0801_R19_Computer_C-Scheme_SEM3_CSC301_EM3_QP

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* Required

Q1. Choose the correct option for following questions. All the Questions are compulsory and carry equal marks

Time: 12.30PM TO 1.10 PM (40 MIN) Max. Marks: 40

*

2 points

$L^{-1}\left[\frac{s+2}{s^2+4s+5}\right]$ is

- (A) $e^{-2t}\,cost$
- (B) $e^{-2t}\,sin\,t$
- (C) $e^{2t}\,cos\,t$
- (D) $e^{2t}\,sin\,t$

*

2 points

If random variable X has the probability distribution as

X	-2	-1	0	1	2
P(X=x)	3k	2k	2k	k	0.2

Then $P(-2<X \leq 2)$ is

- OptOption A: 1
- Option B: 0.7
- Option C: 0.8
- Option D: 0.5

*

2 points

Laplace transform of $\int_0^t \sin 2t \; cosh2t \; dt$ is

$\frac{1}{s}\left[\frac{1}{(s-2)^2-4}-\frac{1}{(s+2)^2-4}\right]$

A

$\frac{1}{s}\left[\frac{1}{(s-2)^2-4}+\frac{1}{(s+2)^2-4}\right]$

B

$\frac{1}{s}\left[\frac{1}{(s-2)^2+4}-\frac{1}{(s+2)^2+4}\right]$

C

$\frac{1}{s}\left[\frac{1}{(s-2)^2+4}+\frac{1}{(s+2)^2+4}\right]$

D

*

2 points

Inverse Laplace transform of $\frac{s-1}{s^2}$ is

- A -1-t
- B -1+t
- C 1+t
- D 1-t

Laplace transform of cos(√3 t) is *

2 points

- A $\frac{s}{s^2+9}$
- B $\frac{s}{s^2-9}$
- C $\frac{s}{s^2+3}$
- D $\frac{s}{s^2-3}$

*

2 points

If coefficients of correlation between variables x, y is 0.5 and coefficient of regression b_{xy} is 0.2 then coefficient of correlation b_{yx} is

- (●) Option A: 1.25
- ( ) Option B: -1.25
- ( ) Option C: 2.5
- ( ) Option D: -2.5

*

2 points

A random variable X has probability distribution with E(X) =1.5 , E(X^2) =3 then then variance is

- (●) Option A: 0.75
- ( ) Option B: 1.5
- ( ) Option C: 3
- ( ) Option D: 5.25

*

2 points

Fourier coefficient a_0 in half range cosine series for $f(x) = e^x, x \in (0,1)$ is

- ( ) e+1
- ( ) -e-1
- ( ) -e+1
- (●) e-1

*

2 points

If a straight line is y=ax+b is fitted to following data

x	0	1	2	3	4
y	1	2	3	4	5

Then values of a & b are

- Option A: a=1, b=0
- Option B: a=1, b=1
- Option C: a=0, b=1
- Option D: a=-1, b=1

*

2 points

Value of constant real number m such that $f(z) = f(x + iy) = e^{3mx+2iy}$ is analytic function is

