Title: Numerical Analysis Assignment of CSE 1st Semester

Batch: CSE 17th Batch

Class Id: 170106

Course Name: Numerical Analysis

Group No: 11

Topics: Newton-Raphson method

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| Question No 01: **Rate of convergence of the Newton-Raphson method is generally \_\_\_\_\_\_\_\_\_\_ .** |
| Answer: **Linear.** |
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| Question No 02: **The equation f(x) is given as x3 – x2 + 4x – 4 = 0. Considering the initial approximation at x=2 then the value of next approximation correct upto 2 decimal places is given as \_\_\_\_\_\_\_\_\_\_** |
| Answer: **Explanation: Iterative formula for Newton Raphson method is given by ,**  **x(1)=x(0)+( f(x(0)) ) / ( f′x(x(0)) )**  **Hence,**  **x0=2 (initial guess),**  **f(x0)=8 and**  **f’(x0)=12.**  **Substituting the values in the equation we get,**  **x1=1.33** |
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| Question No 03: **The Newton-Raphson method of finding roots of nonlinear equations falls under the category of which of the following methods?** |
| Answer: **The Newton Raphson method involves the guessing of the root. Hence it falls under open methods.** |
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| Question No 04: **The Iterative formula for Newton Raphson method is given by \_\_\_\_\_\_\_\_\_\_** |
| Answer: **The Iterative formula for Newton Raphson method is given by**  **x1 = x0-f(x0)/f’(x0)**  **It depends on the initial value and converges slowly.** |
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| Question No 05:  **If f(x) = x2 – 153 = 0 then the iterative formula for Newton Raphson Method is given by \_\_\_\_\_\_\_\_\_\_** |
| Answer:  **Consider,**  **x(n+1)=0.5 [x(n)+( N / (x(n)) )] [Where N=117]**    **Hence,**  **x(n+1)=0.5 [x(n)+( 117 / (x(n)) )].** |
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| Question No 06:  **In Newton Raphson method if the curve f f(x) is constant then \_\_\_\_\_\_\_\_\_\_** |
| Answer: **If the curve f(x) is constant then the slope of the tangent drawn to the curve at an initial point is zero. Hence the value of f’(x) is zero.** |
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| Question No 07: **For what values of 0 the initial guess will be equal to the next iterative values?** |
| Answer: **Iterative formula is given by**  **x(1) = x(0) +( f(x(0)) / fx(x(0)) )**  **For f’(x0) at x=90 degrees approaches ∞.**  **Then for all values of x1=x0.**  **Hence,**  **if f(x0) = 0 then the tan0=90 degrees.** |
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| Question No 08: **The equation f(x) is given as x2-4=0. Considering the initial approximation at x=6 then the value of next approximation correct upto 2 decimal places is given as \_\_\_\_\_\_\_\_\_\_** |
| Answer: **Iterative formula for Newton Raphson method is given by**  **x(1)=x(0)+( f(x(0)) / fx(x(0)) )**  **.**  **Hence,**  **x0=6 (initial guess), f(x0)=32 and f’(x0)=12.**  **Substituting the values in the equation we get x1=3.33.** |
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| Question No 09: **At which point the iterations in the Newton Raphson method are stopped?** |
| Answer: **When the consecutive values of iterations are equal.** |
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| Question No 10: **The Newton Raphson method fails if \_\_\_\_\_\_\_\_\_\_** |
| Answer: **When f’(x0) becomes zero then the value of (f(x0) / f’(x0)) becomes ∞.**  **Hence, Newton Raphson method fails at f’(x0)=0.** |
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| Question No 11:  **What is the idea behind The Newton-Raphson method?** |
| Answer: **It uses the idea that a continuous and differentiable function can be approximated by a straight line tangent to it.** |
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| Question No 12: **What is the Limitation of Newton's Method?** |
| Answer: **Newton's method may not work if there are points of inflection, local maxima or minima around *x*0 or the root.** |
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| Question No 13: **Draw the Geometric Representation of The Newton-Raphson method.** |
| Answer: |
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| Question No 14: **The Newton Raphson method is also called as \_\_\_\_\_\_\_\_\_\_\_\_** |
| Answer: **Tangent method** |
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| Question No 15: **The value of y’/x’ in terms of the angle 0 is given by \_\_\_\_\_\_\_\_\_\_\_\_\_** |
| Answer: **tanθ** |
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| Question No 16: **For decreasing the number of iterations in Newton Raphson method.** |
| Answer: **The value of f’(x) must be increased** |
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| Question No **17: .In Newton Raphson method f’(x) for a given point is given by the formula \_\_\_\_\_\_\_\_\_\_\_\_** |
| Answer: **y’/x’** |
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| Question No 18: **The points where the Newton Raphson method fails are called?** |
| Answer: **stationary** |
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| Question No 19:[**Newton-Raphson method of solution of numerical equation is not preferred when**](https://avatto.com/question/emnm-q-12/)**\_\_\_\_\_\_\_\_** |
| Answer: **The graph of f(x) is nearly horizontal-where it crosses the x-axis.** |
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| Question No 20:  [**Newton-Raphson method is applicable to the solution of**](https://avatto.com/question/emnm-q-15/)**\_\_\_\_\_\_** |
| Answer: **Both algebraic and transcendental Equations** |