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| **King Saud University** | KSU logo tiff.tif | **Math 151** |
| **Science and Medical Studies Section for girls** | **First Term 1431-32H** |
| **College of Science** | **Final Exam** |
| **Department of Mathematics** | **3 Hours** |

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| **Name:** | | | | **Student No.:** | | | |
| **Section No.:** | | | | **Staff member name:** | | | |
| **Question No** | **I** | **II** | **III** | | **IV** | **V** | **Total** |
| **Mark** |  |  |  | |  |  |  |
| **Question I**  **Choose the correct answer and write it in the following table:**   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Question** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | | **Answer** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   **1) The two compound propositions and are logically equivalent**  **a) true b) false**  **2) The compound proposition is**  **a) a tautology b) a contradiction c) a contingency**  **3) The proposition ‘ If or , then and ” is always**  **a) true b) false**  **4) Let be the statement “”, where is real number. The truth value of is**  **a) true b) false**  **5) Let . The truth value of is**  **a) true b) false**  **6) If , then**  **a) true b) false**  **7) Let be a relation on such that . is equal**  **a) b)**  **c) d) none**  **8) Let . Which of the following is not a partition on .**  **a) b) c)**  **9) If and are equivalence relations on a set , then is an equivalence relation on A.**  **a) true b) false**  **10) Let be a relation on defined by . is**  **a) an equivalence relation b) a partial order relation c) none**  **11) If is a Boolean function, then is equal to**  **a) b) c) d) none**  **12) If as in (11), then the dual of is**  **a) b) c) d) none**  **14) Assume that , and represent Boolean variables, then .**  **a) true b) false**  **15) If , then is equal to**  **a) 0 b) 1**  **16) The number of edges of is**  **a) 20 b) 40 c) 10**  **17) Let be a simple graph with four vertices. is a planar graph.**  **a) true b) false** | | | | | | | |

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| **Question II**  **Prove or disprove the following statements:**  **1) If and are rational numbers, then is a rational number.**  🞎 True 🞎 False  **Because**  **2) If and be relations on a set , then .**  🞎 True 🞎 False  **Because**  **3) There exists a relation which is both an equivalence relation and a partial order relation.**  🞎 True 🞎 False  **Because**  **4) Let be a Boolean algebra, and such that , then .**  🞎 True 🞎 False  **Because**  **5) The Boolean function simplifies to .**  🞎 True 🞎 False  **Because**  **6) Let be a simple graph with five vertices. If the degree of one of them is two, then is a planar graph.**  🞎 True 🞎 False  **Because**  **7) The two following graphs are isomorphic**    🞎 True 🞎 False  **Because**  **8) The following graph is bipartite:**    🞎 True 🞎 False  **Because**  **9) There is a simple graph with six vertices, whose degree sequence is 2, 2, 2, 3, 4, 4.**  🞎 True 🞎 False  **Because**  **10) There is a connected simple planar graph with 10 vertices and 16 edges and 7 regions.**  🞎 True 🞎 False  **Because** |

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| **Question III**  **Let be a sequence defined by**  **and**  **Prove that .** |

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| **Question V**  **Let bea Boolean function. Draw circuit of that contains minimum number of AND gate, and OR gate.** |

Good Luck