Reg. No. | | | | | | | | |

G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.

UG DEGREE END SEMESTER EXAMINATIONS - NOVEMBER 2024.

(For those admitted in June 2021 and later)

PROGRAMME AND BRANCH: B.Sc., ELECTRONICS

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
IV	PART - III	CORE	U21EL405	MATHEMATICAL CONCEPTS FOR ELECTRONICS

Date & Session: 12.11.2024 / AN **Time : 3 hours** **Maximum: 75 Marks**

Course Outcome	Bloom's K-level	Q. No.	**SECTION – A (10 X 1 = 10 Marks)** **Answer ALL Questions.**
CO1	K1	1.	The number of significant figures in the number 0.06900 is. a) 4 b) 8 c) 16 d) 32
CO1	K2	2.	f(x) = $2x^3-9x^2+12x+6$ is a polynomial of degree. a) 2 b) 3 c) 1 d) 4
CO2	K1	3.	Find the odd one out. a) Bisection method b) Bolzano's method c) Interval halving method d) Regula-Falsi
CO2	K2	4.	The method which is most elegant to find the real positive or negative roots of a numerical equation is_____. a) Newton's method b) Horner's method c) Regulafalsi d) Raphson method
CO3	K1	5.	Gauss-Elimination method of solving Simultaneous Linear Algebraic Equation is. a) Direct b) Indirect c) Iterative d) Interactive
CO3	K2	6.	The fastest method of solving simultaneous Linear Algebraic equation is_____. a) Guass elimination method b) Jordan method c) Seidalmethod d) Iterative method
CO4	K1	7.	Newton's forward interpolation polynomial is used to extrapolating values of y to the _____ of the beginning. a) right b) left c) center d) one third
CO4	K2	8.	Newton's forward interpolation formula is used to interpolate the value of y is _____. a) nearer to the beginning b) nearer to the end c) nearer to the middle d) nearer to one third
CO5	K1	9.	The technique for computing the value of the function outside the give argument is called _____. a) Interpolation b) Extrapolation c) Partial fraction d) Inverse Interpolation
CO5	K2	10.	The technique for computing the value of the function inside the give argument is called _____ . a) Interpolation b) Extrapolation c) Partial fraction d) Inverse Interpolation
Course Outcome	**Bloom's K-level**	**Q. No.**	**SECTION – B (5 X 5 = 25 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	11a.	State If α,β,γ are the roots $2x^2 + 3x + 5= 0$, find α + β, αβ **(OR)**
CO1	K3	11b.	Examine, If α,β,γ are the roots of the equation $x^2 - px^2 + qx - r = 0$, find the values of (i) $\sum\alpha^2$, (ii). $\sum\alpha^3$, (iii). $\alpha^2\beta$, (iv). $\sum\alpha^2\beta^2$
CO2	K3	12a.	Illustrate the real root of the equation $x^3 - x^2 +1 = 0$ by iteration method **(OR)**
CO2	K3	12b.	Express, a real root of the equation $x^3+2x+5=0$. Using the bisection method in five stages,
CO3	K4	13a.	Solve the following system by Gaussian elimination method 28 + 4y - z = 32 x + 3y + 10z = 24 2x + 17y + 4z = 0 **(OR)**
CO3	K4	13b.	Manipulate , the following equation using Jocobi'sinteration method 20x + y – 2z = 17 3x + 20y – z = -18 2x – 3y + 20z = 25.

