COURSE CODE / NAME: STIK1013 / COMPUTER SYSTEM ORGANIZATION
DATE: 14 JUNE 2012 (THURSDAY)
TIME: 2.30 – 5.00 P.M. (2 ½ HOURS)
VENUE: KTB, BK7 (FWB) & BK8 (FWB)

INSTRUCTION:

1. This book script contains SECTION A (50 marks) and SECTION B (50 marks) in SEVENTEEN (17) printed pages excluding the cover page.
2. Answer SECTION A in OMR answer sheet while SECTION B in the space provided in question book script.
3. You are NOT ALLOWED to remove the exam paper from the examination hall.

MATRIC NO: ____________________________

( with word ) ( with number )

IDENTIFICATION CARD NO.: ____________________________

LECTURER: ____________________________

GROUP: ______ TABLE NO.: ____________

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ANSWER ALL QUESTIONS
SECTION A : MULTIPLE CHOICE QUESTIONS (50 marks)

1. Which of the following are the TRUE definitions of “program”?

   i. Program is a collection of statements written in computer language to solve problems.
   ii. Program is a collection of steps or procedures written in computer language to perform special tasks.
   iii. Program is system support program written in computer language to perform special tasks.
   iv. Program is a collection of instructions written in computer language to solve problems.

A. i, ii and iii.
B. i, ii and iv.
C. i, iii and iv.
D. ii, iii and iv.

2. Which of the following are the TRUE statements to differentiate between “computer organization” and “computer architecture”?

   i. Computer architecture is an attributes of a system visible to a programmer.
   ii. Computer architecture is an operational unit and their interconnections.
   iii. Computer architecture is attributes of a system which have direct impact on the logical execution of a program.
   iv. Computer organization is an operational unit and their interconnections.

A. i, ii and iii.
B. i, ii and iv.
C. i, iii and iv.
D. ii, iii and iv.

3. Which of the following are the TRUE job opportunities in computer related fields?

   i. Programmer, System analyst and System Administrator.
   ii. Web Designer, Web Developer and Database Administrator.
   iii. Network Engineer, Computer Engineer and Information System Consultant.
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4. ________________ is the first large-scale, electronic and digital computer.
   A. EDVAC.
   B. UNIVAC.
   C. ENIAC.
   D. DIFFERENCE ENGINE

5. System software can be divided into
   A. System utilities and System support program
   B. Operating System and System Utilities
   C. Operating System and System Software
   D. System Utilities and Application Software

6. A function of the Operating System (OS) is NOT including:
   A. Memory Management
   B. Device Management
   C. Compression Management
   D. Application Interface

7. Figure 1 shows a different type of software

   ![Software Options]

   Figure 1: Different type of software

From the answer below, what is the best answer to represent the software above?
8. "In this stage, we do an interview and discussion session among user or client"
   Ahmad Albab, System Analyst at Kasturi IT Solution.

   Based on this statement, which phase is the best to describe this?

   A. Feasibility study
   B. Requirement analysis
   C. System Analysis
   D. System design

9. Software that can NOT be categorized as a system utilities including

   A. Scandisk
   B. Kaspersky
   C. Dropbox
   D. Ethereal

10. Which one of this methodology is NOT a Software Development Life Cycle (SDLC)’s methodology?

    A. Iteration
    B. UML
    C. Prototype
    D. Spiral

11. The computer performs its operations using the _________ number system.

    A. binary
    B. base 10
    C. base 8
    D. base 16
12. A byte is a group of ________ bits.
   A. 8
   B. 16
   C. 32
   D. 64

13. In conventional notation, a number can be represented with
   A. magnitude and value
   B. magnitude and sign
   C. sign and decimal point
   D. magnitude and decimal point

14. In one's complement, the inversion of 101101 is
   A. 110010
   B. 010011
   C. 010010
   D. 110011

15. The multiples of 2 in base 2 are: (Hint: multiples of 5 in base 10 are 0, 5, 10, 15, 20, 25...)
   A. 0, 10, 11, 100, 101, 110, 111, etc.....
   B. 0, 1, 10, 100, 1000, 10000
   C. 0, 10, 100, 1000, 10000
   D. 10, 100, 1000, 10000, 100000

16. In one's complement, using 8 bits to store values, what is the sign and magnitude of 10111011?
   A. -68
   B. 68
   C. 187
   D. -187

17. Image can be categorized as bitmap and ________.
   A. jpeg
   B. pixel
   C. video
   D. vector
18. The number 3211 in base 4 is ____________ in base 10
   A. 94
   B. 924
   C. 292
   D. 229

19. Which one of these statements are NOT TRUE about the machine language programming?
   A. A programming language is a language for instructing a programmer to do a system
   B. A source code is a complete program to instruct the computer
   C. The lowest type of programming language is the machine language
   D. By using a machine language, programmer needs a more time to complete a program

20. Programming process includes
   A. Planning the solution on the first steps
   B. Uses the flow chart or pseudo-code in the coding phases
   C. Testing the program by do a translating by using the compiler or interpreter
   D. Documenting the program by do the final documentation at the end of the software development

21. The example of the Object-oriented programming (OOP) language is
   A. Turbo Pascal
   B. HyperCard
   C. C
   D. Phyton

22. Interpreter is one of the program translators. The TRUE fact about the interpreter is
   A. In the interpretation process, the interpreter do not leave a black space of source code translation and execution
   B. The interpreter executed as soon as possible after it read a single statement of the source and translated into a machine instruction
   C. The interpreter translate and executes another (the source code) many statement at a time
D. Linking editing an program execution occur until the entire source code file has been compiled

23. In a compiler, there are three classes of source code statement that needs to know. Select the TRUE statement about these.

