**[LN 1018]** OCTOBER 2018 **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. In an attempt to plot Dose Response curve (DRC), a bioassay was performed with the following results. Find whether any relationship exists.

| Log dose | 0.3 | 0.6 | 0.9 | 1.2 | 1.5 | 1.8 | 2.1 |
|---|---|---|---|---|---|---|---|
| Response | 32 | 58 | 94 | 120 | 150 | 174 | 213 |

2. a) A study revealed that among 90 males 15 were obese and among 60 females 20 were obese. Use chi square test to find whether sex and obesity are associated. ($\chi 2$=3.84 at 5% level).
   b) Discuss precautions for applying chi square distribution.

**II. Write notes on:** **(10 x 6 = 60)**

1. Prepare the decay chart for cobalt-60 teletherapy isotope for the period of one half- life.
2. Define signal to noise ratio.
3. Binominal distribution.
4. Ranga-kutta method.
5. Properties of F test.
6. Define: (i) Truncation error (ii) Round-off error (iii) Relative error.
7. Calculate Mean, standard deviation for the following Diastolic blood pressure data: 93, 90, 95, 85, 90, 78.
8. Evaluate $\int_{-3}^{3} x^4 dx$ using (i) Trapezoidal rule (ii) Simpson's one-third rule.
9. Advantages of MATLAB.
10. Presentation of Data.

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