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: 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.	$The\ fourier\ series\ for\ f(x) = \lvert sinx \rvert$ 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 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:	$\frac{\pi^2}{3}$
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**

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 $L^{-1}\left(\frac{2s^2 - 15s - 11}{(s+2)(s-3)^2}\right)$