MANIPAL
ACADEMY of HIGHER EDUCATION
(Deemed to be University under Section 3 of the UGC Act, 1956)

Reg. No.										

DEPARTMENT OF SCIENCES, II SEMESTER M.Sc (CHEMISTRY)
END SEMESTER EXAMINATIONS, APRIL 2018

Subject: RESEARCH METHODOLOGY AND TECHNICAL COMMUNICATION
[HUM 4220]
(REVISED CREDIT SYSTEM-2017)

Time: 3 Hours | Date: 24.04.2018 | MAX. MARKS: 50

Note: (i) Answer **ALL** questions.

(ii) Draw diagrams and write equations wherever necessary.

1A.	Differentiate between Type 1 and Type 2 error. Give examples.	3
1B.	Differentiate between Probability and Non Probability sampling.	3
1C.	Explain nominal and ordinal data with an example for each.	4
2A.	A university claims that at least 50% of the students use mobile phones in class. A researcher believes that this number is too high and randomly samples 50 students to test at a significance level of 0.02. Write null and alternative hypothesis.	4
2B.	Explain Meta-analysis and Exploratory research.	3
2C.	Explain about Central limit theorem in detail.	3
3A.	Discuss the methods of collecting primary data with merits and demerits.	4
3B.	Memory capacity of 9 students was tested before and after training. State at 5 per cent level of significance whether the training was effective from the following scores: **Student:** 1 2 3 4 5 6 7 8 9 **Before:** 10 15 9 3 7 12 16 17 4 **After:** 12 17 8 5 6 11 18 20 3 Use paired *t*-test.	3

3C.	Weight of 10 students is as follows: ***S. No.:*** **1 2 3 4 5 6 7 8 9 10** ***Weight (kg.):*** **38 40 45 53 47 43 55 48 52 49** Can we say that the variance of the distribution of weight of all students from which the above sample of 10 students was drawn is equal to 20 kgs.? Test this at 5 per cent and 1 per cent level of significance.	3
4A.	A group of seven-week old chickens reared on a high protein diet weigh 12, 15, 11, 16, 14, 14, and 16 ounces; a second group of five chickens, similarly treated except that they receive a low protein diet, weigh 8, 10, 14, 10 and 13 ounces. Test at 5 per cent level whether there is significant evidence that additional protein has increased the weight of the chickens. Use assumed mean (or $A1$) = 10 for the sample of 7 and assumed mean (or $A2$) = 8 for the sample of 5 chickens in your calculations.	4
4B.	How is literature review conducted? Explain various sources of chemical literature.	4
4C.	How to select the journal for publication? Describe the different referencing styles. List few publishers who focus on chemical sciences.	2
5A.	Explain the advantages and limitations of broad and narrowly focused conferences.	4
5B.	Explain the term plagiarism. How to minimize the risk of plagiarism?	4
5C.	What you mean by copyright. How it protects authors and publisher interest?	2