ZIAUDDIN UNIVERSITY EXAMINATION BOARD

EXAMINATION MATERIAL ZUEB - 2022

MATHEMATICS XI

SECTION "A" MULTIPLE CHOICE QUESTION (MCQ'S)

Chapter no 1 SETS	
SUB TOPIC	1.1 Revision A few definitions Operations on sets Some important laws

1) (A∩A') is equal to
   a. U
   b. ϕ
   c. {ϕ}
   d. A

2) If A = {2,3} and B {3,4} then (A – B) ∩ B =
   a. ϕ
   b. {ϕ}
   c. {2}
   d. {3}

3) The number of elements in the set A = {x|x ∈ Z,- 1 ≤ x ≤ 5}where z is the set integers is
   a. 5
   b. 6
   c. 7
   d. 8

4) If U is the universal set and A is any non-empty set then AUA' =
   a. A
   b. A'
   c. U
   d. Φ

5) If A and B are any two sets then (AUB)' =
   a. A'UB'
   b. A'∩B'
   c. A∩B
   d. None of these

6) If A = {2,3} and B = {1,2} then A – B is equal to
   a. {1,1}
   b. {0.3}
   c. {3}
   d. {2}

Chapter no 2	Real & complex number systems
SUB TOPIC	**2.2** The systems c of complex numbers Properties of complex numbers Definition of Imaginary numbers Conjugate of complex numbers Modulus of a complex numbers The subtraction of complex numbers The division of complex numbers **2.3** Geometrical representation of the complex number $x + iy$ as pair of real numbers x , y. The order relations Vector interpretation of complex numbers The triangle inequality. Real and Imaginary part of $(x + iy)''$

1) If z= –3i + 2, then z + ẑ =
- a. 6i
- b. 6
- c. 0
- **d. 4**

2) Imaginary part of $i(3 + 5i^2)$ is
- a. -2i
- b. 3i
- **c. -2**
- d. -5

3) If z is a complex number then $z.\overline{Z}$ =
- a. z^2
- b. $(\overline{Z})^2$
- c. |z|
- **d. $|z|^2$**

4) Let x + 3i = 2yi the values of x and y respectively are
- a. 0 and 0
- b. $\frac{3}{2}$ and 0
- c. $\frac{3}{2}$ and $\frac{2}{3}$
- **d. 0 and $\frac{3}{2}$**

5) (a,b).(c,d) =
- a. (ac + bd, ad + bc)
- b. (ac – bd, ad – bc)
- **c. (ac – bd, ad + bc)**
- d. (ac + bd, ad – bc)

6) The real and imaginary parts of i (3 – 2i) are respectively

a. -2 and 3
b. 2 and -3
c. 2 and 3
d. -2 and -3

7) If z = -4 +3i then $\bar{z}$ is equal to

a. 4+ 3i
b. -4
c. 4 – 3i
d. -4–3i

8) The multiplication inverse of (-3, 8) is

a. (3,-8)
b. $-\left(\frac{1}{3},\frac{1}{8}\right)$
c. $\left(\frac{1}{3},\frac{-1}{8}\right)$
d. $\boldsymbol{\left(\frac{-3}{73},\frac{-8}{73}\right)}$

9) Magnitude of 3 -4i is

a. 25
b. 1
c. 9
d. 5

10) The real and imaginary parts of $\frac{2-i}{3}$ are respectively

a. $\frac{-2}{3}$ *and* $\frac{1}{3}$
b. $\frac{-1}{3}$ and $\frac{-2}{3}$
c. $\boldsymbol{\frac{2}{3}}$ **and** $\boldsymbol{\frac{-1}{3}}$
d. $\frac{-1}{3}$ *and* $\frac{2}{3}$

11) If (x + 3,3)=(-5,3), then value of x is

a. -7
b. -2
c. **-8**
d. -5

Chapter no 3	EQUATIONS
SUB TOPIC	**3.3** The cube roots of unity Properties of the cube roots of unity. Equations reducible to the quadratic form **3.5** The theory of quadratic equations Nature of the roots of a quadratic form **3.6** Relations between the roots and the coefficients of a quadratic equation. To form a quadratic equation when it roots are given. **3.8** System of two equations involving two variables. Solution of different types of systems of equations.

