ZIAUDDIN UNIVERSITY
EXAMINATION BOARD

RESOURCES FOR

"HSC-I MATHEMATICS"

ZUEB EXAMINATIONS 2021

PREFACE:

The ZUEB examination board acknowledges the serious problems encountered by the schools and colleges in smooth execution of the teaching and learning processes due to sudden and prolonged school closures during the covid-19 spread. The board also recognizes the health, psychological and financial issues encountered by students due to the spread of covid-19.

Considering all these problems and issues the ZUEB Board has developed these resources based on the condensed syllabus 2021 to facilitate students in learning the content through quality resource materials.

The schools and students could download these materials from www.zueb.pk to prepare their students for the high quality and standardized ZUEB examinations 2021.

The materials consist of examination syllabus with specific students learning outcomes per topic, Multiple Choice Questions (MCQs) to assess different thinking levels, Constructed Response Questions (CRQs) with possible answers, Extended Response Questions (ERQs) with possible answers and learning materials.

ACADEMIC UNIT ZUEB:

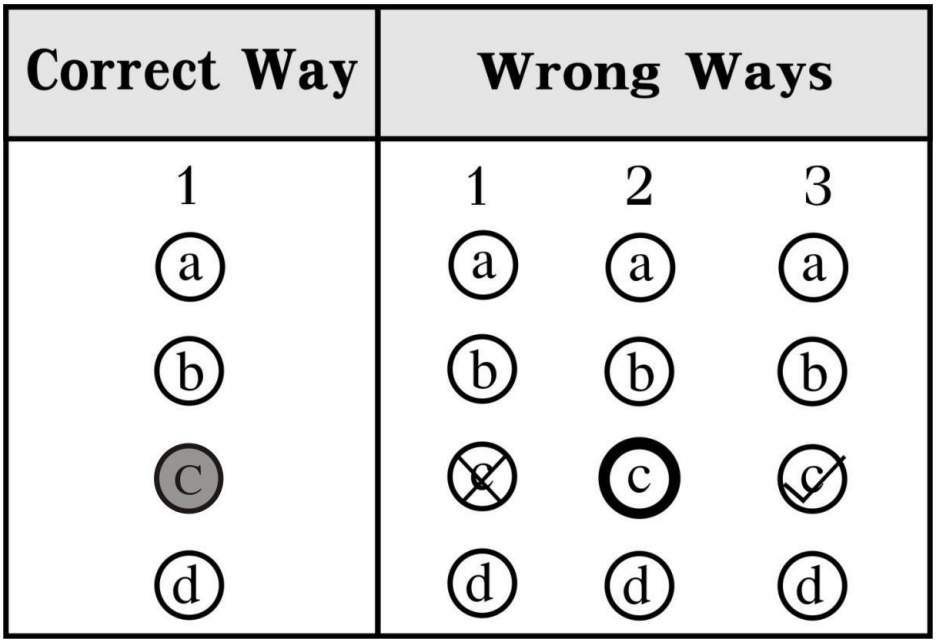
1: Multiple Choice Questions:

The Multiple-Choice Questions with a stem, correct answer and 3 distractors or plausible wrong answers format is designed to assess the content and thinking of students from; R (Remembering); U(Understanding) and A (Applying, Analyzing, Evaluating, Creating). The questions are also classified into three difficulty levels accordingly; D (DIFFICULT), M (MODERATE), E (EASY)

HOW TO ATTEMPT AN MCQ:

MCQ:

- **EACH MCQ HAS FOUR OPTIONS, A, B, C AND D. SELECT ONE OPTION AS THE BEST ANSWER AND FILL IN THE CIRCLE OF THAT OPTION, FOLLOWING THE INSTRUCTIONS GIVEN BY THE INVIGILATOR.**
- **USE BLACK PEN/PENCIL TO FILL IN THE CIRCLE.**



S#	MCQ'S MATERIAL	KEY	CL	DL
1	**A Set is** **A. A collection objects** **B. A group of objects** **C. A collection of objects with a fixed common property** **D. A well define collection of object**	**A well define collection of object**	**K/A**	**E**
2	**Which is not example of a set?** **A. {1, 2, 3, 4}** **B. {a, b, c, d}** **C. {p, q, r, q}** **D. None of these**	**{p, q, r, q}**	**K/A**	**E**
3	**If N = {1,2,3,4, ... }, O = {1,3,5,7, ... }, then N∪O = ?** **A. o** **B. N** **C. *φ*** **D. W**	**N**	**K/A**	**M**

