

COVENANT UNIVERSITY

TUTORIAL KIT

PROGRAMME: DSS

OMEGA SEMESTER

300 LEVEL



Raising A New Generation Of Leaders

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List of Contents

DSS 321: MEASURES OF POPULATION CHANGE

DSS 322: SOCIAL STATISTICS

DSS 323: COURSE TITLE: DATA COLLECTION AND ANALYSIS

DSS 324: LABOUR FORCE AND THEORETICAL CONSIDERATIONS 11

DSS 326: FAMILY SYSTEMS IN NIGERIA

DSS 328: POPULATION GEOGRAPHY 11

COVENANT UNIVERSITY

CANAANLAND, KM 10, IDIROKO ROAD,

P.M.B. 1023, OTA, OGUN STATE, NIGERIA.

TITLE OF EXAMINATION: B.Sc EXAMINATION

COLLEGE: COLLEGE OF BUSINESS AND SOCIAL SCIENCES

SCHOOL: SOCIAL SCIENCES

DEPARTMENT: ECONOMICS AND DEVELOPMENT STUDIES

SESSION: 2014/2015

SEMESTER: OMEGA

COURSE CODE: DSS 321

CREDIT UNIT: 2

COURSE TITLE: MEASURES OF POPULATION CHANGE

INSTRUCTION: ANSWER QUESTIONS 1 and any other Two

TIME: 2 HOURS 15 MINUTES

1(a) Complete the life table and use it to solve the following question with interpretation.

Exact age (years)	Out of 100,000 males born
	Number alive at exact age
X	l_x
0	100,000
1	87,030
2	84,951
3	83,951
4	83,266
5	82,629

6	82,127
7	81,686
8	81,340
9	81,055
10	80,802
11	80,569
12	80,339
13	80,121
14	79,912
15	79,681

(10 Marks)

(i) What is the probability of dying at age 10? (2 Marks)

(ii) What are the person-years lived at exact ages 10 and 15 (2 Marks)

1 (b) For a certain life table population, $l_x = x(x - 4) = 5$

Find

(i) Ultimate age (3 marks)

(ii) q_x (3 Marks)

(iii) ${}^{10}p_{20}$ (4 Marks)

1(c) Simplify the Life Table Population, if $Xp_0 = 1 - \frac{X}{2}$ (6 Marks)

(30 Marks)

(2a) The table below shows the age distribution of women of reproductive age and age specific fertility rates in a certain population.

Age Group	Number of women	Age specific fertility rates
15-19	936480	142.9
20-24	815627	306.9
25-29	673084	303.7
30-34	479915	255.8
35-39	353079	191.9
40-44	280223	86.6
45-49	233088	26.1

The midyear population is 12,046,753 and the number of children under 5 is 1,829,474. Calculate and explain;

- (i) The General Fertility Rate (2 Marks)
- (ii) The Child – Woman Ratio (2 Marks)
- (iii) The Total Fertility Rate(2 Marks)
- (iv) The Gross Reproduction Rate assuming a sex ratio at birth of 1.03 (2 Marks)
- (v) The ASFR for the total population (2 Marks)
- (vi) Number of female birth (2 Marks) **(12 Marks)**

2(b). Define the following terms as used in demography:

- a) Cohort (2 Marks)
- b) Foetal Death (2 Marks)
- c) Death (2 Marks)
- d) Fecundability (2 Marks)

(8 Marks)

(20 Marks)

3(a). Using the data provided below:

Age group	Age Specific Fertility Rate
15-19	0.033
20-24	0.090
25-29	0.120
30-34	0.087
35-39	0.032
40-44	0.006
45-49	0.000

Calculate;

- (i) Relative ASFR (2Marks)
- (ii) Mean age at Child bearing (4 Marks)
- (iii) Median age at Child bearing (4 Marks) **(10 Marks)**

3(b) Explain the following concepts in demographic terms;

- (i) Stationary Population (4 Marks)
- (ii) Current Life Table (3 Marks)

(iii) Generation life Table (3 Marks)

(10 Marks)

(20 Marks)

(4) The mid-year population of Kenya was 18 million in 1982. Between 1970 and 1982 the average annual rate of growth was 4%. The World Bank estimated that, in mid-1990, Kenya's population was 26 million and that by the middle of the year 2000 it will be 40 million.

(a) Assuming that the growth in the population of Kenya between 1982 and 1990, and between 1990 and 2000, is exponential, calculate the annual growth rates using the World Bank's estimates of the population. (4 Marks)

(b) Assume that the World Bank's estimate of 40 million in 2000 is correct. If Kenya's population continues to increase after 2000 at the same rate as the World Bank assumed it would increase between 1990 and 2000, when will it reach 80 million. (4 Marks)

(c) Using the data below, how long will it take Nigeria's population of about 140 million to **Double** and **Triple** if the population is growing at the rates stated below?

Note: Show your working

Rate Per Annum	0.5	0.7	1.0	1.2	1.5	1.7	2.0
-----------------------	------------	------------	------------	------------	------------	------------	------------

(12 Marks)

(20 Marks)

5. (a) For the Life Table define below;

Age x	lx (Male)	lx (Female)	LX (Male)	LX (Female)
0	1000	1000	67,460	72,860
15	962	970	52,958	58229
20	958	968	48159	53385
25	952	965	43373	48559
45	916	937	24622	29506
60	778	854	11801	15944
65	676	795	8065	11830

Calculate:

- (i) CBR for male and female Note: (using Age 0)
- (ii) The expectation of life for male at age 15 and female at age 45
- (iii) The chance that a male age 25 will survive to age 60
- (iv) The probability that a woman age 15 marry to a man age 20 will herself survive to age 60 but then will be a widow (5 Marks Each)

(20 Marks)

MARKING GUIDE

1(a) Complete the life table and use it to solve the following question with interpretation.

Exact age (years)	Out of 100,000 males born
	Number alive at exact age
X	l_x
0	100,000
1	87,030
2	84,951
3	83,951
4	83,266
5	82,629
6	82,127
7	81,686
8	81,340
9	81,055
10	80,802
11	80,569
12	80,339
13	80,121
14	79,912
15	79,681

(10 Marks)

1 a. SOLUTION

(i)
dying

Marks)

(ii)
lived at
and 15

(10)

(15)

1 (b)
table
 $x(x - 4)$

Exact age (years)	Out of 100,000 males born			Probability that a male who reaches this age		Expected number of years of life remaining at age x
	Number alive at exact age	Average number alive in the age interval	Number dying in the age interval	Lives another year	Dies within a year	
x	l_x	L_x	d_x	p_x	q_x	e_x
0	100,000	91,644	12,970	0.8703	0.1297	52.1
1	87,030	85,990	2,079	0.9761	0.0239	58.8
2	84,951	84,451	999	0.9882	0.0118	59.2
3	83,951	83,609	686	0.9918	0.0082	58.9
4	83,266	82,947	637	0.9923	0.0077	58.4
5	82,629	82,378	502	0.9939	0.0061	57.8
6	82,127	81,907	441	0.9946	0.0054	57.2
7	81,686	81,513	346	0.9958	0.0042	56.5
8	81,340	81,198	284	0.9965	0.0035	55.7
9	81,055	80,929	253	0.9969	0.0031	54.9
10	80,802	80,686	233	0.9971	0.0029	54.1
11	80,569	80,454	230	0.9971	0.0029	53.3
12	80,339	80,230	218	0.9973	0.0027	52.4
13	80,121	80,017	209	0.9974	0.0026	51.5
14	79,912	79,797	231	0.9971	0.0029	50.7
15	79,681	79,552	258	0.9968	0.0032	49.8
16	79,424	79,284	279	0.9965	0.0035	49.0
17	79,145	78,995	298	0.9962	0.0038	48.2
18	78,846	78,709	274	0.9965	0.0035	47.3
19	78,572	78,431	283	0.9964	0.0036	46.5
20	78,289	78,141	297	0.9962	0.0038	45.7
21	77,992	77,833	318	0.9959	0.0041	44.8
22	77,674	77,517	314	0.9960	0.0040	44.0

What is the probability of at age 10?

