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BBI-014-1041013 Seat No. _____

M. P. M. (Sem. I) (CBCS) Examination

July – 2021

Remedial Mathematics

Faculty Code : 014

Subject Code : 1041013

Time : Hours] [Total Marks : **35**

1 Answer any **one** of the following : **10**

(a) If $f(x)=\dfrac{2x^2+x}{1+2x}$ then evaluate the following :

(i) $f(2x)+f\left(\dfrac{3}{x}\right)$

(ii) $f(6)-f(8x)$

(iii) $f\left(\dfrac{1}{x}\right)f\left(\dfrac{x}{6}\right)$

(b) Find eigne values and eigen vectors of the matrix $\begin{bmatrix}-2 & -4 & 2\\ -2 & 1 & 2\\ 4 & 2 & 5\end{bmatrix}$.

2 Answer any **five** of the following : **25**

(a) (i) Solve for y : $\log y+\log(y-10)=\log 24$

(ii) If $\log\left(\dfrac{a+b}{2}\right)=\dfrac{1}{2}(\log a+\log b)$, then show that $a=b$

(b) Compute B^{-1} for $B=\begin{bmatrix}1 & 3 & 4\\ 1 & -2 & 0\\ 1 & 3 & 6\end{bmatrix}$.

(c) (i) If $f(x) = 6x^2 + 8x - 625$, then find $f(25)$.

(ii) Find $f(g(6))$ where $f(x) = 6x - 5 \& g(x) = x^2$.

(d) Solve the following system of equation :

$2x + y - z = 1$

$x + 3y + z = 7$

$4x + 8y + z = 14$

(e) (i) If $\begin{bmatrix} a-2b & 3a-2b \\ 2c+d & c-d \end{bmatrix} = \begin{bmatrix} -1 & -7 \\ 6 & 9 \end{bmatrix}$, then find the values of a, b, c and d.

(ii) If $S = \begin{bmatrix} 1 & 3 & 4 \\ 1 & -2 & 0 \\ 1 & 3 & 6 \end{bmatrix}$ then find det(s).

(f) (i) If $f(x^2 + x) = f(x^2) + f(x)$, then compute $f(0)$.

(ii) Find $5A - 6B$ where $A = \begin{bmatrix} 15 & -4 \\ 9 & 3 \end{bmatrix} \& B = \begin{bmatrix} -11 & 2 \\ 8 & 10 \end{bmatrix}$

(g) (i) If $\log(x+3) + \log(x-3) = \log 27$, then find the value of x.

(ii) If $f(x) = \cos x$ *and* $g(x) = 1 - \sin x$ then find $(f+g)\left(\frac{\pi}{2}\right), (f-g)\left(\frac{\pi}{6}\right)$ and $(fg)\left(\frac{\pi}{4}\right)$.
