

Agnihotri Engineering Classes

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Engg. Mathematics-III NUMERICAL METHODS (Revision Sheet)

Q.1) Find a real root of equation $x^3 - x - 11 = 0$ by bisection method which lies between 2 and 3 ?
(Ans = ; 2.375)

Q.2) Find a real root of equation $x^3 - 5x - 7 = 0$ which lies between 2 and 3 by both the regula falsi method and secant method ?
(Ans = ; 2.747)

Q.3) Solve following by Newton Raphson Method ?

a) Evaluate $\sqrt[4]{28}$ to four decimal places? (Ans = ; 5.2915)

b) Find a real root of $x^3 - 3x + 1 = 0$ (Ans = ; 1.532)

c) Find the root of $x^4 - x - 13 = 0$ (Ans = ; 2.095)

Q.4) Apply Gauss Elimination, Gauss Jordan, and Gauss Seidal method to solve following ?

a) $x + 4y - z = -5$
 $x + y - 6z = -12$ (Ans = ; $x = 1.64789$, $y = -1.14085$, $z = 2.08451$)
 $3x - y - z = 4$

b) $x + y + z = 9$
 $2x - 3y + 4z = 13$ (Ans = ; $x = 1$, $y =$, $z = 5$)
 $3x + 4y + 5z = 40$

Q.5) Estimate the value of $f(22)$ and $f(42)$ using Newton's forward and backward interpolation formula from the following data ?

x	20	25	30	35	40	45
y = f(x)	354	332	291	260	231	204

(Ans = ;)

Q.6) Apply Sterling and Bessel's interpolation to find $f(337.5)$ from the given data ?

x	310	320	330	340	350	360
f(x)	2.49136	2.50515	2.51851	2.53148	2.54407	2.55630

(Ans = ; 2.52828)

Q.7) By using Lagrange interpolation and Newton's divided difference formula evaluate $f(1)$ from given data ?

x	-4	-1	0	2	5
y = f(x)	1245	33	5	9	1335

(Ans = ; - 5)

Q.8) Find y' and y'' at $x = 0.1$ and $x = 0.4$ for given data?

X	0.1	0.2	0.3	0.4
y = f(x)	1.10517	1.22140	1.34986	1.49182

(Ans = ; at $x = 0.1$ $y =$, $y' =$
at $x = 0.4$ $y = 1.4913$, $y'' = 1.4770$)

Classes on (ED,BEEE,M1,M2,M3,NA,CONTROL,DSP & other GATE oriented Engineering Subjects)

By :- Agnihotri sir (7415712500) Infront C.M. House, Sherpura, Vidisha

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Q.9) Find third approximation at $x = 0.1$ by using Picard's method for the differential equation $y' = 2y - 2x^2 - 3$ with $y(0) = 2$ (Ans = ; 2.10997)

Q.10) Find by Taylor's series method the value of y at $x = 0.1$ and $x = 0.2$ to five places of decimal from $y' = x^2 y - 1$, $y(0) = 1$ (Ans = ; 0.90033 and 0.80227)

Q.11) Find the approximate value of y corresponding to $x = 1$ by using Euler's method and modified Euler's method for $y' = x + y$ and $y = 1$ when $x = 0$. (Ans= ; 3.18)

Q.12) Apply Runge Kutta method to find an approximate value of y for $x = 0.2$ in steps of 0.1, if $y' = x + y^2$, Given that $y = 0$ when $x = 0$. (Ans = ; 1.2736)

Q.13) The line of regression of x on y and y on x are respectively $20x - 9y - 107 = 0$ and $4x - 5y + 33 = 0$. Find
 i) Mean of x ii) Mean of y iii) Coefficient of correlation between x and y
 (Ans= ; 13, 17 and $r = 0.6$)

Q.14) calculate correlation coefficient 'r' from following data ?

x	21	23	30	54	57	58	72	78	87	90
y	60	71	72	83	110	84	100	92	113	135

(Ans = ; 0.876)

Q.15) Fifteen participants in a contest are ranked by two judges as follows

Rank in c#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Rank in Java	10	7	2	6	4	8	3	1	11	15	9	5	14	12	13

(Ans = ; 0.51)

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