

**PARUL UNIVERSITY**  
**FACULTY OF COMMERCE**  
**B.Com. (Hons.) Summer 2017 – 18 Examination**

**Semester: 1****Subject Code: 16100106****Subject Name: Business Maths****Date: 06/06/2018****Time: 10.30 am to 1.00 pm****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. If  $A$  is a finite set, then  $(A')' = \underline{\hspace{2cm}}$ 
  - a)  $A$
  - b)  $A'$
  - c)  $\emptyset$
  - d)  $1 - A$
2. For two finite sets  $A$  and  $B$ ,  $(A \cup B)' = \underline{\hspace{2cm}}$ 
  - a)  $A' \cap B'$
  - b)  $A' \cup B'$
  - c)  $U$
  - d) none of these
3. If  $A = \begin{bmatrix} 1 & -2 \\ 0 & 4 \\ 7 & 9 \end{bmatrix}$  and  $B = \begin{bmatrix} 10 & -7 \\ 4 & -9 \\ 6 & 3 \end{bmatrix}$  then  $A + B = \underline{\hspace{2cm}}$ 
  - a)  $\begin{bmatrix} 1 & 0 \\ 4 & 6 \\ 7 & 10 \end{bmatrix}$
  - b)  $\begin{bmatrix} 11 & -9 \\ 4 & -5 \\ 13 & 12 \end{bmatrix}$
  - c)  $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$
  - d)  $\begin{bmatrix} 10 & 14 \\ 0 & -36 \\ 42 & 27 \end{bmatrix}$
4. If  $A = \begin{bmatrix} 15 & -4 & 40 \\ 0 & 8 & 6 \\ 13 & 7 & -9 \end{bmatrix}$  then transpose of  $A$  i.e.  $A^T = \underline{\hspace{2cm}}$ 
  - a)  $\begin{bmatrix} 15 & -4 & 40 \\ 0 & 8 & 6 \\ 13 & 7 & -9 \end{bmatrix}$
  - b)  $\begin{bmatrix} 15 & 0 & 13 \\ -4 & 8 & 7 \\ 40 & 6 & -9 \end{bmatrix}$
  - c)  $\begin{bmatrix} -15 & 4 & -40 \\ 0 & -8 & -6 \\ -13 & -7 & 9 \end{bmatrix}$
  - d) none of these
5. If a dice is rolled once, then what is the probability of getting an even number on the dice?
  - a)  $1/6$
  - b)  $1/4$
  - c)  $1/2$
  - d)  $0$
6. What is the probability that you will get 65 marks in this exam of 60 marks?
  - a) 1
  - b) 0.5
  - c) 0
  - d) -1

**B) Do as directed. (Each of one mark)****(06)**

1. State any four subsets of the set  $A = \{1,3,4,7\}$ .
2. If  $U = \{1,2,3,\dots,20\}$  and  $A = \{2,5,6,8,9,11,14,16\}$  then find  $A'$ .
3. Find the determinant of the matrix  $\begin{bmatrix} 14 & 7 \\ 8 & 9 \end{bmatrix}$ .
4. Write the sample space of the random experiment of tossing two fair coins together.
5. If  $P(A) = \frac{1}{3}$ ,  $P(B) = \frac{1}{4}$ , and  $P(A \cup B) = \frac{1}{6}$  then find  $P(A \cap B)$ .
6. If you invest Rs.1000 at an annual interest rate of 5% compounded continuously, calculate the final amount you will have in your account after five years.  $[e^{0.25} = 1.2840]$

**Q.2 Do as directed. (Each of 04 mark)**

(12)

- The probability distribution of demand of a commodity is given below. Find the expected demand and its variance.

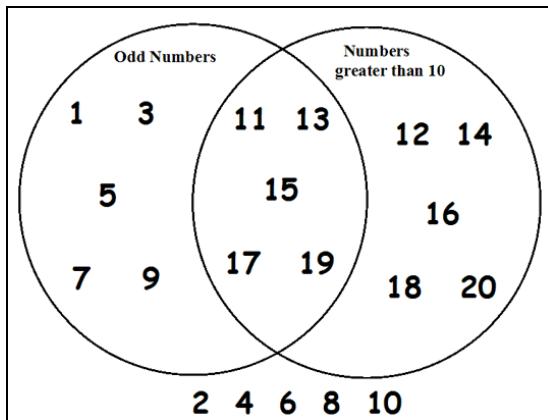
Demand x	5	6	7	8	9	10
Probability P(x)	0.05	0.1	0.3	0.4	0.1	0.05

- Find the present value of Rs.50740 to be received after 3 years, at the interest rate of 8%, compounded quarterly.  $[1.02^{12} = 1.2682]$
- If for an AP, 1<sup>st</sup> term is 10 and the common difference is -3 then find,
  - 10<sup>th</sup> term of this AP
  - Sum of the first 15 terms of this AP.

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

(18)

- Three machine  $M_1$ ,  $M_2$  and  $M_3$  manufacture 20, 45, and 35 percent respectively. Of the total output of their outputs 3, 5 and 4 percent respectively are defective. One product is selected at random from the total output and is found to be defective. Find the probability that it is manufactured by machine (a)  $M_1$  (b)  $M_2$ . (06)
- Find the inverse of  $\begin{bmatrix} 5 & 6 \\ 4 & 8 \end{bmatrix}$ . Solve the following system:  $3x + 15y = 5, 7x + 9y = 2$ . (06)
- From the Venn diagram find the following: (A= odd numbers B= numbers greater than 10) (06)



- $A \cup B$
- $A - B$
- $(A \cap B)'$
- $A \cap B$
- $(A \cup B)'$
- $A' \cup B'$

- Define annuity. Calculate present value on 1<sup>st</sup> Jan, 2011 of an annuity of Rs.500 paid at the end of each month of 2011. The annual interest is 12%.  $[1.01^{-12} = 0.88745]$  (06)

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

(18)

- (A) Find the amount and the compound interest on Rs.8000 at 10% per annum for 1.5 years, if the interest is compounded half-yearly.  
(B) A person deposited Rs.700 at the end of each month of year 2010 in an investment account of 9% annual interest rate. Calculate the future value of the annuity on Dec. 31, 2010. Compounding is done on monthly basis.  $[1.0075^{12} = 1.0938]$  (05)
- (A) In a pack of 52 playing cards, if a card is drawn at random, find the probability that the card is: (a) a spade (b) a king (c) a face card (d) either red or black colour.  
(B) If A and B are two independent events with  $P(A) = \frac{1}{2}$  and  $P(B) = \frac{1}{5}$ , then find  $P(A \cup B)$ .  
(C) If  $E(X) = 0$  and  $V(X) = 16$ , find  $E(2X - 3)$  and  $V(2X - 3)$ . (02)
- (A) If in a class of 60 students, 30 students like Aptitude and 45 like Reasoning, how many students like both the subjects, when all 60 likes at least one of the two subjects?  
(B) Find the product of the following matrices:  $A = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}, B = \begin{bmatrix} 1 & 5 & 9 \\ 7 & 5 & 3 \end{bmatrix}$ .  
(C) For the sets  $A = \{5, 8, 10, 15\}$  and  $B = \{8, 12, 15\}$ , draw a Venn diagram. (02)