37

Version No.				
3	0	0	7	1

ROLL NUMBER						

COMPUTER SCIENCE
HSSC–I
SECTION – A (Marks 13)

Time allowed: 20 Minutes

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/overwriting is not allowed.

Do not use lead pencil.

حصہ اوّل لازمی ہے۔ اس کے جوابات اسی صفحہ پر دے کر ناظم مرکز کے حوالے کریں۔ کاٹ کر دوبارہ لکھنے کی اجازت نہیں ہے۔ لیڈ پنسل کا استعمال ممنوع ہے۔

Answer Sheet No. _____

ہر سوال کے سامنے دیے گئے، کریکولم کے مطابق درست دائرہ کو پر کریں۔ **Invigilator Sign.** _____

Fill the relevant bubble against each question according to curriculum: **Candidate Sign.** _____

	Question	A	B	C	D	A	B	C	D
1.	Which gate produces a **HIGH** output when at least one input is **LOW**?	AND gate	NAND gate	OR gate	NOR gate	○	○	○	○
2.	What is an efficient way to organize a collection of photos on your computer?	Naming them in random order	Grouping them by date or event	Deleting some photos randomly	Printing all photos and shuffling them	○	○	○	○
3.	Which of the following represents a reliable source of information?	A peer-reviewed academic journal	A social media post without citation	A personal blog with no evidence	A random website with advertisements	○	○	○	○
4.	What is the main objective of classification in Supervised learning?	To group data into clusters without labels	To predict continuous values	To reduce the dimensions of data	To assign predefined labels to input data	○	○	○	○
5.	Which type of cloud deployment model is most suitable for organizations with strict regulatory requirements?	Private cloud	Public cloud	Hybrid cloud	Community cloud	○	○	○	○
6.	Consider the list, **P= [2, 5, 3, 4]**, what will the statement **print (max(P))** return?	2	4	5	Error in statement	○	○	○	○
7.	What is the primary goal of **abstraction** in computational thinking?	Writing detailed step–by–step instructions for solving a problem	Using a computer to solve mathematical equations	Repeating a process until a solution is found	Ignoring unnecessary details to focus on the important aspects of problem	○	○	○	○
8.	Which type of feasibility study in SDLC involves evaluating whether the proposed system can be developed with available technology?	Legal feasibility	Schedule feasibility	Technical feasibility	Economic feasibility	○	○	○	○
9.	Which of the following is an example of **open-ended** research question?	How many students use mobile phones in a class?	Does exercise reduce stress?	What are the effects of climate change on agriculture?	Is online education better than traditional education?	○	○	○	○
10.	Which of the following can be classified as a **high-fidelity** prototype?	A detailed mobile app demo with clickable buttons	A hand-drawn wireframe of a website	A basic outline of an app on paper	A simple text document describing the app features	○	○	○	○
11.	What is the main advantage of using a **simulation** instead of real-world testing?	Always gives perfect results	Risk-free and cost-effective	Eliminates the need for real-world experience	Requires no computer programming	○	○	○	○
12.	What will be the result of *x=2 | 4* Python statement?	0	2	4	6	○	○	○	○
13.	Which of the following is an example of a service?	e-book	Laptop	Medical consultation	Pre-packaged food items	○	○	○	○

COMPUTER SCIENCE HSSC–I

Time allowed: 2:40 Hours **Total Marks Sections B and C: 62**

SECTION – B (Marks 42)

Q. 2 Answer the following parts briefly. **(14 x 3 = 42)**

(i)	Assume the variables **x**, **y** and **z** where **x=4**, **y=10**, and **z=2**. What value will be stored in **result1**, **result2** and **result3** after executing following Python statements?
	a) result1 = y – x
	b) result2 = y // z
	c) result3 = x % z
		03	OR	Trace the following pseudocode and complete the table below, which tracks the values of the variables at each iteration of the loop.
				SET product =1
				FOR i FROM 1 TO 3 DO
				product = product * i
				END FOR
				PRINT product
				Iteration No. | Value of **i** | Value of **sum** | Print
				1
				2
				3
					03

