GLOBAL SCHOOL OF SCIENCE

Fourth Weekly Exam – [Bhadra 22, 2082]

PHYSICAL GROUP

Class: XI **Full Marks: 70**

Time: 80 min + 80 min

Attempt all questions

Mathematics

Group A

Multiple Choice Questions **[4 × 1 = 4]**

Rewrite the best option in your answer sheet.

1. If $A \subseteq B$ then $A \cap B =$

   a) B b) A c) $\bar{A}$ d) ϕ

2. Which of the following relation is true for a complex number z?

   a) $z^2 = |z|^2$ b) $z = Re(z) + Im(z)$

   c) $|z| = |\bar{z}|$ d) $z^2 \geq 0$

3. $\lim\limits_{x \to 0} \frac{\sin 5x}{\tan 7x} =$

   a) $\frac{5}{7}$ b) $\frac{7}{5}$ c) 0 d) does not exist

4. $\lim\limits_{x \to 0} \frac{\tan x^\circ}{x} =$

   a) $\frac{180}{\pi}$ b) $\frac{\pi}{200}$ c) $\frac{200}{\pi}$ d) $\frac{\pi}{180}$

Group B

Short Answer Questions. **[3 × 5 = 15]**

5. a. State De-Morgan's laws for two sets and prove any one of them. [1+2]

   b. Define difference of two sets in set builder form. For two non-empty sets A and B, prove that $A - B = A \cap \bar{B}$. [2]

6. a. For a complex number z, if $z^2 = 7 - 24i$, then find all possible values of z. [3]

b. For a complex number $z = \frac{(2, -3)}{(2, 3)}$, find $|z|$ and hence find $z\bar{z}$. [1+1]

7. a. Evaluate: $\lim_{x \to \theta} \frac{x \sin\theta - \theta \sin x}{x - \theta}$ [3]

b. Evaluate: $\lim_{x \to y} \frac{\tan x - \tan y}{x - y}$ [2]

Group C

Long Answer Questions. **[2 × 8 = 16]**

8. a. Define a contradiction. For two simple statements p and q, check whether the compound statement $(p \wedge q) \wedge (p \wedge \sim q)$ is contradiction or not? [1+2]

b. For two complex number z and ω, prove that:
$|z + \omega| \leq |z| + |\omega|$ [3]

c. Evaluate: $\lim_{x \to 0} \frac{1 - \cos x}{3x^2}$ [2]

9. a. For any three non-empty sets A, B and C, prove that:
$A - (B \cup C) = (A - B) \cap (A - C)$ [3]

b. If $z = 4 - 3i$ then find $|z^2|$ and $|z|^2$. What conclusion can be drawn from both the results? [2]

c. Evaluate: $\lim_{x \to \infty} \sqrt{x}\left[\sqrt{x} - \sqrt{x - a}\right]$ [3]

Computer Science

Group A

Multiple Choice Questions [4 × 1 = 4]

Rewrite the best option in your answer sheet.

1. Which part of the computer was used for calculating and comparing?

   a) Memory Unit
   b) CU
   c) ALU
   d) Input Unit

2. What is the main purpose of secondary storage device?

   a) Executing computer instructions
   b) Temporary storage of data
   c) Permanent storage of data
   d) All of these

3. Which of the statement is true about BUS architecture?

   a) A software which is used to transfer data
   b) A method of transferring data
   c) A communication path way over which information and signal are transferred.
   d) All of the above

4. What is the name is given to the first generation of computer language?

   a) Binary Language
   b) Machine Language
   c) Primary Language
   d) Natural Language

= 4]

Group B

Short Answer Questions. [3 × 5 = 15]

5. Differentiate between primary and secondary memory.
6. What is mobile computing? Explain the advantages and disadvantages of mobile computing.
7. Explain supercomputers and mainframe computers in detail.

Group C

Long Answer Questions. [2 × 8 = 16]

8. What are the generations of computers? Explain the different generations of computers along with their technological developments.
9. What is a system bus? Explain the bus architecture with well-labeled diagram.

The End

Semiconductor