

Smt. 2023
22/5/23

Seat Number

--	--	--	--	--	--

PANKH-59

BP-106-RMT
Remedial Mathematics
(711162)

Total Pages : 3]

Time : 1½ Hours

Max. Marks : 35

Note : (1) Do not write anything on question paper except Seat No.

(2) Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.

(3) Students should note, no supplement will be provided.

(4) Simple non-programmable calculator is allowed.

(5) Log table is allowed.

1. (A) Attempt any *one* of the following : 10

(1) Solve the following system of linear equation with the help of Cramer's rule :

$$x + 2y + 3z = 6$$

$$2x + 4y + z = 7$$

$$3x + 2y + 9z = 14.$$

(2) Prove that :

$$3 \log 4 + 2 \log 5 - \frac{1}{3} \log 64 - \frac{1}{2} \log 16 = 2.$$

P.T.O.

(B) (1) Show that the lines $27x - 18y + 25 = 0$ and $2x + 3y + 7 = 0$ are perpendicular to each other.

(2) If $f(x) = x^2$ and $g(x) = \frac{1}{x}$, then prove that the values of $\log\left(\frac{1}{2}\right)$ and $\text{gof}\left(\frac{1}{2}\right)$ are equal.

(3) Evaluate :

$$\int \frac{\cos 2x}{\sin^2 x \cdot \cos^2 x} dx.$$

(4) Using logarithm table calculate the value of :

(i) $\log (2.0017)$

(ii) $\log (106.0606).$

(5) Evaluate the determinant :

$$\begin{vmatrix} 2 & -1 & 5 \\ 3 & 4 & 2 \\ 1 & -2 & -1 \end{vmatrix}.$$

2. Attempt any *five* questions :

25

(1) Evaluate :

$$\lim_{x \rightarrow 0} \frac{\sqrt{x+1} - 1}{x}.$$

(2) Derive first order kinetics equations using logarithmic characteristics.

- (3) Show that the four points whose co-ordinates are $(0, 5)$, $(-2, -2)$, $(5, 0)$ and $(7, 7)$ form a rhombus.

- (4) Differentiate w.r.t. x for function :

$$y = 3 \tan x + 5 \log x + \frac{1}{x}.$$

- (5) If $A = \begin{bmatrix} 3 & 1 \\ 4 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 0 \\ 2 & 5 \end{bmatrix}$, then find out the value for $[AB^{-1}]$.

- (6) Factorise the following polynomial :

$$2x^3 - 10x^2 + 12x.$$

- (7) Simplify the following equation :

$$4 \log 5 + 2 \log 4.$$