Sample Question Paper

Branch: SE EXTC

Sub. : AM-III

Q1.	If F= (ax + 3y +4z)i+(x-2y + 3z)j+(3x+2y-z)k is solenoidal, then find value of a
Option A:	3
Option B:	-3
Option C:	2
Option D:	-2
Q2.	*Find a, b, c if f is irrotational* *F= $(axy+bz^3)i+(3x^2-cz)j + (3xz^2 – y)k$*
Option A:	a=- 6, b= -1, c=1
Option B:	a= 6, b= -1, c=2
Option C:	a= 6, b= -8, c=1
Option D:	a= 6, b= -1, c=1
Q3.	Find Harmonic conjugate of u = e^x cosy
Option A:	V = $-e^x$siny
Option B:	V = e^xsiny
Option C:	V = $-e^x$cosy
Option D:	V = e^xcosy
Q4.	Find analytic function whose real part is u= $x^2 – y^2 – 5x + y + 2$
Option A:	F(z) = $z^2 + 5z – iz + c$
Option B:	F(z) = $z^2 – 5z + iz + c$
Option C:	F(z) = $z^2 – 5z – iz + c$
Option D:	F(z) = $z^2 +2z – iz + c$
Q5.	Verify given function analytic or not f(z) = e^z
Option A:	analytic
Option B:	Not analytic
Q6.	Find $L^{-1}\left[log\left(\frac{s+a}{s+b}\right)\right]$
Option A:	$\frac{1}{t}(e^{-at}-e^{-bt})$
Option B:	$\frac{-1}{t}(e^{-at}-e^{-bt})$
Option C:	$\frac{-1}{t}(e^{-at}+e^{-bt})$

Option D:	$\frac{-2}{t}(e^{-at} - e^{-bt})$
Q7.	Evaluate: $\int_0^\infty e^{-3t}\left[\int_0^t \left(\frac{1-e^{-u}}{u}\right) du\right] dt.$
Option A:	log(4/3)
Option B:	log(3/2)
Option C:	2log(3/4)
Option D:	1/3 log(4/3)
Q8.	Evaluate by Greens theorem $$\int_c (x^2 - xy)dx + (x^2 - y^2)dy$$ C: $x^2 = 2y$ and $x = y$.
Option A:	-2
Option B:	30
Option C:	2
Option D:	15
Q9.	*Find Laplace transform of f(t)* $=\int_0^t \frac{\sin 2u}{u} du.$
Option A:	$\frac{1}{s}\left[\frac{\pi}{2} - \tan^{-1}\left(\frac{s}{2}\right)\right]$
Option B:	$\left[\frac{\pi}{2} - \tan^{-1}\left(\frac{s}{2}\right)\right]$
Option C:	$2\left[\frac{\pi}{2} - \tan^{-1}\left(\frac{s}{2}\right)\right]$
Option D:	$\frac{2}{s}\left[\frac{\pi}{2} - \tan^{-1}\left(\frac{s}{2}\right)\right]$
Q10.	*Use gauss divergence theorm to evaluate* $\iint N.F ds$, *where* $F=x^2i+zj+yzk$, *over the region bdd by x=0, y=0, z=0, y=3, x =1, y=1, z=1.*
Option A:	3/2
Option B:	-3/2
Option C:	15
Option D:	1/2
Q11.	*Use Stokes theorm to evaluate* $\int_c \bar{F}.dr$, *where* $F=x^2i+xyj$, *over the region bdd by x=0, y=0, y=b, x =a.*
Option A:	-ab/2
Option B:	$-ab^2/2$
Option C:	$ab^2/2$

