**Math Grade 6**

**Template for Essay Type Item**

**Subject: Mathematics**

**Domain:** A-Numbers and Operations

**Grade: VI**

**Unit 1: Factors and Multiples**

**Type of Assessment: Formative**

[SLO: M-06-A-01] Identify Factors up to 3-digit numbers.

Type of Task: Extended response

Level of SLO: Comprehension

Task: Task: Write at least 6 factors of 126 from the following.

3, 4, 5, 6, 7, 8, 10, 14, 16, 18, 24, 55, 63

Maximum Marks: 3

Level of Item: Comprehension

**Expected Response:** **Skill Observed Score**

 6 factors of 126 are:

3, 6, 7, 14, 18, 63

Selecting 1 factor 0.5

**Name and Signature of Developer**

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**Name and Signature of Reviewer**

**Template for Essay Type Item**

**Subject: Mathematics**

**Domain:** A-Numbers and Operations

**Grade: VI**

**Unit 1: Factors and Multiples**

**Type of Assessment: Formative**

[SLO: M-06-A-01] Identify Factors up to 3-digit numbers.

Type of Task: Extended response

Level of SLO: Comprehension

Task: Find the prime factors of 120.

Maximum Marks: 5

Level of Item: Comprehension

**Expected Response:** **Skill Observed Score**

2 120

2 60

2 30

3 15

5 5

 1

Finding 2 as prime factor three times 03

 Finding 3 as prime factor 01

 Finding 3 as prime factor 01

**Name and Signature of Developer**

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**Name and Signature of Reviewer**

**Template for Multiple Choice Item**

**Subject: Mathematics**

**Domain:** A-Numbers and Operations

**Grade: VI**

**Unit 1: Factors and Multiples**

**Type of Assessment: Formative**

[SLO: M-06-A-01] Identify Factors up to 3-digit numbers.

Type of Task: MCQ

Level of SLO: Knowledge

Task: Identify which of the following are prime factors of 111?

Maximum Marks (01)

**Options**

**A) 3, 37**

**B) 1, 3**

**C) 1, 37 D) 3, 11**

**Answer: A**

**Reason for Choosing Distracter:** Wrong concept of prime numbers.

**Name and Signature of Developer**

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**Name and Signature of Reviewer**

**Template for Essay Type Item**

**Subject: Mathematics**

**Domain:** A-Numbers and Operations

**Grade: VI**

**Unit 1: Factors and Multiples**

**Type of Assessment: Formative**

[SLO: M-06-A-01] Identify multiples up to 2-digit numbers.

Type of Task: Extended response

Level of SLO: Comprehension

Task: Find three common multiples of 12 and 16.

Maximum Marks: 5

Level of Item: Comprehension

**Expected Response:** **Skill Observed Score**

Multiples of 12: 12, 24, 36, 48, 60, 72,

 84, 96, 108, 120, 132,

 144,…

Multiples of 16: 16, 32, 48, 64, 80, 96,

 112, 128, 144, 160,…

Three Common multiples of 12 and 16 are:

 48, 96 and 144.

Multiples of 12 02

 Multiples of 16 02

 Common Multiples of 12 and 16 01

**Name and Signature of Developer**

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**Name and Signature of Reviewer**

**Template for Multiple Choice Item**

**Subject: Mathematics**

**Domain:** A-Numbers and Operations

**Grade: VI**

**Unit 1: Factors and Multiples**

**Type of Assessment: Formative**

[SLO: M-06-A-01] Identify multiples up to 2-digit numbers.

Type of Task: MCQ

Level of SLO: Knowledge

Task: Odd multiple of 13 is:

Maximum Marks (01)

**Options**

**A) 93**

**B) 91**

**C) 87**

**D) 83**

**Answer: B**

**Reason for Choosing Distracter:** Distracters are odd numbers but not multiples of 13.

**Name and Signature of Developer**

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**Name and Signature of Reviewer**

**Template for Essay Type Item**

**Subject: Mathematics**

**Domain:** A-Numbers and Operations

**Grade: VI**

**Unit 1: Factors and Multiples**

**Type of Assessment: Formative**

[SLO: M-06-A-01] Find prime factors up to 4 -digit numbers and express in index notation.

