

**M.E.S. VASANT JOSHI COLLEGE OF ARTS AND COMMERCE, ZUARINAGAR – GOA**  
**B.Com. (NEP) I Semester End (Regular/Repeat) Examination, November, 2024**  
**SEC –BUSINESS MATHEMATICS I (COM-142)**

Instructions: i) *All questions are compulsory.*

*ii) Figures to the right indicate full marks.*

*iii) Use of simple (non-scientific) calculator is allowed.*

**Time: 01 Hour**

**Total Marks: 20**

**Q 1. Answer each of the following.**

**(1×4=4 Marks)**

- a. State the compound ratio for the given ratios 1:5, 3:2 and 5:5
- b. Define Singleton set.
- c. State the formula for  $\int \frac{1}{x} dx$
- d. Describe 'function' on sets.

**Q 2 A.** State the formula to find roots of the quadratic equation. Also find roots of  $x^2 - 4 = 0$  using the same formula. **(2 Marks)**

**Q 2 B.** Find the compound interest for the principal amount of 5000 at 5% rate of interest p.a. for 5 years which is compounded annually. **(2 marks)**

**Q 3 A.** Find the values of  $x$  for which the function  $f(x) = 16x^2 - 64x - 10$  is an increasing function for  $x > 2$ . **(2 Marks)**

**Q 3 B.** It is found that out of 520 toys manufactured in a factory 47% toys are defective, find the number of non-defective items manufactured. **(2 Marks)**

**OR**

**Q 3 C.** Find the simple interest of Rs 14,000 invested for 6 years at 7% rate of interest. Also find the amount received after 6 years. **(2 Marks)**

**Q 4 A.** State and prove De' Morgans law for sets  $X=\{1,2,3,4,5,6\}$   $A=\{1,2,3\}$   $B=\{3,4,5\}$  **(2 Marks)**

**Q 4 B.** Find  $I = \int (x^3 + 3x^2 - 2x + 5)dx$  **(2 Marks)**

**OR**

**Q 4 C.** Show that  $\int_1^3 (3x^2 + 1)dx$  is 8

**Q 5 A.** State Continued proportion also check if 4,8 and 16 are in continued proportion. **(2 Marks)**

**Q 5 B.** Find the derivative of  $f(x) = 3x^5 - 12x^3 + 2x^2 - 12$  **(2 Marks)**

**OR**

**Q 5 C)** Show that the  $f'(x)$  of  $f(x) = 12x^3 + 25x^4$  is  $36x^2 + 100x^3$  **(2 Marks)**