Option D:	ab^2
Q12.	Find $L^{-1}\left(\frac{s^2}{(s^2+1)^2}\right)$ by convolution theorem
Option A:	1/2(sint - t cost)
Option B:	1/2(sint + t cost)
Option C:	(sint + t cost)
Option D:	1/2(sint + cost)
Q13.	Find Fourier series for $f(x) = x^2$, $-\pi < x < \pi$
Option A:	$x^2 = \frac{\pi^2}{3} + \sum_{n=1}^{\infty} \frac{(-1)^n}{n^2} cosnx$
Option B:	$x^2 = \frac{\pi}{3} + 4\sum_{n=1}^{\infty} \frac{(-1)^n}{n^2} cosnx$
Option C:	$x^2 = \frac{\pi^2}{3} - 4\sum_{n=1}^{\infty} \frac{(-1)^n}{n^2} cosnx$
Option D:	$x^2 = \frac{\pi^2}{3} + 4\sum_{n=1}^{\infty} \frac{(-1)^n}{n^2} cosnx$
Q14.	Find $L^{-1}\left[tan^{-1}\left(\frac{a}{s}\right)\right]$
Option A:	Sinat/t
Option B:	-sinat/t
Option C:	Cosat/t
Option D:	-cosat/t
Q15.	*Verify* $v = e^x$ *siny is harmonic or not*
Option A:	Harmonic
Option B:	Not Harmonic
Q16.	If f(x) = 2x, $0 \le x \le 2\pi$, then find a_4.
Option A:	-0.2
Option B:	0.4
Option C:	0
Option D:	3
Q17.	Find fixed point $w = \frac{3z-5i}{iz-1}$.
Option A:	5/i, i

Option B:	2/i, -i
Option C:	-1, 1
Option D:	2i, i
Q18.	Evaluate $\int_0^\infty e^{-3t}cos^2t\ dt$
Option A:	11/56
Option B:	12/63
Option C:	-2/3
Option D:	11/39
Q19.	Obtain Fourier series for f(x), where F(x) $= x + \frac{\pi}{2}$ for $-\pi < x < 0$ $= \frac{\pi}{2} - x$ for $0 < x < \pi$.
Option A:	F(x)=$9 + \frac{2}{\pi}\sum_{n=0}^{\infty}\frac{1-(-1)^n}{n^2}$cosnx
Option B:	F(x)=$16 + \frac{2}{\pi}\sum_{n=0}^{\infty}\frac{1-(-1)^n}{n^2}$cosnx
Option C:	F(x)=$\frac{4}{\pi}\sum_{n=0}^{\infty}\frac{1-(-1)^n}{n^2}$cosnx
Option D:	F(x)=$\frac{2}{\pi}\sum_{n=0}^{\infty}\frac{1-(-1)^n}{n^2}$cosnx
Q20.	If F= (x + 3y)i+(y - 2z)j+(az+x)k is solenoidal, then find value of a
Option A:	2
Option B:	-2
Option C:	3
Option D:	-3
Q21.	Obtain Half range cosine series for f(x)=x(π-x), in (0, π)
Option A:	X(π-x)=$\frac{\pi^2}{2} - 4\sum_{n=odd}\frac{cosnx}{n^2}$
Option B:	X(π-x)=$\frac{\pi^2}{6} - 4\sum_{n=even}\frac{cosnx}{n^2}$
Option C:	X(π-x)=$\frac{\pi^2}{6} - 4\sum_{n=odd}\frac{cosnx}{n^2}$
Option D:	X(π-x)=$\frac{\pi^2}{6} + 4\sum_{n=odd}\frac{cosnx}{n^2}$
Q22.	Find a_0 by applying Half range cosine series for f(x) = x in (0, 2)
Option A:	4
Option B:	-3
Option C:	2

Option D:	1
Q23.	Solve by using Laplace transform: $3y' + 2y = e^{3t}$, y=1 at t=0.
Option A:	$Y = 10/11\ e^{-(2/3)t} - 1/11\ e^{3t}$
Option B:	$Y = 10/11\ e^{-(2/3)t} + 1/10\ e^{3t}$
Option C:	$Y = 30\ e^{-(2/3)t} + 1/11\ e^{3t}$
Option D:	$Y = 10/11\ e^{-(2/3)t} + 1/11\ e^{3t}$
Q24.	Find orthogonal trajectory: $X^2 - y^2 + x = C$
Option A:	2xy + y = c
Option B:	2xy - y = c
Option C:	xy + y = c
Option D:	xy - y = c
Q25.	Find orthogonal trajectories for $e^x \cos y - xy = c$
Option A:	$e^x \sin y + (x^2 + y^2)/2 = C$
Option B:	$e^x \sin y + (x^2 - y^2) = C$
Option C:	$e^x \sin y + (x^2 - y^2)/2 = C$
Option D:	$e^x \sin y + (x^2 + y^2)= C$