MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2017/2018

THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF ARTS IN PSYCHOLOGY WITH INFORMATION TECHNOLOGY

CITY CAMPUS –REGULAR

APY 305: STATISTICS

Date: 21ˢᵗ February, 2018   Time: 9.00 - 12.00pm

INSTRUCTIONS:

- Answer Question ONE and any other TWO

1. a.) Explain the terms below

   i)   Psychological statistics(5mks)
   ii)   Sample(5mks)

   b.) What is the role of hypothesis in statistics (5mks)

c.) Differentiate between

   i.) descriptive and inferential statistics (5mks)
   ii.) Regression and correlation (5mks)

c.) Educational researchers have hypothesized a relationship between academic self-esteem and school achievement. Examples of these two variables are listed below

Participant	Self esteem	Achievement
1	25	52
2	34	66
3	43	78
4	21	48
5	48	85
6	29	62
7	33	72
8	41	70
9	36	66
10	18	40
11	27	50

12	24	43

For the data above calculate the correlation coefficient between self-esteem and achievement using Karl Pearson's product moment formula and interpret the results.(5mks).

2.a) Explain the term scatter diagram(graphic) method in correlation (5mks)

b.)What are the merits and limitations of using scatter plot in finding correlation coefficient? (5mks)

c.) A researcher was interested in how well student's attitude towards mathematics at the beginning of the school year predicted final exam scores in a ninth grade algebra class. He obtained the following results.

Student	Attitude towards mathematics(X)	Final exam score(Y)
1	59	114
2	52	114
3	45	100
4	52	100
5	46	72
6	45	102
7	60	120
8	36	70
9	44	64
10	49	76
11	43	84
12	41	68
13	60	120
14	46	76
15	49	94
16	42	80
17	43	52
18	33	62
19	23	76
20	42	80
21	46	84
22	60	108
23	43	74
24	51	84
25	51	66
26	51	102

27	32	68
28	37	74
29	42	56
30	44	93

i.   For the information provided in the table, construct a scatter plot with the attitude towards mathematics on the x-axis and the final exam scores on the y-axis. Once the scatter plot has been constructed, sketch where you estimate the best fitting regression line should be placed.(2mks)

ii. Calculate the slope and intercept of the regression line. Write the regression equation.(2mks)

iii. At the beginning of the next school year, students were administered the attitude towards mathematics scale. What will be the predicted final exam scores of three students whose attitude towards mathematics scores were 26, 43, and 53?(2mks)

iv. What is the probability of a student getting a final exam score of 70 or below if that student has a score of 43 on the attitude towards mathematics scale?(2mks)

v.   What is the probability of a student getting a final exam score of 100 or above if that student has a score of 26 on the attitude towards mathematics scale?(2mks)

3. a)Explain two assumptions of Spearman's rank order correlation coefficient.(4mks).

b) Give two merits and one limitation of rank method (6mks)

c.) As part of a study of the effect of group pressures for conformity upon an individual in a situation involving monetary risk, researchers administered, a well – known scale on the authoritarianism and social status strivings. We assume (even hope) data is reliable. The data was:

Compute the Spearman rank correlation coefficient and interpret the results.

Student	A	B	C	D	E	F	G	H	I	J	K	L

Scores of authoritarianism (x)	117	82	98	87	40	116	113	11	83	85	126	106
Scores of social strivings(Y)	81	42	46	39	37	65	88	86	56	62	92	54

4. a) Explain the meaning of chi(x^2) test and give any of its five properties(10mks)

b.)A test of creativity (m=80, d=9) is given to a sample of individuals who have been determined to be creative using another method. The researcher believes that creative individuals will differ from the general population on their variability of this measure. Test this hypothesis at alpha(x)=.10 for the data given below:

88, 95, 100, 98, 88, 80, 110, 82, 84, 99, 92, 90, 88, 86.

(For df=13, x2=5.9, for p=.95 and x2=22.4 for p=.05)(10mks)

5. a.)Critically examine any five sampling methods.(5mks)

b.)Suppose the following scores represent a measure of emphatic concern.

47, 57, 44, 58, 49, 49, 51, 54, 50, 51.

i.).What is the variance (S^2) of the set of scores?(4mks)

ii.).If the set of scores listed above represents a sample of scores from the population, what is the unbiased estimate($s^{\wedge 2}$) of the population variance (d^2)?(4mks)

iii.).What is the degreesof freedom for the sample of emphatic concern scores?(4mks)

iv.).What are the critical values of t from table for a 95% confidence interval? 99% confidence interval? 99.9% confidence interval?(3mks)