SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : MATHEMATICS-III(15A54301) **Course & Branch**: B.Tech(ECE)

Year & Sem: II-B.Tech & I-Sem **Regulation:** R15

UNIT –II

1. Find a positive root of $x^3 - x - 1 = 0$ correct to two decimal places by bisection method. [10 M]

2. Find out the square root of 25 given $x_0 = 2.0, x_0 = 7.0$ using bisection method. [10 M]

3. Find out the root of the equation $x\log_{10}(x) = 1.2$ using false position method. [10 M]

4. Find the root of the equation $xe^x = 2$ using Regula-falsi method. [10 M]

5. Find a real root of the equation $xe^x - \cos x = 0$ using Newton- Raphson method. [10 M]

6. Using Newton-Raphson Method

   a) Find square root of 10. [5 M] b)Find cube root of 27. [5 M]

7. Apply Gauss-Seidel iteration method to solve the equations of $20x + y - 2z = 17$;

   $3x + 20y - z = -18$; $2x - 3y + 20z = 25$. [10 M]

8. Apply Crout's method to solve the equations: $3x + 2y + 7z = 4$; $2x + 3y + z = 5$;

   $3x + 4y + z = 7$. [10 M]

9. Find the root between 1 and 1.5 of the equation $\sin x = \frac{1}{x}$ (measured in radians).Carry out

   computation up to 7^{th} stage. [10 M]

10. a) Define transcendental Equation. [2 M]

    b) Using Newton –Raphson method find square root of a number. [2 M]

    c) Write the formula for Regula-Falsi method. [2 M]

    d) Write the first approximation of the equation $3x = \cos x + 1$ by bisection method. [2 M]

    e) Using Newton –Raphson method find reciprocal of a number. [2 M]

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QUESTION BANK (OBJECTIVE)

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UNIT – II

1. Example of a transcendental equation [ ]

A. $f(x)=c_1e^x+c_2e^{-x}=0$ B. $f(x)=x^2+x-7=0$ C. $f(x)=x^2+5x-7=0$ D. None

2. Example of a algebraic equation [ ]

A. $f(x)=c_1e^x+c_2e^{-x}=0$ B. $f(x)=x^3-7=0$ C. $f(x)=c_1e^{2x}+c_2e^{-3x}=0$ D. None

3. The order of convergence in Newton-Raphson method is [ ]

A. 1 B. 3 C. 0 D.2

4. The Newton-Raphson method fails when [ ]

A. $f^1(x)$ is negative B. $f^1(x)$ is zero C. $f^1(x)$ is too large D. Never fails

5. In case of Bisection method, the convergence is [ ]

A. linear B. 3 C. very slow D. quadratic

6. Under the conditions that f(a) and f(b) have opposite signs and a<b, the first approximation of one of the roots f(x)=0, by Regula-Falsi method is given by [ ]

A. $x_1=\frac{af(a)-bf(b)}{f(a)-f(b)}$ B. $x_1=\frac{af(b)-bf(a)}{f(b)-f(a)}$

C. $x_1=\frac{af(a)+bf(b)}{f(a)+f(b)}$ D. $x_1=\frac{af(b)-bf(a)}{f(b)+f(a)}$

7. Bisection method is used for [ ]

A. Solution of algebraic or transcendental equation B. Integration of a function

C. Differential of a function D. Solution of a function

8. For ---------- method of solution of equations of the form f(x) =0 approximation x_0 is to be very close to the root and $f(x_n) \neq 0$ [ ]

A. Bolzano B. Newton-Raphson C.Secent D. Chord

9. In the bisection method of solution of an equation of the form f(x) = 0 the convergence of the sequence $\langle x_n \rangle$ of midpoints to a root of f(x) = 0 in an interval (a,b) where f(a)f(b)<0 is [ ]

A. Assured and very fast B. Not assured but very fast

C. Assured but very slow D. Independent on the sequence of point

10. Newton-Raphson method is used for [ ]

A. Solution of algebraic or transcendental equation B. Integration of a function

C. Differential of a function D. Solution of a function

11. In the method of False position for solution of an equation of the form f(x) = 0 the convergence of the sequence $\langle x_n \rangle$ iterates to a root of f(x) = 0 is [ ]