1) The roots of a quadratic equation are equal if
- a. $b^2 - 4ac > 0$
- **b. $b^2 - 4ac = 0$**
- c. $b^2 - 4ac < 0$
- d. $b^2 - 4ac$ is a perfect square

2) The product of the roots of the equation $2x^2 - 6x - 15 = 0$ is
- a. -15
- b. 15
- **c. -15/2**
- d. 15/2

3) If $i = \sqrt{-1}$ then value of $(-i^3)^2$ is
- a. 1
- b. i
- **c. –i**
- d. -1

4) If i is an imaginary number then i^{33}
- **a. i**
- b. –1
- c. 1
- d. -i

5) If ω is a complex cube root of unity then ω^{256} is
- a. -ω
- b. ω^2
- **c. ω**
- d. 1

6) The sum of the roots of the equation $y^2 -2y + 8 = 0$

a. 2
b. 4
c. 8
d. -8

7) If 2^{x+2} is =1/32 then x is equal to

a. 2
b. -2
c. -7
d. 8

8) The product of the roots of the equation $y^2 +1 = 7y-7$ is

a. 4
b. 8
c. 7
d. 1

9) If ω is a complex cube root of unity then $(2 - \omega - \omega^2)^2 =$

a. -1
b. 1
c. 3
d. 9

10) The value of $(1+\omega^2)^3$ is

a. 1
b. ω
c. -1
d. -ω

11) The roots of the equation $x^2 + 16 = 0$ are

a. +4i , -4i
b. ± 4
c. $\pm 5i$
d. $\pm 16i$

12) π is a/an

a. Natural number
b. Integers
c. Rational number
d. Irrational number

13) If ω is a complex root cube of unity then $\omega^{17} =$

a. 0
b. 1
c. ω
d. ω^2

14) If the roots of the equations $px^2 + qx + r – 0$ are imaginary then $q^2 – 4pr$ is

a. zero
b. less than zero
c. greater than zero
d. perfect square

15) If $4^{x+2} = 64$ then x is equal to

a. 2
b. 0
c. 1
d. 3

16) If ϖ is a complex cube root of unity then $\varpi^3 + \varpi^4 + \varpi^5 =$

a. 1
b. ϖ
c. ϖ^2
d. 0

17) If ϖ is a complex cube of unity then $(1 + \varpi + \varpi^2)^2$ will be equal to

a. 0
b. 1
c. 4
d. ϖ^2

Chapter no 4	Matrices & Determinants
SUB TOPIC	**1.2** introduction Matrices Notation Special types of matrices Algebra of matrices Properties of matrix operations **4.4** The multiplicative inverse of a square matrix. Distinction between homogenous and non- homogenous systems of linear equations. Solving a system of three non- homogenous linear equations in three unknowns.

1) If order of matrices A and B respectively are 2 x 3 and 3 x 4 than order of AB:

a. 2 x 2
b. 3 x 3
c. 2 x 4
d. 4 x 2

2) If $\begin{bmatrix} 4 & 2 \\ 3 & \lambda \end{bmatrix}$ is a singular matrix then λ=

a. 6
b. ± 5
c. $\frac{3}{2}$
d. $\frac{2}{3}$

3) A square matrix A is said to be singular if

a. |A| = 1
b. A = 0
c. |A| = 0
d. A = 1

4) If the order of two matrices A and B is m x n and n x p respectively then the order of matrix AB is

a. p x m
b. n x p
c. p x n
d. m x p

5) If $\begin{pmatrix} 3 & a \\ 2 & 8 \end{pmatrix}$ is a singular matrix then the value of 'a' is

