Program: SE Information Technology

Curriculum Scheme: Rev-2019

Examination: Second year semester III

Course Code: ITC301 and Course Name: Engineering Mathematics-III

MCQ_SECTION

Time: 2hours and 30 minutes

Max. Marks: 20

1] All questions are Compulsory

2] Assume suitable data wherever required.

1	$L[t^{\frac{5}{2}}]$ is
Option A:	3
	$\frac{L[t^{\frac{5}{2}}] \text{ is}}{\frac{3}{4s^{\frac{3}{2}}}}$
Option B:	$\frac{3\sqrt{\pi}}{4s^{\frac{5}{2}}}$
Option C:	$\frac{5\sqrt{\pi}}{4s^{\frac{5}{2}}}$
	$4s^{\frac{5}{2}}$
Option D:	$\frac{15\sqrt{\pi}}{8s^{\frac{7}{2}}}$
	$8s^{\frac{7}{2}}$
2	L [f(t)] = $\frac{1}{s\sqrt{s+1}}$ then L [$e^{-2t}f(t)$] is 1
Option A:	
	$\overline{(s+2)\sqrt{s+3}}$
Option B:	
	$\overline{(s+2)\sqrt{s+2}}$
Option C:	
	$\overline{(s-2)\sqrt{s-1}}$

Option D:	1
- r	$\overline{(s-1)\sqrt{s}}$
3	Find $L^{-1}\left[\frac{s+2}{(s+2)^2-16}\right]$
Option A:	e ^{2t} cosh4t
Option B:	$e^{-2t}sinh4t$
Option C:	$e^{-2t}cosh4t$
Option D:	e ^{2t} sinh4t
4	Find $L^{-1}\left[\frac{1}{\left(s+4\right)^{3/2}}\right]$
Ontion A:	
Option A:	$2e^{4t}\sqrt{\frac{\pi}{t}}$
Option B:	$e^{-4t}\sqrt{\frac{\pi}{t}}$
Option C:	$e^{4t}\sqrt{\frac{t}{\pi}}$
Option D:	$2e^{-4t}$ $\frac{t}{-}$
	$\sqrt{\pi}$
5	The probability that a 3-card hand drawn at random and without
	replacement from an ordinary deck consist entirely of black card is:
Option A:	1
	17
Option B:	3
<u> </u>	17 2
Option C:	
	17
Option D:	$\frac{1}{8}$
	8
6	The probability density function of a discrete random variable X is
0	given by the formula $P(x) = kx^2$, $x = 0,1,2,3$; the value of
	constant k is:
	1
Option A:	

Option B: $\frac{3}{2}$ Option C: $\frac{1}{6}$ Option D:67The analytic function corresponding to real part $e^{-x}siny$ isOption A: $f(z) = e^{z} + c$ Option B: $f(z) = ie^{z} + c$ Option D: $f(z) = ie^{-z} + c$ Option D: $f(z) = ie^{-z} + c$ Option D: $f(z) = ie^{-z} + c$ Option B:Will have series for $f(x) = sinx $ in $[-\pi, \pi]$ Option A:Will have cosine termsOption B:Will have cosine termsOption D:Doesn't exist9If $f(x) = x^2$ in $[-\pi, \pi]$ then what is the value of the first term in the series $\frac{a_0}{2} + \sum_{n=1}^{\infty} a_n \cos nx + \sum_{n=1}^{\infty} b_n sinnx$ Option A: $\frac{2\pi^2}{2}$ Option B: $\frac{\pi^2}{6}$ Option D: $\frac{\pi^2}{3}$ Option D: $\frac{\pi^2}{3}$ I0Let the regression equation of y on x be $x - 2y + 5 = 0$ then b_{yx} is equal toOption A:-2Option B:1Option B:1Option B:1Option B:1Option B:1Option B:1Option B:1		0						
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Option C: 5	Option A:	-2						
Option C: 5	Option B:	1						
		5						

DESCRIPTIVE_SECTION

Attempt all questions.

Q2	Solve any Four out of six5 Marks each
А	Find Laplace Transformation of $t\sqrt{1 + \sin t}$
В	Find $L^{-1}\left(\frac{(s+3)}{(s^2+6s+13)^2}\right)$ using Convolution Theorem
С	If $f(x) = 9 - x^2$ for -3 <x<3, <math="" fourier="" obtain="" of="" series="">f(x) in [-3, 3].</x<3,>
D	Construct the analytic function whose real part is $e^{2x}(x \cos 2y - y \sin 2y)$
E	The no. of pairs of observation of x and y are 1000. $\sigma_x = 4.5$; $\sigma_y = 3.6$; $\sum (x - \bar{x})(y - \bar{y}) = 4800$ Calculate the coefficient of correlation between x and y series.
F	In a certain college, 4% of the boys and 1% of the girls are taller that 1.8m. Furthermore 60% of the students are girls. If the students are selected at random and found to be taller than 1.8m, what is the probability that the student is a girl?
Q3	Solve any Four out of six 5 Marks each
A	Find Laplace transformation of $\frac{e^{-2t} \sin(2t) \cosh t}{t}$
В	Find the half range sine series of $f(x) = x^2 in(0, \pi)$
С	Find the orthogonal trajectories of the family of curves
	$3x^2y - y^3 = c$

D	The two regression lines are $4x - 5y + 33 = 0$; $20x - 9y = 107$ and variance of x = 25. Find i) mean of x & y ii) Coefficient of correlation iii) Variance of y
E	Two persons A and B toss an unbiased coin alternately on the understanding that the first who gets head wins. If A starts the game, find their respective chance of winning.
F	Find $L^{-1}\left(\frac{2s^2 - 15s - 11}{(s+2)(s-3)^2}\right)$

Q4	Solve any	Solve any Four out of six							5 Marks each		
А	Find Lapla	Find Laplace Transformation of $\frac{e^{-2t} \operatorname{sin2t} \operatorname{cosht}}{t}$									
В	Find $L^{-1}\left(\frac{1}{C}\right)$	Find $L^{-1}\left(\frac{s}{(s^2+a^2)(s^2+b^2)}\right)$ using Convolution Theorem									
С	If $f(x) = 4$	If $f(x) = 4 - x^2$ for $-\pi < x < \pi$, obtain Fourier series of $f(x)$.									
D	Find Harm	Find Harmonic Conjugate of the function $y^3 - 3x^2y$									
Е	E Calculate rank correlation for the following data										
	X	1	2	17		22	27		32		
	Y	1	13	119		117	115		121		
F	Following	Following table is probability density function of discrete random									
	variable X.										
	X	0	1	2	3	4	5	6	7		
	P(X)	0	k	2k	2k	3k	K ²	2 K ²	7 K ² +k		
	Find k, Me	Find k, Mean and variance of X									