

FS 2019-20 MAT1011 (CFE) - ELA
ASSESSMENT-: MULTIPLE INTEGRAL

Fall Semester 2019 - 20

Course: MAT1011 (CFE) - ELA

Slot: L31 + L32

Assessment No: 4

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EXERCISE : 1

Matlab Code :

```
syms x y
f=input('Enter the function f(x,y):')
f1=input('Enter the inner lower limit (limit of y):')
f2=input('Enter the inner upper limit (limit of y):')
a=input('Enter the outter lower limit (limit of x):')
b=input('Enter the outter upper limit (limit of x):')
P=int(f,y,f1,f2)
D=int(P,x,a,b)
```

INPUT –

Enter the function f(x,y):

y*exp(-x*y) f

= y*exp(-x*y)

Enter the inner lower limit (limit of y):

0 f1

=

0

Enter the inner upper limit (limit of y):

3 f2

=

3

Enter the outter lower limit (limit of x):

0 a

=

0

Enter the outter upper limit (limit of x):

$$\frac{2}{b}$$

OUTPUT –

$$P = \frac{1}{x^2} - \frac{(\exp(-3x))(3x + 1)}{x^2} D$$

$$= \exp(-6)/2 + 5/2$$

EXERCISE : 2

Matlab Code :

```
syms x y
f=input('Enter the function f(x,y):')
f1=input('Enter the inner lower limit (limit of x):')
f2=input('Enter the inner upper limit (limit of x):')
a=input('Enter the outer lower limit (limit of y):')
b=input('Enter the outer upper limit (limit of y):')
P=int(f,x,f1,f2)
D=int(P,y,a,b)
```

INPUT –

Enter the function f(x,y):

1 f

=

1

Enter the inner lower limit (limit of x):

((y^2)/4)-1

f1 = y^2/4

- 1

Enter the inner upper limit (limit of x):

((-y^2)/4)+1 f2

=

1 - y^2/4

Enter the outer lower limit (limit of y):

-2 a

= -2

Enter the outer upper limit (limit of y):

2 b

=

2

OUTPUT –

P =

2 - y^2/2

D =

16/3

EXERCISE : 3

Matlab Code :

```
syms x y z
f=input('Enter the function f(x,y,z):')
f1=input('Enter the innermost lower limit (limit of y):')
f2=input('Enter the innermost upper limit (limit of y):')
a=input('Enter the inner lower limit (limit of x):')
b=input('Enter the inner upper limit (limit of x):')
c=input('Enter the outter lower limit (limit of z):')
d=input('Enter the outter upper limit (limit of z):')
P=int(f,y,f1,f2)
D=int(P,x,a,b)
T=int(D,z,c,d)
```

INPUT –

```
Enter the function f(x,y,z):
x+y+z f =
x + y + z

Enter the innermost lower limit (limit of y):
x-z f1
= x -
z

Enter the innermost upper limit (limit of y):
x+z f2 = x + z

Enter the inner lower limit (limit of x):
0 a
=
0

Enter the inner upper limit (limit of x):
z b
= z

Enter the outter lower limit (limit of z):
-1 c
= -1

Enter the outter upper limit (limit of z): 1
d =
1
```

OUTPUT –

```
P =
2*z*(2*x + z)
```

$$D =$$

$$4z^3$$

$$T =$$

$$0$$

EXERCISE : 4

Matlab Code :

```
syms z r t f=
r
z1=input('Enter the innermost lower limit (limit of z):')
z2=input('Enter the innermost upper limit (limit of z):')
r1=input('Enter the inner lower limit (limit of r):')
r2=input('Enter the inner upper limit (limit of r):')
t1=input('Enter the outter lower limit (limit of theta):')
t2=input('Enter the outter upper limit (limit of theta):')
P=int(f,z,z1,z2)
D=int(P,r,r1,r2) T=int(D,t,t1,t2)
disp(['The volume of the region bounded above the paraboloid and below the
cone is ',num2str(double(T))])
```

INPUT –

```
f = r
Enter the innermost lower limit (limit of z):
r/((2)^(0.5)) z1
=
(2^(1/2)*r)/2
Enter the innermost upper limit (limit of z):
1-r^2 z2
=
1 - r^2
Enter the inner lower limit (limit of r):
0 r1
=
0
Enter the inner upper limit (limit of r):
1/((2)^(0.5)) r2
=
0.7071
Enter the outter lower limit (limit of theta):
0 t1
=
0
Enter the outter upper limit (limit of theta):
2*pi
t2 = 6.2832
```

OUTPUT –

P =

$$-r*(r^2 + (2^{1/2}*r)/2 - 1)$$

D =

$$5/48$$

T =

$$(5*\pi)/24$$

The volume of the region bounded above the paraboloid and below the cone is

$$0.6545$$