CALCULUS

K1 QUESTIONS:

UNIT 1:

1. The solution of this auxiliary equation is called______

a.complimentary function

b.orbitrary function

c.clairants function

d.none of these

2. A solution containing as many orbitrary constants as these are independent variables is called a___________

a.particular integral

b.complete integral

c.singular integral

d.none of these.

3. The________integral is define in a similar manner

a.tripule integral

b.complete integral

c.double integral

d.none of this

4. Recurance formula of gamma function is________

a.n+1 gamma(n+1)

b.n gamma (n-1)

c.n gamma (n+1)

d.n gamma (n)

5. Laplace transforms operator's are_____

a. F(t),F(m)

b. F(t),F(s)

c. F(t),L(t)

d. none of these.

6. Inverse of trigonometric $\sin^{-}$ $-$ functions is ………………

a) $-$ b)$-\tan^{-}$ c) **$-\sin^{-}$**

7.F(x,y,z) let us assume the q is ……………..

a) R b**) a** c) P

8. Multiple of integers is $\frac{,\ ,}{,\ ,}\cdot\frac{,\ ,}{,\ ,}$=……………

a)**1** b) -1 c)2

9. Change of variable ? $-$ =…………..

a) $-\sqrt{\ }$ b) $\sqrt{\ }$ c) ½

10. lap-lace transforms L{f(t)} is …………

a) **F(s)** b) 1/s c) F(t)

UNIT 2:

1. The solution of the axillary equation is called

a. particular lntegral

b. complementary function

c. General solution

2. What is the langrang's equation

- **a. Pp+Qq=R**
- b. Pp+Qq =0
- c. P. Q=R

3. Multiple integration be considered either as the inverse of differentiation or as a process of

- a. Addition
- b. Multiplication
- **c. Summation**

4. Gamma (1/2)=

a.π

b.√(π)

c.o

5. L[c.f(t)]=

a. s. L [f(t)]

b. c.L[f(t)]

c. s. L[f(t)]-f(o)

6. In the linear differential equation the higher powers of D operating on x (power)m give

(a) zero

(b) one

(C) three

(d) four

7. The equation which involves in one or more partial derivatives is…

(a) Linear equation

(b) Linear regression

(c) Partial differential equations

(d) Partial regression.

8. The length of sub interval, when a and b points are finite

(a) zero

(b) one

(c) three

(d) four

9. Gamma of n converges when n is____

(a)=o

(b)>0

(c)<o

(d)~1

10. L{sin at} =

(a) s+a/s2+a2

(b) a2/s2+a2

(c) s/s2+a2

(d) a/s2+a2

UNIT 3:

1**.** Find the linear differential equation

a) **$a\, d^2y/dx^2 + b\, dy/dx + cy = x$**
b) $a\, d^2y/dx^2 + b\, dy/dx = 0$
c) $a\, d^2y/dx^2 + b\, dy/dx + cy = y$
d) $a\, d^2y/dx^2 + b\, dx/dy = 0$

2.In linear differential equations, the order of the operator is not

a.) Associative b.) Distributive **c.) Commutative** d.) None of these

3.Highest order of derivative is occurring at

a.) Differential equations b.)Partial differential equations c.)linear differential equations D)Non linear differential equations

4. Integration may be considered either as the _____ of differentiation.

A) Reciprocal B) partial *C) inverse D) both a and b

5. If a,b are subintervals a is n-1 ,b are in ____ order of magnitude.

A) Descending * B) Ascending C) maximum D) minimum

6. Evaluation of multiple integration become easier by

A) change of constant B) change of order C) change of function*D) change of variables

7. Let the auxiliary equation e^mx.[am^2+bm+c]=o has 2 roots equal and real the general solution is _______

a)y=(A+B) b)y=(A+B)e^mx C)y=(A+B)c

8. The complete integral of pq=1 is________

a)z=ax+by b)ax+by+c=z C)z=ax+1/a y+ c

9. Triple integral of (x+y+z)^2 dx dy dz taken over the region defined by x>o,y>o,z>o and x+y+z< or equal to 1

a)31/60 b)24/60 c)45/51

10. Gamma (n).gamma (n+1/2)=__________

a) √π+1/2 b)√π.gamma(2n)/2^2n-2 c)gamma(2n-2)/(2n)

UNIT 4:

