BUSINESS MATHEMATICS   HSSC–I
SECTION – A (Marks 10)

Note: Section – A is compulsory. All parts of this section are to be answered on the separately provided OMR Answer Sheet which should be completed in the first 15 minutes and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

Q. 1 Choose the correct answer A / B / C / D by filling the relevant bubble for each question on the OMR Answer Sheet according to the instructions given there. Each part carries one mark.

1) The value of x in proportion $2:7 = x:49$ is:
   - A. 8
   - B. 12
   - C. 28
   - D. 14

2) Amount paid to an agent as the remuneration of his services is called:
   - A. Commission
   - B. Loss
   - C. Profit
   - D. Salary

3) The simple interest on a loan of Rs.3000/- for 2 years at 7% annually is:
   - A. Rs.520/-
   - B. Rs.420/-
   - C. Rs.320/-
   - D. Rs.220/-

4) It is not possible to compute the amount of:
   - A. Ordinary annuity
   - B. Annuity due
   - C. Perpetuity
   - D. Compound interest

5) If $f(x) = \sqrt{x-1}$, then $f(626)$ is:
   - A. 22
   - B. 23
   - C. 24
   - D. 25

6) The graph of a quadratic equation $ax^2 + bx + c = 0$, opens upward if:
   - A. $a > 0$
   - B. $a = 0$
   - C. $a < 0$
   - D. $a = 1$

7) The solution set of $2x + 1 = 0$ is:
   - A. $\left\{\dfrac{1}{2}\right\}$
   - B. $\dfrac{-1}{2}$
   - C. $\left\{-\dfrac{1}{2}\right\}$
   - D. $\dfrac{1}{2}$

8) Discriminant of the quadratic equation $x^2 + 4x - 12 = 0$ is:
   - A. 64
   - B. -64
   - C. -32
   - D. 8

9) Conversion in decimal number system of $(1001)_2$
   - A. 7
   - B. 8
   - C. 9
   - D. 10

10) A square matrix 'A' is called symmetric if:
   - A. $A + A^t = 0$
   - B. $A - A^t = 0$
   - C. $A = A^{-1}$
   - D. $|A| = 0$

BUSINESS MATHEMATICS HSSC–I

Time allowed: 2:15 Hours   **Total Marks Sections B and C: 40**

NOTE: Attempt any eight parts from Section 'B' and any two questions from Section 'C' on the separately provided answer book. Use supplementary answer sheet i.e. Sheet–B if required. Write your answers neatly and legibly.

SECTION – B (Marks 24)

Q. 2   Attempt any EIGHT parts. All parts carry equal marks.   (8 x 3 = 24)

(i)   A salesman sold a merchandise of Rs.73000/- during a month. He receives 3% on the first Rs.15,000/-, 6% on the next Rs.15,000/- and 8% on the remainder. What was his commission for the month?

(ii)   Three people invested Rs.900/-, Rs.600/- and Rs.300/- in a business. How should they share a profit of Rs.900/-?

(iii)   Twenty men complete the construction of a bridge in 70 days. How many men are required to complete the same construction work in 50 days?

(iv)   Find the compound interest on Rs.40,000/- for one year at 8% payable quarterly.

(v)   Find the amount of an ordinary annuity of Rs.500/- a year for ten years at 4% compounded annually.

(vi)   Draw the graph of $3x - 2y = 6$.

(vii)   The profit function for selling x items is given by $P(x) - 17x - 3400$. What is the profit on 300 items?

(viii)   The sum of two numbers is 47. If one number is 5 more than the other, what are the numbers?

(ix)   Solve for x, y and z if:

$$\begin{bmatrix} x & y \\ y & z \end{bmatrix} + \begin{bmatrix} 2x & -y \\ 3y & -4z \end{bmatrix} = \begin{bmatrix} 6 & 0 \\ 8 & 9 \end{bmatrix}$$

(x)   Subtract $(1111)_2$ from $(100111)_2$.

(xi)   If $A = \begin{bmatrix} 4 & 7 \\ 4 & 15 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 8 \\ 2 & 20 \end{bmatrix}$ Compute $A - 3B$.

SECTION – C (Marks 16)

Note: Attempt any TWO questions. All questions carry equal marks.   (2x 8 = 16)

Q. 3   a.   Rawal Express takes four and a half hours at a speed of 80km/hour to go from Rawalpindi to Lahore. How fast should the train travel to complete the same journey in 3 hours?   **(04)**

b.   On a deal, the car dealer allowed 5% discount to a customer. Find discounted and actual price of the car, if the discount allowed was Rs.6000/-.   **(04)**

Q. 4   a.   Suppose a manufacturer produces and sells a product with monthly revenue $R(x) = 8.5x$ and cost $C(x) = 2.5x + 1200$ **(02+02)**
   i.   How many units must be produced each month to break even?
   ii.   What is the profit. if 300 units are produced?

b.   Find the value of the following by changing into binary system:
$\{(1111111110)_2 - (801)_{10}\} + \{(11100)_2 - (1011)_2\}$ **(04)**

Q. 5   a.   Solve the equation $2\sqrt{x} = x - 8$ **(04)**

b.   If $A = \begin{bmatrix} 2 \\ 1 \\ 3 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 1 & 4 \end{bmatrix}$ **(04)**

   Find the product AB and BA, if possible.