

92235

B. Sc. 4th Semester (Hons) New Scheme

Examination, May-2016

PHYSICS

Paper-Phy-405

Time allowed : 3 hours]

[Maximum marks : 40

Note : Attempt five questions in all, selecting at least two questions from each sections. Use of Scientific calculator and statistical tables are allowed. All questions carry equal marks.

Section-I

1. (a) Find the mean and variance of Binomial distribution. 4
(b) Show that in a Poisson distribution with unit mean, mean deviation about mean is $(2/e)$ times the standard deviation. 4
2. (a) For a normal distribution with mean 50 and s.d. 15, find Q_1 and Q_3 (quartile deviation). 4
(b) Define normal distribution. What are the different properties of normal distribution. 4

3. (a) In partially destroyed laboratory record of an analysis of correlation data, the following results only are legible : 4

Variance of $X = 9$ Regression equation are $8X - 10Y + 66 = 0$, $40X - 18Y = 214$. Find

- (i) the mean values of X and Y
- (ii) the correlation co-efficient between X and Y
- (iii) the standard deviation of Y .

- (b) State and prove central limit theorem for independent and identically distributed random variables. 4

4. (a) Define geometric distribution. Find its moment generating function. 4

- (b) A continuous random variable X has p.d.f.

$$f(x) = 3x^2, 0 \leq x \leq 1$$

find

- (i) the mean and variance

- (ii) k s.t. $f(x < k) = \frac{1}{2}$. 4

Section-II

5. (a) Is Chi-square test of goodness of fit a distribution free method? Justify. 4

- (b) Define Chi-square distribution, State the application of Chi-square distribution. 4

6. (a) Explain in detail the t-test for difference of means. 4

- (b) Ten soldiers visit a rifle range for two consecutive week For the first week their scores are 67, 24, 57, 55, 63, 54, 56, 68, 33, 43, and during the second week they score in the same order : 70, 38, 58, 58, 56, 67, 68, 72, 42, 38. Examine if there is any significant difference in their performance. 4

7. (a) What is meant by sampling distribution and standard error ? Explain. Write standard error of mean. 4

- (b) Define two types of errors, level of significance. 4

8. (a) Obtain the mode of-distribution with (n_1, n_2) d.f. and show that it lies between 0 and 1 4

- (b) Write a short note on application of F-distribution. 4