First Year Engineering (SEM-I)

Engineering Mathematics-I

Sample MCQ's

Q.1 $If\ z = f(x,y)\ and\ \ x = e^{u} + e^{-v}\ ,\ \ y = \ e^{-u} - e^{v}\ \ then\ \frac{\partial z}{\partial u} - \frac{\partial z}{\partial v}\ \ is$

(a) $x\frac{\partial z}{\partial y} - y\frac{\partial z}{\partial x}$

(b) $y\frac{\partial z}{\partial x} - x\frac{\partial z}{\partial y}$

(c) $x\frac{\partial z}{\partial x} - y\frac{\partial z}{\partial y}$

(d) $x\frac{\partial z}{\partial x} - xy\frac{\partial z}{\partial y}$

Q.2 $If\ z = f(u,v)\ and\ \ u = x^{2} - y^{2}\ ,\ \ v = y^{2} - x^{2}\ \ then\ x\frac{\partial z}{\partial y} + y\frac{\partial z}{\partial x}\ \ is$

(a) 0

(b) 1

(c) -1

(d) 2

Q.3 $The\ maximum\ value\ of\ the\ function\ \ x^{3} + 6x^{2} - y^{2}\ \ is$

(a) 32

(b) 16

(c) 24

(d) 64

Q.4 $The\ Rank\ of\ matrix\ \begin{bmatrix} 2 & 4 & 1 \\ 3 & 6 & 2 \\ 4 & 8 & 3 \end{bmatrix}\ is$

(a) 1

(b) 2

(c) 0

(d) 3

Q.5 $The\ Rank\ of\ matrix\ \begin{bmatrix} 4 & 4 & 4 \\ 4 & 4 & 4 \\ 4 & 4 & 4 \end{bmatrix}\ is$

(a) 0

(b) 2

(c) 1

(d) 3

Q.6 $The\ system\ of\ equations\ 2x + y + 6z = 9,\ 8x + 3y + 2z = 13,\ x + 5y + z = 7\ is\ sloved$ $by\ Gauss\ seidel\ method.\ if\ values\ of\ x, y, z\ in\ certain\ iteration\ are\ x = 1.0271, y = 1.0387,$ $z = 0.9765\ then\ the\ values\ of\ x, y, z\ in\ next\ iteration\ are$

(a) $x = 0.7941,\ y = 1.64,\ z = 1.1080$

(b) $x = 0.9914,\ y = 1.0064,\ z = 0.9993$

(c) $x = 0.5785,\ y = 1.46,\ z = 1.8010$

(d) $x = 0.9914,\ y = 1.0064,\ z = 1.0018$

Q.7 $The\ real\ root\ of\ x^3 - 2x - 5 = 0\ by\ newton\ raphson\ method\ starting\ with\ x_0 = 2\ is$

(a) 2.0946

(b) 2.0469

(c) 2.2165

(d) 2.7521

Q.8 $If\ rank\ of\ given\ matrix\ is\ equal\ to\ number\ of\ unknowns\ then\ the\ system\ has$

(a) Non- trivial solution

(b) Trivial solution

(c) Infinite solutions

(d) Non- zero solution

Q.9 $If\ A\ is\ orthogonal\ matrix\ then\ A^{-1}\ is$

(a) $A + A'$

(b) A'

(c) $A - A'$

(d) A

Q.10 $If\ A\ is\ any\ square\ matrix\ then\ A + A'\ is$

(a) Skew Hermitian matrix

(b) Hermitian matrix

(c) Skew symmetric matrix

(d) Symmetric matrix

Q.11 $If\ A\ is\ Hermitian\ matrix\ then\ \ iA\ \ is$

(a) Skew Hermitian matrix

(b) Hermitian matrix

(c) Skew symmetric matrix

(d) Symmetric matrix

Q.12 $If\ u = \log(x^3 + y^3 - x^2y - xy^2)\ then\ \ x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y}\ \ is$

(a) 0

(b) 2

(c) 1

(d) 3

Q.13 $If\ u = \frac{x^3y^3z^3}{x^3+y^3+z^3}\ then\ \ x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} + z\frac{\partial u}{\partial z}\ \ is$

(a) 3u

(b) 2u

(c) 6u

(d) 0

Q.14 $If\ y = \tan^{-1}\frac{y}{x}\ \ then\ \ \frac{\partial^2 u}{\partial x^2}\ \ is$

(a) $\frac{2xy}{(x^2+y^2)^2}$

(b) $\frac{xy}{(x^2+y^2)^2}$

(c) $\frac{2xy}{(x^2-y^2)^2}$

(d) $\frac{xy}{(x^2-y^2)^2}$

Q.15 $If\ \ y = \frac{1}{ax+b}\ \ then\ \ y_n\ is$

(a) $\frac{(-1)^n\ n!\ a^n}{(ax+b)^{n+1}}$

(b) $\frac{(-1)^{n+1}\ n!\ a^n}{(ax+b)^{n+1}}$

(c) $\frac{(-1)^n\ n!\ a^{n+1}}{(ax+b)^{n+1}}$

(d) $\frac{(-1)^{n+1}\ n!\ a^{n+1}}{(ax+b)^{n+1}}$

Q.16 *The value of* $\log(i)$ *is*

(a) $\frac{i\pi}{2}$

(b) $\frac{\pi}{2}$

(c) $i\pi$

(d) $2i\pi$

Q.17 *If z is real the value of* $\tanh^{-1} z$ *is*

(a) $\frac{1}{2}\log\left(\frac{1+z}{1-z}\right)$

(b) $\frac{1}{2}\log\left(\frac{1-z}{1+z}\right)$

(c) $\frac{1}{2}\log\left(\frac{1+2z}{1-z}\right)$

(d) $\frac{1}{2}\log\left(\frac{1+z}{1-2z}\right)$

Q.18 *If* ω *is a complex cube root of unity then* $1+\omega+\omega^2$ *is equal to*

(a) 0

(b) 3

(c) 4

(d) 1

Q.19 *If* $\frac{\sin 5\theta}{\sin\theta} = A\cos^4\theta - B\cos^2\theta + 1$ *then the value of* A *and* B *is*

(a) A=12, B=16

(b) A=16, B=12

(c) A=8, B=6

(d) A=6, B=8

Q.20 *By Demoivre's theorem the value of* $\left(\cos\frac{\pi}{8} - i\sin\frac{\pi}{8}\right)^8$ *is*

(a) 8

(b) 4

(c) -1

(d) 16