a. 10
b. 12
c. -12
d. -1/12

6) $\begin{bmatrix} 2 & 0 \\ 0 & -2 \end{bmatrix}$ is a/an

a. Rectangular Matrix
b. Scalar Matrix
c. Diagonal Matrix
d. Unit Matix

7) If A = $\begin{bmatrix} 1 & 3 & 5 \\ 2 & 4 & 7 \\ 9 & 8 & 6 \end{bmatrix}$ then the fo factor A_{31} is equal to

a. 1
b. -1
c. 0
d. 2

8) If A and B are two matrices conformable for multiplication then $(AB)^t$ is equal to

a. A^tB^t
b. AB
c. $\mathbf{B^tA^t}$
d. BA

9) If A,B and C are nonsingular matrices then $(CBA)^{-1}$ =

a. $A^{-1}B^{-1}C^{-1}$
b. $\mathbf{C^{-1}B^{-1}A^{-1}}$
c. $(ABC)^{-1}$
d. ABC

10) If A is a square matrix then $|A|A^{-1}$ =

a. AA^{-1}
b. $|A|I_3$
c. Adj A
d. A^2

11) A diagonal matrix in which all the diagonal elements are equal is called

a. Null matrix
b. Unit matrix
c. Zero matrix
d. Scalar matrix

12) Two matrices A and B are comfortable for addition if both have

a. Same elements
b. Same order
c. Same rows
d. Same columns

13) $[1\ 2\ 5]^t$ is

a. Diagonal matrix
b. Column matrix
c. Scalar matrix
d. Row matrix

14) The matrix $\begin{bmatrix} \sqrt{3} & 0 & 0 \\ 0 & \sqrt{3} & 0 \\ 0 & 0 & \sqrt{3} \end{bmatrix}$ is a

a. Diagonal matrix
b. Scalar matrix
c. Unit matrix
d. Null matrix

Chapter no 6	Sequences & series
SUB TOPIC	**1.3** introduction arithmetic sequence of arithmetic progression (A.P) standard form of an A.P **1.4** Arithmetic series **6.4** Geometric sequence or geometric progression (G.P). Standard form of a G.P **6.5** Geometric series **6.8** Harmonic sequence or harmonic progression (H.P). General term of an H.P The characteristics relation for an H.P An important theorem Harmonic means. To insert (i) A single harmonic means; (ii) n harmonic means (n >1), between two numbers a and b.

1) The sum of infinite geometric series $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} +$ _______________ is

a. ∞
b. 0
c. 1
d. $\frac{1}{2}$

2) If a^2 b^2 c^2 are three terms of an A.P. then

a. $a^2 = \frac{b2+c2}{2}$
b. $\mathbf{b^2 = \frac{a2+c2}{2}}$
c. $c^2 = \frac{b2+c2}{2}$
d. $a^2 + b^2 + c^2$

3) If in a G.P., a= 3 and r = $\frac{2}{3}$ then S_3 is equal to

a. 19/3
b. 12
c. 15
d. 18

4) The geometric means between 2 and ½ are equal to

a. ± 2

b. $\pm\sqrt{2}$

c. $\pm\frac{1}{\sqrt{2}}$

d. ± 1

5) If 1, x -1 ,3 are in A.P then x =

a. –1

b. 1

c. -2,4

d. 3

6) The H.M. between 3 and 6 is

a. ¼

b. 9/2

c. $\pm\sqrt{18}$

d. 4

7) The progression 3,9,27,81 _________ is a / an

a. A.P.

b. G.P.

c. H.P.

