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| **Question Number** | **I** | **II** | **III** | **Total** |
| **Mark** |  |  |  |  |

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| **Answer** |  |  |  |  |  | |  |

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| **Question I:**  **Choose the correct answer, then fill in the table above:**  **(1) If is a vector in such that then**  **(a) (b) 1 (c) (d) None of the previous**  **(2) The Wronskian of the functions , is equal to**  **(a) -1 (b) 1 (c) 0 (d) None of the previous**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **(3) The unit vector that has the same direction as**  **(a) (b) (c) (d) None of the previous**  **(4) Let be a subset of then is**  **(a) Linearly independent but does not span (b) Spans but is not linearly independent**  **(c) a basis for (d) None of the previous**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **(5) If the coordinate vector of with respect to the basis of is given by , then the vector**  **(a) (b) (c) (d) None of the previous** |
| **Question II:**  **A. Let Then answer the following**  **(i) Prove that is a subspace of**  **(ii) Find a basis for . What is the dimension of**    **B. Let be vectors in then answer the following**  **(i) Find the value of such that are orthogonal.**  **(ii) Use part (i) to compute.**  **B. Let be a set of vectors in , then answer the following**  **(i) Prove that is a basis for**  **(ii) Write the vector as a linear combination of the vectors in** |
| **Question III:**  **Let , with the following operations for**  **Then answer the following:**   1. **Find the object** 2. **If find the object such that** 3. **Show that is not a vector space with the above operations.**   **Good Luck☺** |