1. L(t)=

a)1/s **b)1/s^2** c)2/s^2 d)1

2. The solution of auxiliary equation is called ___

a.Linear equation

b.orbitrary equation

c.complementary equation

d.None of these

3. The solutions containing as many orbitrary constant

is called____

a.Complete integral

b.Particular integral

c.General integral

d.Singular integral

4. Evaluate.$_0\int^a {}_0\int^b (x+y)^2$ dx dy is__

a.24

b.47/30

c.ab/3

d.ab/3(a²+b²)

5 .$_0\int^1 x^{m-1}(1-x)^{n-1}dx$ for n>0,m>0 is known as _____

a.Beta function

b.Gamma function

c. Hormonic function

d.None of these

6. In Laplace transform,L(t) is ___

a.1/S

b.1/S^2

c.2/S

d.)3/s

7.The rule is in 1/f(D)$e^{\alpha x}$,replace D by α,if

α not equal to

a) 1
b) 2
c) 0
d) -1

8. Which is known as Lagrang′s linear equation

a)Pp+Qq=R

b)f(x,y,z,p,q)=0

c)p+q=r

d)PQ+pq=r

9. which is consider as inverse of differentiation or as a process of summation

a)summation

b) integration

c) differentiation

d) none of this

10. gamma (1/2)=

a)1

b)π

c) 0

d)$\sqrt{\pi}$

UNIT 5:

1. Gamma(1/2)=

a.) $\sqrt{\pi}$ b.)$\sqrt{2\pi}$c.) 0 d.) 1

2. **______** is called the Laplace transform.

a.) F(t) b.) F(a) c.) F(b**) d.)F(S**

3 .A function f(t) is said to be of exponential order if Limit certian infinity Power (-st)=

a>0 b.) 1 c.) 0 d.) a<0

4. L(1) =

a.) 0 b.) 1 **c.) 1/s** d.) -1

5. A solution containing by giving particular values to the arbitary constants in a complete integral is called a ......

a) Partial integral b.) singular intergal c.) general intergal d.) complete intergal

6. Which may be consider either as the inverse of differentiation?

summation b.) Integration c.) percentage d.) none of these

7. Gamma of n converges, when n ??

<0 b.) =0 c.) > 1 d.) >0

8. In laplace transformation, f (t)=t then F (s) is **________**

a) 1/2 s b.) 1/s 2 c.) 1+s d.) 1-s

9. Integration may be considered as

(a) Differentiation

(b) Inverse of differentiation
(c) Summation.

10. L(1)=

a) 0

b) 1/s

c) 1/s+a

d) $\sqrt{(\pi)}$

K2 QUESTIONS:

UNIT 1:

1. If $\phi(x) = \int_{x^2}^{0} \sqrt{t}dt,\ then \frac{d\phi}{dx}$

   Answer: $2x^2$

.

2. The function f(x) = x3 - 6x2 + 9x + 25 has
   Answer: a maxima at x= 1 and a minima at x = 3 .
3. The value of a = $\int_0^{5p} (2 - sinx)dx$ **is**

   Answer: >0
4. The interval in which the Lagrange's theorem is applicable for the function f(x) = 1/x is
   Answer: [2, 3]
5. The minimum value of | x2 _ 5x + 21 | is
   Answer: 0
6. The value of the improper integral $\int_0^1 xlnx$

   Answer: -1/4
7. The function f(x) = 3x(x - 2) has a
   Answer: maximum at x = 1
8. What is the derivative of f(x) = | x | at x = 0
   Answer: 0
9. If f (0) = 2 and f (x) = 1 / (5-x2), then lower and upper bound of f(1) estimated by the mean value theorem are
   Answer: 2.2,2.25
10. The unit normal to the plane 2x +y + 2z = 6 can be expressed in the vector form as
    Answer: $i\frac{2}{3} + j\frac{1}{3} + k\frac{2}{3}$

UNIT 2:

1. If x + y = k, x > 0, y > 0, then xy is maximum when

   Answer.: x = ky

2. The maxima and minima of the function f(x) = 2x3 - 15x2 + 36x + 10 occur respectively at

   Answer: x = 1 and x = 3

3. If f(x , y) = x2 + y2, then ?2 f is

Answer: 0.