A. Assured and very fast B. Not assured but very fast

C. Assured but slow D. Independent on the sequence of point

12. In Newton –Raphson method we approximate the graph of f by suitable [ ]

A. Chords B.Tangents C. Secants D. Parallel

13. Newton's iterative formula for finding a root of f(x) = 0 is [ ]

A. $x_{n+1} = x_n + \frac{f(x_n)}{f''(x_n)}$ B. $x_{n+1} = x_n - \frac{f(x_n)}{f''(x_n)}$

C. $x_{n+1} = x_n + \frac{f(x_n)}{f'(x_n)}$ D. $x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$

14. Newton-Raphson method is also called [ ]

A. Method of tangent B. Method of false position

C. Method of chord D. Method of secants

15. Among the method of solution of equation of the form f(x) = 0 the one which is used commonly for its simplicity and great speed is ---method [ ]

A. Secant B. Regula falsi C. Newton – Rasphson D. Bolzano

16. The Regula Falsi method is related to _____ at a point of the curve [ ]

A. Chord B. Ordinate C. Abscissa D. Tangent

17. The Newton – Raphson method is related to _____ at a point of the curve [ ]

A. Chord B. Ordinate C. Abscissa D. Tangent

18. Newton's iterative formula for finding the square root of a positive number N is [ ]

A. $x_{i+1}=\frac{1}{2}\left(x_i-\frac{N}{x_i}\right)$ B. $x_{i+1}=\frac{1}{2}\left(x_i+\frac{N}{x_i}\right)$

C. $x_{i+1}=\left(x_i-\frac{N}{x_i}\right)$ D. $x_{i+1}=2\left(x_i+\frac{N}{x_i}\right)$

19. Newton's iterative formula for finding the cube root of a number N is [ ]

A. $x_{n+1}=3\left(2x_n-\frac{N}{x_n^2}\right)$ B. $x_{n+1}=\frac{1}{3}\left(2x_n-\frac{N}{x_n^2}\right)$

C. $x_{n+1}=\left(2x_n-\frac{N}{x_n^2}\right)$ D. $x_{n+1}=\frac{1}{3}\left(2x_n+\frac{N}{x_n^2}\right)$

20. Newton's iterative formula for finding the reciprocal of a number N is [ ]

A. $x_{n+1}=\left(x_n-\frac{N}{x_n^2}\right)$ B. $x_{n+1}=x_n\left(2-\frac{N}{x_n}\right)$

C. $x_{n+1}=x_n(2-Nx_n)$ D. $x_{n+1}=x_n(2+Nx_n)$

21. Regula- falsi method is used for [ ]

A. Solution of algebraic or transcendental equation B. Integration of a function

C. Differential of a function D. Solution of a function

22. The cube root of 24 by Newton's formula taking $x_0=3$ is_____ [ ]

A.1.889 B.2.889 C.5.889 D.4.889

23. The square root of 35 by Newton's formula taking $x_0=6$ is_____ [ ]

A.7.916 B.5.916 C.6.916 D.4.916

24. Example of a transcendental equation [ ]

A. $f(x)=x\log x-1.2=0$ B. $f(x)=x^3-x-1=0$ C. $f(x)=x^2+x-7=0$ D. None

25. Example of a algebraic equation [ ]

A. $f(x)=x\log x-1.2=0$ B. $f(x)=x^3-x-1=0$ C. $f(x)=x^2\tan x+1=0$ D. None

26. If first two approximation x_0 and x_1 are roots of $x^3-9x+1=0$ are 0 and 1 by bisecton method then x_2 is [ ]

A.1.5 B. 2.5 C. 0.5 D. 3.5

27. If first two approximation x_0 and x_1 are roots of $xe^x=2$ are 0 and 1 by Regula-falsi method then x_2 is [ ]

