**(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2021-22 ONLY)**

**SUB CODE 21 UEC 4A4**

**REG.NO. :**

**N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI**

**END-OF-SEMESTER EXAMINATIONS : MAY – 2023**

**B.Sc. – COMPUTER TECHNOLOGY** **MAXIMUM MARKS: 70**

**IV SEMESTER** **TIME : 3 HOURS**

## PART - III
## BUSINESS MATHEMATICS
### SECTION – A (10 X 1 = 10 MARKS)

**ANSWER THE FOLLOWING QUESTIONS.**
**MULTIPLE CHOICE QUESTIONS.** **(K1)**

1. If a set A has n elements, then the total number of subsets of A is _____.

   a) n b) n2 c) 2n d) done

2. A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 854 in 4 years. The sum is: _____.

   a) Rs. 650 b) Rs. 690 c) Rs. 698 d) Rs. 700

3. A matrix that, when multiplied by itself, yields itself is _____.

   a) Idempotent matrix b) Involuntary matrix

   c) Symmetric matrix d) None of the above

4. $\int_2^4 4xdx = ----$

   a) 26 b) 27 c) 23 d) 24

5. A set of values of decision variables that satisfies the linear constraints and non-negativity conditions of an L.P.P. is called its: _____.

   a) Unbounded solution b). Optimum solution c) Feasible solution d) None of these

**ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES** **(K2)**

6. Define the term ‘set’.

7. Write the formula for compound interest.

8. Define square matrix.

9. Evaluate $\int 1/(x+5)dx$.

10. Define unbounded solution in LPP.

(CONTD.....2)

**SECTION – B (5 X 4 = 20 MARKS)**

**ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)**

11. a) Let A and B be two sets containing 4 and 2 elements, respectively. Then find the number of subsets of the set AxB, each having at least 3 elements.

(OR)

b) Use the properties of sets to prove that for all the sets A and B, $A - (A \cap B) = A - B$

12. a) Given that simple interest on a certain sum of money is Rs. 4016.25 at 9% per annum in 5 years. Find the sum of money.

(OR)

b) A sum of Rs. 12000 is lent out at 5% per annum simple interest for 5 years. What will be the amount after 5 years?

13. a) Find the value of X –Y if $2\begin{bmatrix}1 & 3\\ 0 & x\end{bmatrix} + \begin{bmatrix}y & 0\\ 1 & 2\end{bmatrix} = \begin{bmatrix}5 & 6\\ 1 & 8\end{bmatrix}$

(OR)

b) Solve the following matrix equation for x.

$[x \quad 1]\begin{bmatrix}1 & 0\\ -2 & 0\end{bmatrix} = 0$

14. a) Evaluate: $\int 3ax/(b^2 + c^2x^2)\, dx$

(OR)

b) Determine $\int \tan^8 x \sec^4 x\, dx$

15. a) A small firm manufacture necklaces and bracelets. The total number of necklaces and bracelets that it can handle per day is utmost 24. It takes one hour to make a bracelet and half an hour to make a necklace. The maximum number of hours available per day is 16. If the profit on a necklace is Rs. 100 and that on a bracelet is Rs. 300. Formulate on L.P.P.

(OR)

b) Two tailors A and B, earn Rs. 300 and Rs.400 per day respectively. A can stitch shirts and 4 pairs of trousers while B can stitch 10 shirts and 4 pairs of trousers per day. To find how many days should each of them work and if it is desired to produce at least 60 shirts and 32 pairs of trousers at a minimum labour cost, formulate this as an LPP.

(CONTD.....3)

**SECTION - C (4 X 10 = 40 MARKS)**

**ANSWER ANY FOUR OUT OF SIX QUESTIONS**
**(16th QUESTION IS COMPULSORY AND ANSWER ANY THREE QUESTIONS**
**(FROM Qn. No : 17 to 21) (K4 (Or) K5)**

16 a) In a class of 60 students, 23 play hockey, 15 play basketball, 20 play cricket and 7 play hockey and basketball, 5 play cricket and basketball, 4 play hockey and cricket, 15 do not play any of the three games. Find

(i) How many play hockey, basketball and cricket

(ii) How many play hockey but not cricket

(iii) How many play hockey and cricket but not basketball

b) In a survey of 600 students in a school, 150 students were found to be drinking Tea and 225 drinking Coffee, 100 were drinking both Tea and Coffee. Find how many students weredrinking neither Tea nor Coffee.

17. a) Find the compound interest (CI) on Rs. 12,600 for 2 years at 10% per annum compounded annually.

b) At what rate of compound interest per annum, a sum of Rs. 1200 becomes Rs. 1348.32 in 2 years?

18. a) Write the anti-derivative of the following function: $3x^2+4x^3$

b) Determine the antiderivative F of "f" , which is defined by $f(x) = 4x^3 - 6$, where $F(0) = 3$

19. a) If A is a square matrix such that $A^2 = A$, then write the value of $7A - (I + A)^3$, where I is an identity matrix.

b) If $\begin{bmatrix} a+4 & 3b \\ 8 & -6 \end{bmatrix} = \begin{bmatrix} 2a+2 & b+2 \\ 8 & a-8b \end{bmatrix}$, then write the value of a – 2b. Answer:

20. Solve the following LPP graphically:
Maximise $Z = 2x + 3y$, subject to $x + y \leq 4$, $x \geq 0$, $y \geq 0$

21. Write the procedure for solving an LPP by simplex method.

ETHICAL PAPER

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