

Seat Number

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W-19

**BP 106**  
**RMT Remedial Mathematics**  
**(711162)**

P. Pages : 1

Time : One &amp; Half Hour

Max. Marks : 35

## Instructions to Candidates :

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. Attempt **any one** of the following.

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a) Verify Cayley-Hamilton theorem for the matrix.

$$A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix} \text{ Hence find } A^{-1}.$$

b) Derivative of the product of two function, by using first principal.

2. Attempt **any five** of the following.

25

a) Resolve  $\frac{2x+3}{x^2-2x-3}$  into partial fraction.b) Simplify :  $7 \cdot \log \frac{16}{15} + 5 \cdot \log \frac{25}{24} + 3 \cdot \log \frac{81}{80}$ 

c) Show that

$$\begin{vmatrix} 0 & c & b \\ c & 0 & a \\ b & a & 0 \end{vmatrix}^2 = \begin{vmatrix} b^2+c^2 & ab & ac \\ ab & c^2+a^2 & bc \\ ac & bc & a^2+b^2 \end{vmatrix}$$

d) If  $y = A \cdot \cos nx + B \cdot \sin nx$ . Show that  $y_2 + n^2 \cdot y = 0$ .e) Find two positive number's  $x$  and  $y$  such that,  $x+y=60$  and  $xy^3$  is minimum.f) Evaluate the following integral,  $\int \left(x + \frac{1}{x}\right)^2 \cdot dx$ g) Find the Laplace transform of  $\cosh at - \cos at$ .

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