

University of Asia Pacific
Department of Computer Science and Engineering
Mid-Semester Examination Spring-2022
Program: B.Sc. in CSE

Course Title: Introduction to Computer Science and Programming Methodology

Course No. CSE-101

Credit 3.0:

Time: 1.00 Hour.

Full Mark: 60. There are Four Questions. Answer three questions including Q-1 and Q-2.

- 1 a. Zafrin is writing an essay on "The Global Impact of Covid Pandemic" using the MS Word tool. As she was typing on the keyboard, the information was being displayed on the monitor. After working for several hours, she had severe wrist ache and back pain. This symptom is known as RSI. [10X2=20]

- I. Under the aforementioned scenario, discuss the working procedure of a keyboard.
- II. What do you mean by the term ergonomics? Provide suggestions so that Zafrin can avoid RSI while working and maintain proper ergonomics.

2. Suppose you are working with a number system of base-18 (you have 18 digits in your system- 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G, H). Write the numbers from $(106)_{10}$ to $(116)_{10}$ in your system. [10]

- b. Sajib, Api, Surovi and Siam are playing Scrabbles. The scoreboard is illustrated on the table below: [10]

Players	Scores
Sajib	$(1010101.1)_2$
Api	$(5E)_{16}$
Surovi	$(117)_8$
Siam	$(99.75)_{10}$

Determine the position/rank of each of them using the scoreboard.

3.

Perform the following operations as instructed:

[4x5=20]

- I. $(10000101)_2 - (10110111)_2$
- II. $(11110101)_2 - (10100101)_2$
- III. $(101011.01001)_2 + (110011.001)_2$
- IV. $(1010)_2 * (101)_2$

OR

- I. $(ACB00BD)_{16} + (DB319)_{16}$
- II. $(FC103)_{16} - (10ACD)_{16}$
- III. $(735)_8 * (56)_8$
- IV. $(5645)_7 + (3212)_4$

[4x5=20]

University of Asia Pacific
Department of Basic Sciences & Humanities
Mid-Semester Examination, Spring -2022
Program: B.Sc. in Computer Science and Engineering (1st year/1st semester)

Course Title: Basic Calculus & Co-ordinate Geometry
Credit: 3.00

Time: 1.00 Hour

Course Code: MTH 101
Full Marks: 60

There are **FOUR** questions. Answer **THREE** questions including **Question 1 and 2**. Figures given in the right margin indicate the marks of the respective questions.

1. (a) $\left\{ \begin{array}{l} \frac{1}{x+2}, x < -2 \\ x^2 - 5, -2 < x \leq 3 \\ \sqrt{x+13}, x > 3 \end{array} \right.$ Let $f(x) = \dots$ Find $\lim_{x \rightarrow -2} f(x)$. 08
- (b) Evaluate $\lim_{x \rightarrow \frac{\pi}{2}} (\sin x)^{\tan x}$. 08
- (c) Sketch the graph of $y = \frac{1}{1-x}$. 04
2. (a) Let $f(x) = \begin{cases} 1 & \text{for } x < 0 \\ 1 + \sin x & \text{for } 0 \leq x < \frac{\pi}{2} \end{cases}$. Test the differentiability of $f(x)$ at $x = 0$. 08
- (b) If $y = \sin(ax + b)$ find y_n . 08
- (c) Find the domain and range of $f(x) = \sqrt{4-x^2}$. 04
3. (a) If $y = \sin^{-1} x$ then show that $(1-x^2)y_{n+2} - (2n+1)xy_{n+1} - n^2y_n = 0$. 08
- (b) Find the equation of the tangent at (x, y) to the curve $\left(\frac{x}{a}\right)^{\frac{2}{3}} + \left(\frac{y}{b}\right)^{\frac{2}{3}} = 1$. 08
- (c) Expand $\ln(1+x)$ in powers of x in an infinite series. 04
- OR**
4. (a) An open box is to be made from a 16-inch by 30-inch piece of cardboard by cutting out squares of equal size from the four corners and bending up the sides. What size should the squares be to obtain a box with the largest volume? 08
- (b) If $W = \sin^{-1}\left(\frac{x^2 + y^2}{x+y}\right)$, show that $x \frac{\partial W}{\partial x} + y \frac{\partial W}{\partial y} = \tan W$. 08
- (c) Expand e^{-x} in powers of $(x-2)$ in an infinite series. 04

University of Asia Pacific
Department of Basic Sciences and Humanities
Mid-Semester Examination, Spring- 2022
Program: B.Sc. Engineering (CSE, 1st year/1st semester)

Course Title: Physics

Course No. PHY-101

Credit: 3.00

Time: 1.00 Hour

Full Mark: 60

There are **Four** questions. Answer **Three** including **Q-1** and **Q-4**. Figures in the right margin indicate marks.

