



**KERALA AGRICULTURAL UNIVERSITY**  
**B.Sc. (Hons.) Forestry 2017 Admission**  
**I Semester Final Examination-March-2018**

**Bass.1103**

**Basic Mathematics (2+0)**

**Marks:50**  
**Time:2Hours**  
**(10x1=10)**

**I Fill in the blanks**

- 1 The 10<sup>th</sup> term of series 1,2,4,8..... is.....
- 2 The  $n^{\text{th}}$  term of the H.P is.....
- 3 A number of permutations of 'n' things taken 'r' at a time, when a particular thing is never taken=.....
- 4 From a group of 15 farmers in a village, a team of 11 farmers is to be chosen. In how ways in this can be done?
- 5 If two rows (columns) of a determinant are identical then the value of the determinant is.....
- 6 The arrangement of the binomial coefficient is known as.....
- 7 The value of  $\sin (2A) = \dots\dots\dots$
- 8  $\lim_{x \rightarrow 2} \frac{x^4 - 16}{x - 2} = \dots\dots\dots$
- 9 The value of  $\int \frac{1}{1 + e^x} ds$  is.....
- 10 A function  $y = f(x)$  can have more than one maximum, and then this function is called .....

**II Write Short notes on ANY FIVE of the following**

**(5x2=10)**

- 1 There are 6 varieties on brinjal, in how many ways these can be arranged in 6 plots which are in a line?
- 2 Find the middle term of an AP with 21 terms whose 5<sup>th</sup> term is 27 and the common difference is 5?
- 3 If  $A = \begin{bmatrix} x + y & 7 - x & 8 \\ y + z & 8 - y & 7 + z \end{bmatrix} = \begin{bmatrix} 2 & 6 & 8 \\ 3 & 7 & 9 \end{bmatrix}$ , find  $x, y$  and  $z$ ?
- 4 Find the value of  $(x + a)^4$ ?
- 5 Differentiate the function  $y = (x + 1)^2(x + 2)^3(x + 4)^4$ ?
- 6 Find the value of  $\int \frac{x^2}{x+2} dx$ ?
- 7 Write the necessary and sufficient condition for the function  $y = f(x)$  to have a maximum and minimum?

**P.T.O**

**III Answer ANY FIVE of the following**

**(5x4=20)**

- 1 Find the number of ways in which a committee of 5 farmers can be formed out a group of farmers containing 5 small farmers and 4 big farmers, so that in each committee there are not more than 3 farmers from any group?
- 2 Find the sum to n terms of the series  $5+55+555+\dots$ ?
- 3 Find the determinants of matrix  $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \\ 1 & 4 & 9 \end{bmatrix} = ?$
- 4 (i) Find the value of  $11^7$ ?  
(ii) Show that  $y = x^3 + 2$  is increasing for all intervals
- 5 Differentiate the function  $y = (\sin x)^x$ ?
- 6 Find the value of  $\int \sin 2x \cos 3x dx$ ?
- 7 For the function  $y = 1800 + 7x - 0.03x^2$  obtain update level of fertilizer applications for which yield in maxima and find the maximum yield?

**IV Write an essay on ANY ONE of the following**

**(1x10=10)**

- 1 The following response function in N,P,K is given below:  
 $Z = -0.03N^2 + 0.02NK - 0.02P^2 - 0.03K^2 + 3P + 2N + 4K$   
The farmer can spend only ₹ 500/ha. The price of N is ₹ 2/kg and P is ₹ 1/kg and K is ₹ 4/kg. If the farmer want to get maximum yield how much N,P,K can be applied within this available money?
- 2 How many words can be formed with the letters of the word 'OMEGA'? When
  - (i) 'O' and 'A' occupying end places.
  - (ii) E being always in the middle.
  - (iii) Vowels occupying odd-places
  - (iv) Vowels being never together

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