Answer
0.0029 (2

What are the person-years exact ages 10 (2 Marks)

Answer =
80,686
and
79,552

SOLUTION:

For a certain life population, $l_x =$
 $= 5$

Find

(i) Ultimate age (3 marks)

$$x(x - 4) = 5 = x^2 - 4x - 5 = 0$$

$$\Rightarrow (x - 5)(x + 1) = 0 \quad ab = 0$$

$$\Rightarrow x = 5 \text{ or } x = -1$$

Therefore, the Ultimate age is **5 (3 marks)**

(ii) q_x (3 Marks)

$$q_x = \frac{nd_x}{l_x} = \frac{l_x - l_{x+n}}{l_x} = 1 - \frac{l_{x+n}}{l_x}$$

$$\Leftrightarrow l_{x+n} = x(x - 4) = 5$$

$$\Leftrightarrow l_{x+n} = x^2 - 4x - 5$$

$$\Leftrightarrow (x+n)^2 - 4(x+n) - 5$$

$$\Leftrightarrow (x+n)(x+n) - 4x - 4n - 5$$

$$\Leftrightarrow x^2 + 2xn + n^2 - 4x - 4n - 5$$

$$q_x = 1 - \frac{l_{x+n}}{l_x}$$

$$\Leftrightarrow \frac{l_x - (x^2 + 2xn + n^2 - 4x - 4n - 5)}{x^2 - 4x - 5}$$

$$\Leftrightarrow \frac{x^2 - 4x - 5 - x^2 - 2xn - n^2 - 4x - 4n + 5}{x^2 - 4x - 5}$$

$$= \frac{-2xn - n^2 + 4n}{x^2 - 4x - 5} = \frac{2xn + n^2 - 4n}{x^2 - 4x - 5} = \frac{n^2 + 2xn - 4n}{x^2 - 4x - 5}$$

Therefore, $q_x = \frac{n(n-4-2x)}{x^2 - 4x - 5}$

$$x^2 - 4x - 5$$

(iii) ${}^{10}p_{20}$ (4 Marks)

$${}^{10}p_{20} = \frac{{}^n p_x}{l_x} = \frac{l_{20}}{l_x} = 130$$

Therefore, $l_x = x^2 - 4x - 5$

$$\Rightarrow \frac{x^2 + 2xn + n^2 + 4x - 4n - 5}{x^2 - 4x - 5}$$

$$\Rightarrow \frac{(20)^2 + 2(20)(10) + (10)^2 - 4(20) - 4(10) - 5}{(20)^2 - 4(20) - 5}$$

$$\Rightarrow \frac{400 + 400 + 100 - 80 - 40 - 5}{400 - 80 - 5}$$

$$\Rightarrow \frac{900 - 125}{400 - 85} = \frac{775}{315}$$

\Rightarrow **2.46(The probability of surviving from age 20 to 30)**

1(c) Simplify the Life Table Population, if $Xp_0 = 1 - \frac{X}{2}$ (6 Marks)

$$Xp_0 = 1 - \frac{X}{208}$$

$$Xp_0 = 1 - \frac{l_{0+n}}{l_0}$$

$$Xp_0 + \frac{X}{208} = 1$$

208

$$\frac{L(0+x)}{l_0} = 1 - \frac{x}{208}$$

$$l_x = l_0 \left[1 - \frac{x}{208} \right]$$

$$l_x = l_0 \left[1 - \frac{x}{208} \right]$$

$$L_0 = \frac{l_x(208)}{208-x}$$

$$\frac{l_x}{208-x} + \frac{x}{208} = 1$$

$$\frac{208}{208} = 1$$

(30 Marks)

(2a) The table below tribution of women of reproductive age and age specific fertility rates in a certain population.

Age Group	Number of women	Age specific fertility rates
15-19	936480	142.9
20-24	815627	306.9
25-29	673084	303.7
30-34	479915	255.8
35-39	353079	191.9
40-44	280223	86.6
45-49	233088	26.1

The midyear population is 12,046,753 and the number of children under 5 is 1,829,474. Calculate and explain;

- (vii) The General Fertility Rate (2 Marks)
- (viii) The Child – Woman Ratio (2 Marks)
- (ix) The Total Fertility Rate(2 Marks)
- (x) The Gross Reproduction Rate assuming a sex ratio at birth of 1.03 (2 Marks)
- (xi) The ASFR for the total population (2 Marks)
- (xii) Number of female birth (2 Marks) **(12 Marks)**

SOLUTION:

The table below shows the age distribution of women of reproductive age and age specific fertility rates in a certain population.

Age Group	Number of women	ASFR	No of birth	Female birth	ASFR ^f
15-19	936480	142.9	133,822	65,922	70.394
20-24	815627	306.9	250,315	123,307	151.182

25-29	673084	303.7	204,415	100,697	149.605
30-34	479915	255.8	122,762	60473	126.009
35-39	353079	191.9	67,755	33376	94.532
40-44	280223	86.6	242,267	119343	42.660
45-49	233088	26.1	6,083	2996	12.857
Total	3771496	1.7152	809423.6		

The midyear population is 12,046,753 and the number of children under 5 is 1,829,474. Calculate and explain

$$i. \quad GFR = \frac{\sum B_i}{\sum \text{women}} * 1000$$

$$= \frac{809423.6}{3771496} * 1000 = 214.6$$

$$\frac{809423.6}{3771496} * 1000 = 214.6$$

$$ii. \quad CWR = \frac{5p_0}{{}_{35}W_{15}} * 1000 = \frac{1,829,474}{12,046,753} * 1000 = 152\%$$

$$iii. \quad TFR = 5 * \left(\frac{nB_x}{nW_x} \right) = 5 * 1313.9 = 6569.5 \cong 6.56$$

$$\text{iv. } \text{GRR} = \frac{\text{TFR}}{1 + \text{SR}} = \frac{6569.5}{2.03} = 3236.2$$

_____ V. ASFR

_____ Vi Nuber of Female Birth

SOLUTION:

2(b). Define the following terms as used in demography:

(a) Cohort (2 Marks)

(b) Foetal Death (2 Marks)

(c) Death (2 Marks)

(d) Fecundability (2 Marks)

(8 Marks)

(20 Marks)

SOLUTION:

Cohort: - it is a demographic term used to refer to a situation where people experience the same thing at a particular point in time, for instance, marriage cohort, birth cohort, death cohort, e.t.c.

Foetal Death: - foetal death is the death prior to the complete expulsion or extraction from its mother of a product of conception; irrespective of the duration of pregnancy; the death is indicated by the fact that after such separation the foetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles.

Death: - Is the permanent disappearance of all evidence of life at any time after a live birth has taken place. It is the loss of a member of a population.

Fecundability: - is defined as the probability that a woman is capable of conception (that is, using contraception nor sterile) will conceive in a given menstrual cycle.

3(a). Using the data provided below:

Age group	Age Specific Fertility Rate
15-19	0.033
20-24	0.090
25-29	0.120
30-34	0.087
35-39	0.032
40-44	0.006
45-49	0.000

Calculate;

- (i) Realtive ASFR (2Marks)
- (ii) Mean age at Child bearing (4 Marks)
- (iii) Median age at Child bearing (4 Marks) **(10 Marks)**

SOLUTION

Age group	X	ASFR	Fx	RASFR	CUMM
-----------	---	------	----	-------	------

15-19	17	33	561	89.67	33
20-24	22	90	1980	244.56	123
25-29	27	120	3240	326.08	243
30-34	32	87	2784	236.41	330
35-39	37	32	1184	89.96	362
40-44	42	6	252	16.30	368
45-49	47	0	0	0	
Total	224	368	1001		



(i) Relative ASFR (2Marks) _____

(ii) Mean age at Child bearing (4 Marks)

Mean = $\frac{\sum fx}{\sum f}$

$$\frac{\quad}{f} = 1001$$

$$\frac{\quad}{368}$$

$$= 27.2 \text{ (25-29)}$$

(iii) Median age at Child bearing (4 Marks)

$$\text{Median} = a + \frac{\left[\frac{N}{2} - m^f \right] \times 5}{f}$$

$$= 25 + \frac{184 - 123}{120} \times 5$$

$$= 25 + \frac{61}{120} \times 5$$

$$= 25 + 2.54 = 27.5$$

SOLUTION:

3(b) Explain the following concepts in demographic terms;

(i) Stationary Population

Stationary population: It is a hypothetical population represented by the life table population. It has the characteristics of life table population. In a stationary population, the birth rate is the same as death rate, that is, the rate of natural increase is 'o'. (4 Marks)

(ii) Current Life Table

Current Life Table: it is also called the **conventional or period Life table**. It is based on the experience over a short period of time, i.e, 1-3yrs which mortality has remained substantially constant. It represents the combined mortality experience by age of the population in a particular short period. (3 Marks)

(iii) Generation life Table

Generation life Table: it is based on the mortality experience by particular life cohort, for instance, all births in particular years. It is based on mortality experience over a long period of time. (3 Marks)

(10 Marks)

(20 Marks)

SOLUTION:

(4) The mid-year population of Kenya was 18 million in 1982. Between 1970 and 1982 the average annual rate of growth was 4%. The World Bank estimated that, in mid-1990, Kenya's population was 26 million and that by the middle of the year 2000 it will be 40 million.

(a) Assuming that the growth in the population of Kenya between 1982 and 1990, and between 1990 and 2000, is exponential, calculate the annual growth rates using the World Bank's estimates of the population. (4 Marks)

Solution:

$$P_t = 1990 = 26,000,000$$

$$P_{t+n} = 2000 = 40,000,000 \quad n = 10 ; \quad r = ?$$

$$P_{t+n} = P_t e^{rn}$$

$$\frac{P_{t+n}}{P_t} = e^{rn}$$

$$\text{Log}_e \left[\frac{P_{t+n}}{P_t} \right] = \log_e e^{rn}$$

$$rn = \text{Log}_e \frac{P_{t+n}}{P_t}$$

$$r = \frac{1}{n} \text{Log}_e \frac{40,000,000}{26,000,000}$$

$$r = \frac{1}{10} \text{Log}_e \ln 1.54$$

$$r = \frac{1}{10} \text{Log}_e \ln 1.54 = \frac{0.4371}{10} = 0.04371 = 4.3\%$$

(b) Assume that the World Bank's estimate of 40 million in 2000 is correct. If Kenya's population continues to increase after 2000 at the same rate as the World Bank assumed it would increase between 1990 and 2000, when will it reach 80 million. (4 Marks)

Solution:

Thus the number of years it will take for the population to reach 80million, if it is 40million in the year 2000, and continues growing at an annual rate of 0.043, is given by the equation;

$$P_t = 1990 = 80,000,000$$

$$P_{t+n} = 2000 = 40,000,000 \quad n = ? ; \quad r = 4.3\%$$

$$\text{Log}_e P_{t+n} - P_t = \log_e e^{rn}$$

$$rn = \text{Log}_e P_{t+n} - P_t$$

$$n = \frac{1}{r} \log_e \frac{P_{t+n}}{P_t}$$

$$n = \frac{1}{0.04} \ln \frac{80,000,000}{40,000,000}$$

$$n = \frac{1}{0.04} \times (18.197 - 17.504) = 16.05 = 16.1 \text{ years}$$

(c) Using the data below, how long will it take Nigeria's population of about 140 million to **Double** and **Triple** if the population is growing at the rates stated below?

