

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) 2015-2016 Rahmat M. Samik-Ibrahim      *
002 * R: 05-Jun-2016  -- 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() {
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 }
```

- B / S Tanpa baris 004 - 009, program akan tetap dapat dikompilasi tanpa kesalahan (error).
- B / S Pointer "string" (baris 011) merupakan variabel global.
- B / S Deklarasi "void main()" (baris 12) artinya: tidak ada "passing argument" ke dalam fungsi main().
- B / S Pada saat program dieksekusi, secara otomatis file descriptor dari streams stdin=0 (STDIN_FILENO), stdout=1 (STDOUT_FILENO), dan stderr=2 (STDERR_FILENO).
- B / S Baris 14 akan menutup stream STDOUT_FILENO (1).
- B / S Nilai "fileDescriptor" = 1 (baris 15), akibat baris no 14.
- B / S Jika berkas "output.txt" tidak ada (baris 15), maka fungsi open() akan membuat berkas "output.txt" baru.
- B / S Jika sudah ada berkas "output.txt" (baris 15), maka fungsi open() akan membuka berkas dengan mode menambah (append).
- B / S Fungsi "printf()" (baris 16) akan menulis "ABCD\n" ke layar monitor.

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

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3. 2017-1

C Programing	
<pre> 001 /* 002 * (c) 2017 Rahmat M. Samik-Ibrahim -- This is free software 003 * REV00 Thu Mar 30 16:56:54 WIB 2017 004 * START Thu Mar 30 16:56:54 WIB 2017 005 * 006 * fd2=dup(fd1) duplicates fd1 to fd2 007 * O_RDWR Open the file so that it can be read from and written to. 008 * O_TRUNC Initially clear all data from the file. 009 * O_CREAT If the file does not exist, create it. 010 */ 011 012 #include <stdio.h> 013 #include <unistd.h> 014 #include <sys/types.h> 015 #include <sys/stat.h> 016 #include <fcntl.h> 017 #include <string.h> 018 #define FILE "uts2017-1.txt" </pre>	<pre> 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 } </pre>
Program Output (Line 031):	
Content of file "uts2017-1.txt"	

