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NPTEL

Unit 4 - Week 3

Week 3-Assignment 3-MCQ

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment. **Due on 2018-09-05, 23:59 IST.**

1) Two conjugacy classes of a group ***1 point***

- must be disjoint and isomorphic.
- must be disjoint.
- can not be either disjoint or isomorphic.
- none of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
must be disjoint.

2) Consider the symmetric group S_8. Choose the false statement from below. ***1 point***

- The subset consisting of permutations of six of the original eight objects is a subgroup.
- The subset consisting of odd permutations of the eight objects is a subgroup.
- The subset consisting of even permutations of seven of the original eight objects is a subgroup.
- We can find cyclic groups as subgroups of S_8.

No, the answer is incorrect.
Score: 0

Accepted Answers:
The subset consisting of odd permutations of the eight objects is a subgroup.

3) Consider the dihedral group $D_{5h} = \{e, a, a^2, a^3, a^4, \sigma_1, \sigma_2, \sigma_3, \sigma_4, \sigma_5\}$ where, a is the rotation by $2\pi/5$ and σ_h is a π rotation about an axis in the plane perpendicular to the axis of the above rotations. Find the only invariant non-trivial subgroup of the following group. ***1 point***

ce De

$\{e, \sigma_1, \sigma_2, \sigma_3\}$

$\{e, a, a^2, a^3, a^4, \sigma_1, \sigma_2, \sigma_3, \sigma_4, \sigma_5\}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\{e, a, a^2, a^3, a^4\}$

4) The order of Alternating group of degree $2n$ is **1 point**

$^{2n}C_2$

$^{n}C_2$

$n!/2$

$(2n)!/2$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$(2n)!/2$

5) Which of the following is a possible order for a group so that more than one group structures can be found corresponding to it ? **1 point**

2
3
4
5

No, the answer is incorrect.
Score: 0

Accepted Answers:
4

6) Which one of the following options is not a Point group operation? **1 point**

Translation
Rotation
Reflection
Inversion

No, the answer is incorrect.
Score: 0

Accepted Answers:
Translation

7) The group consisting of n^{th} roots of unity is **1 point**

C_n

A_n

S_n

None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
C_n

8) The number of possible cycle structures of the symmetric group S_8 is **1 point**

24

20

23

22

No, the answer is incorrect.
Score: 0

Accepted Answers:
22

9) The multiplication table of a group is given in table 1. **1 point**

	E	A	B	C	K	L	M	N
E	E	A	B	C	K	L	M	N
A	A	K	N	B	L	E	C	M
B	B	C	K	L	M	N	E	A
C	C	M	L	K	N	B	A	E
K	K	L	M	N	E	A	B	C
L	L	E	C	M	A	K	N	B
M	M	N	E	A	B	C	K	L
N	N	B	L	E	C	M	A	K

Table 1.

Find the π_K.

$\begin{pmatrix} E & A & B & C & K & L & M & N \\ L & E & C & M & A & K & N & B \end{pmatrix}$

$\begin{pmatrix} E & A & B & C & K & L & M & N \\ K & L & M & N & E & A & B & C \end{pmatrix}$

$\begin{pmatrix} E & A & B & C & K & L & M & N \\ M & N & E & A & B & C & K & L \end{pmatrix}$

$\begin{pmatrix} E & A & B & C & K & L & M & N \\ C & M & L & K & N & B & A & E \end{pmatrix}$

No, the answer is incorrect.
Score: 0

Accepted Answers:

$$\begin{pmatrix} E & A & B & C & K & L & M & N \\ K & L & M & N & E & A & B & C \end{pmatrix}$$

10) Suppose that the cycle structure of a particular element of a group, consists of cycles ν_k as, $\nu_1 = 2, \nu_2 = 1, \nu_3 = 0, \nu_4 = 3, \nu_5 = 2$. The order of the conjugacy class to which the element belongs is, ***1 point***

- 5×10^{21}
- 7×10^{21}
- 3×10^{21}
- 10^{21}

No, the answer is incorrect.
Score: 0

Accepted Answers:
5×10^{21}

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