Note: Show your working

Rate Per Annum	0.5	0.7	1.0	1.2	1.5	1.7	2.0
-----------------------	------------	------------	------------	------------	------------	------------	------------

(12 Marks)

Rate Per Annum	Double	Triple
0.5	139	220
0.7	99	157
1.0	70	110
1.2	58	92
1.5	47	74
1.7	41	65
2.0	35	55

Solution:

$$P_{t+n} = P_t (1+r)^n$$

$$P_{t+n} = 3P_t$$

therefore

$$2Pt = Pt (1 + r)^n$$

$$3 = (1 + r)^n$$

Log both sides

$$\text{Log}3 = \log(1 + r)^n$$

$$N\log(1+r) = \log3$$

$$N\log(1+0.01) = 0.4771$$

$$N = \underline{0.3010}$$

$$\text{Log}1.005 = 110$$

(20 Marks)

5. (a) For the Life Table define below;

Age x	lx (Male)	lx (Female)	LX (Male)	LX (Female)
0	1000	1000	67,460	72,860
15	962	970	52,958	58229
20	958	968	48159	53385
25	952	965	43373	48559
45	916	937	24622	29506
60	778	854	11801	15944
65	676	795	8065	11830

Calculate:

- (v) CBR for male and female Note: (using Age 0)
- (vi) The expectation of life for male at age 15 and female at age 45
- (vii) The chance that a male age 25 will survive to age 60
- (viii) The probability that a woman age 15 marry to a man age 20 will herself survive to age 60 but then will be a widow (5 Marks Each)

(20 Marks)

SOLUTION

Age x	lx (male)	Dx	Qx	Px	Lx	Tx	ex
0	1000	38	0.038	0.962	67460	256438	256.44
15	962	4	0.004	0.996	52958	188978	196.44
20	958	6	0.006	0.994	48159	136020	141.98
25	952	36	0.036	0.962	43373	87861	92.29
45	916	138	0.151	0.849	24622	44488	48.57
60	778	102	0.131	0.869	11801	19866	25.53
65	676	-----	-----	1	8065	8065	11.93

Age x	lx (Female)	Dx	Qx	Px	Lx	Tx	ex
0	1000	30	0.030	0.97	72,860	290313	290.313
15	970	2	0.002	0.998	58229	217453	224.178
20	968	3	0.003	0.997	53385	159224	164.488
25	965	28	0.029	0.971	48559	105839	109.678
45	937	83	0.089	0.911	29506	57280	61.131
60	854	59	0.069	0.931	15944	27774	32.522
65	795	-----	-----	1	11830	11830	14.881

- (1) $CBR = 1/ex = 1/Tx/Lx = 1/290313/1000 = 1/290313*1000 = 0.0034$ (FEMALE)
 $CBR = 1/ex = 1/Tx/Lx = 1/256438/1000 = 1/256438*1000 = 0.0039$ (MALE)

(2) Expectation of life for male at Age 15 = 196.44

(3) Expectation of life for male at Age 45 = 61.13

(4) The probability that a woman age 15 married to a man age 20 will herself survive to age 60 but then will be a widow

Man	Woman
20	15
65	60

$${}^Np_x = {}^{45}p_{15} = l_{60}/l_{15} = 854/970 = 0.88$$

$$\text{Man} = nq_x = nd_x/l_x = l_x - l_{x+n}$$

$$\frac{\text{Man}}{L_x} = 1 - \frac{l_{x+n}}{l_x} = 1 - \frac{676}{958} = 0.29$$

COVENANTUNIVERSITY

CANAANLAND, KM 10, IDIROKO ROAD

P.M.B 1023, OTA, OGUN STATE, NIGERIA

TITLE OF EXAMINATION: B. Sc DEGREE EXAMINATION

COLLEGE: CBS

SCHOOL: SOCIAL SCIENCES

DEPARTMENT: ECONOMICS AND DEVELOPMENT STUDIES

SESSION: 2014/2015 SEMESTER: OMEGA

COURSE CODE: DSS 322 CREDIT UNIT: 2

COURSE TITLE: SOCIAL STATISTICS

INSTRUCTION: Answer Question No.1 and any other TWO

TIME: 2 HOURS

1(a) Suppose that L and M are random variables whose joint density function is the bi-variate normal distribution, show that L and M are independent if and only if their correlation coefficient is zero. **(10marks)**

(b) The mean lifetime of electric light bulbs produced by a company has in the past been 1,120hrs with a standard deviation of 125hrs. A sample of 8 electric bulbs recently chosen from a supply of newly produced bulbs showed a mean lifetime of 1070hrs. Test the hypothesis that the mean lifetime of the bulb has not changed using a level of significance of 0.05 and 0.01.

(10marks)

(c) State the probability function of Poisson random variable G

(3marks)

(d) Outline the criteria for testing hypothesis in any choice of study

(7marks)

TOTAL MARKS = 30

2(a) What are the fundamental conditions for Bi-variate normal distribution to hold? **(4marks)**.

(b) A box contains a very large number of red, white, blue and yellow balls in the ratio of 4:3:2:1. Find the probability that in 10 drawings (i) 4 red, 3 whites, 2 blues and 1 yellow ball(s) will be drawn. (ii) 8 red and 2 yellow balls will be drawn **(10marks)**

(c) List six (6) examples of population parameters you know

(6marks)

TOTAL MARKS = 20

3(a) 10% of flashlight batteries in shipment are burnt out. What is the probability that in a sample of 3 batteries (i) At least one is burnt out. (ii) exactly one is burnt out. **(5marks)**

(b) The probability that a gateman was arrested in Mushin Local Government Office is 0.02, taking a sample size of 200, find the probability that (i) One or fewer gatemens have been arrested. (ii) no gateman has been arrested (iii) 1 gateman has been arrested **(6marks)**

(c) Define the term 'type II and type I errors'. **(4marks)**

(d) Outline three uses of Poisson distribution. **(3marks)**

(e) State two applications of Binomial distribution in Industries **(2marks)**

TOTAL MARKS = 20

4(a) The population of a settlement in Lusada consists of 5 members which include: 3, 4, 6, 2, 1. Consider all possible sample size of 2 which can be drawn with replacement. From this population find (i) the standard deviation of the sampling distribution of means (ii) the population standard deviation. (iii) the population mean . **(14marks)**

(b) Strong Tower store in Ota, Ogun state employed 15 salesmen, 10 of whom are married and 5 of whom are single. Then 4 salesmen are to be selected at random from the group to develop a new sales' campaign. Find the probability that 2 of the first salesmen selected are single? **(6marks)**

TOTAL MARKS = 20

5(a) List the types of estimate you know **(2marks)**

(b) State the properties of the types of estimate you have mentioned in 5(a) **(8marks)**

(c) Define the term 'estimation' and 'estimator' **(2marks)**

(d) Outline the types of probability distribution you know and give examples of each of them **(8marks)**

TOTAL MARKS = 20

MARKING GUIDES

1(a) Suppose that L and M are random variables whose joint density function is the bi-variate normal distribution, show that L and M are independent if and only if their correlation coefficient is zero.

Answer to 1(a)

$$f(l, m) = \frac{1}{2\pi\sigma_1\sigma_2\sqrt{1-\rho^2}} \cdot e \left[\frac{-\left[\left(\frac{l-\mu_1}{\sigma_1}\right)^2 - 2\left(\frac{l-\mu_1}{\sigma_1}\right)\left(\frac{m-\mu_2}{\sigma_2}\right) + \left(\frac{m-\mu_2}{\sigma_2}\right)^2\right]}{2(1-\rho^2)} \right]$$

$$\frac{1}{2\pi\sigma_1\sigma_2} e \left[\frac{-\left[\left(\frac{l-\mu_1}{\sigma_1}\right)^2 + \left(\frac{m-\mu_2}{\sigma_2}\right)^2\right]}{2} \right]$$

$$\frac{1}{\sqrt{2\pi}\cdot\sqrt{2\pi}\cdot\sigma_1\sigma_2} e \left[\frac{-\left[\left(\frac{l-\mu_1}{\sigma_1}\right)^2}{2} + \frac{\left(\frac{m-\mu_2}{\sigma_2}\right)^2}{2} \right]$$

$$f(l, m) = \frac{1}{\sigma_1\sqrt{2\pi}} \times \frac{1}{\sigma_2\sqrt{2\pi}} \times \exp \left(-\left(\frac{l-\mu_1}{2\sigma_1^2}\right)^2 + \left(\frac{m-\mu_2}{2\sigma_2^2}\right)^2 \right)$$

$$\text{let } a = \left(\frac{l-\mu_1}{2\sigma_1^2}\right)^2, \quad b = \left(\frac{m-\mu_2}{2\sigma_2^2}\right)^2$$

$$f(x, y) = \frac{1}{\sigma_1\sqrt{2\pi}} \times \frac{1}{\sigma_2\sqrt{2\pi}} \times e^{-(a+b)} = \frac{1}{\sigma_1\sqrt{2\pi}} \times \frac{1}{\sigma_2\sqrt{2\pi}} \times e^{-a-b}$$

$$= \frac{1}{\sigma_1\sqrt{2\pi}} e^{-a} \cdot \frac{1}{\sigma_2\sqrt{2\pi}} e^{-b}$$

$$= \frac{1}{\sigma_1\sqrt{2\pi}} e^{-\left(\frac{l-\mu_1}{2\sigma_1^2}\right)^2} \times \frac{1}{\sigma_2\sqrt{2\pi}} e^{-\left(\frac{m-\mu_2}{2\sigma_2^2}\right)^2}$$

$$= f(l, m) = f(l) \times f(m)$$

For independence, $\rho = 0$. Thus $f(l, m) = f(l) \times f(m)$

(10marks)

