**Gamma function and Beta function**

**Gamma function**

=

…………………..

=

=120

**Prove that and**

put x=y2 dx=2ydy

now

**Beta function**

**Prove that and**

=

2m-1=p 2n-1=q

**proved**

**Example**

**Example**

Evaluate dx=cosd

=

**Evaluate** ,

**Show that** D. M.

**Show that**

Let

=

=

=

=

**Show that** =

=== ==

Prove that

= 

**Evaluate**

====)

**Evaluate**

====

**Trapezoidal and Simpson’s rule of Integration**

**1.Trapezoidal rule of Integration**

A=

y=f(x)

y

y=A+Bx

(x1,y1)

(x0, y0)

yn

y2

y0

y1

xn

x2

x1

x

x0

**Fig 4.**

= = -

=Area of trapezium.

,

,

,

,

Example-Evaluate by trapezoidal rule taking 10 subintervals

,

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| x | 1.0 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |
| y=lnx | 0 | 0.0953 | 0.1823 | 0.2623 | 0.3364 | 0.4054 | 0.4700 | 0.5306 | 0.5877 | 0.6418 | 0.6931 |

=

=0.3852 exact=0.3862

Evaluate by trapezoidal rule taking 5 subintervals.

Evaluate by trapezoidal rule taking 10 subintervals.

Evaluate by trapezoidal rule taking 12 subintervals.

**2.Simpson’s rule of Integration**

If A=

Let be the equation of the curve.

y=f(x)

y

y=A+Bx+Cx2

(x2,y2)

(x1,y1)

(x0, y0)

yn

y2

y0

y1

xn

x2

x1

x

x0

y

y=A+Bx+Cx2

(h,y2)

(0,y1)

(-h, y0)

y2

y0

y1

h

x

0

-h

**Fig 5.**

The curve passes through the three points (-h,y0), (0,y1), (h,y2)

**,**

,

2nd pair,

3rd pair

last pair

Evaluate by Simpson’s rule taking 10 subintervals

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X | 1.0 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |
| y=lnx | 0 | 0.0953 | 0.1823 | 0.2623 | 0.3364 | 0.4054 | 0.4700 | 0.5306 | 0.5877 | 0.6418 | 0.6931 |

=0.3862

Evaluate by Simpson’s rule taking 10 subintervals.

Evaluate by Simpson’s rule taking 12 subintervals.