* U A - 0 6 2 4 *

UA-0624

First Year B. Com. (Honours) Examination

February / March – 2012

Mathematics & Statistics

Time : **3** Hours] [Total Marks : **70**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **F.Y. B. Com. (Honours)**

Name of the Subject :

☛ **Mathematics & Statistics**

☛ Subject Code No. : **0 6 2 4** ☛ Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

(2) Answer all the questions.

(3) Figures to the right indicate full marks of the question.

(4) Graph papers and statistical tables would be supplied on request.

1 (a) Evaluate : **6**

(1) $\lim_{x \to -7} \dfrac{x^2 + 11x + 28}{x^2 + 5x - 14}$

(2) $\lim_{n \to \infty} \dfrac{1 + 2 + 3 + \ldots + n}{(n+3)(n+4)}$

(b) The demand function of a monopolit is $x = 60 - 3P$ **4**

and cost function is $C = \dfrac{x^2}{20} + 50$. How many units

should be produced to get maximum profit ? Also find the maximum profit.

2 (a) Evaluate : **6**

(1) $\int\left[x-\frac{1}{x}\right]^2 \cdot dx$

(2) $\int_3^{11} \sqrt{2x+3} \cdot dx$

(b) Obtain compound interest and effective rate of interest if an amount of Rs. 4,00,000 is deposited in a bank for one year, at the rate of 8% per annum, compounded semi annually. **4**

3 (a) Explain the following terms : **4**

(1) Annuity

(2) Interest

(b) (1) Vrushang deposited Rs. 5,000 in a bank for two years. With interest rate of 5.5% per annum. How much interest would he earn ? What will be the final value of investment ? **3**

(2) Obtain the future value of annuity of Rs. 500 is made annually for 7 years at interest rate of 14% compounded annually. **3**

4 (a) Give the mathematical formutation of linear programming problem. **4**

(b) Solve the following linear programming problem by Simplex method. **6**

Maximize $Z = 20x + 30y$

subject to $3x+3y \leq 36$

$5x+2y \leq 50$

$2x+6y \leq 60$

$x, y \geq 0$

5 (a) Solve the given linear programming problem by graphical method : **5**

Maximize $Z = 168x_1 + 135x_2$

subject to $x_1 + x_2 \leq 20$

$270x_1 + 180x_2 \leq 4500$

$x_1, x_2 \geq 0$

(b) Obtain total transportation cost by Vogel's approximation method for the following transportation problem. **5**

	Warehouse				
Factory	W_1	W_2	W_3	W_4	Supply
F_1	19	30	50	10	7
F_2	70	30	40	60	9
F_3	40	8	70	20	18
Demand	5	8	7	14	34

6 (a) Define the following terms with illustration. **4**

(i) Square matrix

(ii) Orthogonal matrix

(b) Solve the following equations using inverse matrix. **6**

$x + 2y + 3z = 6$

$2x + 4y + z = 7$

$3x + 2y + 9z = 4$

7 (a) If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ then prove that $A^2 - 4A - 5I = 0$. **5**

(b) Obtain IBFS and TTC Min[Min-Max] method : **5**

Origin	Destination				Supply
	D_1	D_2	D_3	D_4	
O_1	11	13	17	14	250
O_2	16	18	14	10	300
O_3	21	24	13	10	400
Demand	200	225	275	250	950