4	**If A = {1,2}, B = {1,2,3} then** **A. B ⊆ A** **B. B = A** **C. A ⊆ B** **D. None of these**	**A ⊆ B**	**K/A**	**M**
5	**Which is subset of every set?** **A. U** **B. X** **C. φ** **D. None of these**	**φ**	**K/A**	**E**
6	**Number of a subset is a set;** **A. n^2** **B. 2^n** **C. 2n** **D. None of these**	**2^n**	**K/A**	**E**
7	**The null or empty set is denoted by;** **A. φ** **B. { }** **C. Both A and B** **D. None of these**	**$both\ A\ and\ B$**	**K/A**	**M**
8	**If z = a + *i*b , then real and imaginary parts respectively are:** **A. b, a** **B. -a, -b** **C. a, b** **D. None of these**	**a, b**	**K/A**	**M**
9	**. Conjugate of (a,-b) is:** **A. a, b** **B. -a, -b** **C. -a, b** **D. None of these**	**a, b**	**K/A**	**E**
10	**Modulus of complex number z = a + *i*b is z = ?** **A. $\sqrt{a^2 - b^2}$** **B. $\sqrt{a^2 + b^2}$** **C. $\sqrt{b^2 - a^2}$** **D. None of these**	**$\sqrt{a^2 + b^2}$**	**K/A**	**E**
11	**i^4 =?** **A. a) –*i*** **B. 1** **C. -1** **D. None of these**	**1**	**K/A**	**M**
12	**$\|5 - 2i^2\|$=?** **A. 2** **B. 5** **C. 3** **D. 7**	**7**	**K/A**	**M**
13	**If $Z_1 = \sqrt{3} - i$, $Z_2 = \sqrt{3} - i$, then $\|Z_1Z_2\|$ =?** **A. 3** **B. 2** **C. 1** **D. 4**	**2**	**K/A**	**E**
14	**Real part $i^3(3 - 5i)$ is:** **A. 3** **B. -5** **C. 5** **D. None of these**	**-5**	**K/A**	**E**

15	**Which of the following has the same value as i^{113}** **A. i** **B. -1** **C. $-i$** **D. 1**	**i**	**K/A**	**M**
16	**The complex root of unity is:** **A. Cube of each other** **B. Square root of each other** **C. Square of each other** **D. None of these**	**Square root of each other**	**K/A**	**M**
17	**The product of the cube root of unity is:** **A. 0** **B. 4** **C. -1** **D. 1**	**1**	**K/A**	**E**
18	**When $b^2 - 4ac$ is a perfect square then the root will be:** **A. Irrational** **B. Rational** **C. Squared** **D. Liner**	**Rational**	**K/A**	**E**
19	**The nature of the roots of the equation $2x^2 - 7x + 6 = 0$ is;** **A. Real, rational, unequal** **B. Positive, imaginary, irrational** **C. Unequal, imaginary, real** **D. Negative, unreal, equal**	**Real, rational, unequal**	**K/A**	**M**
20	**When $x^2 - 5x + 6 = 0$then the roots will be;** **A. Real and rational** **B. Real and irrational** **C. Real and unequal** **D. imaginary**	**Real and unequal**	**K/A**	**M**
21	**For what value of p, q will both roots of the equation $y^2 + (2p - 8) y = 2q + 9$ vanish;** **A. (4,3)** **B. $(4,\frac{-9}{2})$** **C. (2,3)** **D. (9,4)**	**$(4,\frac{-9}{2})$**	**K/A**	**E**
22	**Which term of the A.P. 5, 8, 11, 24, ...is 320?** **A. 104^{th}** **B. 105^{th}** **C. 106^{th}** **D. none of these**	**None of these**	**K/A**	**E**
23	**What is the nth term of G.P. for which a = 8, r = $3/2$ and n =5.** **A. $27/2$** **B. $57/2$** **C. $81/2$** **D. None of these**	**81/2**	**K/A**	**M**
24	**The sum of 1, 3, 5, 7, 9, ... up to 20 term is:** **A. 400** **B. 563** **C. 472** **D. None of these**	**400**	**K/A**	**M**