A. 0.13575 B. 0.33575 C. 0.73575 D. 0.53575

28. If first two approximation x_0 and x_1 are roots of $x^3-x-4=0$ are 1 and 2 by bisecton method then x_2 is [ ]

A.1.5 B. 2.5 C. 0.5 D. 3.5

29. If first two approximation x_0 and x_1 are roots of $x^3-x-4=0$ are 1 and 2 by Regula-falsi method then x_2 is [ ]

A.4.666 B. 2.666 C. 3.666 D. 1.666

30. Newton's iterative formula for finding the pth root of a positive number N is [ ]

A. $x_{n+1}=\frac{1}{p}\left((p-1)x_n+\frac{N}{x_n^{p-1}}\right)$ B. $x_{n+1}=\frac{1}{p}\left((p-1)x_n-\frac{N}{x_n^{p-1}}\right)$

C. $x_{n+1}=p\left((p-1)x_n-\frac{N}{x_n^{p-1}}\right)$ D. $x_{n+1}=\left((p-1)x_n-\frac{N}{x_n^{p-1}}\right)$

31. The general iteration formula of the Regula Falsi method is [ ]

A. $x_{n+1}=x_n+\frac{x_n-x_{n-1}}{f(x_n)-f(x_{n-1})}f(x_n)$ B. $x_{n+1}=x_n+\frac{x_n+x_{n-1}}{f(x_n)-f(x_{n-1})}f(x_n)$

C. $x_{n+1}=x_n-\frac{x_n-x_{n-1}}{f(x_n)-f(x_{n-1})}f(x_n)$ D. $x_{n+1}=x_n-\frac{x_n-x_{n-1}}{f(x_n)+f(x_{n-1})}f(x_n)$

32. If first approximation root of $x^3 - 5x + 3 = 0$ is $x_0 = 0.64$ then x_1 by Newton-Raphson method is [ ]

A.4.6565 B. 2.6565 C. 3.6565 D. 0.6565

33. Newton's iterative formula to find the value of $\sqrt{N}$ is [ ]

A. $x_{n+1} = \frac{1}{2}\left(x_n + \frac{N}{x_n}\right)$ B. $x_{n+1} = \frac{1}{2}\left(x_n - \frac{N}{x_n}\right)$

C. $x_{n+1} = \left(x_n - \frac{N}{x_n}\right)$ D. $x_{n+1} = 2\left(x_n - \frac{N}{x_n}\right)$

34. If first approximation root of $x^2 - 10 = 0$ is $x_0 = 3.8$ then x_1 by Newton-Raphson method is [ ]

A.0.215 B. 1.215 C. 2.215 D. 3.215

35. Newton's iterative formula to find the value of $\sqrt[3]{N}$ is [ ]

A. $x_{n+1} = \frac{1}{3}\left(2x_n + \frac{N}{x_n^2}\right)$ B. $x_{n+1} = \frac{1}{3}\left(2x_n - \frac{N}{x_n^2}\right)$

C. $x_{n+1} = \left(2x_n - \frac{N}{x_n^2}\right)$ D. $x_{n+1} = 3\left(2x_n + \frac{N}{x_n^2}\right)$

36. If first two approximation x_0 and x_1 are roots of $2x - \log_{10}^{x} = 7$ are 3.5 and 4 by Regula-Falsi method then x_2 is [ ]

A. 1.7888 B. 2.7888 C. 3.7888 D. 4.7888

37. If first two approximation x_0 and x_1 are roots of $2x - \log_{10}^{x} = 7$ are 3.5 and 4 by Bisection method then x_2 is [ ]

A. 1.75 B. 2.75 C. 3.75 D. 4.75

38. Crout's triangularisation method is also called [ ]

A. Gauss elimination B. LU factorization C. Gauss jordan D. None of these

39. If first approximation root of $\cos x - x^2 - x = 0$ is $x_0 = 0.5$ then x_1 by Newton-Raphson method is [ ]

A.0.5514 B. 1.5514 C. 2.5514 D. 3.3314

40. If second approximation root of $x + \tan x + 1 = 0$ is $x_1 = 2.77558$ then x_2 by Newton-Raphson method is [ ]

A.1.798 B. 2.798 C. 2 D. 0.798

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