

**UG 5th Semester Examination 2021**

**ECONOMICS (Honours)**

**Paper Code : SEC-1**

**Advanced Statistics**

**[CBCS]**

Full Marks: 32

Time: Two Hours

*The figures in the margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable.*

**Group – A**

Answer any **four** questions.

2×4=8

1. Define 'Mutually Exclusive' events.
2. What do you mean by a random variable?
3. What is the difference between SRSWR and SRSWOR?
4. What do you mean by type I and type II error?
5. Given  $P(A) = 1/2$ ,  $P(B) = 1/3$ ,  $P(AB) = 1/4$  find  $P(\bar{A})$  and  $P(A/B)$ .
6. Define 'Power of a Test'.

**Group – B**

Answer any **four** questions.

4×4 = 16

7. If events A and B are independent then prove that  $\bar{A}$  and  $\bar{B}$  are also independent.
8. If arithmetic mean and standard deviation of a binomial distribution are respectively 4 and  $\sqrt{8/3}$ , find the values of n and p.

9. A card is drawn from each of two well-shuffled packs of cards. Find the probability that at least one of them is an ace.
10. A normal distribution has mean 10.4 and SD 1.2. Find the limits within which a randomly chosen observation would lie with certainty.
11. If a random variable X follows Poisson distribution such that  $P(X=1) = P(X=2)$ ; then find the value of (i) Mean (ii)  $P(X=0)$
12. Differentiate between 'Stratified Sampling' and 'Multi-stage Sampling'.
13. Define Chi-square ( $\chi^2$ ) Distribution. State its two important characteristics.
14. A machine produced 20 defective articles in a batch of 400. After altering it produced 10 defectives in a batch of 300. Has the machine improved? Comment

**Group – C**

Answer any *one* question.

8×1=8

15. A bag contains 8 red and 5 white balls. Two successive draws of 3 balls are made without replacement. Find the probability that the first drawing will give 3 white balls and the second 3 red balls.
16. Two random samples are drawn from two populations and the following results were obtained :  
 Sample I: 16 17 18 19 20 21 22 24 26 27  
 Sample II: 19 22 23 25 26 28 29 30 31 32 35 36

Find the variances of the two samples and test whether the two populations have the same variance.