HiLCoE
School of Computer Science and Technology

Final Exam: ICT Fundamentals (CS211) **Class: DRB2001**

Term: Winter 2020 **Duration: 4 Hours** **Date: 29 May 2020**

Full Name: _____

➡ **N.B. Similar (Copied) answers will be annulled: Both the source and recipient will be penalized.**

General Instruction: Attempt all questions. Write your full name, Batch and Section clearly on an answer sheet. Everything (your name, batch, section, and your answers) should be read-ably hand-written using a pen (not a pencil). Workout your answers on the answer-sheet, sign on it and upload the scan of the answer sheet to *abdella.endris@gmail.com*

Part I

Match items given in **Column 'A'** with items given in **Column 'B'** and write the **best match** on the answer sheet together with the item of **Column 'A'.** That is, make a table on the answer sheet showing items of **Column A** and their best match from **Column B. [15 points]**

'A'		'B'	
1	Elicitation	**A**	Line-of-sight
2	WLAN	**B**	Reduction of Complexity
3	DNS	**C**	Broadcast Transmission
4	Bridge	**D**	Compression
5	Encapsulation	**E**	Hardware that sends and translates data
6	Cloud computing	**F**	Computer Architecture
7	Usability	**G**	Wi-Fi
8	Attenuation	**H**	Efficient Use of Shared Medium
9	WPAN	**I**	Requirements Engineering
10	Router	**J**	Distributed Database
11	Microwave	**K**	Data plus Control Information
12	Simplex system	**L**	Transmission Impairment
13	Multiplexing	**M**	Bluetooth
14	NIC	**N**	Layer 4 device
15	RISC and CISC	**O**	Self-Learning (PnP)
		P	Gateway
		Q	Virtualization
		R	Modem
		S	Synchronization
		T	Configurable Device

Part II:
Workout the following problems neatly on an answer sheet (to be scanned and uploaded to abdella.endris@gmail.com). Read each question carefully and attempt all, including sub-questions (if any). [73 points]

1. (a) Explain the difference and relationship between ASCII and Unicode character coding and representation schemes. (b) Write the ASCII representation for the string "HiLCoE DRB2001" as it is stored in memory (in hexadecimal). [**5 Points**]
2. Demonstrate the single precision floating point representation of the decimal number **– 875.9375** in memory. Show your steps clearly. [**5 Points**]
3. Explain the difference and relationship between context switching and multitasking. **[4 points]**
4. Explain the meaning and uses of modulation. Illustrate your answer with examples. **[4 points]**
5. Explain the Instruction Cycle and describe major components of the CPU. [**5 Points**]
6. Describe fundamental phases of the software system development process (SDLC phases) and explain the activities carried out in each phase. [6 **Points**]
7. Discuss about four SDLC process models you have explored in your group assignment, and include the Open Source model in your discussion as a fourth mandatory SDLC process model. **[6 points]**
8. Describe and explain the three parts of connection-oriented data transfer. **[4 points]**
9. What is the difference between a port address, a logical address, and a physical address? **[4 points]**
10. Describe and explain various ways of classifying networks. **[5 points]**
11. What is the basic difference between a half adder and a full adder? Explain their relationship using their corresponding circuit diagrams. **[4 points]**
12. Look at the IEEE definition of Software Engineering on one of your Chapter 5 slides. What does 2) The study of approaches as in 1) mean? Explain. **[3 points]**
13. All Software system development process models contain fundamental (common) activities or phases. What are the causes of differences between the many varieties of SDLC process models? **[5 points]**
14. Describe and explain at least four functions of communications software. [**4 Points**]
15. What is the difference between IPv4 and IPv6, and why is IPv6 essential? **[4 points]**
16. Explain differences and relationships between LAN, WAN, Internet, Intranet, and Extranet. **[5 points]**

Bonus:

(B1) The bit pattern shown below is stored in IEEE double precision (11 bits exponent) format. Find the retrieved decimal value. Show your steps clearly. [**4 Points**]
0**10000000001**11110000000000000000000000000000000000000000000000000000

(B2) Draw a hybrid network topology with a bus backbone and three star networks. **[4 points]**

Good Luck

Abdella E. Mohammed +251911659888, abdella.endris@gmail.com