



Registration No:
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AR-2018

B.Sc (Ag)

FIRST YEAR EXAMINATION-JULY 2019

EM-111

ELEMENTARY MATHEMATICS

Time : 2 Hours

Maximum : 50 Marks

(Answer **all** questions of Section – A)

SECTION – A

Q.1. Fill-up the blanks

10x0.5=5

- I. Points that are on the same line are called _____ points.
- II. A part of a line that has defined endpoints is called a _____.
- III. The point that is exactly in the middle between two points is called the _____.
- IV. A point formed between two rays with the same endpoint is called _____.
- V. Two angles whose measures together are _____ degree are called supplementary.
- VI. Two lines are perpendicular if the product of their slope is _____.
- VII. A line segment that has its endpoints on the circular border but does not pass through the midpoint is called a _____.
- VIII. Matrix A is orthogonal if $A^T A =$ _____.
- IX. If determinant of a matrix is _____, then the matrix is singular.
- X. $\int x e^x dx =$ _____.

Q.2. Multiple choice (choose the most correct answer)

10x0.5=5

- a. Slope of a line passes through (2,7) and (9,10) is:
a. 7/3 b. 3/7 c. 12/19 d. 16/12
- b. A line passes through (10,n) and (9,1) has a slope of -6. The value of n is:
a. 7 b. -7 c. 10 d. 9
- c. T(2,9) and U(10,1) are the endpoints of a line segment. The midpoint of this line segment is:
a. (6,5) b. (5,6) c. (12,10) d. (10,12)
- d. The distance between points (1,8) and (7,0) is:
a. 0 b. 1 c. 8 d. 10
- e. If height is 2m and base is 2m of a right-angle, then area of the triangle is:
a. 2 b. 4 c. 8 d. none of these
- f. If the radius of a circle is 1.5m, then its circumference is:
a. 1.5π b. 3π c. 2.25π d. none of these
- g. A pair of equations to determine the value of two variables is called:
a. simultaneous linear equations b. paired equations c. quadratic equations d. simple equations
- h. In matrices $(AB)^T$ equals to:
a. B b. A c. $A^T B^T$ d. $B^T A^T$
- i. Angles that sum upto 180° are known as:
a. complementary angles b. reflective angles c. supplementary angles d. vertical angles
- j. $\int f'(x) dx$ is:
a. 0 b. 1 c. $f(x)$ d. $f''(x)$

Q.3. Match the followings (Write the letter of Column-A in the () of Column-B

10x0.5=5

Column-A	Column-B
a. Distance between two points	i. Line segment ()
b. Obtuse angle	ii. Triangle ()
c. $\frac{d(\log x)}{dx}$	iii. $\frac{-1}{x^2}$ ()



d. $\oint x dx$	iv. $\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$ ()
e. $\frac{d(\frac{1}{x})}{dx}$	v. Commutative law ()
f. A part of a line	vi. πd ()
g. $ A \neq 0$	vii. $\frac{x^2}{2}$ ()
h. In matrix, $A+B=B+A$	viii. Non singular matrix ()
i. Circumference of a circle	ix. $\frac{1}{x}$ ()
j. A polygon of 3 sides	x. More than 90° but less than 180° ()

Q.4. Define/Explain in 1-2 sentences

5x1=5

- A line
- Integration by substitution method
- Interior angles
- Congruent triangles
- Matrix

SECTION – B

(Attempt any **five** questions. Each question carries equal marks) 5x6=30

Q.5. a). Find the equation of the line joining the points (3,3) and (7,6). What is the length of the intercept of this line?

b). If vertices of a triangle are $A(x_1, y_1)$, $B(x_2, y_2)$ and $C(x_3, y_3)$ respectively, then find the midpoint D of BC and equation of AD.

Q.6. a). Write the straight line equations of Slope-intercept form, Slope-point form, Two-point form, Intercept form, Normal form and general form.

b). Prove that the diagonals of a rectangle are equal and bisect each other.

Q.7. Write the general equation of a circle. Find the co-ordinates of the centre and radius of the circle passing through the points (3,4), (3,-6) and (-1,2).

Q.8. a). Evaluate the limit when $x \rightarrow 3$ of $f(x) = 2x^3 - 3$.

b). Integrate by Substitution $e^x \cos e^x$.

Q.9. a). Show that
$$\begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix} = (b-c)(c-a)(a-b)$$

b). Find the value of x for
$$\begin{vmatrix} 2 & 2 & x \\ -1 & x & 4 \\ 1 & 1 & 1 \end{vmatrix} = 0$$

Q.10. a). If $A = \begin{bmatrix} 2 & 1 & 2 \\ -1 & 2 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & -2 \\ 1 & 3 \\ 1 & 2 \end{bmatrix}$, find AB.

b). Evaluate
$$\begin{bmatrix} a & b & c \\ b & c & d \end{bmatrix} \times \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$