d. A.G.P

8) The G.M between 2 and 8 is

a. 5

b. 16

c. +8

d. +4,-4

9) The H.M. of 2 and 5 is

a. $\frac{7}{2}$

b. $\pm\sqrt{10}$

c. $\frac{20}{7}$

d. 0

10) If A.M is the Arthmetic mean between a and b, then A.M =

a. $\frac{a+b}{2}$

b. $\frac{ab}{a+b}$

c. $\frac{a}{-3i+4}$

d. $\sqrt{ab}$

Chapter no 7 **Permutations, combination & introduction to probability**	
SUB TOPIC	**7.2** Numbers of permutations Circular (or cyclic) permutations

1) If a die and a coin are tossed simultaneously then the probability of getting two heads is

a. 1/3
b. ½
c. 0
d. 1

2) The number of ways in which 7 girls can be seated around a round table is

a. 6
b. 6!
c. 7
d. 7!

3) ^nP_r is equal to

a. $\frac{r!(n-r)!}{n!}$
b. $\frac{\boldsymbol{n}!}{(\boldsymbol{n}-\boldsymbol{r})!}$
c. $\frac{n!}{n!(n-r)!}$
d. $\frac{n!}{n!r!(n-r)!}$

4) The number of ways in which 5 persons can be seated in a row is

a. 120
b. 24
c. 6
d. Infinite

5) $\binom{6}{2,3}$ is equal to

a. 1
b. 60
c. 120
d. 240

6) The number of permutations of the letters of the word COMMITTEE is

a. $\binom{\mathbf{9}}{\mathbf{2\ 2\ 2}}$
b. $\binom{6}{2\ 2\ 2}$
c. $\binom{9}{2\ 2\ 1}$
d. $\binom{222}{9}$

7) A coin tossed thrice. The probability of getting three tail is

a. $\frac{1}{2}$
b. $\frac{3}{2}$
c. $\mathbf{\frac{1}{8}}$
d. $\frac{2}{3}$

Chapter no 8	**Mathematical induction & binomial theorem**
SUB TOPIC	**8.1** The principle of mathematical induction **8.3** Binomial theorem The binomial theorem for a positive integral index. Some important observations The general term. The middle terms **8.5** Approximations Application of summation of series.

1) $\sum n^3 =$

a. $\frac{n(n-1)}{2}$
b. $[n(n+1)/2]^2$
c. $\frac{n(n+1)}{2}$
d. $\frac{n(n+1)(2n+1)}{6}$

2) The total number of terms in the expansion of $(a+b)^n$ $(n \in N)$ is

a. n
b. n + 1
c. n – 1
d. n + 2

3) $\sum n$ is equal to

a. $\mathbf{\frac{n(n+1)}{2}}$
b. $\frac{n(n+1)}{4}$
c. $\frac{n(n+1)(2n+1)}{6}$
d. $\frac{n2\,(n+1)}{3}$

4) $1–2x + 3x^2–$ __________ is equal to

a. $(1 – x)^{-1}$
b. $(1 – x)^{-2}$
c. $(1 + x)^{-1}$
d. $\mathbf{(1+x)^{-2}}$

5) $\sum_{n=1}^{3} n3$ is equal to

a. 30
b. 12
c. 48
d. 36

6) The middle term in the expansion of $(2x - \frac{1}{x2})^{20}$ is the:

a. Ninth term
b. Tenth term
c. Eleventh term
d. Twelfth term

7) If n = 0 then $\frac{(n+1)!}{n!}$ =

a. 0
b. 1
c. n
d. ∞

8) The middle term in the expansion of $x^2 [x2 + \frac{1}{x}]^{2n}$ is

a. $(2n + 1)^{th}$ term
b. $(2n + 2)^{th}$ term
c. $(n + 1)^{th}$ term
d. $(n + 2)^{th}$ term

9) $\sum n^2$ =

a. $\frac{n(n-1)}{2}$
b. $\frac{n(n+1)}{4}$
c. $\frac{n(n+1)}{6}$
d. $\frac{n(n+1)(2n+1)}{6}$