25	**A number 'A' is said to be the arithmetic mean between two number a and b if a, A, b, form:** **A. A geometric sequence** **B. An Arithmetic sequence** **C. A sequence** **D. None of these**	**An Arithmetic sequence**	**K/A**	**E**
26	**Which one of the following is a geometric sequence?** **A. 2, 4, 8, ...** **B. 1, 2, 4, 5, ...** **C. 3, 7, 15, 19, ...** **D. None of these**	**2, 4, 8, ...**	**K/A**	**E**
27	**The first term of a harmonic sequence is 4 and the fourth term is $2/5$ then what will be the 10^{th} term.** A. $\frac{1}{9}$ B. $\frac{1}{5}$ C. $\frac{1}{7}$ D. **None of these**	$\frac{1}{7}$	**K/A**	**M**
28	**If A, G and H are A. m, G.M and H.M between two number then which statement is true?** **A. $G > A$** **B. $G > H$** **C. $G < H$** **D. None of these**	**$G > H$**	**K/A**	**M**
29	$\frac{(n+5)!}{(n-4)!}$**=?** **A.** $\frac{1}{n-4}$ **B.** $\frac{1}{n-5}$ **C. (n+5)** **D. None of these**	**(n+5)**	**K/A**	**E**
31	$\frac{2!}{0!}$ **=?** **A. 0** **B. 2** **C. 1** **D. None of these**	**2**	**K/A**	**E**
32	**How many distinct four numbers can be formed the integers 1, 2, 3, 4, 5, 6 if each integer is used only once.** **A. 120** **B. 280** **C. 360** **D. None of these**	**360**	**K/A**	**M**
33	**What is the value of $^{16}P_4$?** **A. 4680** **B. 43680** **C. 3680** **D. None of these**	**43680**	**K/A**	**M**

34	**The circumference of a circle is . . . . . .** **A. π** **B. πr^2** **C. 2πr** **D. None of these**	$2\pi r$	**K/A**	**E**
35	**The area of a circle is . . . . . .** **A. πr^2** **B. πr^3** **C. 2πr** **D. None of these**	πr^2	**K/A**	**E**
36	**A circle is called unit circle when its radius is** **A. 1cm** **B. 1 unit** **C. 1 m** **D. None of these**	1 unit	**K/A**	**M**
37	**A line which touches any two points on a circle internally is called** **A. Diameter** **B. Secant line** **C. Chord** **D. Tangent line**	Chord	**K/A**	**M**
38	**A chord which passes through the center of a circle is called** **A. Radius** **B. Secant line** **C. Diameter** **D. None of these**	Diameter	**K/A**	**E**
39	**The distance b/w center to any point on a circle is called** **A. Diameter** **B. Radius** **C. Chord** **D. None of these**	**Radius**	**K/A**	**E**
40	**A line touches any one point on a circle is called** **A. Diameter** **B. Radius** **C. Tangent line** **D. Secant line**	Tangent line	**K/A**	**M**
41	**S =. . . . . .?** **A. rθ** **B. $\frac{\theta}{r}$** **C. $\frac{r}{\theta}$** **D. None of these**	rθ	**K/A**	**M**
42	**If $\sin\theta = -\frac{3}{5}$ and $\cos\theta = \frac{4}{5}$, then ρ(θ) lies in the** **A. 2nd quadrant** **B. 3rd quadrant** **C. 4th quadrant** **D. None of these**	4th quadrant	**K/A**	**E**

43	**The value of $\frac{3\pi}{4}$radian in degree is** **A. 54°** **B. 60°** **C. 108°** **D. None of these**	None of these	**K/A**	**E**
44	**(Secθ + 1)(Secθ – 1) = ...** **A. $Cot^2\theta$** **B. $Sec^2\theta$** **C. $Tan^2\theta$** **D. $Cos^2\theta$**	$Tan^2\theta$	**K/A**	**M**
45	$\sqrt{\frac{1+Cot^2\theta}{1+Tan^2\theta}}$= . . . . **A. Cotθ** **B. Secθ** **C. Cosecθ** **D. 1**	Cotθ	**K/A**	**M**
46	**The value of Sin15° is** **A. $\frac{\sqrt{3}-1}{2\sqrt{2}}$** **B. $\frac{\sqrt{5}-1}{4}$** **C. $\frac{\sqrt{2}-\sqrt{3}}{2}$** **D. None of these**	$\frac{\sqrt{3}-1}{2\sqrt{2}}$	**K/A**	**E**
47	**The amount of rotation of line is called** **A. Measure of sides** **B. Measure of angle** **C. Both A & B** **D. None of these**	Measure of angle	**K/A**	**E**
48	**The amplitude of 7Cos3x is:** **A. 7** **B. 3** **C. 21** **D. None of these**	**7**	**K/A**	**M**
49	**What is the domain of the Cosx?** **A. R** **B. R-{x x = (2k + 1)$\frac{3\pi}{8}$, k ∈ Z}** **C. c)π** **D. R-{x x = kπ, k ∈ Z}**	**R**	**K/A**	**M**
50	**The complete graph of a trigonometry function is . . . . . Series.** **A. A finite** **B. An infinite** **C. A complete series** **D. None of these**	An infinite	**K/A**	**E**
51	**For a triangle ABC, the true statement is:** **A. $AC^2 = AB^2 + AC^2$** **B. Ac = AB + BC** **C. AC < AB + BC** **D. None of these**	AC < AB + BC	**K/A**	**E**

