**Q1: Choose the correct answer:**

1. Purpose of an OS is
   a. Creates abstractions
   b. Multiple processes compete for use of processor
   c. Coordination
   d. all of above

2. Scheduler decides
   a. which processes get to use the processor
   b. when processes get to use the processor
   c. when and which processes get to use the processor
   d. no one of above

3. Virtual Memory allows processes to
   a. delete information stored on a storage device when deleted in primary memory.
   b. reference information stored on a storage device as if it were stored in primary memory.
   c. update information stored on a storage device when updated in primary memory.
   d. all of above

4. Direct Memory Access it’s a way to
   a. increase the CPU utilization.
   b. increase the Memory utilization.
   c. increase the I/O utilization.
   d. no one of above

5. Device Management is implemented across
   a. resource managers
b. device drivers
c. device handlers.
d. all of above

6. The modern OS uses
   a. multiprogramming, the illusion that applications each reside inside of there own computer.
   b. multiprocessor, the illusion that applications each reside inside of there own computer.
   c. multithreads, the illusion that applications each reside inside of there own computer.
   d. all of above

7. In a classic OS system,
   a. only one program can be running per processor, the base thread
   b. additional threads can share the host process’ resources
   c. only one thread can be running per processor, the base thread
   d. no one of above

Q2 Explain briefly, Steps in Thread Scheduling
Q3 Choose the right choice:

1) ---------- A sequence of characters to be treated as a single unit.
   a) token  b) white space  c) lexemes  d) statements

2) ---------- Parsers scan the input from left to right and construct a right most derivation in reverse.
   a) LR  b) bottom up  c) top down  d) predictive

3) ---------- are statements that generally produce no executable code.
   a) declaration statements  b) control statements  c) computation statements  d) structure statements

4) The syntax directed translation scheme is useful because it enables the compiler designer to express the generation---------.
   a) intermediate code  b) source code  c) machine code  d) syntactic code

5) If the source language is assembly language and the target language is machine language then the translator is called---------.
   a) assembler  b) interpreter  c) compiler  d) code generator

6) A grammar that produce more than parse tree for same sentence is said to be ---------.
   a) Ambiguous  b) context free grammar  c) normal form grammar  d) syntactic grammar

7) Operator precedence parse is especially suitable for parsing ---------.
   a) expression  b) recursive routines  c) associative operators  d) all above

Q4 By example give the difference between top down parsing bottom up parsing.
Q5 Choose the correct answer:
1- If A square matrix, and A is invertible matrix. If $A^{-1}$ the inverse of A then..
   a) $A^{-1} = \frac{1}{A}$,  b) $AA^{-1} \neq I$,   c) $A^{-1}A = I$

2- $\frac{d}{dx} (\cot^{-1}(x))$ is  …  …………………  ………
   a) $\frac{1}{1-x^2}$,  b) $-\frac{1}{1+x^2}$,  c) $\frac{1}{1+x^2}$.

3- The solution of following differential equation $y'' - 4y = 0$ is……
   a) $y = c_1 + c_2 e^{4x}$,  b) $y = c_1 + c_2 e^{4x}$,  c) $y = c_1 e^{2x} + c_2 e^{-2x}$

4- The solution of following differential equation $y'' = 0$ is……
   a) $y = c_1 + c_2 x$,  b) $y = c_1 + c_2$,  c) $y = c_1 + xc_2$

5- If $f(t) = \sinh 2t$, the Laplace transformation $[f(s) = L \{\sinh 2t\}]$, is……
   a) $f(s) = \frac{1}{s^2 - 4}$,  b) $f(s) = \frac{2}{s^2 - 4}$,  c) $f(s) = \frac{2}{s^2 + 4}$

6- If $[f(s) = \frac{4}{s^5}]$, the inverse of Laplace transformation $[f(t) = L^{-1} \{\frac{4}{s^5}\}]$ is……
   a) $f(t) = t^4$,  b) $f(t) = 24t^4$,  c) $f(t) = \frac{t^4}{6}$

7- If $f(x, y)$ and its partial derivatives $f_x, f_y, f_{yx},$ and $f_{xy}$ are defined in region containing a point (a, b) and are all continuous at (a, b), then ………
   a) $f_{xx} = f_{yy}$,  b) $f_{yx} = f_{xy}$,  c) $f_{yx} \neq f_{xy}$.

Q6 Find cosine Half-range series for the function defined as $f(x) = 4$, for $0 < x < \pi$.
Choose the correct answer:

1 - Which of the following registers is used to keep track of address of the memory location where the next instruction is located?
   a. Memory Address Register
   b. Memory Data Register
   c. Instruction Register
   d. Program Register

2 - Pipelining strategy is called implement
   a. instruction execution
   b. instruction prefetch
   c. instruction decoding
   d. instruction manipulation

3 - IRR stands for:
   a. Interrupt request register
   b. Input request register
   c. Interrupt resolver register
   d. Input resolver register

4 - A stack pointer is
   a. a 16-bit register in the microprocessor that indicate the beginning of the stack memory.
   b. a register that decodes and executes 16-bit arithmetic expression.
   c. The first memory location where a subroutine address is stored.
   d. a register in which flag bits are stored

5 - The branch logic that provides decision making capabilities in the control unit is known as
   a. controlled transfer
   b. conditional transfer
   c. unconditional transfer
   d. none of above

6 - Interrupts which are initiated by an instruction are
   a. internal
   b. external
   c. hardware
   d. software
7 - A time sharing system imply
   a. more than one processor in the system
   b. more than one program in memory
   c. more than one memory in the system
   d. None of above

8 - Which is a type of microprocessor that is designed with limited number of instructions:
   a. CPU
   b. RISC
   c. ALU
   d. MUX

Q8 What is cache?
Q9 Choose ONE answer from the following:

1. The classic life cycle for software engineering is:

2. The software development process contains three generic phases:
   b. Requirements gathering, Design, Implementation.
   c. Definition, Development, Maintenance.

