5. In a competition a school awarded medals in different categories. 36 medals in dance, 12 medals in dramatics and 18 medals in music. If these medals went to a total of 45 persons and only 4 person got medals in all the three categories, how many received medals in exactly two of these categories ?　**15**

Unit III

6. Find the inverse of $A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$ by elementary row operations.　**15**

7. For the values of parameters λ and μ do the system of equations have :　**15**

(i)　No solution

(ii)　Unique solution

(iii)　More than one solution.

A-504

B.B.A. EXAMINATION, Dec. 2017

(First Semester)

(Main Only)

BBA-107-B

Mathematics for Managers

Time : 3 *Hours*]　　　　[*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note :　Q. No. **1** is compulsory. Remaining eight questions are distributed among four units. The students have to attempt *one* question from each unit.

(Compulsory Question)

1. (a) Define term business mathematics.

   (b) Write the formula to calculate simple and compound interest.

   (c) Explain the importance of Venn-diagram.

   (d) Calculate the value of A and B for given matrices problem.

   $$\begin{bmatrix} a & 2 \\ 4 & 3 \end{bmatrix} + \begin{bmatrix} 2 & 3 \\ 6 & b \end{bmatrix} = \begin{bmatrix} 5 & 5 \\ 10 & 7 \end{bmatrix}$$

   (e) Write the definition of limit.

   (f) If $A = \begin{bmatrix} 1 & -2 & 3 \\ 2 & 3 & -1 \\ -3 & 1 & 2 \end{bmatrix}$ and I in the unit matrix of order 3, then evaluate $A^2 - 3A + 9I$. **2½×6=15**

Unit I

2. What do you mean by business mathematics ? Explain its, uses, scope and applications in day to day life. **15**

3. (a) A cutain principal amounts to Rs. 15,000 in 2.5 years and to Rs. 16,500 in 4 years at the same rate of interest. Find the rate of interest. **7½**

   (b) The difference between simple interest and compound interest compounded annually on a certain sum of money for 2 years at 8% per annum is Rs. 12.80. Find the principal. **7½**

Unit II

4. In a suvey of university students, 64 had taken mathematics course, 94 had taken chemistry course, 58 had taken physics, 26 had taken mathematics and physics, 26 had taken mathematics and chemistry, 22 had taken chemistry and physics course, and 14 had taken all the three courses. Find how many had taken one course only. Solve the problem by using Venn-diagram. **15**

Unit IV

8. (a) Is the following fucntion continuous check : **7½**

$$f(x) = \begin{cases} x^3 - 1 & \text{for } x < 3 \\ x^2 + 14 & \text{for } x \geq 3 \end{cases}$$

(b) Find the value of the limit : **7½**

$$\underset{x \to 0}{\text{Lt}} \frac{x + 2\sin x}{\sqrt{x^2 + 2\sin x + 1} - \sqrt{\sin^2 x - x + 1}}$$

9. Find the absolute maximum and minimum value of a function :

$$f(x) = x^3 + 3x^2 + 1$$

for $\quad -\dfrac{1}{2} \leq x \leq 4$