JAT-010-001107 Seat No. _____

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

December – 2019

Business Mathematics - 01

(Old Course)

Faculty Code : 010

Subject Code : 001107

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions :

(1) Attempt all five questions.

(2) Each question carries equal marks.

(3) Figure to the right indicates marks.

1 (a) Explain the following terms : **7**

(i) One one function

(ii) Many one function

(iii) Constant function.

(b) If $f(x) = x^2,\ g(x) = 5x - 6$ and $x \in \{2, 3\}$ **7**

prove that $f = g$.

OR

1 (a) Explain the following terms : **7**

(i) Function

(ii) Power function

(iii) Domain of function.

(b) $F = N \to N,\ f(n) = \dfrac{n^2(n+1)^2}{4}$ find $f(n) - f(n-1)$. **7**

2 (a) Prove that ${}^{n}P_{r} = \frac{n!}{(n-r)!}$. **7**

(b) How many different words using all the letters of the word 'MAUNISH' can be formed ? How many of them **7**
(i) begin with *M*

(ii) begin with *M* and end with *H*.

OR

2 (a) Prove that ${}^{n}C_{r} = \frac{n!}{(n-r)!\,r!}$. **7**

(b) A bag contains 4 white and 6 black balls. In how many ways selection of 2 balls can be made so that (i) Both are white balls (ii) Both are black balls (iii) Both are different colour ? **7**

3 (a) Find the value of $\left(\sqrt{5}+1\right)^{5} - \left(\sqrt{5}-1\right)^{5}$. **7**

(b) Find the middle term in the expansion of $\left(x + \frac{1}{x}\right)^{10}$. **7**

OR

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

$$1+2+3+.....+n = \frac{n(n+1)}{2}$$

(b) Find S_n if $T_n = 2n^2 + 3n$. **7**

4 (a) Prove that $S_n = \frac{n}{2}\left[2a + (n-1)d\right]$. **7**

(b) Find the sum of $72 + 70 + 68 + ... + 40$. **7**

OR

4 (a) Prove that $S_n = \frac{a\left(r^n - 1\right)}{r-1}$. **7**

(b) Obtain the sum of n terms of the series **7**

$9 + 99 + 999 + ...$

5 Attempt any four : **14**

(1) $\lim_{x \to 2} \frac{x^2 - 5x + 6}{x^2 - 4}$

(2) $\lim_{x \to 2} \frac{x^4 - 16}{x^3 - 8}$

(3) $\lim_{x \to 0} \left(1 - \frac{4}{x}\right)^x$

(4) $\lim_{x \to 0} \frac{7^x - 5^x}{x}$

(5) $\lim_{x \to \infty} \frac{x^3 - 4x^2 + 8}{(x^2 + 1)(2x + 3)}$

(6) $\lim_{x \to 3} \frac{\sqrt{1+x} - 2}{x - 3}$