CLASS TEST

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# ENGINEERING MATHEMATICS

## CE | ME | EE | EC

**Date of Test : 16/04/2026**

## ANSWER KEY

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1. | (b) | 7. | (a) | 13. | (b) | 19. | (a) | 25. | (d) |
| 2. | (b) | 8. | (b) | 14. | (b) | 20. | (b) | 26. | (b) |
| 3. | (b) | 9. | (a) | 15. | (c) | 21. | (d) | 27. | (b) |
| 4. | (b) | 10. | (a) | 16. | (a) | 22. | (d) | 28. | (a) |
| 5. | (a) | 11. | (b) | 17. | (b) | 23. | (a) | 29. | (c) |
| 6. | (c) | 12. | (c) | 18. | (d) | 24. | (a) | 30. | (a) |

## DETAILED EXPLANATIONS

**1. (b)**

$$I = \begin{bmatrix} 1 & \omega & \omega^2 \\ \omega & \omega^2 & 1 \\ \omega^2 & 1 & \omega \end{bmatrix}$$

$$\text{Det}(I) = \begin{vmatrix} 1 & \omega & \omega^2 \\ \omega & \omega^2 & 1 \\ \omega^2 & 1 & \omega \end{vmatrix}$$

$$R_1 \to R_1 + R_2 + R_3$$

$$= \begin{vmatrix} 1+\omega+\omega^2 & 1+\omega+\omega^2 & 1+\omega+\omega^2 \\ \omega & \omega^2 & 1 \\ \omega^2 & 1 & \omega \end{vmatrix}$$

$$= \begin{vmatrix} 0 & 0 & 0 \\ \omega & \omega^2 & 1 \\ \omega^2 & 1 & \omega \end{vmatrix} \qquad [\because 1 + \omega + \omega^2 = 0]$$

$$= 0$$

**2. (b)**

Given,
$$I = \begin{bmatrix} 1 & 2 & 3 & 2 \\ 2 & 3 & 5 & 1 \\ 1 & 3 & 4 & 5 \end{bmatrix}$$

$$R_2 \to R_2 - 2R_1$$
$$R_3 \to R_3 - R_1$$

$$I = \begin{bmatrix} 1 & 2 & 3 & 2 \\ 0 & -1 & -1 & -3 \\ 0 & 1 & 1 & 3 \end{bmatrix}$$

$$R_3 \to R_3 + R_2$$

$$I = \begin{bmatrix} 1 & 2 & 3 & 2 \\ 0 & -1 & -1 & -3 \\ 0 & 0 & 0 & 0 \end{bmatrix} \quad \text{(Echelon form)}$$

Rank = Number of non zero rows = 2

**3. (b)**

Given
$$\vec{f} = ax\hat{i} + by\hat{j} + cz\hat{k}$$

By Gauss divergence theorem:

$$\iint f \cdot ds = \iiint div\, f\, dv$$

$$= \iiint \left( \frac{\partial}{dx}\hat{i} + \frac{\partial}{\partial y}\hat{j} + \frac{\partial}{\partial z}\hat{k} \right) \cdot \left( ax\hat{i} + by\hat{j} + cz\hat{k} \right) dv$$

$$= \iiint\left[\frac{\partial}{\partial x}(ax)+\frac{\partial}{\partial y}(by)+\frac{\partial}{\partial z}(cz)\right]dv = (a+b+c)\iiint dv$$

$$= (a+b+c)\times\frac{4}{3}\pi(1)^3 = \frac{4\pi}{3}(a+b+c)$$

**4. (b)**

Given
$$u = x^3 - 3xy^2$$
$$\frac{\partial u}{\partial x} = u_x = 3x^2 - 3y^2$$
$$\frac{\partial u}{\partial y} = u_y = -6xy$$
$\because$
$$dv = \frac{\partial v}{\partial x}dx + \frac{\partial v}{\partial y}dy$$
$$\int dv = \int\frac{\partial v}{\partial x}dx + \int\frac{\partial v}{\partial y}dy$$
$$v = \int -\frac{\partial u}{\partial y}dx + \int\frac{\partial u}{\partial x}dy$$

For analytic $\left\{\begin{array}{l}\dfrac{\partial u}{\partial x} = \dfrac{\partial v}{\partial y}\\[2ex] \dfrac{\partial u}{\partial y} = -\dfrac{\partial v}{\partial x}\end{array}\right.$

$$= -\int(-6xy)dx + \int(3x^2 - 3y^2)\,dy$$
Free from $x$
$$= \int 6xy\,dx + \int(-3y^2)dy$$
$$v = 3x^2y - y^3 + c$$

**5. (a)**

Eigen values of skew Hermitian matrix is either zero or purely imaginary.

