

COVENANT UNIVERSITY

TUTORIAL KIT

PROGRAMME: DSS

OMEGA SEMESTER

200 LEVEL



Raising A New Generation Of Leaders

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COVENANT UNIVERSITY

CANAANLAND, KM 10, IDIROKO ROAD
P.M.B. 1023, OTA, OGUN STATE, NIGERIA

TITLE OF EXAMINATION: B. SC DEGREE EXAMINATION

COLLEGE: BUSINESS AND SOCIAL SCIENCES

SCHOOL: SOCIAL SCIENCES

DEPARTMENT: ECONOMICS & DEV'T STUDIES

SESSION: 2014/2015

SEMESTER: OMEGA

COURSE CODE: DSS 221

CREDIT UNIT: 2

COURSE TITLE: INTRODUCTION TO POPULATION STUDIES 11

INSTRUCTION: ANSWER QUESTION 1 & ANY OTHER 2 QUESTIONS. TIME: 2 HRS

- 1a) Explain the factors influencing urban growth in Nigeria (10 marks).
b) Explain the determinants of internal migration (10 marks).
c) Explain the characteristics of slums in developing countries (10 marks).
- 2a) Discuss the problems of rural - urban migration and how to stem it in sub-Saharan Africa (10 marks).
b) Discuss the various factors affecting population concentration in Africa (10 marks).
- 3a) Discuss the determinants of urban growth in developing countries (10 marks).
b) Discuss the consequences of migration among West African countries (10 marks).
- 4a) Age and sex are the most basic characteristics of a population. Why and how? (10 marks)
(b) Differentiate between the following concepts using relevant examples.
(i) Rapid and Slowing growth Population Pyramid (5 marks)
(ii) Median age and Child-Dependency (5 marks)
- 5(a) Differentiate between "*a young population*" and "*an aging population*" with examples. (10 marks)
(b) Calculate the Age dependency ratio for each region. (10 marks)

Region	Age <15%	Age 15-64 %	Age 65+%	Dependency Ratio
Africa	44.9	52.0	3.0	
Latin America	35.7	59.7	4.8	
Europe	20.5	66.8	12.7	

MARKING GUIDE

1a) Explain the factors influencing urban growth in Nigeria.

- i. Natural increase, ii. Net migration, iii. Boundary change, iv. Reclassification

b) Explain the determinants of internal migration.

Push-pull factors, pecuniary attractions/social network, immigration policies/government laws, cultural affinity, geographical proximity.

c) Explain the characteristics of slums in developing countries.

Low income population, poverty, unemployment, poor transformation, high crime rate, poor sanitation, lack of amenities such as potable water supply, good educational institution and health. Overcrowding, high proportion of single room dwelling houses, informal settlements, improper land use, arbitrary demarcation of boundaries, absence of well paying manufacturing jobs

2a) Discuss the problems of rural – urban migration and how to stem it in sub-Saharan Africa.

Unemployment, water supply, electricity, sanitation, drainage and solid waste management, housing, efficient /affordable public transportation, environmental degradation, pressure on amenities and urban infrastructural facilities, emergence of sprawl, food scarcity, population congestion, space limitation, moral decay and crime.

Creation of more jobs, provision of low cost housing scheme, rural dev, provision of additional urban infrastructural facilities, urban development scheme, provision of social amenities, development of slums.

b) Discuss the various factors affecting population concentration in Africa.

Factors affecting the population concentration;

1. Geographical /physical factors- topography, climate, soil fertility, mineral deposits,
2. Economic factors- urbanization/modernization/industrialization leading to emergence of companies, education/health institutions, construction, transportation and business establishment thereby attracting people for one thing or the other.
3. Cultural and religious factors
4. Political factors- legislation and government policies on settlement and resettlement, political unrest, conflict or wars

3a) Discuss the implications of young population on socio-economic development in Nigeria. Population or young population, made up of 0-15 years. Increase in youthful population which leads to government diverting resources to social welfare instead of investing in productive undertakings. It tilts age structure leading to increase in rate of resource demand to cater for the population especially the infants, children and mothers. The scenario reduces government savings and investment thereby bringing about poor SED. Cost of treatment of mothers and children, opening new health facilities, educational institutions as well as other basic amenities stretch government resources beyond carrying capacity. The attendant consequences of this in

terms of health, education, and housing inadequacy among others lead to lack of healthy and skilled manpower which lower productivity and affect negatively SED. It also leads to population momentum which is also dangerous as it ensures the growth of population even after replacement level has been achieved.

b) Discuss the consequences of migration among West African countries.

