Seat No:_____ Enrollment No:_____

PARUL UNIVERSITY

FACULTY OF COMMERCE

B.Com.(Hons) Winter 2019 – 20 Examination

Semester: 1 **Date:29/11/2019**
Subject Code: 16100106 **Time:02:00 pm to 04:30pm**
Subject Name: Business Maths **Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Do as directed.

A) Multiple choice type questions. (Each of one mark) **(06)**

1. The cardinal number of singleton set is __ .
   a) 1 b) 4
   c) 2 d) 3
2. If A and B are two independent events then $P(A \cap B) =$___ .
   a) P(A) P(B) b) P(A)−P(B)
   c) 0 d) 1
3. What is the order of the matrix $\begin{bmatrix} 1 & 5 \\ 0 & -7 \\ 1 & 2 \end{bmatrix}$?
   a) 2x3 b) 3x2
   c) 2x2 d) none of these
4. ____ is a fund created to accumulate the specified amount of sum in a future by way of regular periodic payment for some specific purpose.
   a) Annuity b) Sinking fund
   c)effective interest rate d) none of these
5. The determinant of the matrix $\begin{bmatrix} 1 & 0 \\ 2 & 5 \end{bmatrix}$ is __ .
   a) 5 b) 0
   c) 2 d) cannot be determined
6. For the GP 1,3,9,27,… what is the common ratio r ?
   a) 1 b) 3
   c) -3 d) none of these

B) Definitions / One-liners / Terms. (Each of one mark) **(06)**

1. Define sample space.
2. State De Morgan's laws.
3. If the interest rate is 1.25% per month, find the nominal interest rate for 2 years.
4. Define annuity.
5. Find the transpose of the matrix $A = \begin{bmatrix} 5 & 4 \\ 8 & 0 \\ -9 & 15 \end{bmatrix}$.
6. Find the probability of getting an even number if a dice is rolled.

Q.2 Numerical / Short Note Questions. (Each of 04 mark) **(12)**

1. If $P(A) = 0.33, P(B) = 0.25$ and $P(A \cup B) = 0.17$ then find $P(A \cap B)$ and $P(A' \cap B')$.
2. Find the present value of Rs. 50740 to be received after 3 years at the rate of interest 8% per annum if the compounding is done quarterly.$(1.2^{12} = 1.2682)$
3. If the first term of AP is a=4 and the common difference d=2, find the 10^{th} and 15^{th}. Also find the sum of first five terms.

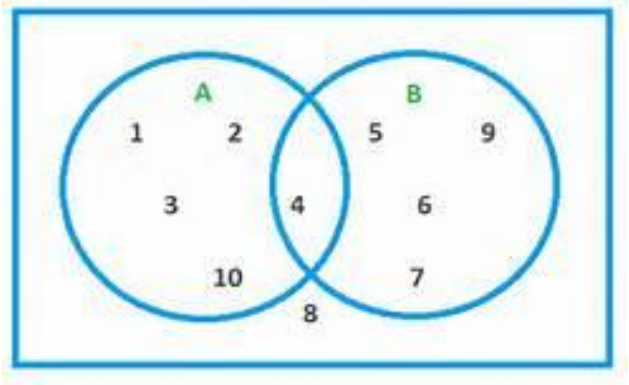
Q.3 Answer the following. (Any Three) **(18)**

1. Solve the following system of linear equations using Cramer's rule: $3x - 2y = 1, 2x + 5y = 3$. **(06)**
2. (a) In a class of 50 students, 35 students like Maths and 25 students like English. If all the 50 students like either Maths or English, find the number of students who like both the subjects. **(04)**
   (b) Draw a Venn diagram for U={1,2,3,4,5,6,7,8,9,10}, A={2,3,5,6,8} and B={1,3,4,7,9}. **(02)**

3. (a) Mr. A deposited Rs. 700 at the end of each month for complete one year at an annual interest rate 9%. Calculate the future value of these ordinary annuity after one year. Compounding is done on monthly basis. (Take $1.0075^{12} = 1.0938$) **(04)**
   (b) If a person invests Rs. 1000 at an annual interest rate of 5% compounded continuously, calculate the final amount he will have after 5 years. (Take $e^{0.25} = 1.2840$) **(02)**
4. In a pharmaceutical factory, machines B_1 and B_2 manufacture 40% and 60% of the total output. Of this production, machines B_1 and B_2 produces 5% and 10% defective products. A product is selected at random and is found to be defective, what is the probability that it is produced by: **(06)**
   (a) machine B_1 and (b) machine B_2

Q.4 Answer the following. (Any two) **(18)**

1. (i) Find the product AB of the two matrices: A = $\begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 5 & 9 \\ 7 & 5 & 3 \end{bmatrix}$.
   (ii) From Venn diagram find the following: (a) $A \cup B$ (b) $A \cap B$ (c) $(A \cup B)'$



2. Find the inverse of the matrix $A = \begin{bmatrix} 1 & 2 & -1 \\ 5 & 4 & 8 \\ 2 & 7 & 6 \end{bmatrix}$
3. The personnel department of a company has records which show the following analysis of its 200 engineers.

Age(Year)	Bachelor's Degree only	Master's Degree	Total
Under 30	90	10	100
30 to 40	20	30	50
Over 40	40	10	50
	150	50	200

If one engineer is selected at random from the company, find (i) The probability that he has only a Bachelor's degree; (ii) The probability that he has a Master's degree given that he is over 40; (iii) The probability that he is under 30 given that he has only a Bachelor's degree