

[LP 1019]

OCTOBER 2019

Sub. Code: 4012

**M.Sc. MEDICAL PHYSICS EXAMS
FIRST YEAR
PAPER II – RADIOLOGICAL MATHEMATICS**

Q.P. Code : 284012

Time : Three hours

Maximum : 100 marks

I. Elaborate on :

(2 x 20 = 40)

1. a) Find the regression equation Y on X for the following data and find the expected SBP of a person who is 60 years old.

| | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Age | 40 | 45 | 48 | 50 | 55 | 50 | 54 | 58 |
| SBP | 120 | 125 | 130 | 127 | 142 | 140 | 146 | 148 |

- b) Differences between correlation and regression.
2. a) A radiologist has to diagnose a cancer patient from a list of 50 patients, 20 of them women and 30 men and 10 of them were found cancer and others were not. 15 of them were urban patients and remaining were not urban. What is the probability of the radiologist diagnosing a urban women cancer patient?
- b) Difference between Binomial and Poisson distribution.

II. Write notes on:

(10 x 6 = 60)

1. Line symmetry and Mirror symmetry.
2. Truncation error ii) Relative error iii) Absolute error.
3. Properties and applications of 't' distribution.
4. Prepare a decay chart and tabulate for Co-60 isotope for the period one half life.
5. Discuss Euler's method and modified Euler's method.
6. MATLAB.
7. Probability sampling.
8. Presentation of data.
9. Picard's method.
10. Use the Taylor series method of order four to solve the initial value problem $u' = t^2 + u^2, u(0) = 1$.
