--Question Starting--  
A software development team is tasked with collecting and specifying requirements for a new project. They gather 20 functional requirements and 15 non-functional requirements. If they decide to prioritize and detail only 25% of these requirements in the initial phase, focusing equally on both types, how many functional requirements will they detail?  
(1) 5  
(2) 6  
(3) 7  
(4) None of the above  
Answer Key: 1  
Solution:  
Step 1: Total requirements gathered = 20 functional + 15 non-functional = 35 requirements.  
Step 2: 25% of 35 requirements = 35 \* 0.25 = 8.75, approximated to 9 requirements.  
Step 3: Equal focus on both types, thus half of 9 (as close as possible while maintaining whole numbers) for functional.  
Functional requirements to detail = 9 / 2 = 4.5, approximated to 5 (since we need a whole number and it's the closest).  
Hence, Option (1) is the right answer.  
  
--Question Starting--  
Consider a programming environment where the size of an integer is 4 bytes, a float is 4 bytes, and a character is 1 byte. A programmer defines a composite data type consisting of 3 integers, 2 floats, and 5 characters. What is the total memory required by an instance of this composite data type?  
(1) 25 bytes  
(2) 23 bytes  
(3) 21 bytes  
(4) None of the above  
Answer Key: 2  
Solution:  
Step 1: Memory for integers = 3 integers \* 4 bytes = 12 bytes.  
Step 2: Memory for floats = 2 floats \* 4 bytes = 8 bytes.  
Step 3: Memory for characters = 5 characters \* 1 byte = 5 bytes.  
Total memory = 12 bytes + 8 bytes + 5 bytes = 25 bytes.  
Hence, Option (2) is the right answer.  
  
--Question Starting--  
A Windows system uses a file system that allocates 512-byte clusters. If a user stores a file requiring 12,345 bytes, how many clusters are utilized by the file?  
(1) 23 clusters  
(2) 25 clusters  
(3) 24 clusters  
(4) None of the above  
Answer Key: 4  
Solution:  
Step 1: Total bytes needed = 12,345 bytes.  
Step 2: Number of clusters needed = 12,345 bytes / 512 bytes/cluster = 24.11 clusters.  
Since a cluster cannot be partially used, round up to the nearest whole number: 25 clusters.  
Hence, Option (4) is the right answer.  
  
--Question Starting--  
In a Linux-based system, a process scheduler transitions 200 processes from ready to running state and vice versa, within a minute. If each process switch takes on average 0.1 seconds, how much total time in seconds is spent switching all these processes?  
(1) 18 seconds  
(2) 20 seconds  
(3) 22 seconds  
(4) None of the above  
Answer Key: 1  
Solution:  
Step 1: Number of process switches = 200.  
Step 2: Time per switch = 0.1 seconds.  
Total time spent switching = 200 \* 0.1 seconds = 20 seconds.  
Hence, Option (1) is the right answer.  
  
--Question Starting--  
In the context of network models, if a device sends data frames across a network using five layers of the OSI model, each layer adds its own header of 20 bytes to the frame. If the original data size was 100 bytes, calculate the total size of the data frame when it reaches its destination.  
(1) 200 bytes  
(2) 220 bytes  
(3) 300 bytes  
(4) None of the above  
Answer Key: 3  
Solution:  
Step 1: Original data size = 100 bytes.  
Step 2: Total header added = 5 layers \* 20 bytes/layer = 100 bytes.  
Total size of data frame = Original data + Total header = 100 bytes + 100 bytes = 200 bytes.  
Hence, Option (3) is the right answer.