KATHMANDU UNIVERSITY
End Semester Examination
February/March, 2019

Marks Scored:

Level : B.Sc.
Year : III

Course : MATH 301
Semester: I

Exam. Roll No.: Time: 30 mins. F.M. : 20

Registration No.: Date FEB 20 2019

SECTION "A"

[10 Q. × 1 = 10 marks]

Fill in the blank space(s) with the most appropriate word(s), figure(s) or symbol(s).

1. Consider the propositions p and q defined as (i) p: Anil is rich (ii) q: Kanchan is poor. In symbolic form the statement 'neither Anil nor Kanchan is poor' is expressed as ____________.

2. $p \vee (p \wedge q) \equiv$ ________________________.

3. For a = 3 and b = 10, the values of q and r such that $a = bq + r$ and $0 \leq r < b$ are q = _________ and r = _________.

4. $[2](mod\ 4) + [3]\ (mod\ 4) =$ ____________________ .

5. In the poset $(Z^+, |)$, the integers 2 and 4 are called ________________ since 2 | 4, but 3 and 5 are not since neither 3 | 5 nor 5 | 3.

6. Let $B_n = [n, 2n]$, then $B_5 \cap B_8 =$ ____________________.

7. The minimum number of edges that are to be removed from a graph to make it disconnected is called ________________________________ of graph.

8. If G(V, E) be an undirected graph, with e edges then according to 'Handshaking theorem', the sum of ___________________________________.

9. In constructing Hasse diagram from digraph of a relation all edges whose existence is implied by ______________________ property of relation are removed.

10. A recurrence relation is defined as $a_0 = 0$, $a_1 =$, $a_n = a_{n-1} + a_{n+2}$, then the value of __________.

SECTION "B"

[10 Q. × 1 = 10 marks]

Fill in the blank space by choosing the most appropriate answers from the given choices. DO NOT TICK the answers.

11. $\sim(p \Rightarrow q) \equiv$ _________________

    (i) $p \nRightarrow q$ (ii) $p \wedge \sim q$ (iii) $p \vee \sim q$ (iv) $\sim p \wedge q$

12. Let "k(x) : x is a student" and " l(x): x is clever." then the statement that "some students are clever" is denoted by ____________________________

    (i) $\exists x\,(k(x) \wedge l(x))$ (ii) $\forall x\,(k(x) \wedge l(x))$
    (iii) $\forall x\,(k(x) \Rightarrow l(x))$ (iv) $\exists x\,(k(x) \vee l(x))$

13. If gcd(a, b) = 1 and b | ap then they imply that ____________________
(i) a | p (ii) a | b (iii) b | p (iv) a | bp

14. If n > 1 be a composite integer, then there exists a prime p such that p | n and ________
(i) $p > n$ (ii) $p \leq \sqrt{n}$ (iii) $p \leq n$ (iv) $p > \sqrt{n}$

15. The subset $A_1, A_2, \ldots\ldots\ldots\ldots, A_n$ is a partition of set A if ________________
(i) $\bigcup_{i=1}^{n} A_i = \Omega$ (ii) $\bigcup_{i=1}^{n} A_i = A$ (iii) $\bigcap_{i=1}^{n} A_i = A$ (iv) $\bigcap_{i=1}^{n} A_i = \phi$

16. If bit string of set A is 01101 and bit string of set B is 00101, then bit string of A – B is ____________________.
(i) 01101 (ii) 00101 (iii) 01000 (iv) 11011

17. The mathematical structure ____________________ is not a poset.
(i) $(\mathbb{Z}, \leq)$ (ii) $(P(A), \subseteq)$ (iii) $(\mathbb{Z}^+, /)$ (iv) $(\mathbb{Z}, <)$

18. A geometric representation of graph redrawn in such way that no two of its edges intersect except only at the common vertex is called ____________________
(i) subgraph (ii) regular graph
(iii) planar graph (iv) isomorphic graph

19. ____ is symmetric.
(i) Adjacency matrix of undirected graph
(ii) Adjacency matrix of directed graph
(iii) Incidence matrix of undirected graph
(iv) Incidence matrix of directed graph

20. To obtain a spanning tree from a graph G with n vertices and m edges we must remove edges from G.
(i) n – 1 (ii) m – 1 (iii) m – n – 1 (iv) m – (n – 1)