(ii)	Write down any three features of **data visualization**.	03	OR	What is **Permissioned Block chain network**? Also list down its applications. (any two)	1+2
(iii)	Write down three comparisons between **Symmetric** and **Asymmetric** encryption.	03	OR	Differentiate between **supervised** and **unsupervised** learning with daily life examples.	03
(iv)	Why is **prototyping** important? Give three reasons.	03	OR	Write down three differences between **Black Box** and **White Box** testing methods.	03
(v)	Determine whether these variable names are valid or invalid. Provide reasons for any invalid variable names. **a)** input **b)** your age **c)** marks1	03	OR	Why is **two-factor authentication** (2FA) important? Also give example.	2+1
(vi)	Briefly explain three harmful effects of increased connectivity on environment.	03	OR	Write down three positive impacts of **AI systems**.	03

(vii)	Which algorithm is more efficient: **insertion** sort or **bubble** sort? Justify your choice with two reasons.	1+2	OR	Correct any three errors in the following Python code:
				`temperature = 5;`
				`if temperature > 30:`
				`  print("It's hot)`
				`elif temperature = 5:`
				`  display("It's cold")`
				`else:`
				`print("The weather is mild")`
					03

(viii)	Evaluate the following expression in Python using the proper order of operations: **2+2**3//2*4%3-1**	03	OR	Compare Bus and Mesh network topologies with respect to design, scalability and reliability.	03
(ix)	Briefly explain any three guidelines to conduct a better qualitative interview.	03	OR	Write down any three key steps in developing the Minimum Viable Product.	03
(x)	Write a Python program that asks the user to input name and marks. Also displays the entered name and marks.	03	OR	Draw truth table for the Boolean function. $F=\bar{X}YZ+X\bar{Y}Z$	03
(xi)	What is the importance of Digital literacy? Give three reasons.	03	OR	Write down any three tasks suitable for **computing devices**.	03

(xii)	Why is **horizontal** scalability considered more suitable for cloud-based applications? Give three reasons.	03	OR	What will be generated by the following Python code?
				`country=["Pakistan", "Iran", "China"]`
				`country [2]= "Turkey"`
				`country.append("Oman")`
				`print(country)`
					03

(xiii)	Compare Parameter and Statistics with daily life example.	03	OR	Write Python statements considering turtle graphics to perform the following actions: **a)** Change the pen colour to **blue**. **b)** Move the turtle **backward** by **150 pixels**. **c)** Rotate the turtle **90 degrees** to the **left**.	03
(xiv)	What is the deployment phase in SDLC? How does the **pilot** deployment method differ from the **parallel** deployment method?	1+2	OR	What is a **sample**? Why is it often used instead of studying an entire **population**?	1+2

SECTION – C (Marks 20)

Attempt the following questions. **(4 x 5 = 20)**

Q.3	Write down any five differences between **Waterfall** and **Agile** software development models.	05	OR	Explain the differences between **Correlation** and **Causation** with examples.	05
Q.4	Simplify the Boolean Function F, using Karnaugh Map. Aso draw the logic circuit for simplified expression. $F=\bar{A}\bar{B}C+\bar{A}BC+A\bar{B}\bar{C}+A\bar{B}C+AB\bar{C}+ABC$	05	OR	Write a Python program that reads two numbers and prints the minimum number by using function.	05
Q.5	Use the **Linear Search algorithm** to find the number **53** from the given set of numbers: 89 | 50 | 36 | 42 | 11 | 53 | 65 | 72 | 24	05	OR	Write a Python program that inputs a number and prints its multiplication table from 1 to 10 using **for loop**.	05
Q.6	What is meant by Internet of Things (IoT)? Describe any four applications of IoT technology.	1+4	OR	What are information sources? Explain any four categories of information sources.	1+4

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3	2	0	7	1

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COMPUTER SCIENCE
HSSC–I
SECTION – A (Marks 13)

Time allowed: 20 Minutes

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/overwriting is not allowed.

