

**U.G. 3rd Semester Examination-2019**

**MATHEMATICS**

**[PROGRAMME]**

**Skill Enhancement Course (SEC)**

**Course Code : MATH(G)SEC-1A&B/T**

**SET-I**

Full Marks : 40

Time : 2 Hours

*The figures in the right-hand margin indicate marks.*

*Symbols have their usual meanings.*

**Answer all the questions from Selected Option.**

**OPTION-A**

**MATH(G)SEC-1A-T**

1. Answer any five questions: 2×5=10

a) Define conditional statement.

b) Draw up truth table and prove that  $\sim(\sim p) \equiv p$ .

c) Define set.

d)  $A = \left\{1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}\right\}$ ,  $B = \left\{\frac{1}{2}, \frac{1}{4}, \frac{1}{6}, \frac{1}{8}\right\}$ ,

$S = \left\{1, \frac{1}{2}, \frac{1}{3}, \dots, \frac{1}{9}\right\}$ . Find  $(A \cup B)'$ ,  $B' - A'$ .

*[Turn over]*

- e) What do you mean by classes of sets?
- f) Prove that if  $A - B = A$  then  $A \cap B = \phi$ .
- g) Write the truth table of disjunction.

2. Answer any two questions: 5×2=10

- a) Give an example of a relation which is symmetric and transitive but not reflexive.
- b) Prove by using law of algebra of sets

$$(A \cap B') \cap A' = \phi.$$

- c) Draw up truth table and prove that

$$\sim(p \Rightarrow q) \equiv p \cap (\sim q).$$

3. Answer any two questions: 10×2=20

- a) i) Write the laws of algebra of sets.
- ii) Using Venn diagrams prove that

$$(A \cap B)' = A' \cup B'. \quad 5+5$$

- b) i) Let  $\mathbb{Z}$  be the set of all integers. If  $a, b \in \mathbb{Z}$  then  $a \equiv b \pmod{5}$  iff  $a - b$  has factor 5. Prove that  $\equiv$  is an equivalence relation on  $\mathbb{Z}$ .

- ii) Prove by using law of algebra of sets  $A \Delta B = B \Delta A$ . 5+5

- c) i) Verify whether the following statements are equivalent:

$$(\sim (p \wedge q)) \text{ and } ((\sim p) \vee (\sim q)).$$

- ii) Show that an equivalence relation on a set determines a partition on that set. Is the converse true? Justify.  $5+5=10$



**OPTION-B**  
**MATH(G)SEC-1B-T**

1. Answer any **five** questions:  $3 \times 5 = 15$
- a) What is the difference between Raster Scan and Random Scan?
  - b) What is display processors?
  - c) What is character generators?
  - d) Write some important input devices which are used in a computer.
  - e) What is Computer Graphic Scan Conversion?
  - f) What is line-drawing algorithms?
  - g) What is circle and ellipse drawing algorithms?
2. Answer any **five** questions:  $5 \times 5 = 25$
- a) Write down a short note about polygon filling.
  - b) Write down a short note about polygon anti-aliasing.
  - c) Write down a short note about line clipping algorithms.
  - d) Write down a short note about polygon clipping algorithms.
  - e) What is the need of transformation in computer graphics?
  - f) What is clipping? Explain a polygon clipping algorithm.
  - g) Write a short note on character generation.