Contributes to population growth, causes unemployment, pressure on social amenities, raises cost of housing and living, causes strain on resources, conflicts due to xenophobia, loss of human capital/skilled labor force, leads to low devt, worsens social indicators such as population per physician ratio, student-teacher ratio, leads to further migration.

4a) Age and sex are the most basic characteristics of a population. Every population has a different age and sex composition—the number and proportion of males and females in each age group—and this structure can have considerable impact on the population’s social and economic situation, both present and future.

The proportion of persons in the working/ productive group of an economy are determined by its age-sex structure, hence, we able to know if the population is relatively young or old. Furthermore, the percentage of women contributing to the fertility of the country are identified and decision makers are better informed about which class of people (in terms of sex or age) to provide a particular service for. (10 marks)

4b) Differences between Rapid and Slow Growth Population

Rapid growth is indicated by a pyramid with a large percentage of people in the younger ages, while the slow growth is reflected by a pyramid with a smaller proportion of the population in the younger ages. The broad base of the rapid growth pyramid is contributed majorly by high fertility, which was also as a result of high mortality. Life expectancy in such population is always very low, Nigeria and Niger are typical examples.

Slow growth pyramid shows that fertility and mortality rates are low, while life expectancy is higher compared with that of rapid growth population. United States of America fall under this category. (5 marks)

Differences between Median Age and Child-Dependency Ratio

Median age is the age at which exactly half the population is older and half is younger. May be used to describe a population as “young” or “old”. If median age is less than 20 = “young”; 30 or over = “old” and between 20 to 29 = “intermediate age”. In 1999, the median age of Uganda (world’s youngest population) was 17.5 years, while that in Italy (world’s oldest population) was 39.9 years.

Child dependency ratio is the ratio of population under 15 to population 15 to 64.

$$\frac{P_{0-14}}{P_{15-64}} \times 100$$

(5 marks)

5a) Some populations are relatively young, that is, they have a large proportion of people in the younger age groups. The high-fertility countries of Africa with large proportions of young adults and children are examples. Other populations are relatively old, such as many countries in Europe. These two types of populations have markedly different age compositions; as a consequence, they also have different proportions of the population in the labor force or in school, as well as different medical needs, consumer preferences, and even crime patterns. A population's age structure has a great deal to do with how that population lives. Developing countries have relatively young populations while most developed countries have old or "aging" populations. In many developing countries, 40 percent or more of the population is under age 15, while 4 percent is 65 or older, examples are Niger, Nigeria, Kenya, Ghana, etc. Developing countries such as Germany, Singapore, Norway, Brazil have ageing population. (10 marks)

5b)

Region	Age <15%	Age 15-64 %	Age 65+%	Dependency Ratio
Africa	44.9	52.0	3.0	92.1% (3 mks)
Latin America	35.7	59.7	4.8	67.8% (3mks)
Europe	20.5	66.8	12.7	49.7% (3 mks)

Interpretation:

Among the three countries, Africa had the highest dependency ratio of 92.1%, which means that a larger percentage of the population are below the age of 15 years, next to it, is Latin America which had 67.8%. This means that their population is relatively young unlike Europe where the dependency ratio is 49.7%. This shows that a larger percent of the population are found within the working age groups (15-64years) and 65+. (1 mark).

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SESSION: 2014/2015
COURSE CODE: DSS 222
COURSE TITLE: Statistical Methods and Sources II
INSTRUCTION: Answer all in section **A** and any other **two** in section **B**. TIME: 2 HOURS

SEMESTER: OMEGA
CREDIT UNIT: 2

SECTION A

1. In a given data with the t value for motivation as 10.97 and the associated probability is 0.000. which of the following is the most appropriate?
a. $P < 0.0001$ b. $P < 0.01$ c. $P < 0.05$ d. $P < 0.001$
2. If R^2 is calculated to be 0.98 how confident would you be in using the line of best fit for prediction?
a. The relationship is too weak to predict
b. Not confident
c. Very confident
d. the relationship is random and thus cannot be predicted
3. If the slope of the regression line is calculated to be 2.5 and the intercept 16 then the value of Y when X is 4 is
a. 66.5
b. 26
c. 16
d. 2.5
4. Assume the cholesterol levels in a certain population have mean $\mu = 200$ and standard deviation $\sigma = 24$. The cholesterol levels for a random sample of $n = 9$ individuals are measured and the sample mean \bar{x} is determined. What is the z-score for a sample mean $\bar{x} = 180$?
a. -3.75 b. -2.50 c. -0.83 d. 2.50
5. When an analysis of variance is performed on samples drawn from K populations, the mean of square due to regression is denoted as
6. The _____ sum of squares measures the variability of the observed values of the response variable around their respective treatment means
a. Treatment b. Error c. Interaction d. Total.
7. In the equation of a straight line, $Y = mX + c$ the term, m is the:
a. dependent variable
b. slope
c. independent variable
d. intercept

Use the following to answer questions 8-10:

The following data are the wheat prices per bushel in the United States for the years 1965 to 1974.