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حصہ اوّل لازمی ہے۔اس کے جوابات اسی صفحہ پر دے کر ناظم مرکز کے حوالے کریں۔کاٹ کر دوبارہ لکھنے کی اجازت نہیں ہے۔لیڈ پنسل کا استعمال ممنوع ہے۔

Answer Sheet No. _____

ہر سوال کے سامنے دیے گئے، کریکولم کے مطابق درست دائرہ کو پر کریں۔ **Invigilator Sign.** _____

Fill the relevant bubble against each question according to curriculum: **Candidate Sign.** _____

	Question	A	B	C	D	A	B	C	D
1.	Which gate produces a LOW output when **at least** one input is HIGH?	AND gate	NAND gate	NOR gate	OR gate	○	○	○	○
2.	What is an efficient algorithm for finding a specific book in a large library?	Asking other visitors for help	Using the catalog system to find its location	Randomly pulling out books from the shelves	Browsing without a plan	○	○	○	○
3.	Which of the following represents a reliable source of information?	A personal blog with no evidence	A social media post without citation	A peer-reviewed academic journal	A random website with advertisements	○	○	○	○
4.	**K-means clustering** is an example of the following statistical modelling technique:	Supervised learning	Semi-supervised learning	Reinforcement learning	Unsupervised learning	○	○	○	○
5.	The key advantage of using a private cloud is:	Higher security and control over data	Lower cost compared to public cloud	Accessible to the public	Reduced need for IT infrastructure	○	○	○	○
6.	Consider the list, **A= [10, 20, 30, 40]**, what will the statement **print (len(A))** return?	0	4	40	Error in statement	○	○	○	○
7.	What does decomposition mean in computational thinking?	Combining smaller problems into a larger solution	Ignoring the problem until it resolves itself	Writing code without any structure	Breaking a problem into smaller, more manageable parts	○	○	○	○
8.	Which type of feasibility study in SDLC assesses whether the proposed system can be completed within a **given timeframe**?	Legal feasibility	Schedule feasibility	Economic feasibility	Operational feasibility	○	○	○	○
9.	Which of the following is an example of a typical survey question?	Solve 5x7=?	What is the capital of China?	How many hours do you spend on the internet daily?	What is the boiling point of water?	○	○	○	○
10.	Which of the following can be classified as a low-fidelity prototype?	A wireframe sketch on paper	A fully functional mobile app	A high-resolution mock up with animations	A completed website with backend functionality	○	○	○	○
11.	Which of the following is a characteristic of qualitative interviews?	They have only one-word answers	They focus on open-ended questions	They only collect numerical data	They follow a strict set of yes/no questions	○	○	○	○
12.	What will be the result of $x = 5$ & 3 Python statement?	1	3	5	7	○	○	○	○
13.	Which of the following is an example of a product?	Online banking	Car repair	Mobile phone	Medical consultation	○	○	○	○

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COMPUTER SCIENCE HSSC–I

Time allowed: 2:40 Hours **Total Marks Sections B and C: 62**

SECTION – B (Marks 42)

Q. 2 Answer the following parts briefly. **(14 x 3 = 42)**

(i)	Assume the variables **x**, **y** and **z** where **x=4**, **y=8**, and **z=2**. What value will be stored in **result1**, **result2** and **result3** after executing following Python statements?
	a) result1 = x + y
	b) result2 = z ** 3
	c) result3 = y/x
		03	OR	Trace the following pseudocode and complete the table below, which tracks the values of the variables at each iteration of the loop:
				SET sum=0
				FOR i FROM 1 TO 3 DO
				sum = sum + i
				END FOR
				PRINT sum
				Iteration no. | Value of i | Value of **sum** | Print
				1
				2
				3
					03