**6. (c)**

$$\lim_{x\to\infty}\left(1+\frac{-2}{x+1}\right)^{(x+1)\cdot\frac{x+2}{x+1}} = \left[\lim_{x\to\infty}\left(1+\frac{-2}{x+1}\right)^{x+1}\right]^{\frac{x+2}{x+1}}$$

$$= (e^{-2})^{\lim_{x\to\infty}\frac{1+2/x}{1+1/x}} = (e^{-2})^1$$

$$\left\{\lim_{x\to\infty}\left(1+\frac{p}{n}\right)^n = e^p\right\}$$

$$= e^{-2}$$

**Alternative:**

$$\lim_{x\to\infty}\left(\frac{x-1}{x+1}\right)^{x+2}; \qquad 1^\infty \text{ form}$$

$$= e^{\lim_{x\to\infty}\left(\frac{x-1}{x+1}-1\right)(x+2)} = e^{\lim_{x\to\infty}\left(\frac{-2}{x+1}\right)(x+2)}$$

$$= e^{\lim_{x\to\infty}(-2)\frac{x\left(1+\frac{2}{x}\right)}{x\left(1+\frac{1}{x}\right)}} = e^{-2}$$

**7. (a)**

Comparing with general partial differential equation,

$$A\frac{\partial^2 f}{dx^2}+B\frac{\partial^2 f}{\partial x\partial t}+C\frac{\partial^2 f}{\partial t^2}+D\frac{\partial f}{\partial x}+E\frac{\partial f}{\partial t}+F=0$$

$A = 1, B = 0, C = 0, E = -1,$

Now since, $B^2 - 4AC = 0$

$\therefore$ Given partial differential equation is parabolic.

$\Rightarrow$ option (a) is correct.

**8. (b)**

We have, $x = \sqrt{13}$ or $x^2 - 13 = 0$

$\Rightarrow$ $f(x) = x^2 - 13, f'(x) = 2x$

$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)} = x_n - \frac{x_n^2-13}{2x_n} = \frac{1}{2}\left(x_n + \frac{13}{x_n}\right)$$

**9. (a)**

To expand $f(3)$ about, $z = -i$, i.e. in power of $z$ + i, put $z + i = t$

Then, $$f(z) = \frac{1}{(t-i+1)^2} = (1-i)^2\left[1+\frac{t}{(1-i)}\right]^{-2}$$

$$= \frac{2}{i}\left[1-\frac{2t}{(1-i)}+\frac{3t^2}{(1-i)^2}-\frac{4t^3}{(1-i)^3}+.....\right]$$

$$= \frac{2}{i}\left[1-\frac{2(z+i)}{(1-i)}+\frac{3(z+i)^2}{(1-i)^2}-\frac{4(z+i)^3}{(1-i)^3}+.....\right]$$

**10. (a)**

$h = 0.2$

$x_0 = 0, x_1 = 0.2$

$f(x, y) = x + y$

$\Rightarrow$ $f(x_0, y_0) = 0 + 0 = 0$

$y_1 = y_0 + hf(x_0, y_0)$

$y_1 = 0 + 0.2(0) = 0$

**11. (b)**

Given differential equation

$$(1 + y^2)dx = \left(\tan^{-1} y - x\right)dy$$

$$\Rightarrow \quad \frac{dx}{dy} = \frac{\tan^{-1} y - x}{1+y^2}$$

$$\Rightarrow \quad \frac{dx}{dy}+\frac{x}{1+y^2} = \frac{\tan^{-1} y}{1+y^2}$$

This is a linear differential equation

$$\text{IF} = e^{\int \frac{1}{1+y^2} dy = e^{\tan^{-1} y}}$$

Its solution is

$$x.\ \text{IF} = \int Q(IF)\, dy$$

$$xe^{\tan^{-1} y} = \int e^{\tan^{-1} y} \frac{\tan^{-1} y}{1+y^2} dy$$

Put $\tan^{-1} y = t$

$$\frac{1}{1+y^2} dy = dt$$

$$xe^{\tan^{-1} y} = \int e^t \cdot t\, dt = te^t - e^t + c$$

$$xe^{\tan^{-1} y} = e^{\tan^{-1} y}\left(\tan^{-1} y - 1\right) + c$$

$$x = \left(\tan^{-1} y - 1\right) + ce^{-\tan^{-1} y}$$

**12. (c)**

Given differential equation

$$\left(1+e^{x/y}\right) + e^{x/y}\left(1 - \frac{x}{y}\right)\frac{dy}{dx} = 0$$