10) $\sum_{n=3}^{20} n^0$=

a. 17
b. 18
c. 19
d. 20

11) The value of $^8P_2$ is

a. 66
b. 76
c. 56
d. 86

12) If |x| < 1 then $1 + x + x^2 + x^3 +$ _______is equal to

a. $(1 - x)^{-2}$
b. $(1+ x)^{-2}$
c. $(1 - x)^{-1}$
d. $(1 + x)^{-1}$

13) $\frac{n!}{(n+1)!}$ is equal to

a. n
b. n + 1
c. $\frac{1}{n}$
d. $\frac{1}{n+1}$

14) If a balanced die is rolled then the probability of getting 3 is

a. $\frac{2}{3}$
b. $\frac{3}{2}$
c. $\frac{1}{3}$
d. $\frac{1}{6}$

15) The total number of terms in the binomial expansion of $(y^2 + \frac{b2}{y2})^n$ is

a. n
b. n – 1
c. n + 1
d. 2n

16) If the sides of a triangle are 5, 5 and 7 units then 2s is equal to

a. 6
b. 9
c. 18
d. 17

17) $\frac{(n+1)!}{n!}$ is equal to

a. $\frac{n+1}{n}$
b. n + 1
c. n(n + 1)
d. (n + 1)!

Chapter no 9	Fundamental of trigonometry	
SUB TOPIC	9.1	Introduction Radian measure General and its measure in degrees and radian. Relation between radian and degree measure. Relation between arc-Length, radius and general angle.
	9.2	The radian function Signs of the trigonometry function in the four quadrants.

1) The angle 135^o in radians is

a. $\frac{5\pi}{4}$

b. 3π/4

c. $\frac{2\pi}{4}$

d. 135π

2) If sin θ < 0 and cos θ > 0 then P(θ) is in

a. 1^{st} Quadrant

b. 2^{nd} Quadrant

c. 3^{rd} Quadrant

d. 4^{th} Quadrant

3) If cot θ < 0 and cos θ < 0 then p(θ) lies in the

a. 1^{st} quadrant

b. 2^{nd} quadrant

c. 3^{rd} quadrant

d. 4^{th} quadrant

4) Cos 90^o cos 30^o –sin 90^o sin 30^o is equal to

a. $\frac{1}{2}$

b. $\frac{3}{2}$

c. $-\frac{3}{2}$

d. $-\frac{1}{2}$

5) If arc length S is equal to the radius r, then the central angle θ is

a. 0 radian

b. ½ radian

c. 2 radian

d. 1 radian

6) If tan θ<0. cos θ >0 then p(θ) is in the

a. 1^{st} quadrant

b. 2^{nd} quadrant

c. 3^{rd} quadrant

d. 4^{th} quadrant

7) The arc length of a unit circle with Centre angle π/6 radian is approximately

a. 0.523

b. 1.52

c. 2.52

d. 3.52

8) If sin θ > 0 and sec θ< 0 then p(θ) lies in this quadrant

a. first

b. second

c. third

d. fourth

9) Cot(-θ)=

a. –cot θ

b. –tan θ

c. $\frac{1}{\cot\theta}$

d. $\frac{1}{\tan\theta}$

Chapter no 10	**Trigonometric identities**
SUB TOPIC	**10.2** The distance formula A fundamental law. Deduction from the fundamental law. The sum and difference identities Applications

