NET/GATE Questions

by Gonit Sora - Thursday, July 28, 2011

https://gonitsora.com/netgate-questions/

Tick out the correct answers. More than one answer may be correct for a question. Tick out all.

1. The number of maximal ideals in $latex \mathbb{Z}/36\mathbb{Z}$ is
   A. 1
   B. 2
   C. 3
   D. 4.

B. The number of subfields of $latex \mathbb{F}_{2^{27}}$ (distinct from $latex \mathbb{F}_{2^{27}}$ itself) is
   A. 1
   B. 2
   C. 3
   D. 4.

C. Let $latex G$ be a group of order 10. Then
   A. $latex G$ is an abelian group
   B. $latex G$ is a cyclic group
   C. there is a normal proper subgroup
   D. there is a subgroup of order 5 which is not normal.

D. Let $latex A$ be a $latex 227\times 227$ matrix with entries in $latex \mathbb{Z}_{227},$ such that all its eigenvalues are distinct. Then its trace is

   A. 0

   B. 226

   C. not definite

   D. $latex 227^{227}$.

E. The number of roots of $latex z^9+z^5+8z^3+2^z+1=0$ between the circles $latex |z|=1$ and $latex |z|=2$ are

   A. 3

   B. 4

   C. 5

   D. 6.

F. Let $latex G$ be a group of order $latex n.$ Which of the following conditions imply that $latex G$ is abelian?

   A. $latex n=15$

   B. $latex n=21$

   C. $latex n=36$

   D. $latex n=63$.

G. Let $latex f:(\mathbb{Q},+)\rightarrow (\mathbb{Q},+)$ be a non-zero homomorphism. Then

   A. $latex f$ is always one-one

   B. $latex f$ is always onto

C. $latex f$ is always a bijection

D. $latex f$ need be neither one-one nor onto.

H. Let $latex R$ be the polynomial ring $latex \mathbb{Z}_2[x]$ and write the elements of $latex \mathbb{Z}_2$ as $latex \{0,1\}$.

Let $latex (f(x))$ denote the ideal generated by the element $latex f(x)\in R$. If $latex f(x)=x^2+x+1$, then the quotient ring $latex \mathbb{R}/(f(x))$ is

A. a ring but not an integral domain

B. an integral domain but not a field

C. a finite field of order 4

D. an infinite field.

I. Let $latex A$ be an $latex n\times n$ matrix with complex entries which is not a diagonal matrix. Then $latex A$ is diagonalizable if

A. $latex A$ is idempotent

B. $latex A$ is nilpotent

C. $latex A$ is unitary

D. $latex A$ is any arbitrary matrix.

J. $latex T:\mathbb{R}^5\rightarrow \mathbb{R}^5$ is a linear transformation with a minimal polynomial $latex (x^2+1)^2$. Then

A. there exists a vector $latex v$ such that $latex T(v)=v$

B. there exists a vector $latex v$ such that $latex T(v)=-v$

C. $latex T$ must be singular

D. such a linear transformation is not possible.

K. Let $latex f:\mathbb{R}^4\rightarrow \mathbb{R}^3$ be given by

$latex f((a,b,c,d))=(3a-2b+c+d,3a-7b-7c+8d,a+b+3c-2d) $.

Then

A. $latex f$ is onto but not one-one

B. $latex f$ is one-one but not onto

C. $latex f$ is both one-one and onto

D. $latex f$ is neither one-one nor onto.

L. $latex F(z-xy,x^2+y^2) =0$ is the solution of the partial differential equation

A. $latex yz_x-xz_y=y^2-x^2$

B. $latex yz_x+xz_y=y^2-x^2$

C. $latex yz_x+xz_y=y^2+x^2$

D. $latex yz_x-xz_y=y^2+x^2$.

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