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| **Q.No** | **Questions** |
| **1.** | a) Define the following logical operators with truth table  (i) Negation (ii) Conjunction (iii) Disjunction (iv) Conditional (v) Bi-Conditional.  b) If P: “This book is good.” and Q: “This book is costly.”  Write the following statements in symbolic form.   * 1. This book is good & costly.   2. This book is not good but costly.   3. This book is cheap but good.   4. This book is neither good nor costly.   5. If this book is good then it is costly. |
| **2.** | a) If p: Ramu is rich  q: Ramu is handsome  Write the following statements in symbolic form.  a) Ramu is poor but handsome.  b) Ramu is rich and handsome.  c) Ramu is either rich or handsome.  d) It is not true that Ramu is rich or handsome.  e) Ramu is neither rich nor handsome.  b) Write down in symbolic form  If p: You have flu  q : You missed the final exam  r: you passed the course    i) You have flu or you missed the exam or you pass.  ii) If you have flu then you will not pass the course or if you miss final exam, you will not pass  the course.  iii) you have flu and you missed exam or you will not miss the exam and you passed the course. |
| **3.** | a) Write down in symbolic form  1. Jack and Jill went up the hill  2. If either Jerry takes calculus or John takes algebra then Alex takes English  3. The growth of crop will be good if there is a rain.  b) Construct the truth table for |
| **4.** | a) Construct the truth table for  b)Construct Truth Table for |
| **5.** | a) Define i) Converse ii) Contrapositive iii) Inverse .  b) Obtain Converse , Contrapositive and Inverse of  “ Team India wins whenever Dhoni is Captain” |
| **6.** | a) Write down the converse, Contrapositive and Inverse of  “ Home Team wins whenever it rains”  b) Define the following topics with truth table  i) Tautology ii) Contradiction iii) Contingency |
| **7** | a) Check whether the following statement is Tautology using truth table.    b) Check whether the following statement is Contradiction using truth table. |
| **8** | a) Verify whether the following statement is Contingency using Truth table    b) Verify whether the following statement is Contingency using Truth table |
| **9** | a) Construct the truth table for  b) Construct the truth table for |
| **10** | a) Define logical equivalence  b) Prove that |
| **11** | a) Prove that  b) Prove that is Tautology. |
| **12** | a) Define i) Connectives ii) Compound Proposition  b) Define: i) NAND (↑) ii) NOR (↓) |
| **13** | a) Define argument, premises and conclusion in the context of rule of inference.  b) Define: Rule of Modus Pones, Rule of Modus Tollens |
| **14** | a) Test the validity of the following argument:  I will become famous or I will not become a musician.  I will become a musician.  I will become famous  b) Test whether the following is a valid argument:  If I study, then I do not fail in the examination.  If I do not fail in the examination, my father gifts a two-wheeler to me.  If I study then my father gifts a two-wheeler to me. |
| **15** | a) Test the validity of the following arguments:  If I study, I will not fail in the examination.  If I do not watch TV in the evenings, I will study.  I failed in the examination.  I must have watched TV in the evenings.  b) Consider the following argument:  I will get grade A in this course or I will or I will not graduate.  If I do not graduate, I will join the army.  I got grade A.  I will not join the army.  Is this a valid argument? |
| **16** | a) Test the validity of the following arguments:  (i)      (ii)    b) Test whether the following arguments are valid:  (i)          (ii) |
| **17** | a) Define Universal Quantifier, Existential Quantifier, Universe of discourse  b) Suppose the universe consists of all integers. Consider the following open statements:  . Write the truth values of the following:  (i) (iii) |
| **18** | a) Consider the following open statements with the set of all real numbers as the universe.  ,  *, , .* Determine the truth values of the following statements:  (i) (ii) (iii)  b) Write down the following proposition in symbolic form and find its negation: “All integers are rational numbers and some rational numbers are not integers” |
| **19** | a) Write down the following proposition in symbolic form and find its negation: “If all triangles are right- angled then no triangle is equiangular”.  b) Write down the negation of each of the following statements.  (i)For all integers n , if n is not divisible by 2, then n is odd  (ii)If k,m,n are integers where k-m and m-n are odd then k-n is even |
| **20** | a)Apply laws of logic and simplify the following switching networks.    b) Explain Switching network. Simplify the switching network using laws of logic |