$$\Rightarrow \quad \left(1+e^{x/y}\right)dx + \left(e^{x/y} - \frac{x}{y}e^{x/y}\right)dy = 0$$

It is of the form $Mdx + Ndy = 0$

$$\therefore \quad M = 1 + e^{x/y}$$

$$\Rightarrow \quad \frac{\partial M}{\partial y} = \frac{-x}{y^2} e^{x/y}$$

Also,

$$N = e^{x/y} - e^{x/y}\frac{x}{y}$$

$$\Rightarrow \quad \frac{\partial N}{\partial x} = \frac{1}{y}e^{x/y} - \frac{1}{y}e^{x/y} - \frac{x}{y^2}e^{x/y} = \frac{-x}{y^2}e^{x/y}$$

$$\because \quad \frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$$

$\therefore$ Given differential equation is exact.

Its solution is, $\displaystyle\int_{y\,=\,C} \left(1+e^{x/y}\right)dx + \int (\text{term of N not containing } x)\, dy = c$

$$\Rightarrow \quad \int\left(1+e^{x/y}\right)dx + \int (0)\, dy = c$$

$$\Rightarrow \quad x + ye^{x/y} = c$$

**13. (b)**

Given differential equation

$$\frac{d^3y}{dx^3} - 3\frac{d^2y}{dx^2} + 4\frac{dy}{dx} - 2y = e^x + \cos x$$

$\Rightarrow$ $(D^3 - 3D^2 + 4D - 2)y = e^x + \cos x$

$$f(D)\,y = Q$$

$$\therefore \quad \text{P.I.} = \frac{1}{f(D)}Q = \frac{1}{D^3 - 3D^2 + 4D - 2}\left(e^x + \cos x\right)$$

$$\text{P.I} = \frac{1}{D^3 - 3D^2 + 4D - 2}e^x + \frac{1}{D^3 - 3D^2 + 4D - 2}\cos x$$

$$= \frac{1}{(D-1)(1-2+2)}e^x + \frac{1}{(-1)D - 3(-1) + 4D - 2}\cos x$$

$$= \frac{1}{D-1}e^x + \frac{1}{3D+1}\cos x = x\frac{1}{1}e^x + \frac{3D-1}{9D^2-1}\cos x$$

$$= xe^x + \frac{(-3\sin x - \cos x)}{-9-1} = xe^x + \frac{1}{10}(3\sin x + \cos x)$$

**14. (b)**

Given equation is Cauchy's-Homogeneous Linear differential equation

$$x^2\frac{d^2y}{dx^2} - 5x\frac{dy}{dx} + 9y = 0$$

Putting, $x = e^z$

$\Rightarrow$ $z = \log_e x$

Then, $$x^2\frac{d^2y}{dx^2} = D(D-1)y$$

$$x\frac{dy}{dx} = Dy \qquad \left[\text{where } D = \frac{d}{dz}\right]$$

Using these values is given differential equation.

$$[D(D-1) - 5D + 9]y = 0$$

$\Rightarrow$ $[D^2 - 6D + 9]y = 0$

Which is the linear differential equation with constant coefficients.

It's Auxiliary equation is

$$m^2 - 6m + 9 = 0$$

$\Rightarrow$ $(m-3)^2 = 0$

$\Rightarrow$ $m = 3, 3$

$\therefore$ Solution of differential equation:

$$y = (c_1 + c_2 z)\,e^{3z} = \left(c_1 + c_2\log_e x\right)e^{3\log_e x}$$

$$= \left(c_1 + c_2\ln x\right)e^{\log_e x^3} = \left(c_1 + c_2\ln x\right)x^3$$

**15. (c)**

The set of equations is written in the form of matrices

$$\begin{bmatrix} 1 & k & 3 \\ 4 & 3 & k \\ 2 & 1 & 2 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

$$AX = B$$

$$[A/B] = \begin{bmatrix} 1 & k & 3 & : & 0 \\ 4 & 3 & k & : & 0 \\ 2 & 1 & 2 & : & 0 \end{bmatrix}$$

