

MATHEMATICS

SET - 1

Sample Questions With Answers 2020 - 2021



OUR PRODUCTS

 **ERF**
EDUFEVER
RANKING FRAMEWORK

 **SHOP**
Edufever exclusive shop

 **EduFever Jobs**

 **एडुफीवर हिन्दी**

This PDF Sponsored by

RM GROUP OF EDUCATION

Choose your dream college with us..

WHO WE ARE

One of the best admission consultancies in India that boast its record breaking success rate of 96 percent.



VISION

To serve students for their career advancements through research and recognition approach.



MISSION

To create a platform where students get recognition for their hard work.



Q.1. Rank of the matrix A =

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

- A. 0
- B. 1
- C. 2
- D. 3

Answer: Option D

Q.3. Consider the following two statements:

(I) The maximum number of linearly independent column vectors of a matrix A is called the rank of A.

(II) If A is an n x n square matrix, it will be nonsingular is rank A = n.

With reference to the above statements, which of the following applies?

- A. Both the statements are false
- B. Both the statements are true
- C. I is true but II is false.
- D. I is false but II is true.

Answer: Option B

Q.3: The rank of a 3 x 3 matrix C (= AB), found by multiplying a non-zero column matrix A of size 3 x 1 and a non-zero row matrix B of size 1 x 3, is

- A. 0
- B. 1
- C. 2
- D. 3

Answer: Option B

Q.4: Matrix, A =

$$\begin{bmatrix} \cos\theta & \sin\theta & 0 \\ \sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$$



- A. orthogonal
- B. non-singular
- C. have A^{-1} exists
- D. both (b) & (c)

Answer: Option D

Q.5: In the matrix equation $Px = q$. which of the following is a necessary condition for the existence of at least one solution for the unknown vector x ?

- A. Augmented matrix $[Pq]$ must have the same rank as matrix P
- B. Vector q must have only non-zero elements
- C. Matrix P must be singular
- D. None of these

Answer: Option A

Q.6: A set of linear equations is represented by the matrix equation $Ax = b$. The necessary condition for the existence of a solution for this system is

- A. A must be invertible
- B. b must be linearly depended on the columns of A
- C. b must be linearly independent of the columns of A
- D. None of these

Answer: Option A

Q.7: The system of linear equations

$$(4d - 1)x + y + z = 0$$

$$-y + z = 0$$

$$(4d - 1)z = 0$$

has a non-trivial solution, if d equals

- A. $\frac{1}{2}$
- B. $\frac{1}{4}$
- C. $\frac{3}{4}$
- D. 1

Answer: Option B

Q.8: If, A , B , C are square matrices of the same order, then $(ABC)^{-1}$ is equal to

- A. $C^{-1}A^{-1}B^{-1}$

- B. $C^{-1}B^{-1}A^{-1}$
- C. $A^{-1}B^{-1}C^{-1}$
- D. $A^{-1}C^{-1}B^{-1}$

Answer: Option B

Q.9: Rank of the matrix

$$\begin{bmatrix} 0 & 0 & -3 \\ 9 & 3 & 5 \\ 3 & 1 & 1 \end{bmatrix}$$

- A. 0
- B. 1
- C. 2
- D. -1

Answer: Option C

Q.10: Eigen vector(s) of the matrix

$$\begin{bmatrix} 0 & 0 & \alpha \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

- A. (0,0, α)
- B. (α ,0,0)
- C. (0,0,1)
- D. (0, α ,0)

Answer: Option D

Q.10: Let $A = (a_{ij})$ be an n -rowed square matrix and I_{12} be the matrix obtained by interchanging the first and second rows of the n -rowed identity matrix. Then $A I_{12}$ is such that its first

- A. row is the same as its second row
- B. row is the same as the second row of A
- C. column is the same as the second column of A
- D. row is all zero

Answer: Option C



Q.11: If functions f and g have domains D_f and D_g respectively, then the domain of f/g is given by