A. The class are control structure, data declaration, data management
B. In the data declaration, there are table that known as declaration table
C. Two types of external subroutines’ place are in compiler library and library store
D. None of above is TRUE

24. Hybrid Object-based Programming language is one of the programming languages. Choose the right fact about this programming language.

A. The language is similar to OOP but in visual condition
B. Visual Basic is the first type of this programming language by Microsoft
C. It is also known as visual programming language
D. None of above

25. Determine the TRUE statement about the compiler and interpreter.

A. Compiler interleave source code translation and execution
B. In compiler, one program will translate and executes the source code line by line
C. The interpreter read the source code, translate into machine instruction, and immediately
D. None of above

26. From the fact below, determine the TRUE statements about the assembly language

A. The usage of mnemonic codes are for the computer understanding
B. Mnemonic codes used a full word from English language
C. Compiler or interpreter is used to turn its program into a machine language
D. By using assembly language, programmer becomes comfortable to do a programming compared to a machine language
27. Which of the following are the **TRUE** statements to differentiate between “material” and “matter”?

   i. A material is and elements, constituents, or substances of which something is composed or can be made.
   ii. A matter is something that has mass which can exist in the form of a solid, liquid, gas or plasma.
   iii. An atom is the smallest indivisible unit of matter.
   iv. All matter is made up of atoms, and atoms are made up of smaller particles called proton, nucleus and neutron.

   A. i, ii and iii.
   B. i, ii and iv.
   C. i, iii and iv.
   D. ii, iii and iv.

28. Which of the following are the **TRUE** statements of the “atom”?

   i. Electrons contain a negative charge.
   ii. Protons a positive charge.
   iii. Neutrons are neutral; they have neither a positive nor a negative charge.
   iv. All matter is made up of atoms.

   A. i, ii and iii.
   B. i, ii and iv.
   C. i, iii and iv.
   D. i, ii, iii and iv.

29. Which of the following are **TRUE** statements of the material?

   i. Insulator is a material that does not conduct electricity, such as glass, ceramics or rubber.
   ii. Conductor is a material that allows an electric current to pass through it such as metals.
   iii. Semi-conductor is a material that is neither a good conductor of electricity nor a good insulator.
   iv. Conductor is a material whose electrical resistance can be switched between insulating and conducting such as silicon.

   A. i, ii and iii.
   B. i, ii and iv.
   C. i, iii and iv.
   D. i, ii, iii and iv.
30. Which of the following are FALSE statements of the “circuit”?

   i. The number of electrons permitted to flow on the circuit at one time is called "voltage".
   ii. Current is measured using amperes, or "Amps".
   iii. The amount of charge between the sides of the circuit is called "current".
   iv. The amount of charge between the sides of the circuit is measure in “volt”.

   A. i and ii.
   B. i and iii.
   C. i, ii and iii.
   D. i, ii, iii and iv.

31. Which of the following is the TRUE translation expression of the below statement?
    “a complement of ABC OR CDE producing F”?

   A. ABC' + CDE = F.
   B. (ABC + CDE)' = F.
   C. ABC' + CDE' = F.
   D. ABC + CDE' = F.

32. Using De Morgan’s Theorem, find the double complement of F, where F = \((A+B+C+D)\).

   A. \(A'.B'.C'.D'.\)
   B. \(A'+B'+C'+D'.\)
   C. \((A + B + C + D)'\).
   D. \(A + B + C + D.\)

33. List out a Central Processing Unit (CPU) data section component.

   i. Arithmetic Logic Unit (ALU).
   ii. Control Unit (CU).
   iii. Register.
   iv. Memory.

   A. i and ii.
   B. i and iii.
   C. i, ii and iii.
   D. i, ii, iii and iv.
34. Show the TRUE statement about “register” in Central Processing Unit (CPU):

   i. High speed memory, internal to the CPU.
   ii. Some registers are user visible.
   iii. Some register are available to the programmer via the machine instruction sets.
   iv. Other registers are used only by the CPU for control purpose.

   A. i and ii.
   B. i and iii.
   C. i, ii and iii.
   D. i, ii, iii and iv.

35. Below are the sequences of fetch operation cycle in Central Processing Unit (CPU). Choose the CORRECT sequence of the fetch operation below:

   i. Instruction is loaded in the register called Instruction Register (IR).
   ii. A register called Program Counter (PC) holds the address of instruction to be fetch next.
   iii. Processor fetches an instruction from memory.
   iv. The CPU always increments the PC, so that the next instruction will be fetched.