On interchanging first and third rows, we have

$$\begin{bmatrix} 2 & 1 & 2 & : & 0 \\ 4 & 3 & k & : & 0 \\ 1 & k & 3 & : & 0 \end{bmatrix}$$

$$R_2 \to R_2 - 2R_1$$

$$R_3 \to R_3 - \frac{R_1}{2}$$

$$\begin{bmatrix} 2 & 1 & 2 & : & 0 \\ 0 & 1 & k-4 & : & 0 \\ 0 & k-\frac{1}{2} & 2 & : & 0 \end{bmatrix}$$

$$R_3 \to R_3 - \left(k-\frac{1}{2}\right)R_2$$

$$\begin{bmatrix} 2 & 1 & 2 & : & 0 \\ 0 & 1 & k-4 & : & 0 \\ 0 & 0 & 2-\left(k-\frac{1}{2}\right)(k-4) & : & 0 \end{bmatrix}$$

For a non trivial solution or for infinite solution,

$$r[A/B] = r[A] = 2$$

$$\Rightarrow \quad 2-\left(k-\frac{1}{2}\right)(k-4) = 0$$

$$\Rightarrow \quad 2 - k^2 + 4k + \frac{k}{2} - 2 = 0$$

$$\Rightarrow \quad -k^2 + \frac{9}{2}k = 0$$

$$k\left(-k+\frac{9}{2}\right) = 0$$

$\Rightarrow k = 0, k = \frac{9}{2}$

Hence, positive value of $k = \frac{9}{2}$

**16. (a)**

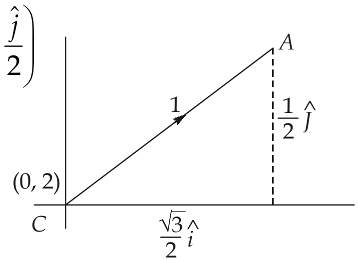
$$\text{Directional derivative} = \vec{\nabla}\phi$$

$$= \left(\hat{i}\frac{\partial}{\partial x} + \hat{j}\frac{\partial}{\partial y} + \hat{k}\frac{\partial}{\partial z}\right)\frac{x}{x^2+y^2} = \hat{i}\frac{y^2-x^2}{(x^2+y^2)^2} - \hat{j}\frac{2xy}{(x^2+y^2)^2}$$

Directional derivative at the point (0, 2)

$$= \hat{i}\frac{4-0}{(0+4)^2} - \hat{j}\frac{2(0)(2)}{(0+4)^2} = \frac{\hat{i}}{4}$$

Directional derivative at point (0, 2) in the direction $\overrightarrow{CA}$ i.e., $\left(\frac{\sqrt{3}}{2}\hat{i}+\frac{\hat{j}}{2}\right)$




$$= \frac{\hat{i}}{4}\cdot\left(\frac{\sqrt{3}}{2}\hat{i}+\frac{\hat{j}}{2}\right)$$

$$= \frac{\sqrt{3}}{8}$$

$$\overrightarrow{CA} = \cos 30°\hat{i} + \sin 30°\hat{j}$$

$$\overrightarrow{CA} = \frac{\sqrt{3}}{2}\hat{i} + \frac{1}{2}\hat{j}$$

**17. (b)**

Given function
$$f(z) = \frac{1}{2}\log_e(x^2+y^2) + i\tan^{-1}\left(\frac{\alpha x}{y}\right)$$

$$\text{real part} = u = \frac{1}{2}\log_e(x^2+y^2)$$

$$\text{imaginary part} = v = \tan^{-1}\left(\frac{\alpha x}{y}\right)$$

For function to be analytic

$$u_x = v_y \qquad \text{(from C-R equation)}$$

$$u_x = \frac{\partial u}{\partial x} = \frac{1}{2}\cdot\frac{2x}{(x^2+y^2)} = \frac{x}{x^2+y^2}$$

$$v_y = \frac{\partial v}{\partial y} = \frac{1}{1+\left(\frac{\alpha x}{y}\right)^2}\cdot\left(-\frac{\alpha x}{y^2}\right) = \frac{-\alpha x}{y^2+\alpha^2 x^2}$$

$$\Rightarrow \quad \frac{x}{x^2+y^2} = \frac{-\alpha x}{y^2+\alpha^2x^2}$$

By comparison,
$$\alpha = -1$$

**18. (d)**

Given:
$$I = \int_c \frac{z+1}{z^2(z-2)}dz$$

poles are;
$$z^2(z-2) = 0$$
$$z = 0, z = 2$$

z = 0 is a pole of second order which lies inside the circle $|z| = 1$.