4. Area bounded by the parabola 2y = x2 and the line x = y - 4 is equal to

   Answer: 18

5. The minimum value of | x2-5x+21 | is

   Answer: 2

6. The interval in which the Lagrange's theorem is applicable for the function f(x) = 1/x is

   Answer: [2, 3]

7. The minimum value of | x2 _ 5x + 21 | is
   Answer: 0
8. The value of the improper integral $\int_0^1 x ln x$

   Answer: -1/4
9. The function f(x) = 3x(x - 2) has a
   Answer: maximum at x = 1
10. What is the derivative of f(x) = | x | at x = 0
    Answer: 0

UNIT 3:

1. State the Implicit function theorem
2. State the Intermediate value theorem
3. State the Inverse function theorem
4. State the Squeeze theorem
5. State the Stokes' theorem
6. State the Extreme value theorem
7. State the Mean value theorem
8. State the Monotone convergence theorem
9. State the L'Hôpital's rule.
10. Green's theorem

UNIT 4:

1. Define the differentiability implies continuity.
2. State the first derivative rule for increase and decrease.
3. State the second derivative rule for concavity.

4. State First and second derivative rules for relative extrema.
5. Define the Product Rule, Quotient Rule, Chain Rule.
6. State the L'Hospital's Rule.
7. Define the Additivity and linearity of the definite integral.
8. What are the of Techniques of anti differentiation such as substitution, integration by parts.
9. Define the Various tests for convergence of series.
10. State Fundamental theorem of calculus.

UNIT 5:

1. State the Intermediate Value Theorem.
2. State the Extreme Value Theorem.
3. State the Mean Value Theorem for Derivatives.
4. State the Rolle's Theorem.
5. State the Fundamental Theorem of Calculus.
6. State the Mean Value Theorem for Integrals.
7. State the Second fundamental theorem of calculus.
8. State the first fundamental theorem of calculus.
9. State the Fermat's theorem.
10. State the Fubini's theorem.

CALCULUS

K2 QUESTIONS:

UNIT-1:

1.Solve $(D^2+5D+6)y=e^x$

2.solve the equation $d^4y/dx^4=0$ and $d^3y/dx^3-3dy/dx+2y=0$

3.solve $(D^2+2D+1)y=2e^{3x}$

4.solve $(D^2-13D+12)y=e^{-2x}+5e^x$

5.solve $(D^2+D+1)y=\sin(2x)$

6.Solve $(D^2+16)y=2e^{-3x}+\cos(4x)$

7.Solve $(D^2+D+1)y=x^2$

8.Solve $(D^2-4D+3)y=e^{-x}. \sin(x)$

9.Solve $(D^2-2D-15)=0$ given that $dy/dx=x$ and $d^2y/dx^2=2$ when $x=0$

10.Solve $(D^3+2D^2-D-2)y= 0$

Unit 2:

1. Eliminate a and b from $z=(x+a)(y+b)$.
2. Obtain the partial differential equation of all spheres whose centre lies on the plane $z=0$ and whose radius is constant and equal to r.
3. Solve $z=ax+by+a$.
4. Solve $z=e^y f(x+ y)$.
5. Eliminate the arbitrary function f∅ from the relation $z=f(x+ay)+\emptyset(x-ay)$.
6. Solve $f(xy)/z$.

7. Solve $pq=x$.

8. Solve $p=2qx$.

9. Solve $p+q=x+y$.

10. Solve $p+q=\sin x + \sin y$.

3 unit:

1. evluate $\int_0^a \int_0^a (X^2+y^2)dx\,dy$

2. evaluate $_0\int^2{}_1\int^2 XY(X+Y)dydx$

3. $_0\int^2{}_{x^2}\int^{2x}(2x+3y)dy\,dx$

4. $_1\int^2{}_1\int^x xy^2\,dy\,dx$

5. $_0\int^a{}_0\int\sqrt{(a^2-x^2)}\sqrt{(x^2+y^2)}dy\,dx$.evaluate change on to polar co ordinates.

6. $\iint x^2y^2dx\,dy$ over the circular area $x^2+y^2\leq 1$.

7. $\iint ydx\,dy$ over the region between the line x+y=2and parabola $x^2=y$.

8. $\iint_a r\sqrt{(a^2-r^2)}drd\theta$over the upper half of the circle r=acos(θ)

9. By changing into polar coordinates evaluate the intergral $\int□^{2a}\int_0\sqrt{(2ax-x^2}x^2+y^2dx\,dy$.

10. $\iiint dxdydz/(x+y+z)^3$taken over the volume bounded by the place x=0,y=0,z=0and x+y+z=1.

