QUESTION BANK (K- Scheme)

APPLIED MATHEMATICS

AMS (312301)

Unit – I INDEFINITE INTEGRATION (C01)

2- marks

1) Evaluate : $\int \frac{dx}{3x+7}$.

2) Evaluate : $\int \frac{dx}{9x^2-16}$.

3) Evaluate : $\int \left\{\frac{1}{\sqrt{1-x^2}} - \frac{Cos\, x}{Sin^{\,2}x}\right\}$ dx.

4) Evaluate : $\int Cos^2\, 2x\, dx$.

5) Evaluate : $\int x\, .\, e^x$ dx.

6) Evaluate : $\int e^{2logx}$.dx

7) Evaluate : $\int \frac{Cos(\, logx)}{x}$ dx.

8) Evaluate : $\int \frac{dx}{Sin^2x.\ Cos^2x}$.

9) Evaluate : $\int x^{2023}.logx\, .dx$.

10) Evaluate : $\int \frac{Sec^2(\, 1+\sqrt{x}\,)}{\sqrt{x}}$ dx.

11) Evaluate : $\int \frac{dx}{x(\, x+1\,)}$.

Unit – IV NUMERICAL METHODS (C04)

2- marks

12) Find the approximate root of the equation $x^3 - 9x + 1 = 0$ lies between 2 and 3 using bisection method (perform one Iteration).

13) Using Bisection method , find the approximate root of the equation $x^2 + x - 3 = 0$, in (1,2) .(perform one Iteration).

14) By using method of False Position , find root of equation $x^2 + x - 1 = 0$ in the interval (0,1) (perform one Iteration)

15) Show that the root of the equation $x^3 - 5x + 1 = 0$, lies between (2,3).

16) Show that the root of the equation $x^3 - x - 4 = 0$, lies between 0 and 2.

Unit – I INDEFINITE INTEGRATION (C01)

4- marks

1) Evaluate : $\int \frac{e^x\,(x+1)}{Sin^2(x.e^x)}$ dx.

2) Evaluate : $\int \frac{dx}{5+4\,cosx}$.

3) Evaluate : $\int e^x . Sin\,x$ .dx.

4) Evaluate : $\int \frac{Sec^2 x}{(1+tanx).(2+tanx))}$ dx.

5) Evaluate : $\int \frac{Cos\,x\,dx}{1+Sin^2\,x}$.

6) Evaluate : $\int \frac{\log x\,.dx}{x.(1+\log x).(2+\log x)}$.

7) Evaluate : $\int \frac{x.Sin^{-1}x\,dx}{\sqrt{1-x^2}}$.

8) Evaluate : $\int \frac{2x^2+5}{(x-1).(x+2).(x+3)}$. dx

9) Evaluate : $\int \frac{dx}{\sqrt{16-6x-x^2}}$.

10)Evaluate : $\int x\,.tan^{-1}x\,.dx.$

11)Evaluate : $\int \frac{x.dx}{x^2+3x-4}$.

12) Evaluate : $\int x^2 . e^{3x} . dx$.

Unit – IV NUMERICAL METHODS (C04)

4- marks

13) Solve the following system of equations by Jacobi's – Iteration method. (Three iterations)

$$5x + 2y + z = 12,\ x + 4y + 2z = 15,\ x + 2y + 5z = 20.$$

14) Solve the following system of equations by using Gauss- Seidal method. (Three iterations)

$$15x + 2y + z = 18\ ;\ 2x + 20y - 3z = 19\ ;\ 3x - 6y + 25z = 22\ .$$

15) Solve the following system of equation by using Jacobi-Iteration method. (Three iterations)

$$10x + y + 2z = 13\ ;\ 3x + 10y + z = 14\ ;\ 2x + 3y + 10z = 15\ .$$

16) Find the approximate root of the equation : $x^4 - x - 10 = 0$, by Newton–Raphson method. (Carry out four iterations).

17) Solve the following by using Jacob's method upto three iterations :

$$20x + y - 2z = 17,\quad 3x + 20y - z = -18,\quad 2x - 3y + 20z = 25.$$

18) Find approximate value of $\sqrt[3]{7}$ by using Newton Raphson method. (four iterations only) .

19) Using Newton - Raphson method find the approximate root of the equation (use four iterations)

$$x^2 + x - 5 = 0.$$

20) Find the approximate root of the equation $x^2 + x - 3 = 0$ in the interval (1, 2) , by using Bisection method (use three iterations).

21) Using Regular –Falsi method , find the approximate root of $x^2 - 2x - 1 = 0$,(Three iterations).