b) | Describe the various parts of a walk. | [4] | CO3 | L2 |
| 6 (a) | Mention the general pattern of Monte- Carlo method and hence determine the value of π.  | [6] | CO3 | L2 |
|  (b) | Mention the differences between descriptive and inferential statistics. | [4] | CO3 | L2 |
| 7 (a) | Discuss the modelling of the probability of proton decay using Poisson distribution. | [6] | CO3 | L2 |
|  (b) | The number of particles emitted per second by a random radioactive source has a Poisson distribution with λ=4. Calculate the probability of P(X=0) and P(X=1). | [4] | CO3 | L3 |
| 8 (a) | Elucidate the importance of size and scale and weight and strength in animation. | [6] | CO3 | L2 |
|  (b) | The jump animation is associated with a push height of 0.5m and a jump magnification of 5.5. Calculate the jump height and the push acceleration given that the gravitational acceleration is 10ms-2. | [4] | CO3 | L3 |

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