PROGRAM: BBA

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SUBJECT:- BUSINESS MATHEMATICS

# MID TERM ASSIGMENT

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# Question No: 1 (MCQ's)

(i) (e)

(ii) (b)

(iii) (d)

(iv) (e)

(v) (b)

(vi) (e)

(vii) (e)

(viii) (e)

(ix) (a)

(x) (e)

Date: _____ (2)

# Question No: 2

(a) Find the domain and range of the function $fog(x)$ where $fog(x) = f(g(x))$

$fog(x)$

$f(x) = \sqrt{x^2-1}$ $\quad g(x) = x+1$

$f(g(x)) = f(x+1)$

$= \sqrt{(x+1)^2 - 1}$

$= \sqrt{x^2+1^2+2x(1)-1}$

$= \sqrt{x^2+x+2x-1}$

$f(g(x)) = \sqrt{x^2+2x}$

Domain:- All real no except $(-2, 0)$

Range:- All positive real no's

(b) :- Solve the following $|3x-3| = 4x-2$

Sol:- $3x-3 = +4x-2$ , $3x-3 = -(4x-2)$

$3x-3 = 4x-2$ , $3x-3 = -4x+2$

$4x-3x = -3+2$ , $3x+4x = 2+3$

$x = -1$ , $7x = 5$

$x = 5/7$

$S.S = \{-1, 5/7\}$

Date: _____ (4)

# Question No:- 3

(a) Find the Inverse for the following:-

$$\begin{bmatrix} -5 & -6 \\ -0 & -7 \end{bmatrix}$$

Sol:- $\begin{bmatrix} -5 & -6 \\ -0 & -7 \end{bmatrix}$

let $A = \begin{bmatrix} -5 & -6 \\ -0 & -7 \end{bmatrix}$

$$A^{-1} = \frac{\text{Adj}A}{|A|}$$

$|A| = \begin{bmatrix} -5 & -6 \\ 0 & -7 \end{bmatrix}$

$= (-5 \times -7) - (-6 \times 0)$

$35 + 6 = 41 \neq 0$

So $A^{-1}$ exist

$$\text{Adj}(A) = \begin{bmatrix} -7 & 6 \\ 0 & -5 \end{bmatrix}$$

$$A^{-1} = \frac{\text{Adj}(A)}{|A|}$$

$$= \frac{\begin{bmatrix} -7 & 6 \\ 0 & -5 \end{bmatrix}}{41}$$

$$A^{-1} = \begin{bmatrix} -7/41 & 6/41 \\ 0/41 & -5/41 \end{bmatrix}$$

Date: _____ (6)

(b) Solve the following :-

$$x + 2y = 2$$

$$3x - 5y = 3$$

Sol :- $x + 2y = 2$

$3x - 5y = 3$

Given

$x + 2y = 2 - (i)$

$3x - 5y = 3 - (ii)$

Multiply (i) by 3

$3x + 6y = 6 - (iii)$

Subtracting (ii) (iii)

$$\begin{array}{r} 3x - 5y = 3 \\ +\ 3x + 6y = +6 \\ \hline +11y = +3 \end{array}$$

$y = 3/11$ Put (i)

Date: _____



$$x + 2y = 2$$

$$x + 2\left(\frac{3}{11}\right) = 2$$

$$x + \frac{6}{11} = 2$$

$$x = 2 - \frac{6}{11}$$

$$x = \frac{22-6}{11}$$

$$x = \frac{16}{11}$$

$$S.S \left\{ \frac{16}{11}, \frac{3}{11} \right\}$$

Date: _____ (8)

# Question No:4

(a) At what Points the function is undefined

$$f(x) = \frac{x-1}{x^2-9x+20}$$

Sol:- $$f(x) = \frac{x-1}{x^2-9x+20}$$

$$f(x) = \frac{x-1}{x^2-4x-5x+20}$$

$$= \frac{x-1}{x(x-4)-5(x-4)}$$

$$= \frac{x-1}{(x-1)(x-5)}$$

$$f(x) = \frac{1}{x-5}$$

at $x=5$ the function is undefind

(b) The Sum of the ages of a girl and her brother is 26 years. Three years ago her age was four times the age of her brother. Find the Present age of the girl and her brother :-

Sol:- Let the age of girl = $x$

age of brother = $y$

According to condition

$$x + y = 26 - (i)$$

$$(x-3) = 4(y-3)$$

$$x - 3 = 4y - 12$$

$$4y - x = -3 + 12$$

$$-x + 4y = 9 - (ii)$$

Adding (i) (ii)

$$x + y = 26$$

$$-x + 4y = 9$$

$$5y = 35$$

$$y = \frac{35}{5} = 7 \quad \text{Put (i)}$$

$$x + 7 = 26$$

$$x = 26 - 7$$

$$x = 19$$

So Age of girl = 19

Age of brothers = 7

# Question No 5:-

(a) Find the factors of all orders of $x^4 - 6x + 9$ :-

Sol:- $x^4 - 16$ and $x^2 - 6x + 9$

Factors of $x^4 - 16$

$$x^4 - 16$$

$$(x^2)^2 - (4)^2$$

$$(x^2)^2 - (4^2)^2$$

$$(x^2 - 4)(x^2 + 4)$$

$$(x^2 - 2^2)(x^2 + 4)$$

$$(x^2 + 2^2)(x^2 + 4)$$

$$(x + 2)(x - 2)(x^2 + 4)$$

Factors of $x^2 - 6x + 9$

(b) $x^2 - 6x + 9$

$$x^2 - 3x - 3x + 9$$

$$x(x-3) - 3(x-3)$$

$$(x-3)(x-3)$$

(b):- The manger of Roseville Appliance bought a coffee maker manufactured in Spain for $ 15 and will sell it for $18.75 Find the Percent of markup based on Cost :-

Sol:- Cost price $ = 15 $

Sale Price = 18.75 $

Percentage of markup = ?

$$\text{Markup} = \frac{\text{Sale price} - \text{Cost price}}{\text{Cost price}}$$

$$\text{Markup} = \frac{18.75\$ - 15\$}{15\$}$$

$$\text{Markup} = \frac{3.75\$}{15\$}$$

$$\text{Markup \%} = \frac{3.75}{15} \times 100$$

$= 0.25 \times 100$

Markup % $= 25\%$