Program: SE Computer Engineering

Curriculum Scheme: Rev-2019

Examination: Second year semester III

Course Code: CSC 301 and Course Name: Engineering Mathematics-III

MCQ_SECTION

Time: 40 Min   Max. Marks: 40

1] All questions are Compulsory

2] Assume suitable data wherever required.

Q1.	L[$t^{\frac{5}{2}}$] is
Option A:	$\frac{3}{4s^{\frac{3}{2}}}$
Option B:	$\frac{3\sqrt{\pi}}{4s^{\frac{5}{2}}}$
Option C:	$\frac{5\sqrt{\pi}}{4s^{\frac{5}{2}}}$
Option D:	$\frac{15\sqrt{\pi}}{8s^{\frac{7}{2}}}$
Q2.	L [f(t)] = $\frac{1}{s\sqrt{s+1}}$ then L [$e^{-2t}f(t)$] is
Option A:	$\frac{1}{(s+2)\sqrt{s+3}}$
Option B:	$\frac{1}{(s+2)\sqrt{s+2}}$
Option C:	$\frac{1}{(s-2)\sqrt{s-1}}$

Option D:	$\frac{1}{(s-1)\sqrt{s}}$
Q3.	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:	$e^{2t}sinh4t$
Q4.	Find $L^{-1}\left[\frac{1}{(s+4)^{3/2}}\right]$
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:	$2e^{-4t}\sqrt{\frac{t}{\pi}}$
Q5.	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:	$\frac{1}{17}$
Option B:	$\frac{3}{17}$
Option C:	$\frac{2}{17}$
Option D:	$\frac{1}{8}$
Q6.	A, B, C hit a target with probabilities 1/ 2, 2 /3, 3/ 4 respectively. If all of them fire at the target, the probability p that at least one of them hits the target is:

Option A:	$\frac{1}{24}$
Option B:	$\frac{23}{24}$
Option C:	$\frac{7}{12}$
Option D:	$\frac{11}{12}$
Q7.	The probability density function of a discrete random variable X is given by the formula $P(x) = kx^2$, $x = 0,1,2,3$; the value of constant k is:
Option A:	$\frac{1}{14}$
Option B:	$\frac{3}{2}$
Option C:	$\frac{1}{6}$
Option D:	6
Q8.	The expected value for a random variable is
Option A:	the long-run average.
Option B:	the most likely value.
Option C:	the most frequent value observed in a random sample of observations of the random variable.
Option D:	always np.
Q9.	The function $f(z) = e^z$ is
Option A:	Analytic
Option B:	Hyperbolic
Option C:	Not Analytic
Option D:	Elliptic
Q10.	The imaginary part of $f(z) = cosz$ is
Option A:	$-sinx\ coshy$
Option B:	$coshx\ cosy$
Option C:	$-sinx\ sinhy$
Option D:	$sinx\ sinhy$

Q11.	The analytic function corresponding to real part $e^{-x}siny$ is
Option A:	$f(z) = e^{z} + c$
Option B:	$f(z) = e^{-z} + c$
Option C:	$f(z) = ie^{z} + c$
Option D:	$f(z) = ie^{-z} + c$
Q12.	The analytic function corresponding to imaginary part $3x^2y - y^3$is
Option A:	$f(z) = z^2 + c$
Option B:	$f(z) = z^3 + c$
Option C:	$f(z) = -z^2 + c$
Option D:	$f(z) = -z^3 + c$
Q13.	Which of these is not Dirichlet's conditions for a function f(x) to be expanded in a Fourier series in the interval (0,2L)
Option A:	f(x) may have discontinuities, finite in number
Option B:	f(x) may have maxima and minima, finite in number
Option C:	f(x) is single valued
Option D:	f(x) is always an even function
Q14.	If f(x) is an odd function, then the Fourier series for f(x) is a
Option A:	Cosine series
Option B:	Sine series
Option C:	Contains both sine series and cosine series
Option D:	neither sine series nor cosine series
Q15.	$The\ fourier\ series\ for\ f(x) = \|sinx\|$ in $[-\pi, \pi]$
Option A:	Will have sine terms
Option B:	Will have cosine terms
Option C:	Is zero
Option D:	Doesn't exist
Q16.	If f(x) = x^2 in $[-\pi, \pi]$ then what is the value of a_0 in the series $\frac{a_0}{2} + \sum_{n=1}^{\infty} a_n \cos nx + \sum_{n=1}^{\infty} b_n sinnx$
Option A:	$\frac{2\pi^2}{3}$

Option B:	$\frac{\pi^2}{6}$
Option C:	$\frac{\pi^2}{2}$
Option D:	$\frac{\pi}{3}$
Q17.	The slope of the line of regression of y on x is called__________
Option A:	Coefficient of correlation
Option B:	Rank correlation coefficient
Option C:	Regression coefficient of y on x
Option D:	Regression coefficient of x on y
Q18.	Correlation coefficient is the _____________mean between the regression coefficients
Option A:	Arithmetic
Option B:	Geometric
Option C:	Harmonic
Option D:	Weighted
Q19.	Regression coefficient are independent of the
Option A:	Change of origin
Option B:	Change of scale
Option C:	Change of origin but not scale
Option D:	Change of origin and scale
Q20.	Let the regression equation of y on x be x - 2y + 5 = 0 then b_{yx} is equal to
Option A:	-2
Option B:	1
Option C:	5
Option D:	½

DESCRIPTIVE_SECTION

Time: 1.20 Hrs. Max. Marks: 40

Write answers on plain paper (A4 size), scan and upload the PDF for Q2 separately and Q3 separately.

Please write Year, Semester, Branch and seat no. on every page.

Assign page number to each page (e.g. page 1 of 5, page 2 of 5 and so on)

Sign on each page.

Attempt all questions.

Q2	**Solve any Four out of six** **5 Marks each**
A	Find Laplace Transformation of $t\sqrt{1 + \sin t}$
B	Find $L^{-1}\left(\frac{(s+3)}{(s^2+6s+13)^2}\right)$ using Convolution Theorem
C	If $f(x) = 9 - x^2$ for -3<x<3, obtain Fourier series of f(x) in [-3, 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 than 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

	$\frac{e^{-2t} \sin(2t) \cosh t}{t}$
B	Find the half range sine series of $f(x) = x^2$ in $(0, \pi)$
C	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 $L^{-1}\left(\frac{2s^2 - 15s - 11}{(s+2)(s-3)^2}\right)$