(b) The mean lifetime of electric light bulbs produced by a company has in the past been 1,120hrs with a standard deviation of 125hrs. A sample of 8 electric bulbs recently chosen from a supply of newly

produced bulbs showed a mean lifetime of 1070hrs. Test the hypothesis that the mean lifetime of the bulb has not changed using a level of significance of 0.05 and 0.01.

Answer to 1(b)

$$n = 8, \bar{X} = 1,070\text{hrs}, \mu = 1120\text{hrs}, S = 125\text{hrs}$$

$$t = \frac{\bar{X} - \mu}{s} \sqrt{n - 1} \quad \text{where } n-1 = \text{degree of freedom}$$

$$\frac{1 - 1}{1} \sqrt{8} - 1 = \frac{-1 \cdot 2}{1}$$

$$= -1.058300524$$

$$\therefore t = -1.06 \text{ (2 decimal places).}$$

Hypothesis testing

$$H_0: \mu = 1120$$

$$H_1: \mu \neq 1120$$

Use a two-tailed test and accept H_0 if $-t_\alpha \leq t \leq +t_\alpha$

$$t_\alpha, n-1, \text{ where } \alpha = 0.05$$

$$t_{0.05, 7} = 2.36$$

$$t = -1.06, t_\alpha = 2.36$$

Accept H_0 if $-t_\alpha \leq t \leq +t_\alpha$

$$-2.36 \leq -1.06 \leq +2.36$$

We accept H_0 because the value of t_c is within the range.

Conclusion: At 0.05 level of significance the mean lifetime of the bulb has not changed thus we accept H_0 .

$$t_\alpha, n-1 = 2.36$$

$$\text{At } 0.01 \quad t_{1\%, 7} = 3.50$$

$$t = -1.06, \text{ Accept } H_0 \text{ if } -3.50 \leq -1.06 \leq +3.50$$

Conclusion: At 0.01 level of significance the mean lifetime of the bulbs has not changed hence we accept the H_0 . (10marks)

(c) State the probability function of Poisson random variable G

Answer to 1(c)

The probability function of Poisson random variable 'G' which represents a number of occurrences of an event during a specified time interval is defined as

$$f(g; \lambda) = \frac{\lambda^g e^{-\lambda}}{g!}$$

Where λ is the mean average, $e = \text{constant} = 2.71828$

(3marks)

(d) Outline the criteria for testing hypothesis in any choice of study

Answer to 1(d)

The formal procedures for testing hypothesis in any choice of study include:

-) State the Null hypothesis $H_0: \bar{X} \neq \mu$
-) State the alternative hypothesis $H_1: \bar{X} = \mu$
-) Choose the level of significance that is; estimate a criterion for rejection or acceptance of the null hypothesis. e.g $\alpha = 0.05, 0.01$ etc.
-) Select the appropriate test statistic. The test statistic which will be appropriate depends on the characteristics of the parent population from which the sample was drawn. The probable statistic includes: z, t, X^2 (chi-square).
-) Estimate the critical region. Here we define the area under which we consider the difference between the sample and population parameters significant enough to reject the hypothesis H_0 .
-) Compute the value of the statistic from a random sample of size n.
-) Conclusion: Compare the value of your calculated test statistic and the standard or tabulated statistic and accordingly reject or accept H_0 . **(7marks)** **TOTAL MARKS = 30**

2(a) What are the fundamental conditions for Bi-variate normal distribution to hold?

Answer to 2(a)

Bi-variate normal distribution will hold with the following conditions:

- (i) $-\infty < x < +\infty, -\infty < y < +\infty$ (ii) μ_1 and μ_2 are the means of X and Y respectively. Type equation here.
- (iii) σ_1 and σ_2 are the standard deviation of X and Y respectively.
- (iv) ρ Is the correlation coefficient between X and Y or the theoretical population coefficient of correlation. **(4marks)**

(b) A box contains a very large number of red, white, blue and yellow balls in the ratio of 4:3:2:1. Find the probability that in 10 drawings (i) 4 red, 3 whites, 2 blues and 1 yellow ball(s) will be drawn. (ii) 8 red and 2 yellow balls will be drawn

Answer to 2(b)

(i) $P(X_1 = 4, X_2 = 3, X_3 = 2, X_4 = 1) =$

$$\frac{n_1! n_2! n_3! n_4!}{n_1^{n_1} n_2^{n_2} n_3^{n_3} n_4^{n_4}} P_1^{n_1} P_2^{n_2} P_3^{n_3} P_4^{n_4}$$

Where $P_1^{(R)} = \frac{4}{1}, P_2^{(W)} = \frac{3}{1}, P_3^{(B)} = \frac{2}{1}, P_4^{(Y)} = \frac{1}{1}$

$$P(R, W, B, Y) = \frac{10!}{4!3!2!1!} \left(\frac{4}{1}\right)^4 \left(\frac{3}{1}\right)^3 \left(\frac{2}{1}\right)^2 \left(\frac{1}{1}\right)^1$$

$$\left(\frac{3}{2}\right) (0.4)^4 (0.3)^3 (0.2)^2 (0.1)^1$$

$$= 12600 \times 2.7648 \times 10^{-6}$$

$$= 0.0348364$$

$$P(4, 3, 2, 1) = 0.03484$$

(5marks)

(ii) Probability that 8 red and 2 yellow balls will be drawn.

$$n = 10, n_1 = 4, n_2 = 3, n_3 = 2, n_4 = 1$$

$$P_1^{(R)} = \frac{4}{1}, P_2^{(Y)} = \frac{1}{1}, n_1 = 8, n_2 = 2, n = 10$$

$$P(R, Y) = \frac{n!}{n_1! n_2!} P_1^{n_1} \cdot P_2^{n_2} = \left(\frac{10!}{8!2!}\right) \left(\frac{4}{1}\right)^8 \left(\frac{1}{1}\right)^2$$

$$= \binom{3}{8} (0.4)^8 (0.1)^2$$

$$= 2.94912 \times 10^{-4}$$

$$= 0.000294912$$

$$\therefore P(8, 2) = 0.00029$$

(5marks)

(c) List six (6) examples of population parameters you know

Answer to 2(c)

The six examples of population parameters are: μ , σ , Kurtosis, Skewness, median, moment.
(6marks)

TOTAL MARKS = 20

3(a) 10% of flashlight batteries in shipment are burnt out. What is the probability that in a sample of 3 batteries (i) At least one is burnt out. (ii) exactly one is burnt out.

Answer to 3(a)

(i) Probability that at least one is burnt out

$$P(x \geq 1) = 1 - p(x = 0)$$

$$\text{where } p(x = 0) = 0.729$$

$$P(x \geq 1) = 1 - 0.729$$

$$\therefore P(x \geq 1) = 0.271. \quad (3\text{marks})$$

(ii) Probability that exactly 1 is burnt out

$$\begin{aligned} P(x = 1) &= f(1) = {}_3C_1 \left(\frac{1}{1}\right)^1 \left(\frac{9}{1}\right)^2 \\ &= 3 \times 0.1 \times 0.81 \\ &= 0.243 \end{aligned} \quad (2\text{marks})$$

(b) The probability that a gateman was arrested in Mushin Local Government Office is 0.02, taking a sample size of 200, find the probability that (i) One or fewer gatemens have been arrested. (ii) no gateman has been arrested (iii) 1 gateman has been arrested

Answer to 3(b)

(i) The probability that one or fewer gatemens have been arrested

$$\begin{aligned} P(x \leq 1) &= \Pr(0) + \Pr(1) = f(1, 4) + f(0, 4) \\ \therefore P(x \leq 1) &= 0.0733 + 0.0183 = 0.0916 \end{aligned} \quad (2\text{marks})$$

(ii) Probability that a gateman has been arrested

$$n = 200, \quad p = 0.02 \quad \lambda = np = 200 \times 0.02 = 4$$

$$x = 1$$

$$\begin{aligned} f(x; \lambda) &= \frac{\lambda^x e^{-\lambda}}{x!} = f(1; 4) = \frac{4^1 e^{-4}}{1!} = 4 \times 0.0183156 \\ &= 0.0732625 \\ &= 0.0733 \end{aligned} \quad (2\text{marks})$$

$$\begin{aligned} \text{Note: } f(0; 4) &= \frac{4^0 e^{-4}}{0!} = 1 \times 0.0183156 \\ &= 0.0183 \end{aligned} \quad (2\text{marks})$$

(c) Define the term 'type II and type I errors'.

