11CSU01B / 11COC04 / 11CRM03

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BCom DEGREE EXAMINATION JUNE 2014
(First Semester)

Common to Branches – **CORPORARE SECRETARYSHIP, COMMERCE WITH COMPUTER APPLICATIONS & COMMERCE (RETAIL MARKETING)**

MATHEMATICS

Time : Three Hours Maximum : 75 Marks

SECTION-A (20 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (10 x 2 = 20)

1 What amount lent at 10% p.a. compound interest with fetch Rs.630 as interest in 2 years?

2 Explain banker's gain.

3 Define non-singular matrix.

4 Write the matrix of I_3.

5 Find $\frac{dy}{dx}$ if $y=5x^3+9x^2$.

6 Find the derivative of $(3x+1)^3$.

7 Integrate e^x-1 with respect to x.

8 Evaluate $\int(x^2-4x+5)dx$.

9 What you meant by solution space?

10 Define degenerate solution.

SECTION - B (25 Marks)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks (5 x 5 = 25)

11 a The difference between the compound interest and the simple interest for 3 years at 5% p.a. on a certain sum of money was Rs.610. Find the sum.

OR

b Mr. X borrows Rs.20,000 at 4% compound interest and agrees to pay both the principal and the interest in 10 equal instalments at the end of each year. Find the amount of these instalments.

12 a If $A=\begin{bmatrix}2&3&5\\4&7&9\\1&6&4\end{bmatrix}$ and $B\begin{bmatrix}3&1&2\\4&2&5\\6&-2&7\end{bmatrix}$, Show that 5(A+B)=5A+5B.

OR

b Solve the following equations by Cramer's rule 3x+2y=8; 5x-3y=7.

13 a Find $\frac{dy}{dx}$ if i) $x^2+y^2=1$ ii) $xy=c^2$.

OR

b If $y=ax^2+bx$, Show that $x^2\frac{d^2y}{dx^2}-2x\frac{dy}{dx}+2y=0$.

Cont...

14 a Evaluate $\int \frac{xdx}{(x-1)(2x+1)}$

OR

b The marginal cost function for producting x units is $y=23+16x-3x^2$ and the total cost for producing 1 units is 40. Obtain the total cost function and the average cost function.

15 a Solve graphically of the following L.P.P:

Maximum $z=x_1+x_2$

Subject to

$$x_1+2x_2 \leq 2000$$
$$x_1+x_2 \leq 1500$$
$$x_2 \leq 600$$

and $x_1, x_2 \geq 0$.

OR

b Use Simplex Method to solve

Maximum $z=x_1+x_2+3x_3$

Subject to the constraints

$$3x_1+2x_2+x_3 \leq 3$$
$$2x_1+x_2+2x_3 \leq 2$$

and $x_1, x_2, x_3 \geq 0$.

SECTION - C (30 Marks)

Answer any **THREE** Questions

ALL Questions Carry **EQUAL** Marks (3 x 10 = 30)

16 Find the true discount and the banker's discount on a bill whose present value is Rs.10,000 and which is (legally) due 4 months hence at 10% p.a. What are its face value and cash value? How much is the banker's gain?

17 Find the inverse of the matrix $A = \begin{bmatrix} 1 & 0 & -1 \\ 3 & 4 & 5 \\ 0 & -6 & -7 \end{bmatrix}$

18 Find for what values of x, the following expression is maximum and minimum respectively.

$$2x^2-21x^2+36x-20$$

Find also the maximum and the minimum values.

19 Integrate xlogx with respect to x.

20 Use Simplex Method to solve the following L.P.P:

Maximum $z = 5x_1+3x_2$

Subject to

$$x_1+x_2 \leq 2$$
$$5x_1+2x_2 \leq 10$$
$$3x_1+8x_2 \leq 12$$

and $x_1, x_2 \geq 0$.

Z-Z-Z END