Total No. of Questions : 4]

SEAT No. :

P5925

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T.Y. B.Com.
STATISTICS
365 f : Business Statistics - II
(2019 Pattern) (Semester - VI)

Time : 2½ Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right side indicate full marks.***

Q1) A) Attempt the following: **[5×1]**

Choose the correct alternative of the following (any five)

a) If X follows standard normal distribution then P(X < 2) =

i) P(X > 2) ii) P(X >-2)
iii) 1 - P(X > -2) iv) 1-P(|X|>2)

b) The hypothesis stating that average proportion of defective entries in journal is less than 10% is

i) left sided hypothesis
ii) right sided hypothesis
iii) two-sided hypothesis
iv) null hypothesis

c) Let $X \rightarrow N$ (300,25) then standard deviation is

i) 300 ii) 12
iii) 25 iv) 5

d) To test independence of two attributes with one attribute at 3 levels and another attribute at 4 levels, under null hypothesis distribution is chi-square with degrees of freedom.

i) 2 ii) 3
iii) 1 iv) 6

e) Testing H0 : P = 0.5 against H1 : P ≠ 0.5 the critical region is

i) left tailed ii) right tailed
iii) two sided iv) neither (i) or (ii)

f) Simple random sampling is used when the population is:

i) Homogeneous ii) Heterogeneous
iii) Discrete iv) Continous

g) The _____ sum of squares measures the variability of the observed values around their respective block means.

i) Error ii) Total
iii) Treatment iv) Block

P.T.O.

B) State whether the following statements are True or False. **[5×1]**

a) Probability of committing type II error is called as level of significance.

b) Selecting a college representative when college is multidisciplinary is systematic sampling.

c) For certain normal distribution mean is 45 and mode is 58.

d) Long form of ANOVA Analysis of variance.

e) Large sample tests are also called as exact test.

Q2) Write short notes (any two) **[5 each]**

a) Stratified sampling

b) Normal distribution

c) Analysis of Variance (ANOVA)

d) Chi-square test

Q3) A) a) Let X be normally distributed random variable with parameters mean = 40 and variance = 1 that is $X \sim N(40, 1)$. **[4]**

Calculate:

i) $P(X \geq 42)$

ii) $P(39 \leq X \leq 41)$

b) From a locality 200 persons were randomly selected and the information regarding educational achievements was collected. The Result is as follows. **[4]**

	Litterate	Illiterate
Men	20	80
Women	30	70

Examine whether gender and education are associated.

(Given : $\chi_{21,0.05} = 3.841$)

B) a) Fill in the blanks of the following ANOVA tables marked "–" **[4]**

Source of variation	Degrees of freedom	Sum of squares	Mean Sum of squares	Variance Ratio
Between shifts	2	41.74		
Between workers	4			
Error		106.79		
Total	14	496.96		

Test the homogeneity of machine shits and workers. Use 5% level of significance

b) On the basis of the following data can we say that there is significant difference in average reading rate of boys and girls: (use 5% level of significance) **[3]**

	Sample size	Average reading rate	Variance
Girls	100	206	450
Boys	100	191	450

Q4) A) a) The PI (pulsality index) of 10 patients before and after certain event are given below: **[4]**

Before	0.45	0.54	0.48	0.62	0.48	0.60	0.45	0.46	0.35	0.40
After	0.60	0.65	0.63	0.78	0.63	0.80	0.69	0.62	0.68	0.50

Test whether PI differ significantly? Use 5% level of significance.

[Given $t_{9,0.05} = 2.262$]

b) In a certain area A, in a sample of 1000 persons 556 persons were found to be vegetarian. Where as in a certain area B, in a sample of 800 persons 330 persons were found to be vegetarian. Do these facts reveal a significant difference between the two areas with respect to food habits? (Use 5% level of significance) **[4]**

B) a) In a population of size 5 the values are 12, 23, 56, 18, 17. Draw all possible sample of size 2 using SRSWOR. Verify that sample mean is an unbiased estimator of population mean. **[4]**

b) Define Normal probability distribution, also state additive property of two independent normal variates. **[3]**