# 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.

17) Find the approximate square root of a number 10 using Bakhshali Iterative method.

18) ) Find the approximate value of $\sqrt{26}$ , using Bakhshali Iterative method.

## 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)

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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).