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 –V

1.a) Tabulate y (0.1), y (0.2), and y (0.3) using **Taylor's series method** given that [5 M]
$y^1 = y^2 + x$ and y(0) = 1

b) Solve $y^1 = x + y$, given y (1)=0 find y(1.1) and y(1.2) by **Taylor's series method** [5 M]

2. Find y(0.1),y(0.2),z(0.1),z(0.2) given $\frac{dy}{dx}$ = x+z , $\frac{dz}{dx}$ = x-y^2 and y(0)=2, [10 M]

Z (0)=1 by using **Taylor's series method** .

3.a) Find the value of y for x=0.4 by **picards method** given that $\frac{dy}{dx}$ = x^2+y^2, y(0)=0 [5 M]

b) Obtain y(0.1) given $y^1 = \frac{y-x}{y+x}$,y(0)=1 by **picards method .** [5 M]

4.a) Given that $\frac{dy}{dx}$ =1+xy and y (0) =1 compute y(0.1),y(0.2) using **picards method** [5 M]

b) Solve y^1= y-x^2 , y (0) =1 by **picards method** upto the fourth approximation. [5 M]

Hence find the value of y (0.1), y (0.2).

5. a) Using **modified Euler's method** find y(0.2) , y(0.4) given y^1= y + e^x, y(0)=0 [5 M]

b) Find the solution of $\frac{dy}{dx}$ = x-y , y(0)=1 at x=0.1, 0.2, 0.3, 0.4, 0.5 using [5 M]

Modified Euler's Method.

6. Given that y^1=x+siny , y(0)=1 compute y(0.2) , y(0.4) with h=0.2 using **Euler's Modified method** [10 M]

7.a) Use **Runge- kutta method** to evaluate y(0.1) and y(0.2) given that $y^1=x+y$, y(0)=1 [5 M]

b) Find y(0.1) and y(0.2) using **R-K 4th order formula** given that $y^1=x^2-y$ and y(0)=1 [5 M]

8. Using R-K method of 4th order , solve $\frac{dy}{dx}=\frac{y^2-x^2}{y^2+x^2}$, y(0)=1 Find y(0.2) and y(0.4) [10 M]

9. a) Use Milne's predictor – corrector method to obtain the solution of the equation [5 M]

$y^1=x-y^2$ at x=0.8 given that y(0)=0 ,y(0.2)=0.02 ,y(0.4) = 0.0795 ,y(0.6)=0.1762

b) Use **Milne's method** to find y(0.8) , y(1.0) from $y^1=1+y^2$, y(0)=0 [5 M]

Find the initial values y(0.2), y(0.4) ,y(0.6)from the R-K method

10. a) Define ODE . [5x2=10M]

b) Write the SFPF formula for Laplace Transforms .

c) Write the formula for R-K method .

d) Write the Milne's predictor – corrector formula.

e) Solve $y^1= y-x^2$, y (0) =1 by **picards method** upto the Second approximation.

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

QUESTION BANK (OBJECTIVE)

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

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

UNIT – V

1.Successive approximations are used in

a)Milne's method b)Picard's method c)Taylor series method d)none [ ]

2..Which of the following in a step by step method:

a)Taylor's series b)Adam's bashforth c)Picard's d)none [ ]

3.Runge-kutta method is self starting method:

a)true b)false c)we can't say d)none [ ]

4.Predictor-corrector methods are self starting methods:

a)true b)false c)we can't say d)none [ ]

5.The second order Runga-kutta formula is

a)Euler's method b)Newton's method

c) modified euler's method d)none [ ]

6. The following is called predictor-corrector method:

a)Picard's method b)Euler's method

c)Milne's method d)none [ ]

7.Which of the following is best for solving initial value problems.

a)Euler's method b)Modified Euler's method

c)Taylor's series method d)Runge-kutta method of order 4 [ ]

8.In Adam's method atleast values of y,prior to the desired value, are Required

a)Five b)two c)six d)four [ ]

9.If' 'n' conditions are specified at the initial point ,then it is called [ ]

a)initial value problem b)final value problem

c)boundary value problem d)none

10. If 'n' conditions are specified at two or more points,then it is called

a)initial value problem b)final value problem

c)boundary value problem d)none [ ]

11. To apply milne's method we require _____ prior values of y

[ ]

a) 1 b) 2 c) 3 d) 4

12. The first order Runge-Kutta method is = _____

[ ]

a) Euler's method b)Modifies Euler's method c)Taylor's method d) Picard's method

13. The second order Runge-Kutta formula is y_1 =_____

[ ]

a) $y_0 + (k_1 + k_2)$ b) $y_0 - (k_1 + k_2)$ c) $y_0 + \frac{1}{2}(k_1 + k_2)$ d) $y_0 - \frac{1}{2}(k_1 + k_2)$

14. To apply Fourier series, the function must satisfies _____ conditions

[ ]

a) Euler's b) Dirichlet's c) Laplace d) none

15. The n^{th} difference of a n^{th} degree polynomial is _____ [ ]

a) Constant b) Zero c) one d) none

16. Successive approximations used in _____method [ ]

a) Euler's b) Taylor's c) Picard's d) R-K

17.,The taylor's for f(x)=log(1+x) is ……

a)$x-\frac{x^2}{2}+\frac{x^3}{3}$-……. b) $x+\frac{x^3}{3}$-……. c) both a and b d)non [ ]

