

**Academic Challenge 2016**  
**Topic Distribution – Computer Science**

Topic	Regional	Sectional	State
General Computing Knowledge (including topics such as basic computer organization, basic networking, or the world wide web)	4	4	4
Digital Logic, Boolean Algebra, Number Systems	4	4	4
Program Logic	16	15	13
Data Structures & Algorithms	3	4	5
Object Oriented Programming	3	3	4
<b>Total</b>	30	30	30

**Reference List**

- [ Title -- Edition -- Author(s) -- Publisher -- Copyright Date -- ISBN ]
1. "Problem Solving with C++" – (7th Edition) – Walter Savitch – Pearson – 2009 – ISBN: 0321531345
  2. "Data Abstraction and Problem Solving with C++: Walls and Mirrors" (6<sup>th</sup> Edition) – Frank Carrano and Timothy Henry – Pearson – 2013 – ISBN: 0132923726
  3. "Discrete Mathematics and its Applications" (6<sup>th</sup> Edition) – Kenneth Rosen – McGraw Hill – 2007 – ISBN: 0072880082
  4. "Computer Organization & Architecture, Designing for Performance" (7<sup>th</sup> Edition) – William Stallings – Prentice Hall – 2006 – ISBN: 0131856448
  5. "Introduction to Algorithms" (2<sup>nd</sup> Edition) – Thomas Cormen, Charles Leiserson, Ronald Rivest – MIT Press – 2001 – ISBN: 0262032937
  6. "Introduction to Computing Systems: From Bits and Gates to C and Beyond" (2<sup>nd</sup> Edition - Yale Patt and Sanjay Patel – McGraw Hill – 2004 – ISBN: 0072467512
  7. "C++ Programming Today" (2<sup>nd</sup> Edition) - Barbara Johnston – Pearson – 2008 – ISBN: 0130150993
  8. "Computing Essentials 2014: Complete Edition" - O'Leary, Timothy J. & Linda I. O'Leary – McGraw-Hill/Irwin – 2014 - ISBN: 978-0-07-351686-8

## NOTES REGARDING CODE ON ALL EXAMS

All syntax for the various commands will follow that used by C++. Some specific items are listed below. For a more comprehensive list, please consult the references listed.

Some reserved words:

for do while switch case break if else struct const

Some data types

int float bool char double

Some operators:

= Used for Assignment

== Used for comparison of equality

/ Division, if two integers are used with this operator, the result is an integer with no remainder

% Modulus, used with two integers, it returns the remainder of the division

\* Star operator, dereferences a pointer to determine the data in which the pointer is pointing

& Address operator, returns the memory location or address of the data

-> Right-arrow operator, used to access structure or class elements of the item in which a pointer is pointing

. Dot operator, used to access structure or class elements of an element of that class

Commands to obtain input from standard input or display to standard output:

cout Prints data to standard output, the monitor unless otherwise specified

cin Reads input from standard input, the keyboard unless otherwise specified

>> used to direct data from standard input to the cin data stream

<< used to direct data from cout to standard output

Note that code segments will be placed in `Courier New` font type as below.

SAMPLE QUESTION USING CODE AS DESCRIBED:

1. What is the output of the following code?

```
int i;
for (i=0; i<4; i++) {
    cout << i << " ";
}
```

a) 1 2 3 4                      b) 0 1 2 3 4    c) 1 2 3 4 5    d) 0 1 2 3 4    e) none of the above