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. Extended Response Questions (ERQs)

### HOW TO ATTEMPT ERQs:

- Write the answer to each Constructed Response Question/ERQs in the space given below it.
- Use black pen/pencil to write the responses. Do not use glue or pin on the paper.

## *SECTION C ( LONG ANSWER QUESTIONS)*

**Prove that** $A \cup B = A \Rightarrow A' \cap B'; = A'$

$A \cap B = A \Rightarrow A' \cup B'; = A'$.

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| S.# | ERQ | ANSWER | CL | DL |
|---|---|---|---|---|
| | **EXERCISE 1.1** | | | |
| **1.** | **Prove that**<br>$A \cup B = A \Rightarrow A' \cap B'; = A'$<br>$A \cap B = A \Rightarrow A' \cup B'; = A'$ | PROOF | **K/A** | **E** |

| S.# | CRQ | ANSWER | CL | DL |
|---|---|---|---|---|
| | **EXERCISE 2.3** | | | |
| **2.** | **Prove that:**<br>**a. Z is real if $\bar{z}$=z, ¥ z € ℂ**<br>**b. ($\bar{z}$) = z, ¥ z € ℂ**<br>**Z is either real or purely imaginary if $(z)^2=\bar{z}^2$** | PROOF | **K/A** | **M** |

| S# | CRQ | ANSWER | CL | DL |
|---|---|---|---|---|
| | **EXERCISE 3.8** | | | |
| **3.** | **Solve the following system of equation:**<br>**a. y+z=5**<br>**$y^2+2z^2=17$** | $\{(3,2),(\frac{11}{3},\frac{4}{3})\}$ | **K/A** | **M** |

| S# | CRQ | ANSWER | CL | DL |
|---|---|---|---|---|
| | **EXERCISE 6.8** | | | |
| **4.** | **Find the value of $n$ so that** $\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ **May become the H.M. between a and b** | -1 | **K/A** | **D** |

| S# | CRQ | ANSWER | CL | DL |
|---|---|---|---|---|
| | **EXERCISE 7.2** | | | |
| **5.** | **In how many ways can 3 English, 2 Urdu and 2 Sindhi books be arranged on a shelf so as to keep all the books in each language together?** | 144 | **K/A** | **E** |

| S# | CRQ | ANSWER | CL | DL |
|---|---|---|---|---|
| | **EXERCISE 8.1** | | | |
| **6.** | **Prove the following propositions by mathematical induction.** $1^4+2^4+3^4+\cdots+n^4=\frac{1}{30}n(n+1)(2n+1)(2n^2+3n-1)$ | $\frac{n(n+1)(n-4)(n+5)}{4}$ | **K/A** | **M** |

| S# | CRQ | ANSWER | CL | DL |
|---|---|---|---|---|
| | **EXERCISE 9.1** | | | |
| **7.** | **A car is running on a circular path of radius equal to double the arc of the circle travelled by the car. Find the angle subtended by the arc at the center of the circular path.** | 0.5 radian | **K/A** | **E** |

| S# | CRQ | ANSWER | CL | DL |
|---|---|---|---|---|
| | **EXERCISE 10.2** | | | |
| **8.** | **Prove that:** **Sin $\frac{sin\,(\theta+\phi)}{cos\,\theta\,cos\,\phi}$ = tan θ + tan ϕ when cos θ cos ϕ ≠ 0** | | **K/A** | **E** |

| S# | CRQ | ANSWER | CL | DL |
|---|---|---|---|---|
| | **EXERCISE 12.2** | | | |
| **9.** | **If the length of larger side of a parallelogram if 55cm and one diagonal of the parallelogram makes angles of measure 30º and 50º with a pair of adjacent sides, find the length of the diagonal.** | 70.7cm (approx.) | **K/A** | **E** |

| S# | CRQ | ANSWER | CL | DL |
|---|---|---|---|---|
| | **EXERCISE 13.2** | | | |
| **10.** | **Solve:** **i.** $\sqrt{Cos\,\theta\sqrt{Cos\theta\sqrt{Cos\theta}}\ldots} = 1$ | $\{2n\pi\}, n \in z$ | **K/A** | **D** |