GURU NANAK INSTITUTE OF TECHNOLOGY

An Autonomous Institute under MAKAUT

2022-2023

RESEARCH METHODOLOGY AND IPR

PGCSE101

TIME ALLOTTED: 3Hours **FULL MARKS:70**

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable

GROUP – A

(Multiple Choice Type Questions)

Answer any ***ten*** from the following, choosing the correct alternative of each question: **10×1=10**

			Marks	CO No.
1.	(i)	One of the primary aim of research is a) to stratify data b) develop a generalized theory c) do statistical analysis d) none of the above	1	CO1
	(ii)	Fundamental research aims to a) develop a hypothesis b) describe characteristics of a social community c) to formulate a generalized theory d) none of the above	1	CO1
	(iii)	The highly structured research process consists of a) nine steps b) ten steps c) eleven steps d) none of the above	1	CO1
	(iv)	An example of probability sampling is a) stratified sampling b) chance sampling c) multi-stage sampling d) none of the above	1	CO2
	(v)	Non-participatory survey is normally done by a) personal interview b) observation c) interview with help of schedule d) none of the above	1	CO1
	(vi)	There exists an individual *I*, who occupies an environment *N*; there are at least two course of actions *C1* & *C2* and at least two possible outcomes *O* & *O2*; a research problem is said to exist if a) $P(O_1 \mid I, C_1, N) = P(O_1 \mid I, C_2, N)$ b) $P(O_1 \mid I, C_1, N) \leq P(O_1 \mid I, C_2, N)$ c) $P(O_1 \mid I, C_1, N) \neq P(O_1 \mid I, C_2, N)$ d) None of the above	1	CO1

(vii) In experimental research the usual conditions are applicable for — 1 — CO2
a) experimental group
b) control group
c) both (a) and (b)
d) none of the above

(viii) Median, mode and mean are related to each other by — 1 — CO3
a) linear relation
b) inequality relation
c) transcendental relation
d) none of the above

(ix) Before-and-after with control design can be classified as — 1 — CO2
a) informal experimental design
b) formal experimental design
c) can be put in any of the above categories
d) none of the above

(x) If Xi is the ith observation and n is the total number of observations then the expression — 1 — CO3

$$\left(X_1 X_2 X_3 \cdots X_i \cdots X_n\right)^{1/n}$$

gives the
a) harmonic mean
b) arithmetic mean
c) geometric mean
d) none of the above

(xi) Qualitative research is specially important in — 1 — CO1
a) behavioural science
b) physical science
c) both (a) and (b)
d) none of the above

(xii) Principle of replication is used primarily to — 1 — CO1
a) control the control group
b) remove effects of local variations
c) control the experimental group
d) none of the above

GROUP – B
(Short Answer Type Questions)
Answer any *three* from the following: **3×5=15**

		Marks	CO No.
2.	Compare between analytical research and applied research	5	CO1
3.	Explain the different steps in research methodology	5	CO1
4.	Explain briefly the following steps in the research process: preparing the research design hypothesis testing	5	CO1
5.	List in an itemized manner, the different components of a research problem and explain each briefly	5	CO1
6.	Define harmonic mean; give an example	5	CO3

GROUP – C
(Long Answer Type Questions)
Answer any *three* from the following: 3×15=45

			Marks	CO No.
7.	(a)	Explain experimental hypothesis testing; give an example	8	CO1
	(b)	Explain non-experimental hypothesis testing; give an example.	7	CO1
8.	(a)	Define quartile deviation; explain briefly with an example	8	CO3
	(b)	Define standard deviation of grouped data: explain briefly with an example.	7	CO3
9.	(a)	Explain the principle of local control with a small example	7	CO1
	(b)	List the three principles of experimental research design as proposed by Prof. Fisher and explain briefly.	8	CO1
10.	(a)	Describe in details the randomized block experiment design approach	8	CO1
	(b)	Describe in details the after-only with control approach for experiment design.	7	CO2
11.	(a)	Explain stratified sampling technique.	5	CO2
	(b)	Discuss the quota sampling technique briefly.	5	CO2
	(c)	Describe the area sampling technique briefly.	5	CO2