Type of Task: Extended response

Level of SLO: Comprehension

Task: Express 324 as product of prime factors in index notation.

Maximum Marks: 5

Level of Item: Comprehension

**Expected Response:** **Skill Observed Score**

2 324

2 162

3 81

3 27

3 9

3 3

 1

324 = 2 × 2 × 3 × 3 × 3 × 3

 = 22 × 34

 Division by 2 and 3 03

 Product of prime factors 01

 Index notation form 01

**Name and Signature of Developer**

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**Name and Signature of Reviewer**

**Template for Essay Type Item**

**Subject: Mathematics**

**Domain:** A-Numbers and Operations

**Grade: VI**

**Unit 1: Factors and Multiples**

**Type of Assessment: Summative**

[SLO: M-06-A-01] Find Prime factors up to 4 -digit numbers and express in index notation.

Type of Task: Extended response

Level of SLO: Comprehension

Task: Find the prime factors of 180 using “factor tree method” and express the product of prime factors in index notation.

Maximum Marks: 5

Level of Item: Comprehension

**Expected Response:** **Skill Observed Score**

180 = 2 × 2 × 3 × 3 × 5

 = 22 × 32 × 5

180

3

5

5

2

9

2

4

3

Factor tree method 03

 Product of prime factors 01

 Index notation form 01

**Name and Signature of Developer**

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**Name and Signature of Reviewer**

**Template for Multiple Choice Item**

**Subject: Mathematics**

**Domain:** A-Numbers and Operations

**Grade: VI**

**Unit 1: Factors and Multiples**

**Type of Assessment: Formative**

[SLO: M -06 - A - 02] Identify base and exponent and express numbers given in expanded form in index notation and vice versa.

Type of Task: MCQ

Level of SLO: Knowledge

Maximum Marks (01)

Task: Expanded form of 2 × 33 × 72 is:

**Options**

**A)** 2 × 3 × 7

**B)** 2 × 3 × 3 × 7

**C)** 2 × 3 × 3 × 3 × 7 × 7

**D)** 2 × 2 × 3 × 3 × 7 × 7

**Answer: C**

**Reason for Choosing Distracter:** Distracters also include product of numbers 2, 3 and 7.

**Name and Signature of Developer**

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**Name and Signature of Reviewer**

**Template for Multiple Choice Item**

**Subject: Mathematics**

**Domain:** A-Numbers and Operations

**Grade: VI**

**Unit 1: Factors and Multiples**

**Type of Assessment: Formative**

[SLO: M -06 - A - 02] Identify base and exponent and express numbers given in expanded form in index notation and vice versa.

Type of Task: MCQ

Level of SLO: Knowledge

Maximum Marks (01)

Task: Product of prime factors of a number in index notation is 23 × 32 × 5. The number is:

**Options**

**A**) 30

B) 180

C) 270

D) 360

**Answer: D**

**Reason for Choosing Distracter:** Distracters include product of 2, 3 and 5.

**Name and Signature of Developer**

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**Name and Signature of Reviewer**

**Template for Essay Type Item**

**Subject: Mathematics**

**Domain:** A-Numbers and Operations

**Grade: VI**

**Unit 1: Factors and Multiples**

**Type of Assessment: Summative**

[ M -06 - A – 03]: Find H.C.F of two or three numbers (up to 3 -digits) using various methods (for instance prime factorization and division method).

Type of Task: Extended response

Level of SLO: Comprehension

Task: Find HCF of 36, 48 and 64 using factorization method.

Maximum Marks: 5

Level of Item: Comprehension

**Expected Response:** **Skill Observed Score**

Prime factors of 36 = 2 × 2 × 3 × 3

Prime factors of 48 = 2 × 2 × 2 × 2 × 3

Prime factors of 64 = 2 × 2 × 2 × 2 × 2 × 2

Common factors = 2, 2

HCF = 2 × 2 = 4

Finding prime factors 03

 Finding common factors 01

Finding HCF 01

**Name and Signature of Developer**

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**Name and Signature of Reviewer**

**Template for Essay Type Item**

**Subject: Mathematics**

**Domain:** A-Numbers and Operations

**Grade: VI**

**Unit 1: Factors and Multiples**

**Type of Assessment: Summative**

[SLO: M -06 - A – 03]: Find H.C.F of two or three numbers (up to 3 -digits) using various methods (for instance prime factorization and division method).