52	**In A triangle, the perpendicular from vertex c bisects the base. The triangle is:** **A. Isosceles** **B. Obtuse** **C. Right angle** **D. None of these**	Isosceles	**K/A**	**M**
53	**If a , b and c the length of sides of the triangle ABC and $\propto$, β and γ are corresponding angle of a triangle, then mathematically law of Sine is written as:** **A.** $\frac{Sin\propto}{a} = \frac{Sin\beta}{b} = \frac{Sin\gamma}{c}$ **B.** $\frac{a}{Sin\propto} = \frac{b}{Sin\beta} = \frac{c}{Sin\gamma}$ **C.** $a^2 = b^2 + c^2 - 2abCos\propto$ **D. None of these**	$\frac{a}{Sin\propto} = \frac{b}{Sin\beta} = \frac{c}{Sin\gamma}$	**K/A**	**M**
54	**If a , b and c the length of sides of the triangle ABC and $\propto$, β and γ are corresponding angle of a triangle, then Cosine of the angle "a" triangle is define as:** **A.** $Cos\propto = \frac{a^2+b^2+c^2}{2ab}$ **B.** $Cos\propto = \frac{b^2+c^2+a^2}{2bc}$ **C.** $Cos\propto = \frac{b^2+c^2-a^2}{2bc}$ **D. None of these**	$Cos\propto = \frac{b^2+c^2-a^2}{2bc}$	**K/A**	**E**
55	**In any triangle ABC, the measure of the sides is proportional to the Sine of the opposite angle. What is Law called?** **A. The law of Sine** **B. The law of Cosine** **C. The law of Tangent** **D. None of these**	The law of Sine	**K/A**	**E**
56	**If a , b , c are the sides of the triangle, then 'R' is:** **A.** $\frac{abc}{4}$ **B.** $\frac{4\Delta}{abc}$ **C.** $\frac{abc}{4\Delta}$ **D.** $\frac{\Delta}{s}$	$\frac{abc}{4\Delta}$	**K/A**	**M**
57	**Area of triangle with each side 3 is:** **A. 9** **B.** $\frac{9\sqrt{3}}{4}$ **C. 27** **D. None of these**	$\frac{9\sqrt{3}}{4}$	**K/A**	**M**
58	**If S = ...** **A.** $\frac{1}{2}$**(b+c-a)** **B.** $\frac{1}{2}$**(a+b+c)** **C.** $\frac{1}{2}$**(a-b-c)** **D. None of these**	$\frac{1}{2}$(a+b+c)\	**K/A**	**E**

59	**Two coins are tossed simultaneously the probability of obtaining no head no tail** **A. 0** **B. $\frac{1}{4}$** **C. 1** **D. $\frac{2}{4}$**	**0**	**K/A**	**E**
60	**Three coins are tossed simultaneously. What is the probability of obtaining all heads?** **A. $\frac{5}{8}$** **B. $\frac{3}{8}$** **C. 1** **D. $\frac{1}{8}$**	$\frac{1}{8}$	**K/A**	**M**
61.	**The in radius r of triangle ABC is equal to** **a. Δ** **b. $\frac{\Delta}{s}$** **c. $\frac{s}{\Delta}$** **d. $\frac{\Delta}{s-a}$**	**e. $\frac{\Delta}{s}$**	**K/A**	**M**
62.	**The number of ways in which 5 persons can be seated in a row is** **a. 120** **b. 24** **c. 6** **d. Infinite**	120	**K/A**	**E**
63.	**If $\|x\| < 1$ then $1 + 2x + 3x^2 + 4x^2 +$_____ =** **a. $(1+x)^{-1}$** **b. $(1- x)^{-1}$** **c. $(1+x)^{-2}$** **d. $(1-x)^{-2}$**	**$(1-x)^{-2}$**	**K/A**	**E**
64.	**(A∩A') is equal to** **a. U** **b. ϕ** **c. {ϕ}** **d. A'**	**ϕ**	**K/A**	**M**
65.	**If I is an imaginary number then i^{33}** **a. I** **b. –i** **c. 1** **d. -i**	-i	**K/A**	**M**
66.	**If z= –3i + 2, then $z + \hat{z}$ =** **a. 6i** **b. 6** **c. 0** **d. 4**	4	**K/A**	**E**