<table>
<tr><td>CO4</td><td>K4</td><td>14a.</td><td>Simplify that $\Delta^3 (\cos 2x) = -6\sin^2 h \cos(4x + 4h)$
(OR)</td></tr>
<tr><td>CO4</td><td>K4</td><td>14b.</td><td>Analyze the value of $e^{1.85}$ given
$e^{1.7}$ = 6.4689, $e^{1.8}$ = 7.2894, $e^{1.9}$ = 7.6859, $e^{2.0}$ = 8.3891,
$e^{2.1}$ = 9.1662, $e^{2.2}$ = 9.0750, $e^{2.3}$ = 9.9742,</td></tr>
<tr><td>CO5</td><td>K5</td><td>15a.</td><td>Evaluate, a table of divided difference for the following data
<table>
<tr><td>x</td><td>0</td><td>2</td><td>3</td><td>5</td><td>6</td></tr>
<tr><td>f(x)</td><td>2</td><td>28</td><td>75</td><td>341</td><td>515</td></tr>
</table>
(OR)</td></tr>
<tr><td>CO5</td><td>K5</td><td>15b.</td><td>Justify the Given $\log_{10}$ 754 = 2.8156, $\log_{10}$ 758 = 2, 8182, $\log_{10}$ 759 = 2.8189 and $\log_{10}$ 761 = 2.8202. find the value of $\log_{10}$ 756 using Newton's divided difference formula (OR) using the following table find f(756).
<table>
<tr><td>x</td><td>754</td><td>758</td><td>759</td><td>761</td></tr>
<tr><td>y</td><td>2.8156</td><td>2.8182</td><td>2.8189</td><td>2.8202</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Course Outcome</th><th>Bloom's K-level</th><th>Q. No.</th><th><u>SECTION – C</u> (5 X 8 = 40 Marks)
Answer <u>ALL</u> Questions choosing either (a) or (b)</th></tr>
<tr><td>CO1</td><td>K3</td><td>16a.</td><td>Examine the equation $x^3 + 3x^3 - 20x^2 - 21x + 30 = 0$.
(OR)</td></tr>
<tr><td>CO1</td><td>K3</td><td>16b.</td><td>State, If α,β,γ are the roots of the equations $x^3 + px^2 + qx + r = 0$, form the equation whose roots are (i) α+β,β+γ,γ+α</td></tr>
<tr><td>CO2</td><td>K4</td><td>17a.</td><td>Illustrate by Horner's method, the root of the equation $x^2 - 3x + 1 = 0$ which lies between 1 and 2 correct to two decimal places.
(OR)</td></tr>
<tr><td>CO2</td><td>K4</td><td>17b.</td><td>Estimate a root which lies between 1 and 2 of
$f(x) = x^2 + 2x^2 + 10x - 20$ (Leonardo's Equation) using RegulaFalsi method.</td></tr>
<tr><td>CO3</td><td>K4</td><td>18a.</td><td>Apply the gauss – Jordan method solve the following equations
20x + y + z = 15
5x + 15y + z = 13
x + y = 5z = 7
(OR)</td></tr>
<tr><td>CO3</td><td>K4</td><td>18b.</td><td>Solve the system of equations
6x – y + z – 20 = 0
2x + 8y – 3z – 3 = 0
X + y + 9z + 6 = 0</td></tr>
<tr><td>CO4</td><td>K5</td><td>19a.</td><td>Analyse the following table gives the corresponding values of
x and y. prepare a forward difference table and express as a function ox x. also obtain y , when x = 2.5
<table>
<tr><td>x</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>y</td><td>10</td><td>13</td><td>22</td><td>43</td><td>58</td></tr>
</table>
(OR)</td></tr>
<tr><td>CO4</td><td>K5</td><td>19b.</td><td>Examine given the table
<table>
<tr><td>x</td><td>0</td><td>0.1</td><td>0.2</td><td>0.3</td><td>0.4</td></tr>
<tr><td>e^x</td><td>1</td><td>1.1062</td><td>1.2224</td><td>1.3599</td><td>1.4108</td></tr>
</table>
Find the value of y = e^x when x = 0.38</td></tr>
<tr><td>CO5</td><td>K5</td><td>20a.</td><td>Evaluate Lagrange's interpolation formula, find the value corresponding to f(x) given that
<table>
<tr><td>x</td><td>0</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>y</td><td>659</td><td>705</td><td>729</td><td>804</td></tr>
</table>
(OR)</td></tr>
<tr><td>CO5</td><td>K5</td><td>20b.</td><td>Justify Lagrange's formula to find y when x = 5 from the following data
<table>
<tr><td>x</td><td>0</td><td>1</td><td>3</td><td>8</td></tr>
<tr><td>y</td><td>1</td><td>3</td><td>13</td><td>123</td></tr>
</table></td></tr>
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