(ii)	What is a **use case** for statistical modelling? Give an example.	2+1	OR	Write down three benefits of integration of Blockchain and IoT.	03
(iii)	How does **Agile model** differ from **Waterfall model**? Justify with at least three reasons.	03	OR	Differentiate between Parameter and Statistics with daily life examples.	1.5 + 1.5
(iv)	Why is successful product development important? Give three reasons.	03	OR	Write down three differences between analog and digital signals.	03
(v)	Determine whether these variable names are valid or invalid. Provide reasons for any invalid variable names. **a)** range **b)** total marks **c)** counter	03	OR	How do computer systems protect against cyber-attacks? Provide three reasons.	03
(vi)	Briefly explain three guidelines regarding the safe and responsible use of information sources.	03	OR	What are embedded systems? Enlist two of their applications.	1+2

(vii)	Which algorithm is more efficient: **insertion** sort or **bubble** sort? Justify your choice with two reasons.	1+2	OR	Correct any three errors in the following Python code:
				number = 0;
				if number > 0:
				print("Positive number)
				eliff number = 0:
				print("Zero")
				else:
				print("Negative number")
					03

(viii)	Evaluate the following expression in Python using the proper order of operations: **3**2-8%4+10/5*3**	03	OR	Compare Star and Ring network topologies with respect to design, scalability and reliability.	03
(ix)	Write down any three features of infographics for data representation.	03	OR	Write down any three key steps in developing the Minimum Viable Product.	03
(x)	Write a Python program that asks the user to input name and age also displays the entered name and age.	03	OR	Draw truth table for the Boolean function. $F=XYZ+X\bar{Y}Z$	03
(xi)	Write down three features of the **Survey** for data collection.	03	OR	What is meant by data searches? Illustrate with an example.	2+1
(xii)	How does vertical scalability differ from horizontal scalability in cloud computing? Illustrate with three differences.	03	OR	What will be generated by the following Python code? list1=[34, "abc", 40, 89] list1[2]=67 list1.append("xyz") print(list1)	03
(xiii)	What is the difference between a population and a sample in statistics? Illustrate with example.	03	OR	Write Python statements considering turtle graphics to perform the following actions: **a)** Rotate the turtle **45 degree** to the **right**. **b)** Move the turtle **forward** by **100 pixels**. **c)** Change the pen colour to **red**.	03
(xiv)	What is the deployment phase in SDLC? How does the **direct** deployment method differ from the **phased** deployment method?	1+2	OR	Compare **supervised** and **unsupervised** learning with daily life examples.	1.5 + 1.5

SECTION – C (Marks 20)

Attempt the following questions. **(4 x 5 = 20)**

Q.3	What is encryption? Differentiate between symmetric and asymmetric encryption in terms of speed, complexity, security and key structure.	1+4	OR	What is data collection? Compare primary and secondary data collection methods based on the originality, cost, time required and reliability.	1+4
Q.4	Using a 3-variable Karnaugh Map, simplify the following Boolean Function F. Also represent the simplified Boolean expression with a logic circuit diagram. $F=A\bar{B}\bar{C}+\bar{A}\bar{B}C+A\bar{B}C+\bar{A}BC+ABC+\bar{A}B\bar{C}$	05	OR	Write a Python program that reads three numbers and prints their product by using function.	05
Q.5	Use the **Binary Search** algorithm to find the number, **75** from the given set of numbers: 9 | 10 | 26 | 34 | 41 | 58 | 67 | 75 | 83	05	OR	Write a Python program that takes a number and prints its factorial using **for loop**.	05
Q.6	What does Artificial Intelligence mean? Describe any four positive impacts of AI systems.	1+4	OR	What are assistive technologies? Provide four examples of their everyday uses.	1+4

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Version No.				
9	0	0	7	1

ROLL NUMBER						

COMPUTER SCIENCE
HSSC–I
(Old Curriculum)
SECTION – A (Marks 13)

Time allowed: 20 Minutes

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/overwriting is not allowed.