$$\underset{z=0}{\text{Res}}\ f(z) = \frac{1}{(2-1)!}\left\{\frac{d}{dz}\left[(z-0)^2\times\frac{z+1}{z^2(z-2)}\right]\right\}_{z=0}$$

$$= \frac{1}{1!}\left\{\frac{d}{dz}\left[\frac{z+1}{z-2}\right]\right\}_{z=0}$$

$$= \left\{\frac{(z-2)\times 1-(z+1)\times 1}{(z-2)^2}\right\}_{z=0} = \frac{-3}{(0-2)^2}$$

$$= \frac{-3}{4}$$

$z = 2$, is a pole of first order, which lies outside the circle $|z| = 1$.)

∴ Residue of $f(z)$ at $z = 2$ is 0.

∴ $$\oint_z f(z)\,dz = 2\pi i \text{ (sum of residues of poles that lies inside the circle)}$$

Hence, $$\int_c \frac{z+1}{z^3-2z^2}dz = 2\pi i\left(\frac{-3}{4}\right) = \frac{-3\pi i}{2}$$

**19. (a)**

$$\text{Probability of choosing a male} = P(M) = \frac{1}{2}$$

$$\text{Probability of choosing a female} = P(F) = \frac{1}{2}$$

If $B$ represent a blind person,

$$P\left(\frac{B}{M}\right) = \frac{5}{100} = 0.05$$

and $$P\left(\frac{B}{F}\right) = \frac{25}{10000} = 0.0025$$

∴ $$P\left(\frac{M}{B}\right) = \frac{P\left(\frac{B}{M}\right)\times P(M)}{P(M)\times P\left(\frac{B}{M}\right)+P(F)\times P\left(\frac{B}{F}\right)}$$

$$= \frac{0.05\times 0.5}{0.05\times 0.5+0.5\times 0.0025} = 0.95$$

**20. (b)**

$$\vec{F} = \sin y\hat{i} + x(1+\cos y)\hat{j}$$

$$\int_c \vec{F}\cdot\vec{dr} = \int_c\left[\sin y\hat{i} + x(1+\cos y)\hat{j}\right]\cdot\left(\hat{i}dx+\hat{j}dy\right)$$

$$= \int_c \sin y\,dx + x(1+\cos y)\,dy$$

On applying Green's theorem, we have

$$\oint_c(\phi\,dx+\psi dy) = \iint_s\left(\frac{\partial\psi}{\partial x}-\frac{\partial\phi}{\partial y}\right)dx\,dy$$

$$= \iint_s\left[(1+\cos y)-\cos y\right]dx\,dy$$

where $s$ is the circular plane surface of radius $a$

$$= \iint_s dx\,dy = \text{Area of circle} = \pi a^2$$

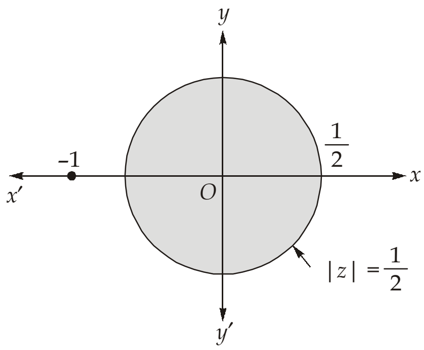
**21. (d)**

Pole of the integrand is given by

$$z + 1 = 0$$
$$z = -1$$

The given circle $|z| = \frac{1}{2}$ with centre at $z = 0$ and radius $\frac{1}{2}$ does not enclose any singularity of the given function. Thus, by Cauchy's theorem,

$$\int_c \frac{3z^2 + 7z + 1}{z + 1} dz = 0$$




**22. (d)**

$$\left(\frac{d^3y}{dx^3}\right)^{2/3} + \left(\frac{d^3y}{dx^3}\right)^{3/2} = 0$$

$$1 + \left(\frac{d^3y}{dx^3}\right)^{\frac{3}{2}-\frac{2}{3}} = 0$$

$$\left(\frac{d^3y}{dx^3}\right)^{\frac{5}{6}} = -1$$

Raising power 6 on both sides,

$$\left(\frac{d^3y}{dx^3}\right)^{5} = 1$$

Thus, degree of differential equation is 5.