   A. i,ii, iii and iv.
   B. ii, iii, i and iv.
   C. iii, ii, iv and i.
   D. iv, ii, iii and i.

36. In execute cycle, the Central Processing Unit (CPU) interprets the instruction and perform the required action. List the TRUE action of execute cycle:

   i. Data may be transferred from processor to memory or from memory to processor.
   ii. Data may be transferred to or from a peripheral device by transferring between the processor and an I/O module.
   iii. CPU performs some arithmetic or logic operation on data.
   iv. Monitoring the sequence of instructions.

   A. i and ii.
   B. i and iii.
   C. i, ii and iii.
   D. i, ii, iii and iv.
37. What is the meaning of the instruction ADD R, Y?

A. Add the value contained in data location Y to the contents of register R.
B. Add the value contained in data location R to the contents of register Y.
C. Add the value contained in data location R with the value in location Y.
D. Add the contained of register R with the value Y.

38. What will happen if fewer addresses in the instruction?

i. More primitive instructions and less complex CPU.
ii. Instructions with shorter length and more total instructions in a program.
iii. More longer program and more complex programs.
iv. Longer execution times.

A. i and ii.
B. i and iii.
C. i, ii and iii.
D. i, ii, iii and iv.

39. Choose Assembly language instruction which will move the content of AX register to memory address 111.

A. MOV 111, AX
B. MOV AX, 111
C. MOV [111], AX
D. MOV [111], [AX]

40. Below are lists of Assembly language format. Rearrange it into sequence starting from the left to the right.

I. Comment
II. Operation
III. Label/Name
IV. Operand

A. II, I, III, IV
B. II, III, I, IV
C. III, II, IV, I
D. I, II, III, IV
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41. Which of the following is NOT an instruction of OPERAND FIELD?
   A. TRY
   B. ADD
   C. MOV
   D. PROC

42. Which of the following is described about DX (One of General Register)?
   A. Accumulator Register
   B. Base Register
   C. Count Register
   D. Data Register

43. Which is NOT TRUE about SRAM?
   A. slower than DRAM
   B. generates more heat than DRAM
   C. limited in capacity
   D. too expensive for practical implementations

44. Cache memory holds ________________.
   A. data only
   B. instructions only
   C. direct tunneling address modes
   D. frequently used data and instructions

45. ________________ is small high speed memory unit used for storing temporary result in CPU.
   A. ROM
   B. RAM
   C. Register
   D. Hard disk
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46. The technique whereby part of the program is stored on disk and is brought into memory for execution as needed is called _________.
   
   A. memory allocation  
   B. virtual storage  
   C. interrupts  
   D. prioritized memory  

47. Which of the following is the **CORRECT** line of bus system based on functional groups?
   
   A. Data and Address lines.  
   B. Data and Control lines.  
   C. Data, Address and Control lines.  
   D. Data, Address and Signal lines.  

48. When interrupt occur, the processor and the Operating System(OS) are responsible for:
   
   i. recognizing an interrupt.  
   ii. suspending the user program.  
   iii. servicing the interrupt.  
   iv. resuming the user program.  
   v. stop the system and shutdown.  
   
   A. i, ii, and iii.  
   B. i, ii, iii, and iv.  
   C. i, ii, iv, and v.  
   D. i, ii, iii, iv, and v.  

49. Which of the following is **FALSE** statement regarding Bus Interconnection?
   
   A. TWO (2) types of Bus are Dedicated and Multiplexed.  
   B. TWO (2) methods of bus arbitration are Centralized and Distributed.  
   C. TWO (2) types of bus timing are Asynchronous and Synchronous.  
   D. TWO (2) types of bus width are according to Control and Address Bus.  

50. Show the **TRUE** steps when interrupt pending occur:
   
   i. Save context.  
   ii. Suspend execution of current program.  
   iii. Set PC to start address of interrupt service routine (ISR) (also known as interrupt handler routine).  
   v. Restore context and continue interrupted program.
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A. i, ii, iii, iv, and v.
B. i, iii, ii, iv, and v.
C. ii, i, iii, iv, and v.
D. ii, iii, iv, v, and i.
SECTION B : STRUCTURED QUESTIONS (50 marks)

1. List down THREE (3) differences between the software at the early existence of computer and the software that we have currently (6 marks)

2. There are eight phases in Software Development Life Cycle (SDLC). List and describe all involved phases accordingly. (8 marks)
3. Calculate in 8-bit numbers
   
a) $111 + (-88)$ using one’s compliment technique. 
   
   (4 marks)

   b) $53 + (-33)$ using two’s compliment technique. 
   
   (4 marks)

4. Convert $6118_{10}$ to
   
a) Base 5 
   
   (2 marks)
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b) Base 16

(3 marks)

5. The questions below involve conversion of floating points.

a) Convert \(0.828125_{10}\) to base 2.

(3 marks)

b) Convert \(1011.10111_{2}\) to decimal.

(3 marks)
6. Draw the logic circuit from the expression \( F = ABC + BCD + DE \) using only NAND gates. 

(8 marks)

7. Draw the truth table from the expression \( F = AB + CD + (BCD)' \) 

(9 marks)

END OF QUESTION