432   E

Unique Paper Code – A645
Name of the Paper - Mathematical Awareness (In lieu of Qualifying Course)
Name of the course - B.A(Hons.)French
                    B.A(Hons.)Italian
                    B.A(Hons.)German
                    B.A(Hons.)Social Work
Semester - 1
Duration – 2hrs.
Maximum Marks –38 for regular | 50 for NCWEB

Attempt all the questions as per the directions question wise.

1. Do any two parts
   (a) Answer the following briefly:

   i.   When and what was Ramanujan's first job work other than tuitions?
   ii. What is the full name of Ramanujan?Name the disease from which Ramanujan was
        suffering?.
   iii. Where was Srinivas Ramanujan born?
   iv. Name the goddess Ramanujan himself attributed his excellent powers to.   **(4)**

   (b)   Answer the following :

        a. Name the book written by Newton that explained the theory of Gravitation.
        b. When did Noether die?
        c. What was the 'Principia' based upon?
        d. Name the city where Euclid used to teach?   **(4)**

   **(c) State which of the following statements are true or false. If false, give the correct
   answer.**

        a. Newton discovered the series for log (1+x).
        b. Ramanujan received all his early education in Kumbhakonam.
        c. Euclid geometry deals with the geometry of triangles and circles.
        d. Emmy Noether was born in 1881.   **(4)**

2. Do any three parts:

a) Define
  i. Algebraic numbers
  ii. Transcendental numbers
  iii. Prime numbers
  iv. Mersenne primes
  v. Fermat numbers (5)

b) i. Write the recursion formula for the Fibonacci numbers. (3)
  ii. State the Prime Number Theorem as stated by Gauss. (2)

c) i. Define Magic Square of nth order. (3)
  ii. Define Latin Squares and Diagonal Latin squares. (2)

d) i. In how many ways five Indian and four Englishmen can be seated at a round table if no two Englishmen sit together? (3)
  ii. Define primitive Pythagorean Triples. State the Pythagorean number theorem. (2)

3. Do any three parts:

(a) Make a comparative study of the following:
  i. Euler Path and Hamilton Path.
  ii. Fractals and snowflake curves. (5)

(b). State Four Colour Map Theorem. What is a chromatic number? Give chromatic number for a plane and Klein Bottle. (5)

(c) State Euler's formula for polyhedra. Verify it for five regular polyhedra. (5)

d) . Explain the difference in the paintings before and after the development of the perspective geometry. (5)

4. Do any two parts :

a) . Find the two numbers whose arithmetic mean is 10 and geometric mean is 8. (4)

b).. From a pack of 52 cards, two cards are drawn at random. Find the probability that one is a king and other is a queen. (4)

(c) Use graphical method to solve the LP problem:

$$\text{Min } z = 4x + 3y$$

w.r.t.

$$x + y \leq 5$$
$$-x + y \leq 7$$
$$x + 2y \geq 10$$
$$x, y \geq 0$$

Also indicate the feasible region. (4)