Type of Task: Extended response

Level of SLO: Comprehension

Task: Find HCF of 275 and 325 using division method.

Maximum Marks: 5

Level of Item: Comprehension

**Expected Response:** **Skill Observed Score**

 1

 275 325

 275 5

 50 275

 250 2

 25 50

 50

 0

Therefore HCF = 25

Selecting smaller number as divisor 01

 Procedure of division 03

Writing HCF 01

**Name and Signature of Developer**

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**Name and Signature of Reviewer**

**Template for Essay Type Item**

**Subject: Mathematics**

**Domain:** A-Numbers and Operations

**Grade: VI**

**Unit 1: Factors and Multiples**

**Type of Assessment: Formative**

SLO:[ M -06 - A – 03]: Find L.C.M of two or three numbers (up to 3 -digits) using various methods (for instance prime factorization and division method).

Type of Task: Extended response

Level of SLO: Comprehension

Task: Find LCM of 36, 48 and 64 using factorization method.

Maximum Marks: 5

Level of Item: Comprehension

**Expected Response:** **Skill Observed Score**

Prime factors of 36 = 2 × 2 × 3 × 3

Prime factors of 48 = 2 × 2 × 2 × 2 × 3

Prime factors of 64 = 2 × 2 × 2 × 2 × 2 × 2

Common factors = 2, 2, 2, 2, 3

Uncommon factors = 2, 2, 3

LCM = 2 × 2 × 2 × 2 × 3 × 2 × 2 × 3

 = 576

Finding prime factors 03

 Finding common & uncommon factors 01

Finding LCM 01

**Name and Signature of Developer**

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**Name and Signature of Reviewer**

**Template for Essay Type Item**

**Subject: Mathematics**

**Domain:** A-Numbers and Operations

**Grade: VI**

**Unit 1: Factors and Multiples**

**Type of Assessment: Summative**

[SLO: M -06 - A - 04] Solve real-world word problems involving H.C.F and L.C.M.

Type of Task: Extended response

Level of SLO: Application

Task: Find greatest length of string that can exactly measure 90 m, 105 m and 120 m long strings.

Maximum Marks: 5

Level of Item: Application

**Expected Response:** **Skill Observed Score**

Prime factors of 90 = 2 × 3 × 3 × 5

Prime factors of 105 = 3 × 5 × 7

Prime factors of 120 = 2 × 2 × 2 × 3 × 5

Common factors = 3, 5

HCF = 3 × 5

 = 15

Therefore length of string = 15 m

Finding prime factors 03

 Finding common 01

 Finding length of string 01

**Name and Signature of Developer**

1. Dr Khalid Mahmood
2. Mr. Sardar Habib

**Reviewer Comments: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Name and Signature of Reviewer**

**Template for Essay Type Item**

**Subject: Mathematics**

**Domain:** A-Numbers and Operations

**Grade: VI**

**Unit 1: Factors and Multiples**

**Type of Assessment: Summative**

[SLO: M -06 - A - 04] Solve real-world word problems involving H.C.F and L.C.M.

Type of Task: Extended response

Level of SLO: Application

Task: In a school, the bell of primary section rings after 30 minutes and bell of secondary section rings after 40 minutes. If both bells ring at 8am together, then at what time will both bells ring again together?

Maximum Marks: 5

Level of Item: Application

**Expected Response:** **Skill Observed Score**

 2 30, 40

 2 15, 20

 2 15, 10

 3 15, 5

 5 5, 5

 1, 1

LCM = 2 × 2 × 2 × 3 × 5

 = 120

 Required time = 120 min = 2 hours

Therefore bells will ring together again at 10am.

Procedure of division 02

 Finding LCM 01

Finding time of bells 02

**Name and Signature of Developer**

1. Dr Khalid Mahmood
2. Mr. Sardar Habib

**Reviewer Comments: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Name and Signature of Reviewer**