COP 4530 Term Exam 1
Fall 2001
Professor Chris Lacher

Name:
SSN:
CS Username:
Score: $/ 100$

## This test contains 10 questions on 2 pages. Each question is worth 10 points.

1. Given a class $X$ and a pointer declared as $X^{*}$ Xptr ; how does one dynamically allocate an $X$ object? (Circle all correct answers.)
A. Xptr $=$ new $X$;
B. new Xptr = X ;
C. new $X=$ Xptr;
D. Xptr $=\mathrm{X}$ new;
E. $X=$ new $X p t r$;
F. None of the above.
2. How would you de-allocate the object allocated in the previous question?
A. Xptr delete;
B. delete Xptr;
C. delete [] Xptr;
D. Xptr [] delete;
E. X delete;
F. delete X;
G. Xptr delete [];
H. None of the above.
3. Given a class $X$ and a pointer declared as $X^{*}$ Xptr ; how does one dynamically allocate an array of 10 X objects? (Circle all correct answers.)
A. Xptr $=\mathrm{X}$ new [10];
B. new Xptr = X [10];
C. Xptr $=$ new X [10];
D. new X [10] $=$ Xptr;
E. $\mathrm{X}=$ new Xptr [10];
F. None of the above.
4. How would you de-allocate the object allocated in the previous question?
A. X delete;
B. delete X;
C. delete [] Xptr;
D. Xptr [] delete;
E. Xptr delete;
F. delete Xptr;
G. Xptr delete [];
H. None of the above.

For the next two questions, assume you are implementing a BitVector class based on a private data member declared as

```
private:
    TVector < unsigned char > ByteVector;
```

5. Write a function that will return a mask for any given index in BitVector.
```
unsigned int Mask (unsigned int index)
{
}
```

6. Write implementation code for the member function Unset that makes the index k bit have value 0 :
```
void Unset (unsigned int k)
{
}
```

For the next two questions, assume you are creating a client program of TVector<>.
7. Write a code fragment that declares and correctly sizes a vector v1 of 20 integers:
8. Write a code fragment that declares another vector $v 2$ of integers and then makes $v 2$ into a copy of v1:

For the next two questions, assume you are implementing a TVector<T> template class based on private data members declared as

```
private:
    unsigned int rawdatasize;
    T* rawdata;
```

9. Write code implementing the Size () method:
```
unsigned int Size() const
// returns the number of elements stored by the vector
{
}
```

10. Write code implementing SetSize () from "scratch", i.e., without calling any other methods.
```
void SetSize (unsigned int sz)
// sets the size of the vector to sz
{
```

\}

