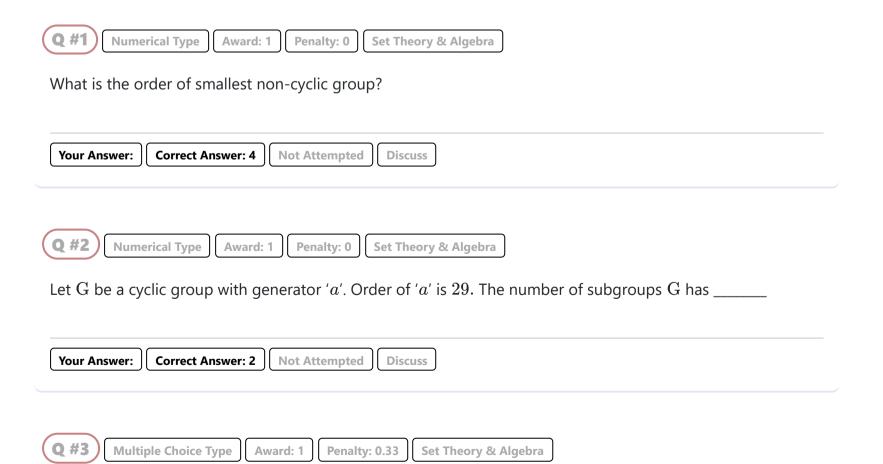
Summary in Graph

Exam Summary (GO Classes Test Series 2024 | Discrete Mathematics | Test 3)

Qs. Attempted:	9 1 + 8	Correct Marks:	9
Correct Attempts:	5	Penalty Marks:	1.33 0 + 1.33
Incorrect Attempts:	4	Resultant Marks:	7.66

EXAM RESPONSE EXAM STATS FEEDBACK

Technical

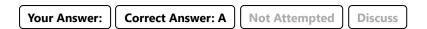


In a group G, every element other than the identity element has order 2 then G is?

- A. Abelian group
- B. Cyclic group
- C. Non-abelian group

https://gateoverflow.in/quiz/results.php

D. Non-cyclic group





What is the smallest positive integer n such that there is a group of order n which is not abelian?

Let \mathbf{Z} be the group of all integers under the operation of addition. Which of the following subsets of \mathbf{Z} is/are NOT a subgroup of \mathbf{Z} ?

- A. $\{0\}$
- B. $\{n \in {f Z} : n > 0\}$
- C. $\{n \in \mathbf{Z} : n \text{ is an even integer}\}\$
- D. $\{n \in \mathbf{Z} : n \text{ is divisible by both 6 and 9}\}$

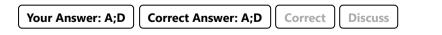
The multiplication table (*) for a group $G = \{a, b, c, d\}$ is given below.

*	a	b	c	d
a	a	b	c	d
b	b	a		
c	c		a	
d				a

Fill in the rest of the table.

Which of the following is/are false?

- A. d*b=d
- B. b*c=d
- C. (c*d)*c = d
- D. G is a cyclic group.





Let R be the set of all real numbers.

Let $S = R \setminus \{-1\}$ and define a binary operation on S by a*b = a+b+ab.

Which of the following is true?

- A. (S, *) is a not a group.
- B. (S, *) is a group but not abelian.
- C. (S, *) is a cyclic group.
- D. (S, *) is an abelian group but not cyclic.

Your Answer: D Correct Answer: D Correct Discuss

Q #8 Multiple Select Type Award: 2 Penalty: 0 Set Theory & Algebra

Which of the following multiplication tables defined on the set $G=\{a,b,c,d\}$ form a group?

	0	a	b	\mathbf{c}	d
	a	a	\mathbf{c}	d	a
(a)	b	b	b	\mathbf{c}	d
	\mathbf{c}	\mathbf{c}	\mathbf{d}	\mathbf{a}	b
	\mathbf{d}	d	\mathbf{a}	b	\mathbf{c}
	_		h	0	٦
	0	a	b	\mathbf{c}	d
	o a	a a	b b	c	$\frac{\mathrm{d}}{\mathrm{d}}$
(b)					
(b)	a	a	b	c	d

	0	a	b	\mathbf{c}	d
	a	a	b	\mathbf{c}	d
(c)	b	b	\mathbf{c}	d	\mathbf{a}
	\mathbf{c}	c	d	\mathbf{a}	b
	d	d	\mathbf{a}	b	\mathbf{c}
		I	1		1
	0	a	b	c	d
	o a	a	b b	c	$\frac{\mathrm{d}}{\mathrm{d}}$
(d)					
(d)	a	a	b	c	d

Your Answer: B;C;D Correct Answer: B;C Incorrect Discuss

Q #9 Multiple Select Type Award: 2 Penalty: 0 Set Theory & Algebra

Let G be a group under binary operation *. Let $g \in G$.