67.	**The sum of the roots of the equation $y^2 - 2y + 8 = 0$** **a. 2** **b. 4** **c. 8** **d. -8**	2	**K/A**	**E**
68.	**$\binom{6}{2,3}$ is equal to** **a. 1** **b. 60** **c. 120** **d. 240**	60	**K/A**	**M**
69.	**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**	n+1	**K/A**	**M**
70.	**The geometric means between 2 and ½ are equal to** **a. ± 2** **b. $\pm\sqrt{2}$** **c. $\pm\frac{1}{\sqrt{2}}$** **d. ± 1**	**± 1**	**K/A**	**E**
71.	**$\sum$ n is equal to** **a. $\frac{n(n+1))}{2}$** **b. $\frac{n(n+1))}{4}$** **c. $\frac{n(n+1)(2n+1)}{6}$** **d. $\frac{n2(n+1))}{3}$**	**$\frac{n(n+1))}{2}$**	**K/A**	**E**
72.	**If 1, x -1 ,3 are in A.P then x =** **a. 2** **b. 1** **c. -2,4** **d. 3**	3	**K/A**	**M**
73.	**The number of permutations of the letters of the word COMMITTEE is** **a. $\frac{9!}{2!\times 2!\times 2!}$** **b. $\frac{6}{222}$** **c. $\frac{9}{221}$** **d. $\frac{222}{9}$**	**$\frac{9!}{2!\times 2!\times 2!}$**	**K/A**	**M**
74.	**If arc length S is equal to the radius r, then the central angle θ is** **a. 0 radian** **b. ½ radian**	**1 radian**	**K/A**	**E**

	c. 2 radian **d. 1 radian**			
75.	**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. $c^2 = a^2 - b^2$**	**$c^2 = a^2 + b^2$**	**K/A**	**E**
76.	**If $r\cos\theta = 4$ and $r\sin\theta = 3$ then r =** **a. 3** **b. 5** **c. 6** **d. 2**	5	**K/A**	**M**
77.	**A coin tossed thrice. The probability of getting three tail is** **a. $\frac{1}{2}$** **b. $\frac{3}{2}$** **c. $\frac{1}{8}$** **d. $\frac{2}{3}$**	**$\frac{1}{8}$**	**K/A**	**M**
78.	**$\frac{1}{2} - 2\sin^2\theta$ is equal to** **a. $\sin\theta$** **b. $\cos\theta$** **c. $\sin 2\theta$** **d. $\cos 2\theta$**	**$\cos 2\theta$**	**K/A**	**E**
79.	**The angle 135^o in radians is** **a. $\frac{5\pi}{4}$** **b. $\frac{3\pi}{4}$** **c. $\frac{2\pi}{4}$** **d. 135π**	**$\frac{3\pi}{4}$**	**K/A**	**E**
80.	**The period of sin x is** **a. $\pi/2$** **b. π** **c. $-\pi$** **d. 2π**	**2π**	**K/A**	**M**
81.	**If roots of the equation $ax^2 + bx + c = 0$ are real then $b^2 - 4ac$ is** **a. Positive** **b. Negative** **c. Zero** **d. Perfect square**	**Negative**	**K/A**	**M**
82.	**Tan $(180^o - \theta)$ =** **a. tan θ** **b. $-\tan\theta$** **c. cot θ** **d. – cot θ**	**$-\tan\theta$**	**K/A**	**E**

83.	**If ω is a complex cube of unity then $(1 + \omega + \omega^2)^2$ will be equal to** **a. 0** **b. 1** **c. 4** **d. ω^2**	0	**K/A**	**E**
84.	**$1/1+\tan^2\theta$** **a. $\sec^2\theta$** **b. $\cos^2\theta$** **c. $\sin^2\theta$** **d. $\cot^2\theta$**	**$\sec^2\theta$**	**K/A**	**M**
85.	**86. 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**	**½ bc sin α**	**K/A**	**M**