VET BVL POLYTECHNIC

1ST INTERNALS (CS/EC/ME/CE)

Date : 28-12-2020 **Time : 80 minutes**
Marks : 30

Answer one full question from each section, one full question carries 10 marks

Section A

1) a. Find A^2 if $A = \begin{bmatrix} 1 & 3 & 4 \\ -1 & 2 & 1 \\ 0 & 3 & 3 \end{bmatrix}$ (5)

b. Solve $2x-y = 3$ and $x+2y = 4$ by cramers rule (5)

2) a. If $A = \begin{bmatrix} 4 & 3 \\ 1 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$ show that $(AB)^T = B^T A^T$ (5)

b. Find m if $\begin{vmatrix} 2 & m-1 & -3 \\ 1 & -2 & 4 \\ 3 & -1 & 5 \end{vmatrix} = 3m-1$ (5)

Section B

3) a. Convert 105° into radians. (2)

b. Find the value of sin 75° . (3)

c. If $\tan\theta = \frac{12}{5}$, $180° < \theta < 270°$ find the value of $\frac{3\sin\theta+4\cos\theta}{3\sin\theta-4\cos\theta}$ (5)

4) a. Simplify : $\sin420°\cos(-390°) + \sin(-330°)\cos300°$. (5)

b. Simplify : $\frac{\sin70°+\sin50°}{\cos70°+\cos50°}$ (5)

Section C

5) a. Solve x & y by determinant method 4x+y=7, 3y+4z=5,5x+3z=2. (5)

b. Simplify : $\frac{\cos(360-\theta)\tan(360+\theta)}{\cot(270-\theta)\sin(90+\theta)}$ (5)

6) a. If $A = \begin{bmatrix} 2 & -1 \\ 5 & -6 \end{bmatrix}$ then prove that $\mathbf{A^2+4A-7I=0}$. (5)

b. If $\mathbf{A+B+C=\pi}$, show that tanA+tanB+tanC=tanAtanBtanC. (5)

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