- A. The union of D_f and D_g
- B. The intersection of D_f and D_g
- C. The intersection of D_f and D_g without the zeros of function g
- D. None of the above

Answer: Option C

Q.12: Let the closed interval $[a, b]$ be the domain of function f . The domain of $f(x - 3)$ is given by

- A. The open interval (a, b)
- B. The closed interval $[a, b]$
- C. The closed interval $[a - 3, b - 3]$
- D. The closed interval $[a + 3, b + 3]$

Answer: Option D

Q.13: Let the interval $(a, +\infty)$ be the range of function f . The range of $f(x) - 4$ is given by

- A. The interval $(a - 4, +\infty)$
- B. The interval $(a + 4, +\infty)$
- C. The interval $(a, +\infty)$
- D. None of the above

Answer: Option A

Q.14: If $\phi(x) = \int_{x^2}^0 \sqrt{t} dt$, then $\frac{d\phi}{dx}$

- A. $2x^2$
- B. \sqrt{x}
- C. C.0
- D. D.1

Answer: Option A

Q.15: The value of $a = \int_0^{5\pi} (2 - \sin x) dx$ is

- A. A.>0
- B. B.2
- C. C.0 - 1 + 100 - 10 + 1
- D. undefined

Answer: Option A

Q.16: If $f(x) = |x|$, then for interval $[-1, 1]$, $f(x)$

- A. satisfied all the conditions of Rolle's Theorem
- B. satisfied all the conditions of Mean Value Theorem
- C. does not satisfied the -conditions of Mean Value Theorem
- D. None of these

Answer: Option C

Q.17: The function $f(x) = x^3 - 6x^2 + 9x + 25$ has

- A. a maxima at $x = 1$ and a minima at $x = 3$
- B. a maxima at $x = 3$ and a minima at $x = 1$
- C. no maxima, but a minima at $x = 1$
- D. a maxima at $x = 1$, but no minima

Answer: Option A

Q.18: The interval in which the Lagrange's theorem is applicable for the function $f(x) = 1/x$ is

- A. $[-3, 3]$
- B. $[-2, 2]$
- C. $[2, 3]$
- D. $[-1, 1]$

Answer: Option C

Q.19: The function $f(x) = \begin{cases} \sin\left(\frac{\pi x}{2}\right), & x < 1 \\ |2x - 3| [x], & x \geq 1 \end{cases}$

- A. Is continuous at $x = 1$
- B. Is differentiable at $x = 1$
- C. Is continuous but not differentiable at $x = 1$
- D. None of these

Answer: Option C

Q.20: If $f(x) = [x \sin \pi x]$ {where $[x]$ denotes greatest integer function}, then $f(x)$ is

- A. Continuous at $x = 0$
- B. Continuous in $(-1, 0)$
- C. Differentiable at $x = 1$
- D. Differentiable in $(-1, 1)$

Answer: Option A

Q.21: If z and w two complex numbers, then

- A. $\overline{z + w} = \bar{z} + \bar{w}$
- B. $\overline{z + w} = \bar{z} - \bar{w}$
- C. $\overline{z + w} = \bar{z} / \bar{w}$
- D. $\overline{z + w} = \bar{z} \cdot \bar{w}$

Answer: Option A

Q.22: The square root of the number $(-3)^2$ are

- A. -3
- B. 3
- C. 3, -3
- D. $3i, -3i$

Answer: Option C

Q.23: The reciprocal of the number i is:

- A. $-i$
- B. i
- C. 1
- D. -1

Answer: Option A

Q.24: If $z_1 = 2 + i$, $z_2 = 1 + 3i$, then $\text{Re}(z_1 - z_2) =$

- A. 1
- B. i
- C. $2i$
- D. 2

Answer: Option B

Q.25: $a^2 + b^2$

- A. $(a + b)(a - b)$
- B. $(a + ib)(a - ib)$
- C. $(a + b)(a - ib)$
- D. $(a + ib)(a - b)$

