Program: BE Electronics Engineering

Curriculum Scheme: Revised 2012

Examination: Second Year Semester IV

Course Code: EXS401 Course Name: Applied Mathematics-IV

Time: 1 hour Max. Marks: 50

==========

Note: All the questions are compulsory and carry equal marks.

Q.1	Is S = {(a,1,1) / a is real}is Subspace?
Option A:	Yes
Option B:	No
Option C:	Sometimes yes
Option D:	Sometimes no
Q.2	The eigen values for $A=\begin{bmatrix}1 & 2 & 2\\ 2 & 1 & 2\\ 2 & 2 & 1\end{bmatrix}$ are
Option A:	1, 2, 3
Option B:	-1, -1, 5
Option C:	0, 3, 5
Option D:	1, 3, 6
Q.3	If λ is the eigen value of matrix A then 1/ λ is eigen value of
Option A:	A^{-1}
Option B:	A^2
Option C:	A-I
Option D:	|A|
Q.4	Evaluate $\int_A^B (2y+ix)\,dz$ along $y=x$ from A(0,0) to B(2,2)
Option A:	1
Option B:	6
Option C:	-1
Option D:	None
Q.5	If (5, 8, 10) is a linear combination of (1, 2, 2) & (3, 4, 6) then
Option A:	(5, 8, 10) = 2 (1, 2, 2) + 1 (3, 4, 6)
Option B:	(5, 8, 10) = 3 (1, 2, 2) + 1 (3, 4, 6)

Option C:	(5, 8, 10) = (1, 2, 2) + 5 (3, 4, 6)
Option D:	(5, 8, 10) = 1 (1, 2, 2) + 10 (3, 4, 6)
Q.6	Evaluate $\int_0^{1+i} (x^2 - i\,y)\,dz$ along $y = x$
Option A:	1
Option B:	6
Option C:	-1
Option D:	None
Q.7	Check whether the vectors u=(-2, 3, 4) and v=(3, -2, 3) are orthogonal?
Option A:	Yes
Option B:	No
Option C:	Sometimes yes
Option D:	Sometimes no
Q.8	Evaluate $\int_C \frac{dz}{z^3(z+4)}$ where C is the circle |z|=2
Option A:	0
Option B:	лi/32
Option C:	1
Option D:	4
Q.9	If a square matrix A is non derogatory then it's eigen values are
Option A:	Same
Option B:	Distinct
Option C:	Inverse
Option D:	Transpose
Q.10	Check whether the Cauchy-Schwartz inequality is verified or not for (2,3,0) and (4,2,1)
Option A:	Yes
Option B:	No
Option C:	Sometimes yes
Option D:	Sometimes no
Q.11	Find the poles of the function $f(z) = \frac{z-1}{z^2+2z+5}$
Option A:	-1-2i & -1+2i
Option B:	-1-2i
Option C:	-2i
Option D:	-1+2i

Q.12	What is the residue of $f(z)=\frac{3z^2+z}{z^2-1}$ at z=1
Option A:	1
Option B:	3
Option C:	2
Option D:	0
Q.13	Verify whether the Pythagorean theorem is applicable for u = (3,4) and v = (-4, 3)
Option A:	Yes
Option B:	No
Option C:	Sometimes yes
Option D:	Sometimes no
Q.14	If 1, 2 & 3 are eigen values of matrix A then eigen values of matrix A^3 are
Option A:	2, 3 & 9
Option B:	1, 4 & 9
Option C:	2, 3 & 2
Option D:	0, 3 & 9
Q.15	If the vectors (2, -1, 3), (4, 1, 2) and (8, -1, 8) determinant is not zero then these vectors
Option A:	Span vector space R^3
Option B:	Do not Span vector space R^3
Option C:	Span I
Option D:	Do not Span I
Q.16	Find the extremals of $\int_0^1 (xy+y^2-2y^2y')dx$
Option A:	y = -x / 2
Option B:	y = x
Option C:	y = 3x
Option D:	y = 0
Q.17	Find the extremals of $\int_{x_1}^{x_2} \frac{y'^2}{x^2} dx$
Option A:	$y = c_1x^3 + c_2$
Option B:	$y = c_1x + c_2$
Option C:	$y = c_1x^5 + c_2$
Option D:	$y = c_1x^6 + c_2$
Q.18	Every square matrix satisfies its own

Option A:	Transpose equation
Option B:	Identical equation
Option C:	Characteristic equation
Option D:	Linear equation
Q.19	If f(z) is analytic inside and on a closed curve C of a simply connected region R and if z_0 is any point within C then $f(z_0)$ is
Option A:	$\frac{1}{2\pi i}\int_C \frac{f(z)}{z-z_0}dz$
Option B:	$\frac{1}{2\pi i}$
Option C:	$\int_C \frac{f(z)}{z-z_0}dz$
Option D:	0
Q.20	If c_1 & c_2 are two concentric circles of radii r_1 & r_2 with the centre z_0 and if f() is analytic on C_1 & C_2 and in the annular region R between the circles, then for any point z in R we express it in
Option A:	Taylor series
Option B:	Laurent series
Option C:	Exponential series
Option D:	Trigonometric series
Q.21	If the geometric multiplicity of each its eigen values coincides with the algebraic multiplicity then the matrix is
Option A:	Inverse
Option B:	Diagonalisable
Option C:	Transpose
Option D:	Derogatory
Q.22	What is the order of pole of $f(z)=\frac{z^2}{(z-1)^2(z+2)}$ at z = 1
Option A:	4
Option B:	3
Option C:	2
Option D:	1
Q.23	Evaluate $\int_0^{2\pi} \frac{d\theta}{5+3\sin\theta}$
Option A:	Π / 2

Option B:	Π
Option C:	1
Option D:	0
Q.24	If f(z) is an analytic function and if it's derivative f'(z) is continuous at each point within and on a simple closed curve C then the integral of f(z) along the closed curve C is
Option A:	1
Option B:	0
Option C:	2
Option D:	5
Q.25	Which trial equation Raleigh-Ritz method assume?
Option A:	$\bar{y}(x) = a + bx + cx^2$
Option B:	$\bar{y}(x) = ax + bx^2$
Option C:	$\bar{y}(x) = a + bx$
Option D:	$\bar{y}(x) = a + bx^2$