3. The elements of computer-based system include:
   a. Software, Hardware, People, Procedures, Documents.
   b. Software, Computer programs, Data structures, Documents.
   c. Software, Hardware, Programmers, Analysts, Designers.

4. The hardware engineering process can be viewed in three phases:
   a. Planning and specification, Implementation, Manufacturing.

5. The main functions of definition phase are:
   a. Defined element of software in detail.
   b. Analysis the requirements, and represent the flow and structure of information.
   c. All the above.

6. The human engineering process include following steps:
   c. Identify customer's need, Economic Analysis, Documentation.

7. The cost-benefits analysis in software engineering include:
   a. Cost of modifying, Cost of management Staff.
   b. Cost of operating system, Cost of application.
   c. All of above.

Q10 There are a set of principles that may be used to specify and design data during software engineering. List only five of them.
Q11: Choose the correct answer:

1. When sampling an image, each sample correspond to a small area of that image known as ............
   a. Grey level
   b. Pixel
   c. Pattern
   d. None of the above.

2. Binary images often created from gray scales images via ............ Operation
   a. Shrink
   b. Scale
   c. Threshold
   d. transport

3. The main application of image subtraction is ............
   a. Noise removal
   b. Change detection
   c. Edge detection
   d. All of the above

4. When an image is conduced into a histogram, all ............ information is discarded
   a. Spatial
   b. Grey level
   c. Temporal
   d. color

5. A histogram skewed toward the right implies a ............
   a. Bright image
   b. Dark image
   c. Noisy image
   d. Blur image

6. Mean filter has the negative effect of ............ an image
   a. Sharpening
   b. Blurring
   c. Rotating
   d. None of the above
7. Median filter operate perfectly with images corrupted by ..........
   a. Uniform noise
   b. Gaussian noise
   c. Salt-and-pepper noise
   d. Pepper noise.

8. When segmenting an image, the resulted image will be ..........
   a. non overlapping regions
   b. Preserve the edge
   c. Clear from noise
   d. all of the above

**Q12**

Briefly identify the main steps in which edge detection process goes through.
Q13: Choose the correct answer:

1. HyperText Markup Language (HTML) is used to specify
   a. text/image format
   b. video/animation format
   c. sound format
   d. all of above

2. JavaScript could be defined as
   a. scripting language for Web pages
   b. uses a C++/Java-like syntax, so familiar to programmers, but simpler
   c. good for adding dynamic features to Web page, controlling forms and GUI
   d. all of above

3. Java applets can
   a. define expressive functions of Java
   b. define small, special-purpose programs in Java called applets.
   c. define complex tasks or data heavy tasks, such as graphics
   d. no one of above

4. CGI program executes on
   a. server, sends its results back to browser as a Web site
   b. client, sends its results back to browser as a Web page
   c. server, sends its results back to browser as a Web page
   d. all of above

5. Hypertext Transfer Protocol (HTTP) is a
   a. application-level protocol for distributed, collaborative, hypermedia information systems
   b. network-level protocol for distributed, collaborative, hypermedia information systems
   c. data link-level protocol for distributed, collaborative, hypermedia information systems
   d. all of above
6. The command `<a href="URL" target="_blank">…</a>` causes
   a. the page to be loaded in a new page
   b. the page to be loaded in a new web site
   c. the page to be loaded in a new window
   d. all of above

7. PHP code is embedded in HTML using
   a. heads
   b. tags
   c. cookies
   d. all of above

8. You can insert the content of one ASP file into another ASP file before the server executes it, with the
   a. `#include` directive.
   b. `#inout` directive
   c. `iostream` directive
   d. no one of above

Q14 Write code to design web page (symbol computer desktop), for

`Sort_icon.asp`
Q15: Choose the correct answer:

1. A class is a collection of ____________ and _____________.
   (A) data-members, member functions
   (B) data-members, member functions and main()
   (C) data-members, member functions, main() and include statements
   (D) None of these

2. An object is ________________
   (A) a variable of class datatype.
   (B) same as a class.
   (C) just like a global variable.
   (D) collection of data-members and member functions.

3. Wrapping up of data & functions together in a class is known as _____.
   (A) Overloading
   (B) Data Abstraction
   (C) Polymorphism
   (D) Encapsulation

4. Preventing direct accesses of data-members of the class from outside world is known as _____________.
   (A) Polymorphism
   (B) Encapsulation
   (C) Data Hiding.
   (D) scope resolution.

5. Creating a new class using one or more existing classes is known as _____________.
   (A) Polymorphism
   (B) Encapsulation
   (C) Overloading
   (D) inheritance

6. Ability of an operator or function call to take different forms is known as _____________.
   (A) Polymorphism
   (B) Encapsulation
   (C) Overloading
   (D) Inheritance

7. In C++ a function contained within a class is called
   (A) a member function
   (B) an operator
   (C) a class function
   (D) a method

8. The fields in a class of a C++ program are by default
   (A) protected
   (B) public
   (C) private
   (D) None
What are the main three common concepts that all OOP languages share?