CICT PART III SECTION 6

RESEARCH METHODS

FRIDAY: 1 December 2017.   **Time Allowed: 3 hours.**

Answer ALL questions. Marks allocated to each question are shown at the end of the question.

QUESTION ONE

(a)   Differentiate between the following terms as used in research methods:

    (i)   "Dependent variables" and "independent variables".   (2 marks)

    (ii)   "Extraneous variables" and "confounding variables".   (2 marks)

    (iii)   "Validity" and "inter-rater reliability".   (2 marks)

    (iv)   "Experimental research" and "ex post facto research".   (2 marks)

    (v)   "Open-ended questions" and "closed-ended questions".   (2 marks)

(b)   A researcher has developed the following scale which he has requested respondents to comment on each of the statement:

1	2	3	4	5
Strongly agree	**Agree**	**Undecided**	**Disagree**	**Strongly disagree**
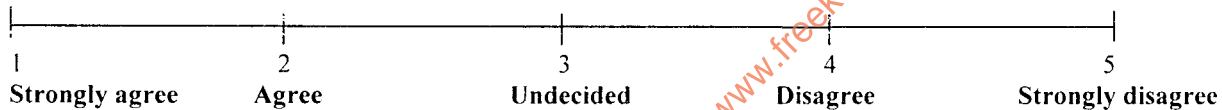
Required:
(i)   Identify the type of scale illustrated above.   (1 mark)
(ii)   Examine five merits of the identified scale in (b) (i) above while undertaking a research exercise.
                                                                                                       (5 marks)

(c)   John Maina has recently graduated with a certificate in information communication technology (CICT) from Pinto Computer College. Part of the requirements for the award of the certificate is undertaking a research project to be submitted to the examinations body. John is wondering how to identify a researchable problem. He has approached you for guidance.

Required:
Advise John Maina on four ways of identifying a specific research problem.   (4 marks)
                                                                                              (Total: 20 marks)

QUESTION TWO

(a)   Martin Kivuva, an information technology specialist intends to investigate if there is a correlation between how interested people are in cars and their driving skills.

Required:
In relation to the above proposed study, suggest an appropriate null hypothesis.   (2 marks)

(b)   Explain three limitations of test of hypothesis.   (3 marks)

(c)   Systematic bias and sampling errors are the main causes of making an incorrect inference from a given data during the selection of a sampling procedure.

Required:
In reference to the above statement:

    (i)   Distinguish between "sampling unit" and "sampling procedure".   (4 marks)

    (ii)   Outline four factors that could lead to systematic bias and sampling errors.   (4 marks)

    (iii)   Cite three characteristics of a good sample design.   (3 marks)

(d) The following table shows the number of primary schools connected to the internet in 15 counties in your country:

County number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Number of schools	30	10	5	17	57	20	26	10	20	53	32	42	30	25	23

A sample of ten schools is to be selected using county as clusters and selecting samples within clusters proportional to size.

Required:
Using a starting point of 10, determine the number of schools to be chosen from each county. (4 marks)

(Total: 20 marks)

QUESTION THREE

(a) A critical review of the literature is necessary to help a researcher develop a thorough understanding of, and insight into, previous research that relates to the research question(s) and objectives.

Required:

(i) Assess six objectives of the critical review of the literature. (6 marks)

(ii) Explain the meaning of the word "critical" in reference to the statement in (a) above. (4 marks)

(b) Examine four possible reasons that could make it difficult to find relevant materials when searching online databases during research. (4 marks)

(c) Evaluate three sources of literature during research giving suitable examples in each case. (6 marks)

(Total: 20 marks)

QUESTION FOUR

(a) The key aspects to consider in exploratory data analysis is guided by the research question(s) and objectives and may include identification of specific values in the data, highest and lowest values, trend over time, proportion distribution as well as comparison between variables in your data (Sparrow, 1989).

Required:
In relation to the above statement, discuss five ways in which exploratory data could be analysed. (10 marks)

(b) Bibliography is appended to the research report containing a list of books pertinent to the research that has been conducted.

Required:
Examine three sets of information contained in a bibliography. (6 marks)

(c) The abstract section is one of the most important parts of a research project report.

Required:
Outline four principles that might be considered in writing a good abstract. (4 marks)

(Total: 20 marks)

QUESTION FIVE

(a) (i) Explain the term "ethics" as used in research. (2 marks)

(ii) Summarise four general ethical issues that might arise during the research process. (4 marks)

(b) Assess three components of research recommendations which a researcher should include in a research project. (6 marks)

(c) Outline four types of information that might be included in appendices of a research report. (4 marks)

(d) Sampling of sales was done in similar supermarkets in two towns for a new product and the following results were obtained:

Town	Mean sales	Variance	Size of sample
A	57	5.3	5
B	61	4.8	7

Required:
Determine whether there is any evidence of difference in sales in the two towns. Test at 5% level of significance. (4 marks)

(Total: 20 marks)

....

t Table

cum. prob	$t_{.50}$	$t_{.75}$	$t_{.80}$	$t_{.85}$	$t_{.90}$	$t_{.95}$	$t_{.975}$	$t_{.99}$	$t_{.995}$	$t_{.999}$	$t_{.9995}$
one-tail	0.50	0.25	0.20	0.15	0.10	0.05	0.025	0.01	0.005	0.001	0.0005
two-tails	1.00	0.50	0.40	0.30	0.20	0.10	0.05	0.02	0.01	0.002	0.001
df											
1	0.000	1.000	1.376	1.963	3.078	6.314	12.71	31.82	63.66	318.31	636.62
2	0.000	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	22.327	31.599
3	0.000	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	10.215	12.924
4	0.000	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	0.000	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	5.893	6.869
6	0.000	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	0.000	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	0.000	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	0.000	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.297	4.781
10	0.000	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	0.000	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	0.000	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	3.930	4.318
13	0.000	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	3.852	4.221
14	0.000	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	3.787	4.140
15	0.000	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	0.000	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	3.686	4.015
17	0.000	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.646	3.965
18	0.000	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.610	3.922
19	0.000	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.579	3.883
20	0.000	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.552	3.850
21	0.000	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.527	3.819
22	0.000	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.505	3.792
23	0.000	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.485	3.768
24	0.000	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.467	3.745
25	0.000	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.450	3.725
26	0.000	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.435	3.707
27	0.000	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.421	3.690
28	0.000	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.408	3.674
29	0.000	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.396	3.659
30	0.000	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.385	3.646
40	0.000	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.307	3.551
60	0.000	0.679	0.848	1.045	1.296	1.671	2.000	2.390	2.660	3.232	3.460
80	0.000	0.678	0.846	1.043	1.292	1.664	1.990	2.374	2.639	3.195	3.416
100	0.000	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.174	3.390
1000	0.000	0.675	0.842	1.037	1.282	1.646	1.962	2.330	2.581	3.098	3.300
z	0.000	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.090	3.291
	0%	50%	60%	70%	80%	90%	95%	98%	99%	99.8%	99.9%
						Confidence Level					