Reg. No...................................   Name...

M. A. DEGREE END SEMESTER EXAMINATION APRIL 2017
SEMESTER – 2: ECONOMICS
COURSE: 16P2ECOT10 – STATISTICAL TOOLS FOR ECONOMIC ANALYSIS
(For Regular - 2016 Admission)

Time: Three Hours   Max. Marks: 75
(Use of Scientific calculators and statistical tables permitted.)

PART A
Answer any *eight* questions. Each question carries **2** marks

1. Define random variable with examples.

2. What do you understand by   probability mass/density function?

3. What are the properties of cumulative distribution function?

4. What are the properties of mathematical expectation?

5. Define raw moments.

6. Define Poisson distribution and point out its relevance.

7. Define lognormal distribution.

8. Explain the concept of sampling distribution.

9. Distinguish between parameter and statistic with examples.

10. What is point and interval estimation?

11. Define the standard normal distribution.

12. Write the mean and variance of the chi-square distribution.

(2 x 8 = 16)

PART B
Answer any *seven* questions. Each question carries **5**marks

13. Derive   the mean and variance of binomial distribution .Given that mean =6 and variance =4, find the value of n and p.

14. I f a discrete random variable   has the probability function as,

x:	0	1	2	3	4	5	6	7	8
P(x):	c	2c	3c	5c	5c	4c	3c	2c	c

    Find i)   the value of c   ii) E(x)

15. If $f(x) = e^{-x}$, $0 < x < \infty$, Find the mean and variance of the distribution.

16. The traffic police recorded an average of 3 road accidents per week .The number of accidents is distributed as Poisson distribution. Find the probability of

   i) at most one accident per week   ii) exactly two accidents per week.

17. Explain i) Type I and Type II errors ii) Significance level and power of the test.

18. The sample mean   from a random sample of size 50 drawn from a population   has the value 52.5. The population standard deviation is known to be equal to 16.

   Find   95%   confidence interval for the population mean.

19. Explain the concept of null and alternative hypotheses, Acceptance region a and rejection region.

20. Define student's 't' distribution .What are the basic assumptions for student's t test.

21. A manufacturer of dry cells claimed that average life of their cells is 24.0 hours. A sample of 10   cells had   mean life of 22.5 hours with a standard deviation of 3.0 hours. On the basis of   available   information,   test whether the claim of the manufacturer is correct.

22. Explain the method of testing   proportion of single population.

$(7 \times 5 = 35)$

PART C
Answer any *two* questions. Each question carries 12 marks

23. Describe the Chi-square   distribution and test of independence.

   Data on the sex and preference for the colour are given in the table. Test whether there is any   relationship between sex and preference for the colour.

colour	Sex		
	Males	**Females**	**Total**
Green	40	60	100
Yellow	30	20	50
White	30	20	50
Total	100	100	200

24. Explain the concept and   assumptions of ANOVA.

   The following table relate to the production in kgs. of three machines A,B,C.

A	14	16	18		
B	14	13	15	22	
C	18	16	19	19	2

Is there any significant difference in the production of three machines? α=0.05

25. What are the properties of normal distribution?

The life expectancy of light bulbs whose life times are normally distributed with a mean life of 750 hours with a standard deviation of 80 hours. What is the probability that a light bulb will   last 850 hours   ii)   between 780 and 850 hours.

26. Explain the paired't' test. The results of   IQ test are given below. Find out whether there is any change in IQ after the training   programme,   given α=0.05

Candidate	1	2	3	4	5	6	7
IQ before	112	120	116	125	131	132	129
IQ after	120	124	118	129	136	136	125

(12 x 2 = 24)

****