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حصہ اوّل لازمی ہے۔ اس کے جوابات اسی صفحے پر دے کر نگرانِ مرکز کے حوالے کریں۔ کاٹ کر دوبارہ لکھنے کی اجازت نہیں ہے۔ لیڈ پنسل کا استعمال ممنوع ہے۔

Answer Sheet No. _____

ہر سوال کے سامنے دیے گئے، کریکولم کے مطابق درست دائرہ کو پُر کریں۔ **Invigilator Sign.** _____

Fill the relevant bubble against each question according to curriculum: **Candidate Sign.** _____

	Question	A	B	C	D	A	B	C	D
1.	Which pointing device is popular with ATM machines?	Touch pad	Track ball	Touch screen	Light pen	○	○	○	○
2.	USB flash drive is what type of memory?	Magnetic memory	Optical memory	Flash memory	Primary memory	○	○	○	○
3.	What is the most cost effective method to print salary slips for 2000 employees?	Dot matrix printer	Laser printer	Ink jet printer	Plotter	○	○	○	○
4.	Hubble Space Telescope exists in _____ earth orbit.	Geostationary	Medium	Low	High	○	○	○	○
5.	Which of the following is used to mount the processor on the motherboard?	Power supply	Clipboard	CPU socket	Expansion slot	○	○	○	○
6.	The mail services are available to network user through the _____ layer.	Application	Physical	Data link	Transport	○	○	○	○
7.	The layer that is responsible for flow control and ensuring error free message delivery is:	Application layer	Session layer	Transport layer	Physical layer	○	○	○	○
8.	Which of the following networks provides remote access to individuals and offices to their organizations network?	LAN	WAN	MAN	VPN	○	○	○	○
9.	Date/time data type has a size of:	2 bytes	4 bytes	8 bytes	16 bytes	○	○	○	○
10.	The instruction needed at the time of starting the computer are stored in:	Hard disk	ROM	Cache	RAM	○	○	○	○
11.	Which of the following instructions transfers data from a memory location to a register; register to memory and register to register?	LD	STO	JMP	MOV	○	○	○	○
12.	Identify the cardinality of the following relationship: One COLLEGE can have many DEPARTMENTS; One DEPARTMENT belongs to one COLLEGE.	One-to-one	One-to-many	Many-to-many	Many-to-one	○	○	○	○
13.	The relationship between the entities STUDENT and COURSE is:	Unary	Binary	Ternary	Recursive	○	○	○	○

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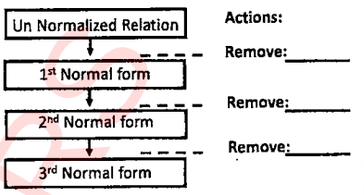
COMPUTER SCIENCE HSSC–I
(Old Curriculum)

Time allowed: 2:40 Hours **Total Marks Sections B and C: 62**

SECTION – B (Marks 42)