Answer: Option B

Q.26: $|z_1 - z_2| =$

- A. $|Z_1| + |Z_2|$
- B. $\leq |Z_1| + |Z_2|$
- C. $\leq Z_1 + Z_2$
- D. $Z_1 + Z_2$

Answer: Option B

Q.27: $|z_1 + z_2| =$

- A. $|Z_1| + |Z_2|$
- B. $\leq |Z_1| + |Z_2|$
- C. $\leq Z_1 + Z_2$
- D. $Z_1 + Z_2$

Answer: Option B

Q.28: Polar form of a complex number is

- A. $r(\tan\theta + i\cot\theta)$
- B. $r(\sec\theta + i\operatorname{cosec}\theta)$
- C. $r(\cos\theta + i\sin\theta)$
- D. $r(\sin\theta + i\cos\theta)$

Answer: Option C

Q.29: Write the following complex number in the form $a + bi$:

$18 - \sqrt{-81}$

- A. $18 + 9i$
- B. $18 - 9i$
- C. $27 + 0i$
- D. $0 + 9i$

Answer: Option B

Q.30: Simplify the following expression:

$(20 - 4i) - (6 - 5i) + (2i - 3a)$

- A. $6 - 3a - 23i$
- B. $14 - 3a + 3i$
- C. $-3a + 18i$
- D. $26 - 3a - 7i$



RM GROUP OF EDUCATION

Choose your dream college with us..

Journey of Your Dream College Starts Here...



10+

FRANCHISE



50+

EXPERT COUNSELORS



20+

MOU SIGNED COLLEGES



120+

COURSES



5100+

STUDENTS COUNSELED

OUR SERVICES



Career Counselling

Team with 50+ Career Counsellors having 8 years of combined expertise.



*Scholarship Assistance

Dedicated team to help you get over 5000+ scholarships Programs..



*Colleges Comparison

10,000+ free online resources to get the college of your Dream..



Entrance Exam Updates

Get updated notification of 30+ major entrance exams in India.



*Counselling Assistance

Complete counselling assistance (Seat locking, Freezing & Documentation).



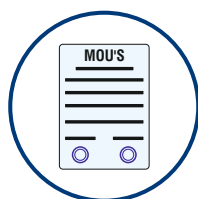
Free Exam Study Materials

Explore 1000+ Notes & study materials to boost your exam preparation.

*Services are for premium customers



2500+ Clients



100+ MOU'S



ISO 9001:2018



10+ Partners

Answer: Option B

Q.31: Length of line joining two points (1, 2) and (4, 8) is:

- A. 3
- B. 9
- C. $\sqrt{45}$
- D. 45

Answer: Option C

Q.32: Length of line joining two points (16, 4) and (36, 6) is:

- A. 22
- B. $\sqrt{22}$
- C. 404
- D. $\sqrt{404}$

Answer: Option D

Q.33: Consider a line passing through (16, 4) and (36, 6), gradient of this line is equal to:

- A. -0.1
- B. 0.1
- C. -10
- D. 10

Answer: Option B

Q.34: Coordinates of midpoint of line joining two points (16, 4) and (36, 6) are:

- A. (26, 5)
- B. (5, 26)
- C. (10, 1)
- D. (1, 10)

Answer: Option A

Q.35: Consider a line passing through (1, 2) and (4, 8), gradient of this line is equal to:

- A. $\frac{1}{2}$
- B. $-\frac{1}{2}$
- C. 2
- D. -2

Answer: Option C

Q.36: The points $(-1, 1)$ and $(1, -1)$ are symmetrical about the line

- A. $Y + x = 0$
- B. $Y = x$
- C. $X + y = 1$
- D. None of these

Answer: Option B

Q.37: The equation of straight line which passes through the point (1, 2) and makes an angle \cos^{-1} with the x-axis is

- A. $X + Y - 2 = 0$
- B. $2X + Y - 2 = 0$
- C. $X + 2Y - 2 = 0$
- D. none of these

Answer: Option A

Q.38: The equation of the line through (3, 4) and parallel to the line $y = 3x + 5$ is