1) Cos (90 – α) is equal to

a. sin α

b. cos α

c. –cos α

d. –sin α

2) Tan (180° – θ) =

a. tan θ

b. – tan θ

c. cot θ

d. – cot θ

3) The distance between (a,0) and (0,b) is

a. $a^2 + b^2$

b. $(a^2 + b^2)^{1/2}$

c. $\sqrt{a+b}$

d. None of these

4) $1 - 2\sin^2\frac{\theta}{2}$ is equal to

a. $\sin\theta$

b. $\boldsymbol{\cos\theta}$

c. $\mathrm{Sin}\,\frac{\theta}{2}$

d. $\cos\frac{\theta}{2}$

5) The distance between the point (1,1) and (2,1) is

a. 0 unit

b. 1 unit

c. 2 units

d. 3 units

6) Sin (180 + θ) =

a. cos θ

b. –cos θ

c. sin θ

d. –sin θ

7) $1/1+\tan^2\theta$

a. $\sec^2\theta$

b. $\boldsymbol{\cos^2\theta}$

c. $\sin^2\theta$

d. $\cot^2\theta$

8) cos μ - cosv =

a. $2\sin\frac{\mu+u}{2}\cos\frac{\mu-u}{2}$

b. $2\cos\frac{\mu+u}{2}\cos\frac{\mu-u}{2}$

c. $2\sin\frac{\mu+u}{2}\sin\frac{\mu-u}{2}$

d. $\boldsymbol{-2\sin\frac{\mu+u}{2}\sin\frac{\mu-u}{2}}$

Chapter no 12	**Solution & triangles**
SUB TOPIC	**12.2** Solution of a triangles. **12.5** Circles associated with a triangle Circum-radius in terms of the measure of a side and the measure if the opposition angle. Circum-radius r in terms of the measure of three sides of a triangle. The in-radius of a triangle. Radii of e-circles of a triangle.

1) If angle a in ΔABC is in standard position the law of cosine is
   a. $a^2 = b^2 + c^2 + 2bc \cos \alpha$
   b. $a^2 = b^2 + c^2 - 2bc \cos \alpha$
   c. $a^2 = b^2 + c^2 - bc \cos \alpha$
   d. $a^2 = b^2 + c^2 + bc \cos \alpha$

2) If a,b,c are the sides of triangle ABC then R =
   a. $\frac{abc}{4}$
   b. $\frac{\Delta}{abc}$
   c. $\frac{\Delta}{s}$
   d. $\frac{abc}{4\Delta}$

3) Area of a triangle ABC is
   a. ½ ab sin β
   b. ½ bc sin α
   c. ½ ac sin γ
   d. ½ bc sin β

4) If the sides of a triangle are 5, 6 and 7 units then 2s is equal to
   a. 6 units
   b. 9 units
   c. 18 units
   d. 27 units

5) The circle inscribed within a triangle so that it touches all the sides of the triangle is called
   a. In circle
   b. In Centre
   c. Circum circle
   d. Circum Centre

6) The in radius r of triangle ABC is equal to

a. $s\Delta$
b. $\frac{\Delta}{s}$
c. $\frac{s}{\Delta}$
d. $\frac{\Delta}{s-a}$

7) If $|x| < 1$ then $1 + 2x + 3x^2 + 4x^2 +$ _____________ =

a. $(1+x)^{-1}$
b. $(1-x)^{-1}$
c. $(1+x)^{-2}$
d. $(1-x)^{-2}$

8) In a triangle ABC if $\gamma = 90^o$ then the law of cosine reduces to

a. $a^2 = b^2 + c^2$
b. $b^2 = a^2 - c^2$
c. $c^2 = a^2 + b^2$
d. $c^2 = a^2 - b^2$

9) In an escribed triangle ABC, $\frac{\Delta}{r3} =$

a. s
b. (s – a)
c. (s – b)
d. (s – c)

10) If $r\cos\theta = 4$ and $r\sin\theta = 3$ then r =

a. 3
b. 5
c. 6
d. 2

11) If the sides of a triangle are a, b ,and c then $\frac{a-b+c}{2} =$

a. s
b. s – a
c. s – b
d. s – c

Chapter no 13 Inverse trigonometric function & trigonometric equations		
SUB TOPIC	**13.2**	Applications Solution of trigonometric equations.

1) The period of sin x is

a. $\pi/2$
b. π
c. $-\pi$
d. 2π

2) The principle value of tan (arc tan (-1)) is

a. -1
b. 1
c. ∞
d. 0

3) The period of tanx is

a. π
b. $\frac{\pi}{2}$
c. 2π
d. None of these