Answer to 3(c)

'Type II error' is the error of not rejecting the null hypothesis when it is false (e.g. the asserted mean is false but we say there are no grounds for disbelieving it). In short, a type II error is the error of not rejecting a hypothesis when it is in fact false. **(2marks)**

'Type 1 error' is the error of rejecting the null hypothesis when it is true. (e.g. the asserted mean is true but we say it is not). Summarily type 1 error is the error of rejecting a hypothesis when it is in fact true. **(2marks)**

(d) Outline three uses of Poisson distribution.

Answer to 3(d)

The **three uses** of Poisson distribution are: (i) In quality control statistics to check the number of defects
(ii) In biology to count the number of bacteria

(iii) In physics to count the number of particles emitted by radioactive substances.

(iv) It is used in insurance to count the number of casualties

(v) In waiting time problems to count the number of incoming telephone calls. **(3marks)**

(e) State two applications of Binomial distribution in Industries

Answer to 3(e)

The **two uses** of Binomial distribution in industries are: In Error Analysis; In solving insurance problems;
In Quality control; In Game plan **(2marks)**

TOTAL MARKS = 20

4(a) The population of a settlement in Lusada consists of 5 members which include: 3, 4, 6, 2, 1. Consider all possible sample size of 2 which can be drawn with replacement. From this population find (i) the standard deviation of the sampling distribution of means (ii) the population standard deviation. (iii) the population mean.

Answer to 4(a)

(i) The standard deviation of the sampling distribution of means

$$\bar{X} = \frac{3+4+6+2+1}{5} = \frac{16}{5} = 3.2$$

$$\sigma_{\bar{X}} = \sqrt{\frac{\sum_{i=1}^2 (X_i - \mu)^2}{N}}$$

$$\sqrt{(3 - 3.2)^2 + (3.5 - 3.2)^2 + (4.5 - 3.2)^2 + (2.5 - 3.2)^2 + (2 - 3.2)^2 + (3.5 - 3.2)^2 + (4.0 - 3.2)^2 + (5 - 3.2)^2 + (5.0 - 3.2)^2 + (6 - 3.2)^2 + (4 - 3.2)^2 + (3.5 - 3.2)^2 + (2.5 - 3.2)^2 + (3 - 3.2)^2 + (4 - 3.2)^2 + (2 - 3.2)^2 + (3.5 - 3.2)^2 + (1.5 - 3.2)^2 + (1.0 - 3.2)^2}$$

$$\sqrt{1.48}$$

$$\sigma_{\bar{X}} = 1.22$$

(4marks)

4b (ii) The population standard deviation

$$\begin{aligned}\sigma &= \sqrt{\frac{\sum_{i=1}^k (X - \mu)^2}{N}} \\ &= \sqrt{(3 - 3.2)^2 + (4 - 3.2)^2 + (6 - 3.2)^2 + (2 - 3.2)^2 + (1 - 3.2)^2} \\ &= \sqrt{\frac{(-0.2)^2 + (0.8)^2 + (2.8)^2 + (-1.2)^2 + (-2.2)^2}{5}} \\ &= \sqrt{\frac{0.04 + 0.64 + 7.84 + 1.44 + 4.84}{5}} \\ &= \sqrt{\frac{14.8}{5}}\end{aligned}$$

$$\sigma = 1.72$$

(4marks)

4b(iii) The mean of the sampling distribution of means is given by

$$\mu_{\bar{X}} = \frac{\sum \frac{f_o a}{f_o} \cdot \frac{m}{m}}{N}$$

where number of sample means = 25.

Consider the numbers with respect to replacement

3,	4,	6,	2,	1	Their corresponding means are
3,3	3,4	3,6	3,2	3,1	3 3.5 4.5 2.5 2 = 15.5
4,3	4,4	4,6	4,2	4,1	3.5 4 5 3 2.5 = 18.0
6,3	6,4	6,6	6,2	6,1	4.5 5.0 6.0 4.0 3.5 = 23.0
2,3	2,4	2,6	2,2	2,1	2.5 3 4.0 2.0 1.5 = 13.0
1,3	1,4	1,6	1,2	1,1	2.0 2.5 3.5 1.5 1.0 = 10.5

$$\mu_{\bar{X}} = \frac{1.5 + 1.0 + 2.0 + 1.0 + 1.5}{5} = \frac{8}{5}$$

$$\therefore \mu_{\bar{X}} = 3.2$$

(6marks)

(b) Strong Tower store in Ota, Ogun state employed 15 salesmen, 10 of whom are married and 5 of whom are single. Then 4 salesmen are to be selected at random from the group to develop a new sales' campaign. Find the probability that 2 of the first salesmen selected are single?

Answer to 4(b)

$$X = 2, N = 15, n = 4, K = 5$$

$$\text{Single} = \text{success} = K = 5$$

$$h(x; N, n, K) = P(2) = \frac{\binom{N-K}{n-x} \binom{K}{x}}{\binom{N}{n}} = \frac{\binom{15-5}{4-2} \binom{5}{2}}{\binom{15}{4}}$$

$$= \frac{{}^1C_2 \times {}^5C_2}{{}^15C_4}$$

$$= \frac{4 \times 1}{1} = \frac{4}{1}$$

$$\therefore P(2) = 0.3297$$

(6marks)

TOTAL MARKS = 20

5(a) List the types of estimate you know

Answer to 5(a)

Point and Interval estimates

(2marks)

(b) State the properties of the types of estimate you have mentioned in 5(a)

Answer to 5(b)

Point Estimate

This is an estimate of a population parameter given by a single number. It has the following properties

- (1) It is a single value.
- (2) It assumes different values with different samples.
- (3) It may not exactly equal to the population characteristic being estimated.
- (4) No legitimate probability statement could be associated with it.

(4marks)

Interval Estimate

This is an estimate of the population parameter given by two numbers between which the parameter may be considered. It has the following properties

- (1) It has a stated range.
- (2) It allows for objective evaluation of the precision of an estimate.
- (3) It makes allowance for the error margin.
- (4) A probability statement can be associated with it.

(4marks)

(c) Define the term 'estimation' and 'estimator'

Answer to 5(c)

Estimation is a statistical method employed to make inferences about likely values of the population parameters using sample statistic. **(1mk)**

Thus when a sample statistic is used to estimate a population parameter, the statistic is referred to as an **estimator**. **(1mk)**

(d) Outline the types of probability distribution you know and give examples of each of them

Answer to 5(d)

There are 2 types of probability distribution namely:

-Discrete and Continuous probability distribution.

Discrete distribution

(1) Binomial distribution (2) Hyper-geometric distribution

(3) Multinomial distribution (4) Negative distribution **(4marks)**

Continuous distribution

(1) Normal distribution (2) Exponential distribution

(3) Gamma distribution (4) Beta distribution **(4marks)**

TOTAL MARKS = 20

COVENANT UNIVERSITY

CANAANLAND, KM 10, IDIROKO ROAD,

P.M.B. 1023, OTA, OGUN STATE, NIGERIA.

TITLE OF EXAMINATION: B.Sc EXAMINATION

COLLEGE: COLLEGE OF BUSINESS AND SOCIAL SCIENCES

SCHOOL: SOCIAL SCIENCES

DEPARTMENT: ECONOMICS AND DEVELOPMENT STUDIES

SESSION: 2014 /2015

SEMESTER: OMEGA

COURSE CODE: DSS 323

CREDIT UNIT: 2

COURSE TITLE: DATA COLLECTION AND ANALYSIS

INSTRUCTION: ANSWER QUESTIONS 1 and any other Two

TIME: 2 HOURS

1.) EFFECT OF RELIGION ON CONTRACEPTIVE USE.

Using the above research title formulates:

- i. The general objective for this research problem (2 Marks)
- ii. State three specific objectives for this study (3 Marks)
- iii. Identify the dependent and the independent variables and state four other independent variables that may be used for this study (5 Marks)
- iv. Formulate a set of 5 questions in a standard questionnaire to carry out the above study.(10Marks)
- v. Identify and explain five Problems of Data Collection in Nigeria (10 Marks)

(30 Marks)

2a.) What is Qualitative Research? (2 Marks)

(b) Briefly discuss **3 forms** of qualitative research methods that you know.(6 Marks)

(c) Identify four ways of getting 'Good' qualitative research results (4 Marks)

(d) Identify four sets of procedure necessarily followed to get the desired data/ information from the field work in demography. (8 Marks) **(20 Marks)**

3a) What is sampling? (2 Marks)

b.) Discuss the Classification of Sampling Methods. (10 Marks)

c.)What are the things to consider in determining how large the sample size should be in a study? (8Marks)

(20 Marks)

4a).Explain the concept of Ethics in Social Science Research (8 Marks)

b.) Outline various elements of informed consent (4 Marks)

c.) Outline and explain the various ways privacy can be achieved in a research (4 Marks)

d.) Identify the privacy in research in Social Sciences (4 Marks) **(20 Marks)**

5a) Explain the term Triangulation in research (3 Marks)

(b) Explain the various methods of quantitative research (3 Marks)

(c) Identify various steps and procedure for data analysis in Social sciences. Explain any **TWO** of such procedure (8 Marks)

(d) Outline any three Merits and three Demerits of primary data (6 Marks) **(20 Marks)**

MAKING GUIDE

SOLUTIONS

QUESTION 1

i.) **The general objective is:** To examine effect of religion affiliation on the use of contraceptive among mothers (2 marks)

ii.) **Specific Objectives**

-) To examine the effect of religiosity on family planning.
-) To determine the knowledge, Attitude and practice of family planning among religion groups in the study area.
-) To identify factors affecting knowledge, Attitude and practice of family planning among religion groups in the study area. (3 marks)

iii.) $Y = a + b_1x_1 + b_2x_2 + \dots + b_kx_n + \mu$ eqn (1)

Y –Dependent variable and this represents Contraceptive use

a – Intercept/ Constant term

β 's – Coefficient Parameters

x_1 to x_n – Independent variables(This represent Religion)

a) Age, Occupation, Income, Education (5 marks)

iv.) **SAMPLE OF A STANDARD QUESTIONNAIRE**

Introduction

Good morning/ afternoon/evening. My name is I am from Covenant University. We are conducting a survey research on maternal health education in this city/ town/ village and I would be grateful if you could spare few minutes to answer some questions for us. Every information supplied would be treated with utmost confidentiality and has no legal implications. Thank you.