18. The taylor's for solutions of the equations $\frac{dy}{dx}$ = f(x,y),y(x_0)=y_0 is …… [ ]

a) $y(x)=y_0+(x-x_0)y_0^1+\frac{(x-x_0)^2}{2!}y_0^{11}$ …… b) $y(x)=y_0+\frac{(x-x_0)^2}{2!}y_0^{11}$ ……

c) both a and b d)none

19. Disadvantage of picard's method is……..

a) It can be applied to those equations only in which successive integrations can be performed easily

b)can be applied to those equations only in which successive integrations can be performed difficulty. c) both a and b d)none [ ]

20. The predictor-corrector methods are not …… methods

a)Picard's method b)Euler's method

c)Milne's method d)self- starting method [ ]

21. The R-K method is a …….. method

a)Picard's method b)Euler's method

c)Milne's method d)self- starting method [ ]

22.The fourth order R-K formula is ……..

a)$y_1=y_0+\frac{1}{6}(k_1+2k_2+2k_3+k_4)$ b) $y_1=y_0+\frac{1}{6}(k_1+2k_3+k_4)$

c) $y_1=y_0+\frac{1}{6}(k_1+2k_2+2k_3)$ d)none [ ]

23. Using Euler's method $y^1=\frac{y-x}{y+x}$,y(0)=1 and h=0.02give y_1=…….

a)0.02 b) 1.02 c) 2.02 d)3.02 [ ]

24.Using Euler's method $y^1=\frac{y-x}{y+x}$,y(0)=1 then the picard's method the value of

$y^1(x)$=…… [ ]

a) 1 +2log(1+x) b) 1-x+2log(1+x) c) x+2log(1+x) d)none

25. If $\frac{dy}{dx}$ = x-y and y(0)=1 then by picard's method the value of $y^1(1)$ is … [ ]

a) 0.905 b) 1.905 c) 2.905 d)none

26. If $\frac{dy}{dx}=x^2+y^2$,y(0)= 0 then by picard's method the value of $y^1(x)$ is…. [ ]

a) 1 +2log(1+x) b) 1-x+2log(1+x) c) x+2log(1+x) d)$x^3/3$

27. If $\frac{dy}{dx}$ = x+y ,y(0)= 1and $y^1(x)=1+x+x^2/2$, then by picard's method the value of $y^2(x)$

is……. [ ]

a) $1+x+x^2+x^3/6$ b) $1-x+x^2+x^3/6$ c) x+2log(1+x) d)none

28. If y_0=1 h=0.2 ,$f(x_0,y_0)$=1 then by Euler's method the value of y_1=…. [ ]

a) 0.2 b) 1.2 c) 2.2 d)none

29. If y^1=y-x and y(0)= 2 ,h=0.2 then by Euler's method the value of y_1=….. [ ]

a) 0.4 b) 1.4 c) 2.4 d)none

30.If $\frac{dy}{dx}$ = - x,y(0)=1,h=0.01 then by Euler's method the value of y_1=….. [ ]

a) 1.99 b) 2.99 c) 0.99 d)none

31.If y_1=1.02,h=0.02 ,$f(x_1,y_1)$=0.9615 then the value of y_2 by Euler's method is [ ]

a) 1.0577 b) 1.0477 c) 1.0377 d)none

32. if y_1=1.1,h=0.1,$f(x_1,y_1)$=1.2 then by euler's method the value of y_2 is… [ ]

a)0.22 b) 1.22 c)2.22 d)3.222

33.if y_1=1.2,h=0.2, $f(x_1,y_1)$=1.4, then by euler's method the value of y_2 is…… [ ]

a)3.48 b)2.48 c)1.48 d)0.48

34. If $\frac{dy}{dx}$ =$\frac{y-2x}{y}$,y(0)=1 and h=0.1 the the value of y_1 by eulers method is… [ ]

a)1.1813 b)0.1813 c)2.1813 d)3.1813

35.If $\frac{dy}{dx}$ =$\frac{y^2-x^2}{y^2+x^2}$,y(0)=1, h=0.2 then the value of k_1 in fourth order R-K method is.. [ ]

a)0.01 b)0.002 c)0.2 d)0.000002

36. If $\frac{dy}{dx}$ =$x+y^2$, y(0)=1, h=0.1 the value of K_2 in the fourth order R-K method is.. [ ]

a)0.1152 b)0.5211 c)1.5211 d)1.1152

37.If $\frac{dy}{dx}$=x^2+y^2,$f(x_0,y_0)$=1, h=0.1,k_1=0.1,k_2=0.1105 ,k_3=0.1105 and k_4=0.1222 then the value of y(1.1) by fourth order R-K method is…….. [ ]

a)0.5566 b)0.4488 c)0.1107 d)0.2234

38.If $\frac{dy}{dx}$=x+y,$f(x_0,y_0)$=1, h=0.2,k_1=0.1,k_2=0.11 ,k_3=0.1105 and k_4=0.12105 then the value of y(0.2) =…….. [ ]

a)1.5566 b)1.4488 c)1.1107 d1.2428

39.Given y_0,y_1,y_2,y_3 milne's corrector formula y_4 =……. [ ]

a) $y_2+\frac{h}{3}(f_2+4f_3+f_4)$ b) $y_2-\frac{h}{3}(f_2+4f_3+f_4)$ c) $y_2+\frac{h}{3}(f_2-4f_3+f_4)$ d)none

40.Milne's predictor formula y_4=..... [ ]

a) $y_2+\frac{h}{3}(f_2+4f_3+f_4)$ b) $y_2-\frac{h}{3}(f_2+4f_3+f_4)$ c) $y_0+\frac{4h}{3}(2f_1-f_2+2f_3)$ d)none