1. (a) Define crystalline and amorphous solids and explain them with example. 15
(b) Write short note on polycrystalline solids. 5
2. Explain Bragg's law. Determine Bragg's equation. 20

OR

3. (a) Define energy level with figure. 5
(b) Classify solids and explain each in terms of energy bands. 15
4. Write short notes on (i) Newton's corpuscular theory, (ii) Wave theory, (iii) Electromagnetic wave theory, (iv) Quantum theory of light. 20

University of Asia Pacific
Department of Basic Sciences and Humanities
Mid Semester Examination, Spring 2022
Program: B.Sc. Engineering (Computer Science)
1st year 1st semester

Course Title: Bangladesh Studies: Society and Culture
Credit: 2
Full Marks: 40

Course Code: HSS 111(a)

Total Time: 1 Hour

There are **THREE** Questions. Answer **TWO** including **Q1** (20+20)
Figures in the right margin indicate marks.

- Q1.** a. Define culture and the elements of culture. 5
- b. Briefly discuss how nonmaterial elements of culture play a stronger role in building up an individual's social identity. 15

- Q2.** a. Define socialization. 3
- b. What are the theories of child development? Briefly discuss the theory of child development given by Jean Piaget. 17

OR

- Q3.** a. Name four major theoretical perspectives sociologists use. Mention the key persons. 3
- b. Briefly state the differences between the conflict and the functionalist perspectives with relevant examples. 17

University of Asia Pacific
Department of Basic Sciences and Humanities
Mid Semester Examination, Spring 2022
Program: B. Sc. Engineering (Computer Science)
1st year 1st semester

Course Title: Bangladesh Studies: History Course Code: HSS 111(b)

Credit: 2.00

Total Time: 1 Hour

Full Marks: 40

There are **Three** Questions. Answer **Two** Questions including Q-1.

1. a. Why the era of Sasanka is so significant in the history of Bengal? 5
b. How Gopala did establish his authority over Bengal during the *Matsyanyayam*? 5
c. Write in detail about the achievement of the Pala Dynasty. 10
 2. a. Write about the achievements of two Independent Sultanate dynasties. 10
b. Describe the Muslim society of Bengal under the Muslim Sultanate. 10
- OR
3. a. Discuss how the Mughals established their authority in Bengal by defeating the 10
Bera Bhuiyans.
b. Write about the Mughal rule in Bengal in light of the activities of important 10
Subadars.

University of Asia Pacific
Department of CSE
Mid-Semester Examination, Spring 2022
Program: B.Sc. (Honours) in CSE
Year: 1st Semester: 1st

Course Title: English I – Written and Spoken English Course Code: HSS 101 Credit: 3.00
Time: 1 hour Full Marks: 20

Instructions:

- *Marks are indicated in the right margin.
- *Answer all the questions.

1. Correct these sentences.

(1 x 5 = 5)

- a. We arrived late because there were so many traffic on the road.
- b. All of the CDs, even the scratched one, is in this case.
- c. Either my sisters or my mother is coming to the meeting.
- d. Advances in medicine mean that people are living longer.
- e. The number of students going to higher education have increased.

2. Fill in the blanks with appropriate words.

(1 x 5 = 5)

- a. People communicate by both visual and _____ (aural/oral) means.
- b. The drug can be harmful if taken in _____ (access/excess).
- c. The horse walked with an unsteady _____ (gait/gate).
- d. The training airplane has _____ (dual/duel) controls.
- e. Technology without the creative _____ (flair/flare) of the programme-maker to fill the new channels would be sterile.

3. Suppose you are Ahmed Nihal. You have recently completed your B.Sc. in Computer Science and Engineering from UAP. You would like to go abroad for higher studies. Now write a letter to the International Student Adviser of a foreign university to seek further information about their M.Sc. program.

(10 x 1 = 10)

The End