| Vivekananda College of Engineering & Technology, Puttur<br>[A Unit of Vivekananda Vidyavardhaka Sangha Puttur ®]<br>Affiliated to VTU, Belagavi & Approved by AICTE New Delhi | | | |
|---|---|---|---|
| CRM08 | Rev 1.10 | BS | 30-03-2021 |

# CONTINUOUS INTERNAL EVALUATION - 3

| Dept:BS | Sem / Div:1/A,B,C,D,E,F | Sub: Calculus and Linear Algebra | S Code:18MAT11 |
|---|---|---|---|
| Date:07-04-21 | Time: 9:30-11:00 | Max Marks: 50 | Elective:N |

Note: Answer any 2 full questions, choosing one full question from each part.

| QN | | Questions | Marks | RBT | CO's |
|---|---|---|---|---|---|
| | | **PART A** | | | |
| 1 | a | Solve: $(x^2+y^2+x)dx+xydy=0$ | 8 | L2 | CO4 |
| | b | Find the orthogonal trajectories of the family of $r^n=a^n \cos n\theta$ | 8 | L3 | CO4 |
| | c | Solve: $xyp^2-(x^2+y^2)p+xy=0$ | 9 | L2 | CO4 |
| | | **OR** | | | |
| 2 | a | If the temperature of the air is 30°C and the metal ball cools from 100°C to 70°C in 15minutes find how long it takes for the metal ball to reach the temperature of 40°C | 8 | L3 | CO4 |
| | b | Solve: $x^3\frac{dy}{dx}-x^2y=-y^4\cos x$ | 8 | L2 | CO4 |
| | c | Find the general and singular solution of $(px-y)(py+x)=a^2p$ by reducing to Clairaut's form by using the substitution $X=x^2$, $Y=y^2$ | 9 | L1 | CO4 |

## PART B

| Q.No | | Question | Marks | Level | CO |
|---|---|---|---|---|---|
| 3 | a | Find the rank of matrices (i) $A=\begin{bmatrix}4&0&2&1\\2&1&3&4\\2&3&4&7\\2&3&1&4\end{bmatrix}$ (ii) $A=\begin{bmatrix}0&1&-3&-1\\1&0&1&1\\3&1&0&2\\1&1&-2&0\end{bmatrix}$ | 8 | L1 | CO5 |
| | b | Solve by Gauss-Jordan method 2x+5y+7z=52, 2x+y-z=0 , x+y+z=9 | 8 | L2 | CO5 |
| | c | Find numerically largest eigen value and the corresponding eigen vector of the matrix A by Power method . $A=\begin{bmatrix}6&-2&2\\-2&3&-1\\2&-1&3\end{bmatrix}$ Take $X_0=[0,0,1]^t$ | 9 | L2 | CO5 |
| | | **OR** | | | |
| 4 | a | Solve the following system of equations by Gauss-Seidel Method 20x+y-2z=17, 3x+20y-z=-18, 2 x-3y+20z=25. | 8 | L2 | CO5 |
| | b | Reduce the matrix $A=\begin{bmatrix}-1&3\\-2&4\end{bmatrix}$ into the diagonal form | 8 | L2 | CO5 |
| | c | Investigate the values of $\lambda,\mu$ such that $x+y+z=6, x+2y+3z=10, x+2y+\lambda z=\mu$ may have (i)no solution (ii)unique solution (iii)infinite solution | 9 | L2 | CO5 |

Prepared by: Nayana 3/4/2021

HOD: M.Ramananda Kamath 03/4/21