SECTION A: BIO-DATA

- 1.) How old are you?
1) 15-19 (2) 20-24 (3) 25-29 (4) 30-34 (5) 35-39 (6) 40-44 (7) 45-50
- 2.) Gender (1) Female (2) Male
- 3.) Religion (1) Christianity (2) Muslim (3) Traditional
- 4.) Marital Status..... (1) Monogamy (2) Polygamy (3) Separated (4) Never married
- 5.) Highest educational attainment..... (1) Primary (2) Secondary (3) Tertiary (4) No schooling.
- 6.) How much do you earn per month...? (1) 5000-15,000 (2) 20,000- 30,000 (3) 40,000- 50,000 (4) 60,000- 70,000 (5) 80,000- 90,000 (6) 100,000 and above.
- 7.) What is your occupation...?

(1) Professional Farming (2) Peasant Farming (3) Trading (4) Civil Servant (5) skilled Artisan (6) Labourer/ Other Artisan (7) Full time Housewife (8) schooling/ Unemployed.

8.) What is your husband's occupation...?

(1) Professional Farming (2) Peasant Farming (3) Trading (4) Civil Servant (5) skilled Artisan (6) Labourer/ Other Artisan (7) Full time Housewife (8) schooling/ Unemployed.

v. Identify and explain five Problems of Data Collection in Nigeria (10 Marks)

- ◆ *v. Lack of statistical awareness*
- ◆ *Inadequate funding of statistical agency*
- ◆ *Poor social facilities*
- ◆ *Lack of adequate coordination among data collection agency*
- ◆ *Cultural or religions problems*
- ◆ *Inadequate statistical manpower*

QUESTION 2

2a.) Qualitative Research can be defined as the aim to gather an in-depth understanding of [human behaviour](#) and the reasons that govern such behaviour. This is a method of inquiry employed in many different academic disciplines, traditionally in the [social sciences](#), but also in [market research](#) and further contexts. (2 marks)

2b.) Forms or types of Qualitative Research Methods (6 marks)

- ▶ Case study
This attempts to shed light on a phenomenon by studying in-depth a single case example of the phenomena. The case can be an individual person, an event, a group, or an institution.
- ▶ Grounded theory
Theory is developed inductively from a corpus of data acquired by a participant-observer.
- ▶ Phenomenology
Describes the structures of experience as they present themselves to consciousness, without recourse to theory, deduction, or assumptions from other disciplines.
- ▶ Ethnography
Focuses on the sociology of meaning through close field observation of sociocultural phenomena. Typically, the ethnographer focuses on a community.
- ▶ Historical
Systematic collection and objective evaluation of data related to past occurrences in order to test hypotheses concerning causes, effects, or trends of these events that may help to explain present events and anticipate future events (Gay, 1996).
- ▶ Ethical Inquiry

An intellectual analysis of ethical problems. It includes the study of ethics as related to obligation, rights, duty, right and wrong, choice.

2c) Identify four ways of getting 'Good' qualitative research results (4 Marks)

Getting good qualitative research result depends on:

The quality of the data collector

The quality of the data analyzer

The quality of the presenter / writer

Written field notes

Audio recordings of conversations

Video recordings of activities

Diary recordings of activities / thoughts

(d) Identify four sets of procedure necessarily followed to get the desired data/ information from the field work in demography. (8 Marks)

Procedure:

A set of procedure is followed to get the desired data/ information from the field work in demography, to process and analyse the facts in a logical and scientific manner.

Techniques:

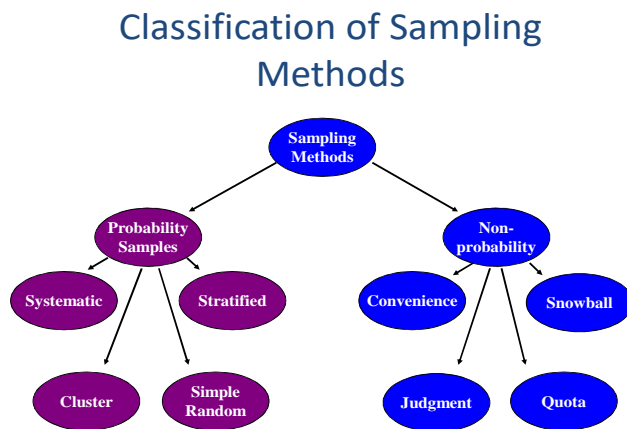
- ❖ *Observing the phenomenon and recording the details,*
- ❖ *Inquiring about the facts through questionnaires/schedules*
- ❖ *Making measurements.*
- ❖ *Conducting tests.*
- ❖ *Recording the events*

3a) What is sampling? (2 Marks)

- ▶ Sampling is the process of selecting observations (a sample) to provide an adequate description and robust inferences of the population
The sample is ***representative*** of the population.
- ▶ There are 2 types of sampling:

Non-Probability sampling
Probability sampling

b.) Discuss the Classification of Sampling Methods. (10 Marks)



▶ **Simple Random Sampling**

Each element has an equal chance of being included in the sample – e.g. using a table of random numbers; generated by computer; or lottery method. Selection is not biased but chance determined. It is not frequently use and it requires sampling frame. No form of expertise is needed in conducting this method.

▶ **Systematic Random Sampling**

Researcher works with a list of possible cases to determine the sampling interval necessary to reach the desired sample size. $(N/n)=k$ where N = population, n = sample size, k = sampling interval. Every k th interval is then taken from the pre-established list beginning with at a randomly selected starting point. It requires periodic ordering and a sampling frame.

Stratified Random Sampling

Population to be sampled is divided into homogenous groups based on characteristics the researcher considered important to the indicators being measured. Selection from each group will be done by a simple random approach. Each group is important and must be represented in the selection. It therefore requires accurate information on proportions of each stratum.

▶ **Cluster Sampling**

First a simple random sampling of clusters is chosen from a sampling frame (e.g. schools, health facilities, and youth cluns). Then, a simple random sampling of individuals within each cluster is selected. Low cost/high frequency of use. Requires list of all clusters, but only of individuals within chosen clusters.

▶ **Multi- Stage Sampling**

This is Similar to cluster sampling. There are several stages of sampling and sub-sampling; usually used in large scale population surveys.

NON- PROBABILITY SAMPLING

Samples are not chosen by random chance. Sample of subjects chosen on the basis of opportunities. You use your judgment to choose what you think is representative of a larger population.

▶ **Convenience Sampling**

Not randomly determined, also called accidental sampling. Drawn on the basis of opportunity e.g. Youth attending a school activity, people attending a conference, etc.

▶ **Judgment or Purposive Sample**

The sampling procedure in which an experienced research selects the sample based on some appropriate characteristic of sample members to serve a purpose. This method is highly bias.

▶ **Quota Sampling**

A sampling frame is defined in advance. Selection from different strata is not based on random principle. Not all elements have possibility of being selected, hence may not be representative.

▶ **Snow ball Sampling**

Also known as network or chain referral sampling. Data is collected from a small group of people with special characteristics (e.g. men who have sex with men). These people are asked to identify other people like them and data collected from these referrals who are also told to identify other people like them. Process continues until a target sample size is reached.

c.)What are the things to consider in determining how large the sample size should be in a study? (8Marks)

There are two basic requirements for the sample to fulfill. A sample must be representative and adequate. The sample is said to be representative when it reflects the various patterns and sub classes of the universe of the study. Similarly, a sample is adequate if it provides very precise result to the investigator. It is important to note that larger is the sample size, greater is the accuracy.

(20 Marks)

4a). Explain the concept of Ethics in Social Science Research (8 Marks)

Ethical issues arise from the kind of problem social scientist are investigating and the method use to obtain valid and reliable data. They may be evoking by the research issues, the method of data collection, the kind of persons serving as research assistance and the type of data collected.

