

FIRST SEMESTER B.Com. DEGREE EXAMINATION, 2014

Business Mathematics - I

(Revised)

Time : Three Hours

Maximum : 80 Marks

Instructions to Candidates

- 1) Mathematical tables will be supplied on request.
- 2) Simple calculator is allowed.

Section A**I. Answer any ten of the following. (2×10=20)**

- 1) Define Singleton set and Empty set.
- 2) Define symmetric relation giving an example.
- 3) Write the subsets of the set $A = \{1,2,3\}$.
- 4) Define one-one mapping.
- 5) Find the value of $(169)^{0.5}$
- 6) Change $\log_x 64 = 3$ into exponential form then find x.
- 7) Define 'Inverse proportion with an example.
- 8) If $A = \{1,2\}$ and $B = \{x,y,z\}$ find $A \times B$.
- 9) find the n^{th} term of 4,9,14,19, -----
- 10) Define Geometric progression.
- 11) Write the section formulae for internal division and external division.
- 12) If $(-6,8)$ is the centroid of the triangle whose vertices are $(12,4)$, $(x,6)$ and $(0,y)$, find x and y.

Section B**II. Answer any three of the following. (3×5=15)**

- 13) If $A = \{1,2,3,4\}$, $B = \{3,4,5,6\}$, $C = \{4,5,6,7\}$, find

- i) $A - (B \cap C)$
- ii) $(A \cap B) - (B \cup C)$
- iii) $(A \cup B) - C$

14) Show that $\frac{3 \cdot 2^{n+1} + 2^n}{2^{n+2} - 2^{n-1}} = 2$

15) If $u = v^2 = w^3 = z^4$ then prove that $\log_u^{(uvwz)} = 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4}$

16) A bookshelf contains 240 books, each of thickness 1 inch (1"). find the number of $\frac{3}{4}$ inch thick books it can hold.

17) Find the sum of all natural numbers between 5000 and 1000 which are divisible by 13.

18) The coordinates of two points A and B are (-2,4) and (4,-2) respectively. Find the equation and the slope of the line AB.

Section - C

III. Answer any **three** of the following (3×15=45)

19) a) Out of the total 150 students who appeared for ICWA Examination from a centre, 45 failed in accounts, 50 failed in maths and 30 failed in costing. Those who failed both in Accounts and maths were 30, those who failed both in maths and costing were 32 and those who failed both in Accounts and costing were 35. The students who failed in all the three subjects were 25. Find out the number who failed atleast in any one of the subjects. (8)

b) A market research group conducted a survey of 2000 consumers and reported that 1440 consumers liked product A and 900 consumers liked product B. What is the least number that must have liked both products?(7)

20) a) If $3^x = 5^y = (75)^z$, show that $xy = z(2x+y)$. (8)

b) Show that $\frac{1}{\log_a^p} + \frac{1}{\log_b^p} + \frac{1}{\log_c^p} = \frac{1}{\log_x^p}$ where $abc = x$. (7)

21) a) An enterprise produced 600 units in the 3rd year of it's existence and 700 units in the 7th year what was the initial production? (8)

b) Find three numbers in AP such that their sum is 27 and the sum of their squares is 341. (7)

22) a) The product of first and second terms of a GP is 256 and that of second and third terms is 16, find the 5th (fifth) term. (8)

b) At 10% P.a compound interest, a sum of money accumulates to Rs. 17,500 in 4 years. find the sum invested initially. (7)

- 23) a) A man's property is shared among his three sons A, B and C. The ratio of A's share to B's share is 7:5 and the ratio of B's share to C's also 7:5. If B receives Rs. 560 more than C, find the value of property and the share received by each son.

(8)

- b) A locomotive making 160 strokes per minute travels 80 miles in 2 hours. How many strokes must the same Engine make to travel 500 miles in 10 hours?

(7)

- 24) a) Find the equation of the straight line passing through the point $(-3, 1)$ and perpendicular to the line $2x + 3y = 12$.

(8)

- b) Determine the coordinates of the vertices of the triangle ABC if the middle points of its sides BC, CA and AB have coordinates $(3, 2)$, $(-1, -2)$ and $(5, -4)$ respectively.

(7)

Answer any ten of the following.

(2×10=20)

- 1) Define 'proper subset' and give an example.
- 2) Define 'symmetric relation'.
- 3) Write the subsets of the set $A = \{1, 2, 3\}$.
- 4) Define 'one-one mapping'.
- 5) Find the value of x .
- 6) 'Change log' x to base a and write down the formula.
- 7) Define 'inverse proportion' with an example.
- 8) If $A = \{1, 2\}$ and $B = \{x, y\}$, find $A \times B$.
- 9) Find the n^{th} term of $4, 9, 14, 19, \dots$.
- 10) Define 'arithmetic progression'.
- 11) Write the section formula for internal division and external division.
- 12) If $(-6, 8)$ is the centroid of the triangle whose vertices are $(1, 2)$, (x, y) and $(0, 1)$, find x and y .

Section B

B. Answer any three of the following.

(3×5=15)

- 13) If $A = \{1, 2, 3, 4\}$, $B = \{3, 4, 5, 6\}$, $C = \{2, 3, 5, 7\}$, find

i) $A \cup B \cup C$

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

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