1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
2.58	2.12	2.33	2.13	2.31	2.39	2.44	2.52	2.54	2.61

8. Construct a simple index of the wheat prices using 1968 as the base year. What is the index number for 1973?
 a. 106.28 b. 119.25 c. 94.09 d. 9.56
9. Construct a simple index of the wheat prices using 1970 as the base year. What is the index number for 1973?
 a. 102.38 b. 97.67 c. 104.25 d. 106.2
10. The percentage change in wheat price from 1965 to 1970 has:
 a. stayed the same b. increased c. decreased d. none of the above.

$$\frac{\sum P_0 Q_x}{\sum P_0 Q_0} \times 100$$

11. The formula $\frac{\sum P_0 Q_x}{\sum P_0 Q_0} \times 100$ is used to calculate:
 a. The Paasche price index b. The Laspeyres price index
 c. The Paasche quantity index d. The Laspeyres quantity index
12. In correlation analysis the proportion of variation left unexplained is denoted as.....
13. In correlation 'r' indicates the direction of association and its value ranges between and
14. In the multiple regression model, the *t*-statistic for testing that the slope is significantly different from zero is calculated
 a. by dividing the estimate by its standard error.
 b. from the square root of the *F*-statistic.
 c. by multiplying the *p*-value by 1.96.
 d. using the adjusted *R*² and the confidence interval.
15. If the total contribution that has been explained by response variable $R^2 = 0.8462$. Determine the proportion left unexplained.

(Each question = 2 marks)

SECTION B

1. Given that $\sum XY = 242$, $\sum X = 27.5$, $\sum Y = 76$, $\sum X^2 = 96.25$, $\sum Y^2 = 640$ and $n = 10$.
 a. Obtain the least square regression equation (5 marks)
 b. Determine the correlation coefficient and (10 marks)
 c. Find the proportion of variation in the response variable that is left unexplained by the explanatory variable. (5 marks)

2. The prices of three commodities milk, butter and sugar from 1980-1983 are given below:

	Prices	Quantity
--	--------	----------

Commodity	1980	1981	1982	1983	1980	1981	1982	1983
Milk	20	30	25	40	120	140	180	200
Butter	35	15	32	30	190	110	105	100
Sugar	43	38	30	20	70	75	80	62

- a. Find a simple price index of 1981 and 1983 using 1982 as the base year. (5 marks)
 - b. Determine the simple price index of 1981 using 1982-1983 as the base year. (5 marks)
 - c. Using laspeyre price indexes determine the weighted price index of 1983 using 1981 as the base year. (5 marks)
 - d. Using paasche price indexes determine the weighted price index of 1983 using 1981 as the base year. (5 marks)
3. The table below shows the existence of a linear relationship between the type of payment and hours of work.

Type of payment	12	16	8	13	10	20	12	23	21	11
Hours of work	5	6	2	8	10	7	15	20	17	4

Using Analysis of variance determine:

- a. The null and alternative hypothesis (4marks)
 - b. Using 0.05 test whether there exist a linear relationship between the variables (6 marks)
Present your results in a table and compare the linearity of the variables and, (6marks)
 - c. Comment on your result. (4marks)
4. A firm ordered sack of chemical with a normal weight of 60 kg and a random of 10 sacks was taken and it was found that that the mean is 50kg with a standard deviation of 2.0kg. The firm wishes to test whether the mean weight of sample is less than the nominal weight.
- a. State the null and alternative hypothesis (5marks)
 - b. Test this hypothesis at a significant level of 1% and 5% (5marks)
 - c. Compare the critical value with the tabulated value and represent your answer diagrammatically. (6marks)
 - d. Interpret your results (4marks)

MARKING GUIDES

1. D
2. C
3. B
4. B
5. $S^2_{YX}/S_{XX}/K-1$
6. D
7. B
8. B
9. D
10. C
11. D
12. $1 - r^2$
13. -1 and +1
14. A
15. $0.1538 = 15.38\%$

TOTAL 30 MARKS

SECTION B Question 1

a. $Y = a + bx$

$$b = \frac{\sum XY - n\bar{X}\bar{Y}}{\sum X^2 - n(\bar{X})^2} = \frac{242 - 10(2.75)(7.6)}{96.25 - 10(2.75^2)} = \frac{33}{20.625} = 1.6$$