We define $\langle g
angle$ as follows :

$$\langle g \rangle = \{g^n \mid n \in \mathbb{Z}\}$$

Which of the following is /are true about $\langle g \rangle$ under binary operation *?

- A. $\langle g \rangle$ is also a group.
- B. $\langle g \rangle$ is a cyclic subgroup of G.
- C. $\langle g \rangle$ is abelian.
- D. If $H \leq G$ and $g \in H$, then $\langle g \rangle \leq H$.

Your Answer: Correct Answer: A;B;C;D Not Attempted Discuss

Q #10 Multiple Choice Type Award: 2 Penalty: 0.67 Set Theory & Algebra

Let ${
m G}$ be a group and let ${
m H}=\{x^{-1}|x\in {
m G}\}$ then which of the following is true?

- A. $G\subseteq H$ but G may not be same as H
- B. $H \subseteq G$ but H may not be same as G
- C.H=G
- D. H may not be a group.

Your Answer: C

Correct Answer: C

Correct Discuss

Penalty: 0.67

Q #11

Multiple Choice Type

Award: 2

Set Theory & Algebra

Let G_1 and G_2 be two groups as following:

1. G_1 is a group such that $orall x,y,z\in \mathrm{G}_1$

$$xy = zx$$
 implies $y = z$

2. G_2 is a group such that $\forall x,y,z\in\mathrm{G}_2$

$$xyz = ayc$$
 implies $xz = ac$

where $x,y,z,a,c\in \mathrm{G}_2$

Then which of the following is True?

- A. G_1 is abelian, G_2 is not abelian.
- B. Both G_1 and G_2 are abelian.
- C. G_2 is abelian, not G_1 .
- D. Neither of G_1 and G_2 is abelian.

Your Answer: A

Correct Answer: B

Incorrect Discuss

Q #12

Multiple Choice Type

Award: 2

Penalty: 0.67

Set Theory & Algebra

Let \mathbf{Z} be set of integers, and "+" be an integer addition operation.

Let p,q be distinct primes. If ${
m J}$ is a proper subgroup of $({
m {f Z}},+)$ containing exactly three of $\{p,p+q,pq,p^q,q^p\},$

(Note : J may contain other elements of Z which are not in this set), which three elements does J include?

- A. $\{p,p+q,pq\}$
- B. $\{pq, p^q, q^p\}$
- C. $\{p,pq,p^q\}$
- D. $\{p,pq,q^p\}$

Your Answer:

Correct Answer: C

Not Attempted

Discuss

Numerical Type

Award: 2

Penalty: 0

Set Theory & Algebra

A binary operation "*" on a set A is a function from $A \times A$ to A, which maps pair (a, b) to a * b. Binary operation "*" on a set A is commutative if $a*b=b*a, \forall a,b\in A$. The total number of different commutative binary operations on a set of four elements is?

Your Answer: 6

Correct Answer: 1048576

Discuss Incorrect

Q #14

Multiple Choice Type

Award: 2 Penalty: 0.67

Set Theory & Algebra

Consider the following statements:

1. Suppose G is a group and $a,x\in G$. If order of x=2, Then (axa^{-1}) has order 2.

https://gateoverflow.in/quiz/results.php

2. A finite group is never the union of two of its proper subgroups.

Which of the above statements is/are true?

- A. Only 1
- B. Only 2
- C. Both
- D. None

Your Answer: A Correct Answer: C Incorrect Discuss

Q #15 Multiple Choice Type Award: 2 Penalty: 0.67 Set Theory & Algebra

Let S be the set of all functions $f: R \to R$. Consider the two binary operations + and * on S defined as pointwise addition and composition of functions, as follows.

- (f+g)(x) = f(x) + g(x)
- (f*g)(x) = f(g(x))

Which of the following statements are true?

- I. * is commutative.
- II. + and * satisfy the left distributive law i.e. f * (g + h) = (f * g) + (f * h).
- III. + and * satisfy the right distributive law i.e. (g+h)*f=(g*f)+(h*f).
- A. All
- B. II only
- C. III only
- D. II and III only

Your Answer: C Correct Answer: C Correct Discuss

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