



PBL-010-001107

Seat No. _____

B. B. A. (Sem. I) (CBCS) Examination

November/December - 2018

Paper - 107 : Business Mathematics - I

Faculty Code : 010

Subject Code : 001107

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions : (1) Attempt all the questions.
 (2) Figures to the right side indicate marks of each question.

- 1 (a) Prove that : 7
 $nP_r = n(n-1)(n-2)(n-3)\dots(n-r+1)$
 (b) In how many 10 examination papers be arranged 7
 so that the best and worst papers are never come
 together.

OR

- 1 (a) Prove that $nC_r = \frac{n!}{r!(n-r)!}$. 7
 (b) Find the value of n and r . 7
 $nC_{r-1} : nC_r : nC_{r+1} = 3 : 4 : 5$

- 2 (a) Prove that $S_n = \frac{n}{2}(2a + (n-1)d)$ 7
 (b) $10 + 9.5 + 9 + \dots + 0.5$. Find n and T_{17} 7

OR

- 2 (a) Prove that $S_n = \frac{a(r^n - 1)}{r - 1}$. 7
 (b) Sum of n terms : 7
 $5 + 55 + 555 + 5555 + \dots$

3 (a) Find the middle term of $\left(\frac{9}{x} - \frac{x}{a}\right)^{10}$. 7

(b) Find the value of $(\sqrt{3} + 1)^5 - (\sqrt{3} - 1)^5$. 7

OR

3 (a) Using the principle of Mathematical induction prove that 7

$$1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6}$$

(b) Find the sum of n terms of 7
 $1 \times 4 + 3 \times 7 + 5 \times 10 + \dots$

4 (a) Explain : Equal functions, one-one function. 7

(b) If $f(x) = x(x+1)(2x+1)$. Prove that $f(x) - f(x-1) = 6x^2$ 7

OR

4 (a) If $f(x) = \frac{x^2 + 1}{x^3 - x + 1}$, find $f(1) - f(0)$. 7

(b) If $g(x) = \frac{x(x-1)}{3+x}$, find $\frac{g(2) + g(1)}{g(0) + g(-2)}$ 7

5 Attempt any four : 4

(1) $\lim_{x \rightarrow 2} \frac{x^3 - 3x^2 + 3x - 2}{2x^3 - 5x^2 - x + 6}$

(2) $\lim_{x \rightarrow 1} \frac{\sqrt{x+5} - \sqrt{6}}{\sqrt{x+7} - \sqrt{8}}$

(3) $\lim_{x \rightarrow 0} \frac{2^{4x} - 2^{3x}}{x}$

(4) $\lim_{n \rightarrow \infty} \frac{\sum n}{(n+1)(n+2)}$

(5) $\lim_{x \rightarrow 2} \left(\frac{1}{x-2} - \frac{1}{x^2 - 3x + 2} \right)$

(6) $\lim_{x \rightarrow 5} \frac{\sqrt{x} - \sqrt{5}}{x - 5}$