QUESTIONS BANK FOR FIRST SEMESTER

Numerical analysis

Q1) Create the Equation for the reciprocal for square roots of numbers by (N.R.M)

Q2) Derive formula to the Remainder of Taylor Series

Q3) If $f(x)\_{ }=cosx $ by Maclaurin expansion prove that $ cos\frac{π}{3}=\frac{1}{2}$

Q4) Derive Secant Method $ $

Q5) Find the first root for the following equations by N-R system Method

 $x\_{1}-x\_{2}=6 , x\_{1}=4+ 2x\_{2 }$ If $\overline{x\_{0}}=\left(\genfrac{}{}{0pt}{}{1}{0}\right)$

Q6) Create the Equation for the reciprocal of numbers by (N.R.M)

Q7) Derive Taylor Series

Q8) If $f(x)\_{ }=cosx $ by Maclaurin expansion prove that $ cosπ=1$

Q10) Find the first root for the following equations by N-R system Method

 $3x\_{1}+ x\_{2}=6 , x\_{1}=6- 2x\_{2 }$ If $\overline{x\_{0}}=\left(\genfrac{}{}{0pt}{}{1}{0}\right)$

Q11):A) Define error theorem and explain all types of error

B)Write this polynomial ( 𝒙𝟔  = −𝟒 ) in powers ( 𝒙 − 𝟏)

Q12: Find the value for the following Numbers by (N.R. M) :

 $\frac{1}{ \sqrt{15}}$ , $\frac{1}{ \sqrt{210}}$ , $ \frac{1}{ \sqrt{47}}$

Q13: A) Write this polynomial ( $x^{7}-2x^{3} -1=0$ ) in powers ( $x-3$)

 B) Define Errors theorem and compare between Absolute Error with

 The Relative True Error

 Q14: Find the first Iteration for following statements by N-R system Method

 $x\_{o}=\left[\begin{matrix}0\\1\end{matrix}\right]$ $f(x\_{o})=\left[\begin{matrix}1\\2\end{matrix}\right]$ $J\_{o}=\left[\begin{matrix}1&0\\0&4\end{matrix}\right]$

Q15: If $x\_{1}=sin0- \frac{3(sin0)+12}{3} $ then find: a) $x\_{o}$ b)$ f(x)$ c) Third Iteration

Q16: Find Maclaurian series for $f\left(x \right)=sinx$ $ $

Q17: Create the Equation for the square roots of numbers by (N.R.M)

Q18: Find the first Iteration for following statements by N-R system Method

 $x\_{o}=\left[\begin{matrix}1\\0\end{matrix}\right]$ $f(x\_{o})=\left[\begin{matrix}2\\1\end{matrix}\right]$ $J\_{o}=\left[\begin{matrix}4&0\\0&1\end{matrix}\right]$

Q19: If $x\_{1}=e ^{0}- \frac{3(e ^{0})+12}{3} $ then find: a) $x\_{o}$ b)$ f(x)$ c) Third Iteration

Q20: A) Write this polynomial ( $x^{7}-4x^{3} -2=0$ ) in powers ( $x-2$)

 B) Define Errors theorem and compare between Truncation errors

 with Round-off errors

Q21) Derive N.R.M formula

Q22) Find the first roots for the following equations by N-R system Method

 $x\_{1}+x\_{2}=5 , x\_{1}=2+ 2x\_{2}$ , if $\overline{x\_{0}}=\left(\genfrac{}{}{0pt}{}{0}{1}\right)$

Q23) Create the Equation for the reciprocal of numbers by (N.R.M)

Q24: Find the first Iteration for following statements by N-R system Method

 $x\_{o}=\left[\begin{matrix}0\\-1\end{matrix}\right]$ $f(x\_{o})=\left[\begin{matrix}51\\27\end{matrix}\right]$ $J\_{o}=\left[\begin{matrix}1&0\\0&14\end{matrix}\right]$

Q25: If $x\_{1}=sin30- \frac{8\left(sin30\right)+42}{4} $ then find: a) $x\_{o}$ b)$ f(x)$ c) Third Iteration

Q26: Find Maclaurian series for $f\left(x \right)=sin2x$ $ $

Q27: Create the Equation for the $\sqrt{114}$ of numbers by (N.R.M)

Q28: Find the first Iteration for following statements by N-R system Method

 $x\_{o}=\left[\begin{matrix}1\\0\end{matrix}\right]$ $f(x\_{o})=\left[\begin{matrix}2\\1\end{matrix}\right]$ $J\_{o}=\left[\begin{matrix}4&0\\0&1\end{matrix}\right]$

Q29: If $x\_{1}=e ^{1}- \frac{12(e ^{1})+12}{3} $ then find: a) $x\_{o}$ b)$ f(x)$ c) Third Iteration

Q30: A) Write this polynomial ( $x^{7}-4x^{3} -2=0$ ) in powers ( $x-2$)

 B) Define Errors theorem and compare between absolute error

 with relative absolute error

Q31) Derive the equation to find $\frac{1}{99}$

Q32) Find the first roots for the following equations by N-R system Method find the first itration

 $x\_{1}+x\_{2}-21=5 , 2x\_{1}=22+ 2x\_{2}$ , if $\overline{x\_{0}}=\left(\genfrac{}{}{0pt}{}{2}{1}\right)$

Q33) Create the Equation for the reciprocal of numbers by (N.R.M)

$Q34: $Find the value for the following Numbers by (N.R. M) :

$\sqrt{129}$ , $\sqrt{19}$ , $\sqrt{384}$

 $Q35:$Find the value for the following Numbers by (N.R. M) :

 $ $ $\frac{1}{ 270}$ , $\frac{1}{21} $ , $\frac{1}{329}$

 $Q36: $if we mix two mathematical methods we can derive the equation for one method by NRM

*a) Find Taylor series around the point* 𝑎=𝜋4

*b)Use five term of this series to estimate* 𝑠𝑖𝑛𝜋6

*c) Find remainder of Taylor series*

*d) Find Maclaurianseries and General Formula(G.F)*

Q Write the General table for Forward Differences (F.W.D.)

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