P P SAVANI UNIVERSITY

Second Semester of B.Sc. (Hons.) Agriculture End Semester Examination

December - 2022

SGAG1180-Elementary Mathematics

22.12.2022, Thursday Time: 10:00 a.m. to 12:00 p.m. Maximum Marks: 50

Instruction:

1. Draw a neat and labeled diagram whenever it is required.
2. Start new questions from new page.

Q.1 Multiple choice questions. **(15)** **CO** **BTL**

1.1 $\frac{d}{dx}\sin x = \cos x$. **1** **3**

a. True b. False

1.2 Find the $\lim_{x\to 1}(x+1)^2$. **1** **5**

a. 2 c. 4

b. 1 d. 5

1.3 Find the $\lim_{x\to\frac{\pi}{2}}\sin x$. **1** **5**

a. 0 c. 4

b. 1 d. 5

1.4 $\frac{d}{dx}(u.v) = u\frac{d}{dx}(v) + v\frac{d}{dx}(u)$ it is true or false. **1** **2**

a. True b. False

1.5 $\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{v\frac{d}{dx}u - u\frac{d}{dx}v}{v^2}$ it is true or false. **1** **1/2**

a. True b. False

1.6 $\frac{d}{dx}\cos x =$ ____. **1** **3**

a. $\cos x$ c. $\sin x \cos x$

b. $-\sin x$ d. None of these

1.7 $\int (x^2 + \sin x)dx =$ ____. **2** **5**

a. $\frac{x^3}{3} + \cos x + C$ c. $\frac{x^3}{3} - \cos x + C$

b. $x - \cos x + C$ d. None of these

1.8 $\int uvdx = u\int v\,dx - \int\left[\frac{du}{dx}\int v\,dx\right]dx$ it is true or false. **2** **2**

a. True b. False

1.9 $\int_a^a f(x)dx =$ ____. **2** **5**

a. 0 c. $f(a)$

b. 1 d. a

1.10 $\int \frac{1}{x} dx =$ ____. 2 5

a. $\log x + C$ c. 1

b. 0 d. None of these

1.11 If A and B are matrices, then which from the following is true? 3 1/2

a. $A + B \neq B + A$ c. $AB \neq BA$

b. $(A^T)^T \neq A$ d. All the true

1.12 The matrix $A = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ is a ____. 3 2

a. Diagonal matrix c. Symmetric matrix

b. Skew-Symmetric matrix d. None of these

1.13 If A and B are square matrices of order 2, then $(A + B)^2 =$ ____. 3 2

a. $A^2 + 2AB + B^2$ c. $A^2 + AB + BA + B^2$

b. $A^2 + 2BA + B^2$ d. None of these

1.14 If the order of a matrix A is $m \times p$. And order of a matrix B is $p \times n$. Then the order of matrix AB is? 3 1/2

a. $m \times n$ c. $n \times p$

b. $n \times m$ d. $m \times p$

1.15 Find the adjoint of the matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$. 3 5

a. $\begin{bmatrix} 4 & 2 \\ 3 & 1 \end{bmatrix}$ c. $\begin{bmatrix} 4 & -2 \\ -3 & 1 \end{bmatrix}$

b. $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ d. $\begin{bmatrix} 1 & -2 \\ -3 & 4 \end{bmatrix}$

Q.2 Answer the following questions. **(06)**

2.1 Define one-one function. 1 1

2.2 Define function 1 2

2.3 Write $\frac{d}{dx} x^2 =$ ____. 1 4

2.4 Write $\int x^2 \, dx =$ ____. 2 5

2.5 $\begin{bmatrix} 1 & 1 \\ 2 & 3 \end{bmatrix} + \begin{bmatrix} 2 & -1 \\ -1 & 1 \end{bmatrix} =$ ____. 3 5

2.6 If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ then $A^T =$ ____. 3 4

Q.3 Answer the following questions. **(05)**

3.1 Write $\frac{d}{dx} \sin x =$ ____. 1 5

3.2 Write $\frac{d}{dx} x^n =$ ____. 1 5

3.3 $\lim_{x \to 3} x^2 =$ ____. 1 4

3.4 If $A = \begin{bmatrix} 2 & 1 \\ 5 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & -1 \\ -5 & 2 \end{bmatrix}$ then $AB =$ ____. 3 5

3.5 If $A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ then $A^T =$ ____. 3 4

Q.4	**Answer the following questions. (Attempt any six)**	**(12)**		
4.1	Find $\lim_{x\to -1} \frac{x^{10}+x^5+1}{x-1}$.		1	5
4.2	Find $\lim_{x\to 3} \frac{x^2-9}{x-3}$.		1	5
4.3	Find $\frac{d}{dx}\frac{\cos x}{x}$.		1	4
4.4	Evaluate $\int x^3 + x^2 + x\, dx$.		2	5
4.5	Evaluate $\int (\sin x + \cos x)\, dx$.		2	5
4.6	If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ then find $A + B$.		3	2/4
4.7	If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ then find A^2.		3	5
4.8	If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ then find adj(A).		3	4
Q.5	**Answer the following questions. (Attempt any three)**	**(12)**		
5.1	Check the Continuity of a function given by $f(x) = 2x + 1$ at $x = 1$.		1	4
5.2	If $y = x^2 \log x$ then find $\frac{dy}{dx}$.		1	5
5.3	Evaluate $\int x^n \log x\, dx$.		2	5
5.4	If $A = \begin{bmatrix} -2 & 2 \\ 3 & 3 \\ 2 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 1 & 1 \\ -1 & 2 & 3 \end{bmatrix}$ then find the following terms: **(i)** AB **(ii)** BA		3	2/4
5.5	If $A = \begin{bmatrix} 2 & 2 \\ -3 & -6 \\ 4 & -4 \\ 0 & 5 \end{bmatrix}$, and $B = \begin{bmatrix} 2 & 6 \\ 8 & -2 \\ -6 & 5 \\ 2 & -4 \end{bmatrix}$ then find the following terms: **(i)** $A + B$ **(ii)** $A - B$		3	2/4

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CO : Course Outcome Number BTL : Blooms Taxonomy Level

Level of Bloom's Revised Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create