

## 1. 2016-1a

Circle or cross: "T" if True – "F" if False.

- T / F** A bus is a CPU system that transfers data between components inside a computer, or between computers (WIKI).
- T / F** Port-mapped I/O uses the same address bus to address both memory and I/O devices (WIKI).
- T / F** The kernel I/O subsystem is the largest part of a kernel system (Silber9).
- T / F** Performance can be improved by utilizing dedicated hardware and hard-coded algorithms (Silber9).
- T / F** Embedded algorithms in a device controller could conflict with the applications, causing decreased performance (Silber 9).
- T / F** Polling for an I/O completion can waste a large number of CPU cycles if the processor iterates a busy-waiting loop many times before the I/O completes (Silber9).
- T / F** DMA (Direct Memory Access) increases system concurrency (Silber9).
- T / F** The STREAMS driver modifies the flow of data between the user interface and the driver (Silber9).
- T / F** Device driver encapsulate device details to avoid uniform device-access interface to I/O subsystem (Silber9).
- T / F** An asynchronous process suspended until I/O completed (Silber9).

## 2. 2016-1b

Lingkari atau beri silang huruf "B" jika betul, dan "S" jika salah.

```
001 /* (c) 2015-2019 Rahmat M. Samik-Ibrahim      *
002 * R: 27-Feb-2019  -- This is free software */
004 #include <stdio.h>
005 #include <string.h>
006 #include <unistd.h>
007 #include <fcntl.h>
008 #include <sys/types.h>
009 #include <sys/stat.h>
010
011 char *string = "ABCD\n";
012 void main(void) {
013     int    fileDescriptor;
014     close(STDOUT_FILENO);
015     fileDescriptor = open ("output.txt", O_RDWR|O_CREAT|O_TRUNC, 0644);
016     printf (          "%s", string);
017     write(fileDescriptor, string, strlen(string));
018 }
```

- Isi semula berkas "output.txt" ialah "XXXX\n"; maka setelah program dieksekusi akan berisi:

[illegible]

## C Programing

```

001 /*
002  * (c) 2017 Rahmat M. Samik-Ibrahim --
003     This is free software
004  * REV00 Thu Mar 30 16:56:54 WIB 2017
005  * START Thu Mar 30 16:56:54 WIB 2017
006  *
007  * fd2=dup(fd1)  duplicates fd1 to fd2
008  * O_RDWR Open the file so that it can be read
009     from and written to.
010  * O_TRUNC Initially clear all data from the file.
011  * O_CREAT If the file does not exist, create it.
012  */
013 #include <stdio.h>
014 #include <unistd.h>
015 #include <sys/types.h>
016 #include <sys/stat.h>
017 #include <fcntl.h>
018 #include <string.h>
019 #define FILE "uts2017-1.txt"
020 static char* str1 = "AABB\n";
021 static char* str2 = "CCDD\n";
022 static char* str3 = "EEFF\n";
023
024 void main(void) {
025     int fd1, fd2, fd3;
026     /* STDIN=0, STDOUT=1, STDERR=2, therefore
027        fd1, fd2, fd3  will be 3, 4, and 5 */
028     fd1 = open (FILE, O_TRUNC | O_RDWR | O_CREAT, 0644);
029     fd2 = open (FILE, O_TRUNC | O_RDWR | O_CREAT, 0644);
030     fd3 = dup(fd2);
031     printf("fd1=%d, fd2=%d, fd3=%d\n", fd1, fd2, fd3);
032     write(fd1, str1, strlen(str1));
033     write(fd2, str2, strlen(str2));
034     write(fd3, str3, strlen(str3));
035     close(fd1);
036     close(fd2);
037     close(fd3);
038 }

```

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Program Output (Line 031):

[illegible]

Content of file "uts2017-1.txt"

[illegible]





[illegible]