D32519 (Pages : 3) Name

Reg. No..................

FIRST SEMESTER B.C.A. DEGREE EXAMINATION, JANUARY 2013

(CCSS)

BCA

CA 10 02—DISCRETE MATHEMATICS

Time : Three Hours ———— Maximum : 30 Weightage

Part A (Objective Type Questions)

Answer all **twelve** *questions.*

1. The value of $c(n, n)$ *is* :

   (a) 1. (b) n.

   (c) 0. (d) n!.

2. What is the order of the recurrence relation $a_r - 6a_{r-1} = 0, r$ 1.

   (a) 0. (b) 1.

   (c) 2. ———— (d) 6.

3. Example of a group of four elements.

   (a) s_4.

   (b) Klein group.

   (c) Set of integers less than under addition.

   (d) z_4 under multiplication.

4. The value of np_n -1 is :

   (a) n. (b) n!.

   (c) 1. (d) n-1.

5. If $p = F$ and $q = F$ then p Q is ————

6. The negation of 3x, $p(x)$ is ————

7. The value of 01 is ————

8. Formula for $p(n, r)$ is ————

9. If $p = T$ then pn $\not p$ = F. True *or* False.

10. Can every group of prime order a generator ?

Turn

11. Every integral domain is a fluid. True *or* False.

12. $c(n, r) = c(n, n - r)$. True *or* False.

(12 x 1/ = 3 weightage)

Part B (Short Answer Questions)

Answer all questions.

13. Form the conjunction of :

P : It is raining today.

Q : There are 20 tables in this room.

14. Evaluate $p(n, r)$ for $n = 6$ and $r = 2$.

15. Find the number of ways to paint 12 offices so that 3 of them will be green, 2 of them pink, 2 of them yellow and the remainings are white.

16. If $c(n, 9) = c(n, 8)$. Then find c

17. Define commutative ring with example.

18. Write the truth table for conjunction and disjunction.

19. Symbolize the expression

"all the world loves a lover".

20. Suppose a housekeeper wants to schedule spaghetti dinner three times each week. Find the number of ways of scheduling it.

21. If G is group with binary operation $*$ and if a and b are any elements of G. Then show that the linear equation a $* x = b$ and y $*$ a $= b$ have unique solutions in G.

(9 x 1 = 9 weightage)

Part C (Short Essay Questions)

Answer any five *questions.*

If $a = a_0 + a_i r + a2\ r^2 + \quad + a_n r^n$, show that $a = o(r^{-})$.

If $\frac{1}{8!} + \frac{1}{9!} = \frac{x}{10}$ find

ind the value of n such that $p(n, 5) = 42\ p(n, 3)$.

ow that every field F is an integral domain.

ate and prove division algorithm for Z.

27. Find the truth table for $(p \vee Q) \vee p$.

28. Let $a = r + O(1/r)$ and $b = \sqrt{r} + O(1/r)$. Show that $ab = r^{3/2} + O$

(5 x 2 = 10 weightage)

Part D (Essay Questions)

Answer any two questions.

29. Solve the equations :

$a_r = 3a_{r-1} + 2b_{r-1}$ and

$b_r = a_{r-1} + b_{r-1}$ with the

boundary conditions $a_0 = 1$ and $b_0 = 0$.

30. If **R** is a ring with additive identity 0, then for any $a, b \in$ **R,** we have

(a) $0 \cdot a = a \cdot 0 = 0$.

(b) $a(-b) = (-a)b = -(ab)$.

(c) $(-a)(-b) = ab$.

31. Write the truth table for $\sim(p \wedge Q)$ and $(\sim p \vee \sim Q)$ and verify them.

(2 x 4 = 8 weightage)