SHRI RAMSWAROOP MEMORIAL UNIVERSITY

End Semester Examination (2021-22)-Odd Semester

BA (Hons.) Economics – I Year (I Sem)	
Course Name: Mathematics for Economics	Code: BEM1004
Time: 02 Hours	Max Marks: 60

University Roll No.															
(To be filled by the Student)															

Note: Please read instructions carefully:

a) The question paper has 03 sections and it is compulsory to attempt all sections.

b) All questions of Section A are compulsory; questions in Section B and C contain choice.

Section A: Very Short Answer type Questions **Attempt all the questions.**		**BL**	**CLO**	**Marks (10)**
1.	Explain the following by Venn Diagram: (a) Differences among sets (b) Intersection of sets	BL 2	CL01	02
2.	Differentiate $Y = (1+X^2+X^3)(3X+5)$ with respect to X.	BL 2	CL02	02
3.	The product of 3 consecutive terms in geometric progression is 216 and their sum is 19, find the terms.	BL 4	CL01	02
4.	Briefly describe the properties of multiplication of matrices.	BL 2	CL03	02
5.	Explain the rule of the integral of a sum or difference of two functions.	BL 2	CL04	02
Section B: Short Answer Type Questions **Attempt any 03 out of 05 questions.**		**BL**	**CLO**	**Marks (30)**
1.	Explain De Morgan's Law of Set Theory with an example.	BL 2	CL01	10
2.	Discuss necessary and sufficient conditions for minimization of cost with an example.	BL 2	CL02	10
3.	The demand function of a firm is P = 1000 – 0.2Q and its cost function is C = 35Q +1000, where P = Price, Q = Output and C = Cost. Find output at which the profit of the firm is maximum.	BL 4	CL02	10
4.	If $A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 2 & 3 \\ 3 & 2 & 3 \end{pmatrix}$ and $B = \begin{pmatrix} 4 & 5 & 6 \\ 5 & 5 & 6 \\ 6 & 5 & 6 \end{pmatrix}$ Prove that $AB \neq BA$.	BL 5	CL03	10
5.	Marginal cost of producing X units of a commodity in a day is 16X - 1591. The selling price is Rs. 9 per unit and fixed cost is Rs. 1800. Find its profit function.	BL 4	CL04	10
Section C: Long Answer Type Questions/Case Study **Attempt any 01 out of 04 questions.**		**BL**	**CLO**	**Marks (20)**
1.	Out of a group of 20 teachers in a school 10 teach Mathematics, 9 teach Economics and 7 teach Statistics. 4 teach Mathematics and Economics but none teach both Mathematics and Statistics. How many teach: (a) Economics only	BL 5	CL01	20

<table>
<tr><td></td><td>(b) Mathematics only
(c) Economics and Statistics
(d) Economics and Mathematics</td><td></td><td></td><td></td></tr>
<tr><td>2.</td><td>Total cost function of a product is given below:
$C = 1,000 + 300Q – 20Q^2 + Q^3$.
(a) Find Average Variable Cost
(b) Find Marginal Cost
(c) Find slope of the Marginal Cost curve
(d) At what level of output is Marginal Cost equal to Average Variable Cost?</td><td>BL 4</td><td>CL02</td><td>20</td></tr>
<tr><td>3.</td><td>ABC company sells three commodities in the markets of Kanpur and Kolkata as shown below:
<table>
<tr><td>City</td><td>Article A</td><td>Article B</td><td>Article C</td></tr>
<tr><td>Kanpur</td><td>15,000</td><td>35,000</td><td>42,000</td></tr>
<tr><td>Kolkata</td><td>13,500</td><td>24,000</td><td>28,000</td></tr>
<tr><td>Sale price per unit</td><td>Rs. 5</td><td>Rs. 6</td><td>Rs. 4</td></tr>
</table>
Find the total revenue from each city using matrix algebra.</td><td>BL 4</td><td>CL03</td><td>20</td></tr>
<tr><td>14.</td><td>The cost of constructing a 750 feet road is as follows:
Rs. 3000 for the first foot and in addition Rs. 500 for every subsequent foot. Find:
(a) the cost of constructing the last foot of the road.
(b) the cost of constructing first 100 feet of the road.
(c) the cost of constructing the last 100 feet of the road.
(d) the cost of constructing the entire road.</td><td>BL 4</td><td>CL01</td><td>20</td></tr>
</table>
