Quiz -4

Total marks = 21

Question-1) Threads within a process share [1 mark]
a) program counter
b) stack
c) heap
d) global variables

Answer: C and D

Question-2) Context switch can happen between [1 mark]
a) different processes
b) different threads
c) some process A and thread B of some process C

Answer: A, B and C

Question-3) Which of these applications are accurately using multithreading [1 mark]
a) video game process having Thread-A for taking user input, and Thread-B for rendering GUI and also connecting to players playing over the network.
b) program dividing an array into four chunks and creating four threads where each thread computes the sum of elements in a different chunk. Total sum is the partial sum calculated by two threads.
c) News reporter thread sends news to be handled by different threads such as a thread for posting on twitter, another thread for posting on internet, and another thread for telecasting on TV.

Answer: C

Question-4) Which of these are correct: [1 mark]
a) All concurrent programs are always parallel programs
b) All parallel programs are concurrent programs

Answer: B

Question-5) Which of these are valid advantages of multithreading [1 mark]
a) responsiveness
b) sharing of registers across different threads inside a process
c) utilization of multicores

Answer: A and C

Question-6) JVM executes the main method on a thread with priority [1 mark]
a) NORM_PRIORITY
b) MAX_PRIORITY
c) MIN_PRIORITY

Answer: A

Question-7) Garbage collection thread is killed by the JVM as soon as the main method terminates [1 mark]
a) True

b) False

Answer: B

Question-8) Thread is _____ in Java [1 mark]
a) Concrete class
b) Abstract class
c) Interface

Answer: A

Question-9) Name the API(s) from Thread In Java that demonstrate/represent following phase in a Thread's lifecycle. The thread in question is the one whose object is used to invoke these APIs. [1 x 4 mark]

(i) Thread is added to the ready queue
   a. run()
   b. start()
   c. join()
   d. sleep()
   e. yield()
   Answer: B

(ii) Thread is added to the wait queue
   a. run()
   b. start()
   c. join()
   d. sleep()
   e. yield()
   Answer: D and E

(iii) Thread is added to the terminated queue
   a. run()
   b. start()
   c. join()
   d. sleep()
   e. yield()
   Answer: C

(iv) Thread is in the running queue
   a. run()
   b. start()
   c. join()
   d. sleep()
   e. yield()
   Answer: A

Question-10) See the following code that uses ForkJoin framework to calculate the value of Fib(n). Choose the option(s) below that suits this code: [2 mark]

```
Fibonacci left = new Fibonacci(n -1);
Fibonacci right = new Fibonacci(n -2);
left.fork();
right.compute();
left.join();
```

a) Object "right" must also be fork/join similar to "left"
b) Single thread execution would first calculate "right" and then "left".
c) Single thread execution would first calculate "left" and then "right".
Answer: B

Question-11) Four objects of Runnable type "A" are created and each of them are then used by 4 different threads (each thread created with one of the Runnable object and then started). Which of the three variables (var1, var2, and var3) will be shared among these 4 threads? [2 mark]

a) var1
b) var2
c) var3
d) var1, var2, and var3

```
class A implements Runnable {
   private static int var1 = 10;
   private int var2;
   public A() { var2 = new Integer(10); }
   @Override
   public void run() {
      int var3 = var2++;
      ……
      var1 += var3;
   }
}
```

Answer: A

Question-12) Which of the following is an efficient implementation? [1 mark]

a) Server application spawns a new thread for serving an incoming client connection
b) Server application uses a fixed size thread pool and adds the incoming client connection as a task in the task pool

Answer: B

Question-13) What is the speedup of an algorithm that takes 4 seconds to execute by using four threads as compared to 8 seconds to execute by using a single thread [2 mark]

a) 4
b) 2
c) 0.25
d) 0.5

Answer: B

Question-14) What is the parallel efficiency of an algorithm that takes 4 seconds to execute by using eight threads as compared to 8 seconds to execute by using a single thread [2 mark]

a) 4
b) 2
c) 0.25
d) 0.5

Answer: C