Ethical consideration are necessary in research because harm may be caused by ;

- ◆ Violating informants' right privacy by posing sensitive questions or by gaining access to record that may contain personal data.
- ◆ Observing the behaviour of the informant without them being aware.
- ◆ Failing to respect or observe certain cultural values, traditions or taboos.

b.) Outline various elements of informed consent (4 Marks)

- i Competence
- ii Voluntarism
- iii Full Information
- iv Comprehension

c.) Outline and explain the various ways privacy can be achieved in a research (4 Marks)

- i By Anonymity
- ii By confidentiality of the study

d.) Identify the privacy in research in Social Sciences (4 Marks)

- i Sensitivity to information
- ii Settings being observed
- iii Dissemination of information

5a) Explain the term Triangulation in research (3 Marks)

In the [social sciences](#), **triangulation** is often used to indicate that two (or more) methods are used in a study in order to check the results. "The concept of triangulation is borrowed from navigational and land surveying techniques that determine a single point in space with the convergence of measurements taken from two other distinct points."^[1] The idea is that one can be more confident with a result if different methods lead to the same result.

Triangulation is a powerful technique that facilitates validation of data through cross verification from two or more sources. In particular, it refers to the application and combination of several research methods in the study of the same phenomenon.^[2]

-) It can be used in both quantitative (validation) and qualitative (inquiry) studies.
-) It is a method-appropriate strategy of founding the credibility of qualitative analyses.
-) It becomes an alternative to traditional criteria like reliability and validity.
-) It is the preferred line in the social sciences.

(b) Explain the various methods of quantitative research (3 Marks)

- ◆ Experiments
- ◆ Survey

(c) Identify various steps and procedure for data analysis in Social sciences. Explain any **TWO** of such procedure (8 Marks)

Five Step Procedure for Data Analysis:

- Step One: Validation and editing (quality control)
- Step Two: Coding
- Step Three: Data Entry
- Step Four: Machine Cleaning of Data
- Step Five: Tabulation and Statistical Analysis

(d) Outline any three Merits and three Demerits of primary data (6 Marks) **(20 Marks)**

Merit

Basic Unbiased information data
 Original data from the primary market/ population
 Data direct from the population.

Demerit

1. Large volume of data.
2. Huge volume of population.
3. Time consuming
4. Direct and personal intervention has to be there.
5. Raw data

COVENANTUNIVERSITY

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P.M.B 1023, OTA, OGUN STATE, NIGERIA

TITLE OF EXAMINATION: B. Sc DEGREE EXAMINATION

COLLEGE: CBS

SCHOOL: SOCIAL SCIENCES

DEPARTMENT: ECONOMICS AND DEVELOPMENT STUDIES

SESSION: 2014/2015 SEMESTER: OMEGA

COURSE CODE: DSS 324 CREDIT UNIT: 2

COURSE TITLE: LABOUR FORCE AND THEORETICAL CONSIDERATIONS 11

INSTRUCTION: Answer Question No.1 and any other TWO

TIME: 2 HOURS

1(a) Discuss the factors affecting female labour force participation rates in Nigeria. (10marks)

(b) Explain the likely effects of mortality rates on working age population? (5marks)

(c) The drive for the development of economically under developed countries and the rebuilding of economies devastated by the Second World War combine to stimulate national planning and development. Explain the above statement with examples (15marks)

TOTAL =30MARKS

2 (a) What are the necessary conditions that must be fulfilled when making projections?

(3marks)

(b) Discuss briefly some of the assumptions about social-economic factors affecting labour supply that might be made when projecting the size of the Labour force projection in any country of your choice. (12marks)

(c) Outline five (5) applications of labour force statistics in Nigeria (5marks)

TOTAL =20MARKS

3 (a) Identify and discuss the demographic and economic factors influencing the size of labour force growth in a developing country. (14marks)

(b) List four (4) categories of unemployed persons that you know (6marks)

TOTAL =20MARKS

4. (a) List four (4) stages which Demographic factors undergo in affecting the Labour force size and growth. (4marks)

(b) Discuss briefly the Demographic indicators of the Economically Active Population of any Developing country of your choice (10marks)

(c) What are the reasons for high dependency ratio in Nigeria? (6marks)

TOTAL =20MARKS

5(a) Discuss the significance of labour force projection in Nigeria (10marks)

(b) Explain with examples the economic implications of changes in length of working life in Nigeria? (10marks)

TOTAL =20MARKS

MARKING GUIDES

1(a) Discuss the factors affecting female labour force participation rates in Nigeria. (10marks)

Answer to 1(a)

The factors affecting female labour force participation rates in Nigeria include:

1. Pursuit of higher educational attainment
2. Reduction in gender based discrimination
3. Reduction in fertility rates by women in labour force
4. Participation of women in decision making in the family
5. Improvement in child care and nutrition of the family
6. Alleviation of poverty in the country
7. Increase in feminism, women empowerment and enforcement of women reproductive rights in the family
8. Reduction in violence against women within the families
9. Equitable distribution of wealth within the family setting
10. Reduction in over-dependence of women on men in undertaken family responsibility
11. Increase in divorce and single parenting by women in Nigeria

Each point carry 1mark x10 = (10marks)

(b) Explain the likely effects of mortality rates on working age population?

Answer to 1(b)

The likely effects of mortality rates on working age population are:

- J The negative effect of falling mortality rates on the proportion of the working age population in developing countries may be offset by the positive effects of improving condition of health as well as upon the productive capacity of the Labour Force. **(2mks)**
 - Mortality rates may have negative effects. **(1mk)**
 - J Losses of potential Labour supply and impairment of productive efficiency due to illness have been emphasised as factors in the economic problem. **(2mks)**
- Total= (5marks)**

(c) The drive for the development of economically under developed countries and the rebuilding of economies devastated by the Second World War combine to stimulate national planning and development. Explain the above statement with examples.

Answer to 1(c)

- Essentially, projections are needed for a clearer understanding of socio-economic and demographic issues.
- However, there are two types of projections;
(1) Projection of man-power/ labour supply: This dealt with the number of persons that are likely going to be available for work at future dates;

(2) Projection of man-power/ labour demand: This relates to the number of jobs that are likely going to be offered in different sectors of the economy.

- Labour supply projection aims at estimating the size of the labour force in a future year, it must be made by sex and age-group.
- In theory, labour supply projection can be made for any period of time from 1 to 20 years. The average age projection period is approximately 10 years.
- Interestingly, labour supply projections are the products of two separate projections namely:

(1) A projection of total population by sex and age; and

(2) A projection of activity rate for each group considered. The size of labour force depends largely on the number of persons in the population who are of working age.

- Anticipated changes or expected changes in the size and composition of the total population can have direct influence on labour force projection.

Each point carry 1.5marks x10

(15marks)

TOTAL =30MARKS

2 (a) What are the necessary conditions that must be fulfilled when making projections?

Answer to 2(a)

It is necessary to consider the following: the country's level of economic development; and assess the social-economic demographic; and the cultural setting.

(3marks)

(b) Discuss briefly some of the assumptions about social-economic factors affecting labour supply that might be made when projecting the size of the Labour force projection in any country of your choice.

Answer to 2(b)

1. Over the projection period, the world would not be drastically different from now;
2. There would be no wars or major social-disturbances;
3. Recent trends in school enrolment would continue for example, people may be staying in school longer and delaying labour force entry;
4. Work and employment patterns would not change drastically for instance, normal work week of say 40 hours have to remain as the norm but the significant changes in hour should be taken into account especially when we have very high average hours of work per week.
5. Recent Labour Force participation trends would continue in the future if that seems realistic. Also, if a country is yet to experience large increases of women in the Labour Force and it is felt that cultural or religious patterns would not obstruct such movement. The possibility of increased women's Labour Force participation may need to be considered.
6. The participation rate of women would not exceed that of men.

Each point carry 2marks x 6 = (12marks)

2 (c) Outline five (5) applications of labour force statistics in Nigeria

Answer to 2(c)

The applications of labour force statistics in Nigeria include the following:

- (1.) For macroeconomic planning
- (2.) For Human resource development
- (3.) Labour force statistics are essential in the design and the evaluation of overall government policies aimed at promoting and creating employment
- (4.) Labour force statistics constitutes a major element in formulating and evaluating government policies on income generating and maintenance, alleviation of properties and redistribution of income.
- (5.) It can be used to explain the past growth of an economy and to study the demographic and socio-economic factors affecting the size and composition of a work force.
- (6.) It is used for projection of the economically active population and its components as a basis for socio-economic planning.
- (7.) It is used to inform the public about the state of employment or to focus attention on such issues as child's labour or unemployment.
- (8.) Business planners can also use labour force statistics to plan on the future course of the economy.
- (9.) Labour force data appropriately broken by geographical areas for instance, states can furnish information on local labour market especially on the number of persons available in specific occupations that can be of great help to a company proposing to extend or set up operations in a given area.

Tick 5points, each point carry 1mark =

(5marks)

TOTAL =20MARKS

3 (a) Identify and discuss the demographic and economic factors influencing the size of labour force growth in a developing country.

Answer to 3(a)

- The demographic factors identified are: fertility; mortality and migration. **(3marks)**
- However, age structure is dependent on the above demographic factors. **(2marks)**
- The size of the L.F in any society is a function of age structure in that population which is also determined by the demographic factors of fertility; mortality and migration.
- The percentage of working age population in LDCs is generally smaller than in Developed countries.
- Due to high fertility which makes for larger number of children in the developing countries; this also leads to higher dependency ratio.
- Under given condition of mortality and fertility; the ratio of the male L.F to the male population would be reduced by a change from the pattern of age specific activity rates which is common in developing countries compared to that in industrialized countries.
- Shift in the age distribution of the adult population may influence the L.F trends.
- The age structure of the adult population has more to do with the composition of the L.F.
- In developed countries, the ageing of the population has resulted in a swelling proportion of elder workers in the L.F.

