Roll No. ..... Exam Code : J-21

Subject Code—51639

B. Com. (General)/(Hons.)

EXAMINATION

(Batch 2018)

(First Semester)

BUSINESS MATHEMATICS—I

BC-105

Time : 3 *Hours* *Maximum Marks :* 80

Note : Attempt any *Five* questions. Q. No. **1** is compulsory.

1. (a) Explain the concept of Annuities.

(b) What are the properties of determinants of a matrix ?

(c) Solve for x :

$$\log_x(8x-3)-\log_x 4=2$$

(d) How many terms of the series 4, 2, 0, –2, –4, –6, ...may be taken so that their sum is 6 ?

(e) Find the maximum and minimum values of the expression : **5×4=20**

$$x^3 - 3x^2 - 9x + 27$$

2. If the sum of m terms of an A.P. is to the sum of n terms of the same A.P. is as $m^2 : n^2$, prove that the ratio of its mth and nth terms is $2m-1 : 2n-1$. **15**

3. Mr. X decides to deposit Rs. 5,000 at the end of each year in bank, which pays compound interest at the rate of 5% per annum. What will be his total accumulation at the end of 15 years ? (Given : $(1.05)^{15} = 2.080$) **15**

4. Find the present value of an annuity of Rs. 1,200 payable at the end of each 6 months for 3 years when the interest is earned at 8% per year compounded semi-annually. (Take $(1.04)^6 = 1.2653$). **15**

5. Solve the following equations by matrix method : **15**

$$x + y + z = 1$$
$$x + 2y + 3z = 6$$
$$x + 3y + 4z = 6$$

6. If $A = \begin{bmatrix} 1 & 0 & -2 \\ 2 & 2 & 4 \\ 0 & 0 & 2 \end{bmatrix}$, verify $A^3 - 3A + 2I = 0$ and hence find A^{-1}. **15**

7. Differentiate the following w.r.t. x : **15**

$$y = \frac{x^2 + 3x + 5}{x^2 + 2}$$

8. Find the point elasticity of the demand function $q = \sqrt{10 - P^2}$ at $P = 2$. **15**

9. In how much time will Rs. 1,600 amount to Rs. 1,852.00 at 20% per annum, the interest being compounded quarterly ? **15**