Find the following :

(a) $A \cup B$

(b) $A \cap B$

(c) $A \cup C$

(d) $C \cup B$

(e) $A \cup B \cup C$

(f) $A \cap B \cap C$

(g) $(A \cup B) \cap C$

(h) $A \cap C$

Or

A manufacturer produces 1200 computers each week. After week 1, he increases production by :

Scheme I : 80 computers each week

Scheme II : 5% each week

(i) Find the output in week 20 under each scheme

(ii) Find the total output over the first 20 weeks under each scheme. **12**

Subject Code—0585

B.B.A. (First Year) EXAMINATION

(Batch 2009 to 2017)

BUSINESS MATHEMATICS

BBA-105

Time : 3 *Hours* *Maximum Marks :* 70

Section A

Note : Attempt any *Seven* questions. **7×5=35**

1. How much should be invested now (to the nearest Rs.) to receive Rs. 35,000 per annum in perpetuity if the annual rate of interest is 9% ?

2. Three years ago a retailer sold action man toys for Rs. 17.50 each. At the end of the first year he increased the price by Rs. 6% and at the

end of the second year by a further Rs. 5%. At the end of the third year the selling price was Rs. 20.06. What was the percentage price change in third year ?

3. ABC's Dresses sells a dress at a 10% margin. The dress cost the shop Rs. 100. Calculate the profit made by ABC's dresses.

4. Find the slope of the straight line that passas through the point (2, –1) and (–2, –11).

5. Find the derivatives of the following functions :

(a) $f(x) = 4$

(b) $f(x) = 4x^3$

(c) $f(x) = x^8$

6. Find the Cartesian product of X = {3, 4, 9} and Y = {9, 16, 81}. Write the function that maps X to Y.

7. The following scores are observed for the times taken to complete a task, in minutes :

12, 34, 14, 15, 21, 24, 9, 17, 11, 8

What is the median score ?

8. Find the determinant of the following matrix :

$$\begin{vmatrix} 2 & 3 & 5 \\ 3 & 1 & 2 \\ 1 & 4 & 3 \end{vmatrix}$$

9. Find the inverse of the following matrix, if exist :

$$\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$$

10. Write down the axioms of probability.

Section B

Note : Attempt all the questions.

11. Consider the sets of real numbers :

A = {1, 5, 6, 11}, B = {–3, 5, 7, 11, 18, 25}.
C = {–4, 1, 15, 19}

199 and less than 200	8
200 and less than 201	93
201 and less than 202	148
202 and less than 203	48

(a) Calculate the mean, standard deviation and median of the weights of the packages.

(b) Explain whether or not you think that the distribution is symmetrical.

Or

Solve the system of three simultaneous equations :

$$x - 3y - 2z = 5$$
$$4x + y + 2z = 116$$
$$6y + 5z = 47$$ **11**

12. (a) Calculate the present value of Rs. 60,000 at year 6, if a return of 15% per annum is obtainable.

(b) Calculate the present value of Rs. 1,00,000 at year 5, if a return of 6% per annum is obtainable.

(c) How much would a person need to invest now at 12% to earn Rs. 4,000 at year 2 and Rs. 4,000 at year 3 ?

Or

Suppose that the sum of Rs. 100 is invested at an annual rate of interest of 10%. Calculate the value of the investment in five years' time if the interest is compounded (a) annually, (b) semi-annually, (c) continuously. **12**

13. In a quality control test, the weights of standard packages were measured to give the following grouped frequency table :

Weights in grams	**Number of packages**
198 and less than 199	3