- 2/3
- -2/3
- 3/2
- -3/2

*

2 points

For $f(z) = sinx\ cosh(y) + i\ cosx\ \sinh(y)$, where $z = x + iy$, $f'(z)$ is

- -sin z
- sinh z
- cos z
- cosh z

*

2 points

The value of $\int_0^{\infty} e^{-3t}\left(\frac{\sinh t}{t}\right) dt$ is

$\frac{1}{3} ln\, 3$

A

$\frac{1}{3} ln\left(\frac{1}{3}\right)$

B

$\frac{1}{2} ln\, 2$

C

$\frac{1}{2} ln\left(\frac{1}{2}\right)$

D

*

2 points

Laplace transform of $f(t) = t^2 e^{-t}$ is

A $\frac{2}{(s-1)^3}$

B $\frac{2}{(s+1)^3}$

C $\frac{\Gamma(2)}{(s-1)^3}$

D $\frac{\Gamma(2)}{(s+1)^3}$

2 points

Fourier coefficient b_1 for $f(x) = x.sinx$, where $x \in (0, 2\pi)$ is

- (●) 0
- ( ) π
- ( ) -π
- ( ) $\frac{\pi}{\sqrt{2}} - \frac{\pi}{\sqrt{3}}$

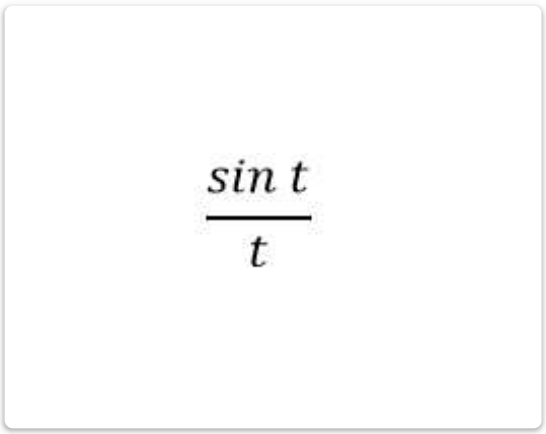
Option 4

Clear selection

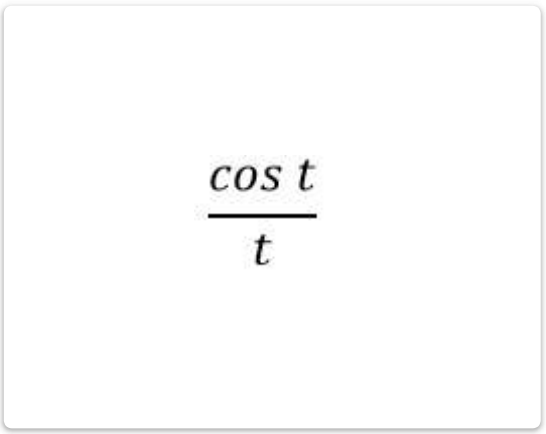
*

2 points

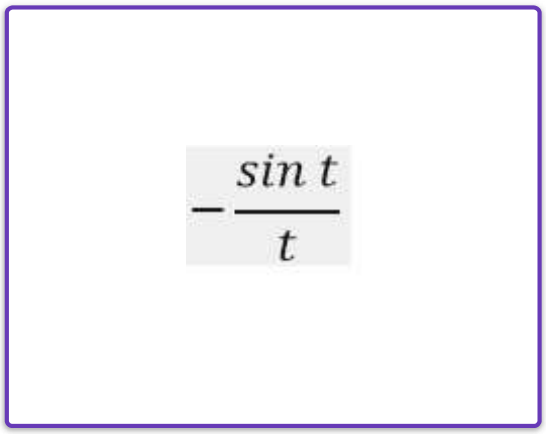
$L^{-1}(tan^{-1}s)$ is



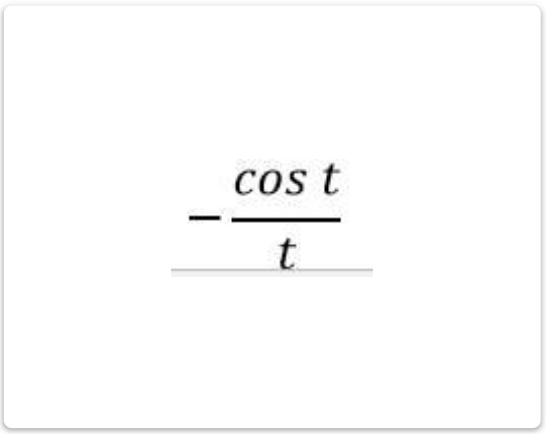
Option 1



Option 2



Option 3



Option 4

The coefficient of rank correlation between two variables with unequal ranks is - 0.9 . If the number of pairs is 5 ,then the sum of squares of differences in ranks is * 2 points

- ○ Option A: 37
- ○ Option B: 36
- ○ Option C: 39
- ◉ Option D: 38

For real variables x, y function u(x,y)=2xy * 2 points

- ○ does not satisfy Laplacian equation.
- ○ is not continuous.
- ◉ is harmonic.
- ○ is continuous but not partially differentiable

* 2 points

Fourier coefficient a_2 for f(x)=x , x belongs to (-1, 1) is

- ○ -1
- ○ 1
- ◉ 0
- ○ 2

*

2 points

A continuous random variable X has the probability law $f(x) = k^2x^3$, $0 \leq x \leq 3$, $k > 0$ then value of k is

- Option A: 2/81
- Option B: 4/81
- Option C: 4/9
- Option D: 2/9

*

2 points

$L^{-1}\left[\frac{s(2s^2-3)}{(s^2+1)(s^2-4)}\right]$ is

- cosh t+cosh 2t
- cos t+cosh 2t
- cos t+cos 2t
- cosh t+cos 2t

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