Q. 2 Answer the following parts briefly. **(14 x 3 = 42)**

(i)	What is mobile communication? Enlist the components required in mobile communication system?	1+2	OR	Write down any three differences between primary & secondary memory	03
(ii)	In a **Hospital Management System**, there are two entities: **DOCTOR** and **PATIENT**. • A **Doctor** can treat multiple **Patients**. • A **Patient** can be treated by multiple **Doctors** over time. • However, a **Patient** must always have at least one **Doctor** assigned for treatment. • A **Doctor** can treat many patients, but there is no restriction on the number of patients a doctor can treat. **Based on the above scenario, answer the following:** i. What is the cardinality of the relationship between Doctor and Patient? ii. What is the modality of the relationship between Doctor and Patient?	03	OR	What actions should be taken to complete the normalization process as shown? 	03
(iii)	What is the purpose of data transfer instruction? Give any two examples of data transfer instructions?	03	OR	How software license helps the owner of the software? Provide three key ways.	03
(iv)	Why do flash memory devices have faster access time than hard disk? Write any three reasons.	03	OR	Why data access time in sequential access devices is more than the random-access devices? (any three reasons)	03
(v)	Give any three differences between CISC and RISC architectures.	03	OR	How CD drive/player converts the stored information on CD into 0s and 1s?	03
(vi)	Suppose you want to add two numbers 25 and 45. Which steps will ALU perform to do this addition?	03	OR	Write down any three differences between **SIMM** & **DIMM**.	03
(vii)	Write down one example of each Open-Source Software, Shareware and Freeware.	03	OR	If a college wants to setup a computer lab, which topology is best and why? Support your answer with two reasons.	03
(viii)	Write down any three applications of GPS?	03	OR	Write down any three advantages of DBMS over conventional file management system.	03
(ix)	Write down any three differences between columnar and tabular reports.	03	OR	What is SDRAM? Write down any two features of SDRAM	1+2
(x)	Draw a neat diagram to illustrate the steps of instruction cycle.	03	OR	Write down three applications of Virtual Private Network.	03
(xi)	Write down the purpose of following ports: **a)** Fire wire Port **b)** Serial Port **c)** USB Port	03	OR	Write down any three differences between IDE and SATA interface cable.	03
(xii)	Give one real life application for each of the following digital computers: **a)** Supercomputer **b)** Mainframe computer **c)** Microcomputer	03	OR	Write down the purpose of the following satellites. **a)** GEO **b)** MEO **c)** LEO	03
(xiii)	How is data bus different from address bus? Give three reasons.	03	OR	What are Columnar, Tabular and Datasheet Form views?	03
(xiv)	Write down the purpose of the following queries: a) select b) delete c) update	03	OR	Write down any three differences between impact printers and non-impact printers.	03

SECTION – C (Marks 20)

Attempt the following questions. **(4 x 5 = 20)**

Q.3	How is OSI Model different from TCP/IP Model? Describe protocol and devices used on first three layers of OSI Model.	2+3	OR	Consider the following IP address: **10010001 . 00001010 . 00100010 . 00000011** Express the IP address in decimal-dotted notation. Also write its class name and default subnet mask.	3+2
Q.4	A doctor sees many patients and a patient may have many doctors. Many doctors may consult on a test and recommend it. A doctor can recommend many tests to a patient. Patients have a token number, name and age. Doctor has name, qualification, contact no and specialization. Likewise, test has name, date, time and result of test. Patient, doctor and test have unique identifiers. Observe the above scenario and answer the following: i Enlist the entities ii. Enlist attributes for each entity iii. Draw an E-R diagram and assign cardinalities	1+1 +3	OR	What are the functions of the following expansion cards? **a)** Sound card **b)** Modem card	2.5 + 2.5
Q.5	What is Random Access Memory (RAM)? Explain the two main types of RAM (DRAM and SRAM) in terms of functionality and performance.	05	OR	Observe the table **STUDENT,** apply normalization rules, and convert the table up to 2NF by showing step by step procedure of 1NF, 2NF **STUDENT** Std ID | StdName | Society ID | Soc Name | Sup ID | Supervisor | Position 123 | Nosheen | 001 | Urdu | 1 | Mr.Waseem | Chairman 003 | Maths | 2 | Ms.Ayesha | Member 132 | Khalida | 001 | Urdu | 1 | Mr.Waseem | Member 142 | Ali | 002 | English | 1 | Mr.Waseem | Member 005 | Physics | 3 | Mr.Liaqat | Chairman 008 | Biology | 4 | Ms.Yasmeen | Member	05
Q.6	Explain the purpose and applications of any two types of short distance wireless communication	2.5 + 2.5	OR	What is the main distinction between system software and application software? How do they work together? Explain the purpose of business software and provide two examples	1+1 + 2+1