$b = 1.6$

$$\begin{aligned} a &= \bar{y} - b\bar{x} \\ &= 7.6 - 1.6(2.75) \\ &= 3.2 \\ a &= 3.2 \end{aligned}$$

(5 Marks)

The least square regression equation = $Y = 3.2 + 1.6X$

(2 Marks)

Q1b $r = \frac{\sum XY - n\bar{y}\bar{x}}{\dots}$

$$\sqrt{[\sum X^2 - n \bar{X}^2] [\sum Y^2 - (n\bar{Y}^2)]}$$

R= 0.91987

Interpretation : there is a strong relationship (8 marks)

Q1c

The total contribution that is explained by the response variable = r^2

There the proportion left unexplained = $1-r^2$

Where $r = 0.91987$ $r^2 = 0.8462$

$1-r^2 = 1-0.8462 = 0.1538$ 15.38% (5 marks)

Question 2

(a) $P_{1982/1981} = \frac{P_{1981}}{P_{1981}} \times 100 = 95.4\%$ Interpretation: the price decreases by 4.6%
2.5 marks

$P_{1982/1983} = \frac{P_{1983}}{P_{1982}} \times 100 = 103.4\%$ Interpretation: the price increases by 3.4%
2.5 marks

(b) $P_{1982-83\#/1983} = \frac{P_{1981}}{P_{1982-83}} \times 100 = 93.8\%$ 3
marks

Interpretation: the price index decreases by 6.2% of 1981 2.5
marks

(c) $\frac{P_{1983} * q_{81}}{P_{1981} * q_{81}} \times 100 = 119.5\%$ the price index increases by 19.5% 4
marks

(d) $\frac{P_{1983} * q_{83}}{P_{1981} * q_{83}} \times 100 = 124.1\%$ the price index increases by 24% 4
marks

TOTAL 20

MARKS

Question 3

Type of payment	12	16	8	13	10	20	12	23	21	11
Hours of work	5	6	2	8	10	7	15	20	17	4
XY	60	96	16	104	100	140	180	460	357	44
X ²	144	256	64	169	100	400	144	529	441	121
Y ²	25	36	4	64	100	49	225	400	289	16

(2 marks)

$$\sum Y/n = 9.4$$

$$\sum X/n = 14.6 \quad (1 \text{ mark})$$

H₀: there is no linearity between X and Y

H₁: there is linearity between X and Y 2 marks

$$SYX = \sum XY - n (\sum Y/n) (\sum X/n)$$

$$= 1557 - 10 (9.4)(14.6) = 184.6^2 = 34077.16 \quad 1 \text{ mark}$$

$$SXX = \sum X^2 - n (\sum X/n)^2$$

$$= 2368 - 10(14.6^2) = 236.4 \quad 1 \text{ mark}$$

$$SYY = \sum Y^2 - n (\sum Y/n)^2$$

$$= 1208 - 10(9.4^2) = 324.4 \quad 1 \text{ mark}$$

Source of Variation	degree of freedom	sum of square	mean of square	F calculated
Due to Regression	1	144.15	144.15	6.4
Due to Residual	8	180.25	22.53	
Total	9	43.5		

6 marks

$$F_{0.05}^T (2-1)(10-2)$$

$$F \text{ tabulated} = 5.32 \quad 1 \text{ mark}$$

Diagram 1 mark

Interpretation: Accept H₀ and Reject H₁. There is no linearity between the rate of deterioration and mode of payment at 5 % level of significance. 4 marks

TOTAL 20 MARKS

Question 4

H₀: $x = \mu$ (mean weight is not less than nominal weight)

H₁: $x < \mu$ (mean weight is less than nominal weight) (5 marks)

Since N < 30 we use t test

$$t \text{ test} = \frac{x - \mu}{s} \text{ where } x=50, \mu=60, s=2.0 \text{ and } N=10$$

$s / \sqrt{N-1}$

$$t = \frac{50-60}{2.0\sqrt{10-1}} = -14.92 = -15$$

(5 marks)

For 0.05 level of significance $t_{\text{tabulated}} = t_{0.05 \text{ at } 10-1} = 1.83$

(2.5 marks)

For 0.01 level of significance $t_{\text{tabulated}} = t_{0.01 \text{ at } 10-1} = 2.82$

(2.5marks)

Draw the one tail test table graph

Decision: since $t_{\text{calculated}} > t_{\text{tabulated}}$ we reject H_0 and accept H_1

(2 marks)

Conclusion: the mean weight is less than nominal weight at 1% and 5% level of significance (3 marks)

TOTAL 20

MARKS