- It is clear that ageing tends to diminish spatial and occupational mobility.
- On this account, the increasing number of elderly workers may aggravate problems of unemployment although it may diminish the unemployment problem associated with the absorption of young people into the L.F.

Each point above carry 1mark x 9

(9marks)

3 (b) List four (4) categories of unemployed persons that you know

Answer to 3(b)

Job-losers; Job-leavers; new entrants into the Labour force; and those persons returning to the Labour force after a period of time

Each point carry 1.5marks x 4

(6marks)

TOTAL =20MARKS

4. (a) List four (4) stages which Demographic factors undergo in affecting the Labour force size and growth.

Answer to 4(a)

1. High birth rate and High mortality
2. High birth rate and decline mortality
3. High immigration
4. Stable population growth

Each point carry 1 x 4

(4marks)

- (b) Discuss briefly the Demographic indicators of the Economically Active Population of any Developing country of your choice

Answer to 4(b)

The Demographic indicators of economically active population of Nigeria include:

(1.)Employment : They employed are those who worked during the reference period (one week, one month, one year) or who had a job but were not at work for some reasons. By work, we mean those who work for pay or profit or as unpaid worker in a family enterprise. It excludes housework done around ones home and volunteer work for charity. Work done for pay includes; self-employment and wage employment. In general, anyone who worked at all for pay or profit is counted as employed no matter how long. However, unpaid family workers are known as employed only if they work for a longer period of time during the reference week or at-least for 15 hours.
(3.5marks)

(2.) Unemployment: they unemployed are those who are not classified as employed but their activity indicates that they are participating in the Labour force. These activities include: actively looking for work

within a specified time period; waiting to be called back from a lay-off; and those who want to start a new job within a specified time period. The unemployed must also be available for work except for temporary illness. The unemployed can be considered as constituting four groups namely: job-losers; job-leavers; new entrants into the Labour force; and those persons returning to the Labour force after a period of time. Discouraged workers are not counted as unemployed because they do not meet the activity test of current job seeking. However, in some countries, discouraged workers are included in the official definition of the unemployed while others tabulate them in the category of hidden unemployment. **(3.5marks)**

(3.) Under-employment: The most significant part of the Labour force in many countries is the prevalence of under-employment. Some people are fully employed, others are totally unemployed. In between these exchange; there are large number of people who have no regular jobs, yet they do some kind of vocational intermittent work. Also, many people who work for long hours but get so little that they can not be considered adequately or gainfully employed in any meaningful sense. **(3marks)**

4(c) What are the reasons for high dependency ratio in Nigeria?

Answer to 4(c)

The reasons for high dependency ratio in Nigeria are stated below:

1. Improved health facilities
2. Political instability (War)
3. Structural adjustment policies
4. Retrenchment
5. Educational structure/ASUU strikes
6. High fertility
7. Early marriage
8. Women tendency to give birth to many children

Tick 6points, each point carry 1mark =

(6marks)

TOTAL =20MARKS

5(a) Discuss the significance of labour force projection in Nigeria

Answer to 5(a)

1. Labour force projections are needed for many planning purposes.
2. They are useful for analysing how many workers would be available for work and examine demographic characteristics of those workers. Such analysis can be used in planning educational training and job program.
3. Labour force projections are also important in their relationship to the demand size that is, how many workers would the economy require given a projection of the future size of L.F; planners can determine

the level of economic growth and consequently, the employment growth that would be needed to utilise the L.F so as to avoid unemployment and under-employment.

4. Labour force projections are also useful in estimating the demand for certain goods and services which in turn can be used to project employment by industries for example; different age groups would require a different mixture of goods such as; education for the young and medical-care for the old.

Each point carry 2.5marks x 4

(10marks)

(b) Explain with examples the economic implications of changes in length of working life in Nigeria?

Answer to 5(b)

- If the mortality in less developing countries were reduced to the level of that existing in the more developed countries; there would be gain in years of working life.
- This however, depends on whether a declining mortality is accompanied by a decline from high levels of fertility prevailing in many less-developing countries.
- Since it is fertility rather than mortality which determines primarily the population age structure
- Hence, there are relationships between groups which are likely to be producers and those who are likely to be dependants. This shows that that a decrease in mortality is not likely to lead to economic gain.

Each point carry 2.5marks x 4

(10marks)

TOTAL =20MARKS

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P.M.B 1023, OTA, OGUN STATE, NIGERIA
TITLE OF EXAMINATION: B.Sc. EXAMINATION
COLLEGE: COLLEGE OF BUSINESS & SOCIAL SCIENCES
SCHOOL: SOCIAL SCIENCES
DEPARTMENT: ECONOMICS & DEVELOPMENT STUDIES
PROGRAM: DEMOGRAPHY & SOCIAL STATISTICS
SESSION: 2014/2015 **SEMESTER: OMEGA**
COURSE CODE: DSS 326 **CREDIT UNIT: 2**
COURSE TITLE: FAMILY SYSTEMS IN NIGERIA
INSTRUCTION: ANSWER QUESTION 1 AND ANY OTHER TWO QUESTIONS
TIME: 2 HOURS

1. (a) Discuss the functionalism theory of marriage by Lion Greenslade (2009) and the criticisms levied against it. (20 marks)
(b) Briefly discuss any five (5) functions of the family as outlined by Murdock (1960) (5 marks)
(c) List any five (5) factors which you think might have caused or influenced changes in the African or Nigerian family. (5 marks)
2. (a) Briefly explain the family system in Africa and narrow it down to your country (15marks)
(b) Mention the features of the family (5marks)
3. The days when cultural values and virtues are seriously pursued with vigorous tenacity in matters relating to marriage and family life are gradually going.
i. Why do you think this is so in contemporary marriage and family life? (5marks)
ii. Discuss any five (5) ways, with pragmatic examples how marriage and family life will look like in this 21st Century and beyond (15marks)
4. (a) What is Family? (6 marks)
(b) The role of family in national development can never be over-emphasized. Discuss (10marks)
(c) Citing relevant example(s) differentiate between marriage (wedding) and family (home) (4marks)
- 5 (a) Explain in clear terms how women are described in African family system (10marks)
(b) Briefly describe the forms of marriage contracted in Nigeria (10marks)

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TITLE OF EXAMINATION: B.Sc EXAMINATION

COLLEGE: COLLEGE OF BUSINESS & SOCIAL SCIENCES (CBSS)

SCHOOL: SOCIAL SCIENCE

DEPARTMENT: ECONOMICS & DEVELOPMENT STUDIES

PROGRAM: DEMOGRAPHY & SOCIAL STATISTICS

SESSION: 2014/2015

SEMESTER: OMEGA

COURSE CODE: DSS 328

CREDIT UNIT: 2

COURSE TITLE: POPULATION GEOGRAPHY 11

INSTRUCTION: ANSWER QUESTION 1 AND ANY OTHER TWO QUESTIONS

TIME: 2 HOURS

1. (a) The population of Nigeria is not likely to stabilize soon even if her NNR is one (1) due to population momentum. Discuss. (10marks)

(b) In what year did the world population hit 7 billion? (2 mark)

(c) In a chronological order, give an account of the growth of the world population from 1804 till date. (10 marks)

(d) What percentage of the world population is Nigeria since her present population is 177.5m compared to the world population which is currently 7,238,000,000 (approximately 7.2 billion)?

(4marks)

(d) Highlight any four (4) factors that can make a settlement or an area to be sparsely populated.

(4

marks)

2. (a) What is population density? (5 marks)

(b) According to Population Reference Bureau (PRB, 2014), the population and land areas (km²) of the ten (10) most populous countries in the world are presented in the table below. Study the table and answer the questions that follow.

Country	Population(In Million)	Land Area(Km ²)	Population Density (/sqkm)?
China	1,364	9, 571,300	
India	1,296	3, 165, 596	
USA	318	9, 826, 630	
Indonesia	251	1, 904, 570	
Brazil	203	8, 547, 404	
Pakistan	194	796, 095	
Nigeria	177	927, 768	
Bangladesh	158	147, 570	
Russia	144	17, 075, 200	
Japan	127	377, 837	

(b) i. Calculate the population density of each of the above countries (5marks)

ii. What **PROPORTION** and **PERCENTAGE** of the world population are these countries?

(2mark)

iii. If the total coverage of THE ENTIRE UNIVERSE is 510, 065, 600 square kilometres, what percentage of the earth's land cover are these countries? (3marks)

(c) Citing relevant examples, discuss five (5) factors affecting population density (5 marks)

3. (a) What are population policies? (4 marks)

(b) State any three (3) areas of concern in population policy (3 marks)

(c) State any three (3) reasons why nations draw up population policies (3 marks)

(d) The 2004 NNPP came on board as a result of the failure of the 1988 NNPP to meet its goals and targets. Discuss. (10 marks)

4. (a) Three main technological changes collectively called "Neolithic Revolution" turned man from hunting and gathering to peasant farming and sedentary agriculture. Discuss (10 marks)

(b) Citing relevant examples, briefly discuss the differences between rural and urban settlements along the following factors: population size, occupation, land use, culture and service provision.

(5marks)

(c) Write short note on Millennium Development Goals (5marks)

5(a). Explain the factors affecting the growth of cities in Africa (10marks)

(b) Explain the factors affecting the population distribution and density in Africa (10marks)