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KERALA AGRICULTURAL UNIVERSITY

B.Sc (Hons.) Forestry. 2014 Admission
1st Semester Final Examination- February-2015

at. No: Bash.1102

itle:Basic Mathematics (2+0)

Marks: 50⁰⁰
Time: 2 hours

I a.) Choose the correct answer.

(10 x1=10)

1. The elements of the main diagonal of a skew symmetric are
a.) All real numbers b.) All Zeros c.) All imaginary numbers d.) None of these
2. Differential coefficient of e^{2x} is
a.) e^{2x} b.) $2.e^{2x}$ c.) $e^{2x}/2$ d.) None of these
3. To multiply a matrix by a scalar K multiply
a.) Any row by K b.) Every element by K c.) Any column by K
4. The value of the determinant $\begin{vmatrix} 1 & 1 \\ 1 & 1 \end{vmatrix}$ is
a.) 0 b.) 1 c.) -1 d.) 2
5. If every minor of order r of a matrix A is Zero then the rank of A is
a.) Greater than r b.) Equal to r c.) Less than or equal to r d.) Less than r

I b.) State whether the following statements are true or false

1. If b is the Harmonic mean between a and c then $b^2 = ac$
2. The product of a complex number and it's conjugate is a real number.
3. If A and B are two matrices conformable for multiplication $AB=BA$ always
4. A square matrix is singular if $|A|=0$
5. $(AB)^{-1} = A^{-1} B^{-1}$

II. Answer any FIVE of the following

(5 x 2=10)

1. Insert six arithmetic means between 3 and 24
2. Differentiate $e^x \log x$ w.r.t.x
3. If $\theta=30^\circ$ verify that $\sin 2\theta=2 \sin \theta \cos \theta$
4. Using Cramer's rule solve $2x + 3y = 5$, $3x - 2y = 1$

5. The first term of a G. P is 2 and the sum to infinity is 6. Find the common ratio.

6. A particle is moving on a line according to the formula $S = 12t - 3t^2$ where S is in metres and t is in seconds. Find its velocity and acceleration

7. If $A+B=45^\circ$, show that $(1+\tan A)(1+\tan B)=2$

III Answer any FIVE of the following

(5 x 4=20)

1. Differentiate \sqrt{x} , from first principles.

2. Evaluate using Sarrus Method $\begin{vmatrix} 1 & 2 & -2 \\ -1 & 1 & 2 \\ 2 & 1 & 3 \end{vmatrix}$.

3. Integrate x^3+2x^2+x w.r.t x

4. Differentiate x^x

5. Insert three geometric means between 1 and 256.

6. Show that $\cos 55^\circ + \cos 65^\circ + \cos 175^\circ = 0$

7. a. If $A = \begin{bmatrix} 2 & 1 & 1 \\ 1 & 1 & 3 \end{bmatrix}$ and $\begin{bmatrix} 1 & 2 & -2 \\ -1 & 1 & 2 \\ 0 & 2 & 3 \end{bmatrix}$ find AB and BA and show that $AB \neq BA$

IV Answer any ONE

(1 x 10=10)

1. a. Integrate $\sqrt{ax+b}$ w.r.t x

b. Find the maximum and minimum of x^3+4x^2-3x+1

2. a. Expand $(2a+b)^6$ using binomial theorem

b. Sum to n terms of $4 + 44 + 444 + \dots$