Roll No. ☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (Radiotherapy Technology)   (Sem.–1)
ELEMENTARY MATHEMATICS AND PHYSICS
Subject Code : BSRT-101-19
M.Code : 77188

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. **Write briefly :**

   a) Find the angles of triangle which are in the ratio of 2:3:4.

   b) Draw the line passing through (2, 3) and (3, 2). Find the coordinates of the points at which this line meets the x-axis and y-axis.

   c) Find the amount of interest if Rs. 20000 is invested at 10% per annum (p.a.) for 3 years.

   d) A and B complete a work in 6 days. A alone can do it in 10 days. In how many days they can together do the work?

   e) The angle of elevation of a ladder leaning against a wall is 60° and the foot of the ladder is 12.4 m away from the wall. Find the length of the ladder.

   f) What is meant by quantization of charge?

   g) Why is it necessary to make rubber tyres of aircrafts slightly conducting? It may be noted that ordinary rubber is an insulator.

   h) What is the relation between Tesla and Gauss?

   i) What do you mean by Lorentz force?

   j) How does a voltmeter differ from ammeter?

SECTION-B

2. A number is increased by 20% and then decreased by 20%. Find the net increase or decrease percent.

3. Plot a line graph for the variables p and q, where p is four times q, i.e., the equation is p = 4q. Using the graph, find the value of (i) p, when q = 6 and (ii) q, when p = 20.

4. A and B can do a piece of work in 12 days, B and C in 15 days, and C and A in 20 days. How much time will A alone take to finish the job?

5. What is meant by electric lines of force? Give their important properties.

6. What do you mean by alternating current? Discuss power factor of an AC circuit.

SECTION-C

7. A reduction of 20% in the price of sugar enables Mrs. Shah to buy an extra 3 kg of it for Rs.360. Find :

   a) The original rate

   b) The reduced rate per kg.

8. What is Biot-Savart's Law? Derive an expression for the magnetic field at a point near a long straight wire carrying a current.

9. What do you mean by electromagnetic induction and self-inductance? Discuss construction and working of transformer.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.