- A. $3X - Y - 5 = 0$
- B. $3X + Y - 5 = 0$
- C. $3X + Y + 5 = 0$
- D. $3X - Y + 5 = 0$

Answer: Option A

Q.39: The quadratic equation whose roots are the x and y intercepts of the line passing through (1, 1) and making a triangle of area A with axes is

- A. $X^2 + ax + 2a = 0$
- B. $X^2 - 2ax + 2a = 0$
- C. $X^2 - ax + 2a = 0$
- D. None of these

Answer: Option B

Q.40: The incentre of the triangle formed by the lines $y = |x|$ and $y = 1$ is

- A. (0, 2 -)
- B. (2 -, 0)
- C. (2 +, 0)
- D. (0, 2 +)

Answer: Option A

Q.41: Difference equation is used in :

- A. Discrete time analysis
- B. Continuous time analysis
- C. Digital analysis
- D. None of the mentioned

Answer: Option A

Q.42: Difference equation in discrete systems is similar to the _____ in continuous systems.

- A. Difference equation
- B. Differential equation
- C. Quadratic equation
- D. None of the mentioned

Answer: Option B

Q.43: Difference equation model results in:

- A. Sampled-data systems
- B. Numerical analysis of continuous time systems
- C. Continuous time feedback systems
- D. Both a and b

Answer: Option D

Q.44: Difference equation technique for higher order systems is used in:

- A. Laplace transform
- B. Fourier transform
- C. Z-transform
- D. None of the mentioned

Answer: Option C

Q.45: Difference equation solution yields at the sampling instants only:

- A. True
- B. False

Answer: Option A

Q.46: The poles of a digital filter with linear phase response can lie

- A. Only at $z=0$
- B. Only on the unit circle
- C. Only inside the unit circle but not at $z=0$
- D. On the left side of Real (z) $=0$ line

Answer: Option B

Q.47: Assertion (A): An LTI discrete system represented by the difference equation. $y(n+2) - 5y(n+1) + 6y(n) = x(n)$ is unstable.

Reason (R): A system is unstable if the roots of the characteristic equation lie outside the unit circle.

- A. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true but R is NOT the correct explanation of A
- C. A is true but R is false
- D. A is false but R is false

Answer: Option A

Q.48: Assertion (A): For the rational transfer function $H(z)$ to be causal, stable and causally invertible, both the zeroes and the poles should lie within the unit circle in the z -plane.

Reason (R): For a rational system, ROC is bounded by poles

- A. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true but R is NOT the correct explanation of A
- C. A is true but R is false
- D. A is false but R is true

Answer: Option B

Q.49: If $X(z) = (z+z-3)/(z+z-1)$, then $x(n)$ series has:

- A. Alternate 0s
- B. Alternate 1s
- C. Alternate 2s
- D. Alternate -1s

Answer: Option A

Q.50: Assertion (A): The stability of the system is assured if the ROC includes the unit circle in z -plane.

Reason (R): For a causal stable system all the poles should be outside the unit circle in the z-plane.

- A. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true bit R is NOT the correct explanation of A
- C. A is true but R is false
- D. A is false but R is true

Answer: Option C

EduFever™

RM GROUP OF EDUCATION

Choose your dream college with us..

WHY CHOOSE US?



- ✓ Expert career guidance & suggestions.
- ✓ Interest based career counselling.
- ✓ Get updated notification of major entrance exams in India.
- ✓ Explore 1000+ Notes & study materials to boost your exam preparation.
- ✓ *Complete counselling assistance (Seat locking, Freezing & Documentation).
- ✓ Assured admission in 20+ MOU signed colleges across the country.
- ✓ Personalized counselling videos and live updates of major entrance exams in India.

HOW TO APPLY

Visit Us

www.rmgoe.org

I Accept

Read the Instruction page carefully

Payment

Make the payment using your banking credentials.



Apply Now

Click on "apply now"

Application Form

Fill the application details very carefully

Congratulations

For successful Registration



0120-2663444, 98730-56333



mail@rmgoe.org



Scan QR Code