**23. (a)**

$$\nabla\phi = \frac{\partial\phi}{\partial x}\hat{i} + \frac{\partial\phi}{\partial y}\hat{j} + \frac{\partial\phi}{\partial z}\hat{k}$$

$$= \left(10xy + 2.5z^2\right)\hat{i} + (5x^2 - 10yz)\hat{j} + (-5y^2 + 5zx)\hat{k}$$

$$= 12.5\hat{i} - 5\hat{j} \text{ at } P(1, 1, 1)$$

Also direction of the given line is

$$\hat{A} = \frac{2\hat{i} - 2\hat{j} + \hat{k}}{3}$$

Hence, the required directional derivative = $\nabla\phi \cdot \hat{A}$

$$= \left(12.5\hat{i} - 5\hat{j}\right) \cdot \frac{\left(2\hat{i} - 2\hat{j} + \hat{k}\right)}{3}$$

$$= \frac{(25+10)}{3} = \frac{35}{3} = 11\frac{2}{3}$$

**24. (a)**

We can also write

$$\left(ye^x dx - e^x dy\right) + 2xy^2 dx = 0$$

Multiplying throughout by $\frac{1}{y^2}$, follows

$$\frac{ye^x dx - e^x dy}{y^2} + 2x\,dx = 0$$

$$d\left(\frac{e^x}{y}\right) + 2xdx = 0$$

Integrating, we get

$$\frac{e^x}{y} + x^2 = c \text{ which is required solution}$$

**25. (d)**

The probability that $A$ can solve the problem is $\frac{1}{2}\cdot$ Similarly the probabilities that $B$ and $C$ cannot solve the problem are $1-\frac{1}{3}$ and $1-\frac{1}{4}$.

$\therefore$ The probability that $A$, $B$ and $C$ cannot solve the problem is $\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right)$

$$= \frac{1}{2}\times\frac{2}{3}\times\frac{3}{4} = \frac{1}{4}$$

**26. (b)**

$$f(x) = \frac{x^3}{3} - x$$

We will find the first and second derivative.

$f'(x) = \frac{3x^2}{3} - 1 = x^2 - 1$ and $f''(x) = 2x$ to determine maximum value of $x$,

Putting $f'(x) = x^2 - 1 = 0$ gives $x = 1$ or $-1$

For $x = -1$ only, $f''(x) < 0$ which means maximum value of the function exists for $x = -1$.

**27. (b)**

Given that the partial differential equation is parabolic

$$\therefore \quad B^2 - 4AC = 0 \qquad \text{Here, } A = 2, C = 2$$
$$\therefore \quad B^2 - 4 \times 2 \times 2 = 0$$
$$B^2 - 16 = 0$$
$$B^2 = 16$$

**28. (a)**

For solenoidal vector field,

$$\nabla \cdot \vec{F} = 0$$

$$\frac{\partial\left(y^2 - z^2 + 3yz - 2x\right)}{\partial x} + \frac{\partial(3xz + 2xy)}{\partial y} + \frac{\partial(2xy - axz + 2z)}{\partial z} = 0$$

$$-2 + 2x - ax + 2 = 0$$

From here, $a = 2$

**29. (c)**

Given: $$A = \begin{bmatrix} -1 & 2 & 3 \\ 0 & 3 & 5 \\ 0 & 0 & -2 \end{bmatrix}$$

$\because$ Given matrix is upper triangular matrix.

Hence, its eigen values $= -1, 3, -2$

then the eigen values of $A^3 + 5A + 8I$ are

$$\lambda_1 = (-1)^3 + 5(-1) + 8 = 2$$
$$\lambda_2 = (3)^3 + 5(3) + 8 = 50$$
$$\lambda_3 = (-2)^3 + 5(-2) + 8 = -10$$

**30. (a)**

Given matrix $A$ is $\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{bmatrix}$

Determinant of $A$, $|A| = 1$

$$\text{Adj } A = \begin{bmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}$$

$$\therefore \quad \text{Inverse of matrix } A, A^{-1} = \frac{adj(A)}{|A|} = \begin{bmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}$$

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