UNIT-4:

1. Prove that $\iint_R e^{-x^2-y^2}dxdy=1/4\pi(1-\bar{e}^{R^2})$. where D is the region x≥0,y≥0,and $x^2+y^2\leq R^2$.
2. Given that x + y=u, change the variables to u, v in the integral ∬ (xy(1-x-y)½) dxdy taken over the area of the triangle with sides x=0 ,y=0 ,x+y=1 and evaluate it.
3. Solve $\int_0^\infty \bar{e}^{x^3}dx$.
4. Solve $\int_0^\infty \bar{e}^{x^4}dx$.
5. Write the properties of beta function.
6. Solve $\int_0^{\frac{\pi}{2}} sin^4\theta\ cos^6\theta d\theta$.
7. Write the relation between beta and gamma function.
8. Solve $\int_0^{\frac{\pi}{2}} sin^6\theta cos^6\theta d\theta$.
9. $solve \int_0^{\frac{\pi}{2}}\sqrt{tan\theta}d\theta$.
10. Solve $\int_0^\infty x^4\bar{e}^{x^4}dx$.

UNIT – 5:

1. Find L $(t^3) - 3t^2 + 2$

2. Find L [cos h 5t]

3. Find L [sin^2 2t]

4. Find L {t . sin at}

5. Find L $\{t^2.e^{-3t}\}$

6. Find $L^{-1}[\frac{s}{(s^2+a^2)^2}]$

7. Find $L^{-1}[\frac{s+2}{(s^2+4s+5)^2}]$

8. Find $L^{-1}[\frac{s-3}{s^2+4s+13}]$

9. Find $L^{-1}[\frac{s}{(s+3)^2+4}]$

10. Find $L^{-1}[\frac{1}{(s^2+a^2)^2}]$

CALCULUS

K3 QUESTIONS:

UNIT 1:

1.Solve $X^2(d^2y/dx^2)+3x(dy/dx)+y=1/(1-x)^2$

2.Solve $(D^2+2D+5)y=e^x$. X

3.Solve $(D^2+4D+5)y =e^x+x^3+\cos(2x)$

4.Solve $(D^2-4D+3)y=\sin(3x).\cos(2x)$

5.Solve $(D^2-2mD+m^2)y=e^{mx}$

UNIT 2:

1. Solve $q=xp +p^2$.

2. Solve $z= px + qy +\sqrt{(1+p^2+q^2)}$

3. Find the general solution of $(y+z)p +(z+x)q=x+y$.

4. Solve $p(1+q^2)=q(z-1)$.

5. Solve $p^2+q^2=npq$.

UNIT 3:

1.∬xydx dy taken over the poaitive quardrant of circle $x^2+y^2=a^2$.

2.∬(x^2+y^2)dxdy over the region for which each greater then are equal to 0 and $x+y\leq1$.

3.∬xy dxdy taken over the positive quatrant of the elipse.

4.∬x^3y dxdy over the region for which x and y are greater then are equal to zero and $x^2/a^2+y^2/b^2\leq1$

5.find the value of ∬(a^2-x^2)dxdy.taken over the upper half of the circle $x^2+y^2=a^2$.

UNIT 4:

1. $\iint_R$ (x-Y)^4 $e^{x\ y} dx\ d$, ?ere ist?e squre it? verti es 1,0 , 2,1 , 1,2 , 0,1 .

2.Evaluate $\int_0 . \int_x e^{y\ y\,dxdy\ \ y\ anging\,t\ \ o\ d\ o\ int\ \ gtation}$.

3.Evaluate $\int^{a} . \int_{x2/a}^{a\ x} x \ \ dxd$.(k4)

4.Evaluate $\iint_R x \; dxdy$ where R is the region in the first quadrant bounded by the hyperbola $x^2-y^2=b^2$ and the circle is $x^2+y^2=c$ and $x^2+y^2=$. 0 d .(k5)

5.Find the area of the curvilinear quadrilateral boundary by the four parabolas. (k4)

UNIT 5:

1. Find [$\frac{}{a}$]

2. Find L (3t)

3. Find L (cos t . cos 2t)

4 Find L {t . e^{t} sin t}

5. Find [——————]

6. Find [—————]