

Reg.No.									
---------	--	--	--	--	--	--	--	--	--



MANIPAL INSTITUTE OF TECHNOLOGY
 Manipal University, Manipal – 576 104



RESEARCH SCHOLARS – Course Work
SUBJECT: ADVANCED RESEARCH METHODOLOGIES (HSS – 601/602)
DATE (18/05/2016)

Time: 3 Hours.

MAX.MARKS: 50

Instructions to Candidates:

- ❖ Answer **ANY FIVE FULL** questions.
- ❖ Missing data, if any, may be suitably assumed.
- ❖ Use of **non-programmable** calculators is permitted.

- 1A)** Explain any five 'articles of faith' which form the basis for scientific research. (05)
- 1B)** What are the two approaches to research? Explain. (05)
- 2A)** What is the necessity to formulate a research problem? Justify your answer. (05)
- 2B)** Diagrammatically explain the Steps involved in a research process. (05)
- 3A)** The performance speed (seconds) of Robots of three different make under four different applications is given in the following table. (05)

	Performance Speed (Seconds)			
	Appn. 1	Appn. 2	Appn. 3	Appn. 4
Make 1	6	7	3	8
Make 2	5	5	3	7
Make 3	5	4	3	4

State if the make of the Robots vary significantly (95% confidence level). The following table gives the F-distribution.

$v_1 \backslash v_2$	1	2	3	4	5	6	8	12	24	∞
1	161.4	199.5	215.7	224.6	230.2	234.0	238.9	243.9	249.1	243.3
2	18.51	19.00	19.16	19.25	19.30	19.33	19.37	19.41	19.45	19.50
3	10.13	9.55	9.28	9.12	9.01	8.94	8.85	8.74	8.64	8.53
4	7.71	6.94	6.59	6.39	6.26	6.16	6.04	5.91	5.77	5.63
5	6.61	5.79	5.41	5.19	5.05	4.95	4.82	4.68	4.53	4.36
6	5.99	5.14	4.76	4.53	4.39	4.28	4.15	4.00	3.84	3.67
7	5.59	4.74	4.35	4.12	3.97	3.87	3.73	3.57	3.41	3.23
8	5.32	4.46	4.07	3.84	3.69	3.58	3.44	3.28	3.12	2.93
9	5.12	4.26	3.86	3.63	3.48	3.37	3.23	3.07	2.90	2.71

- 3B)** Name the different methods of sampling used in quantitative research. (05)
- 4A)** With the help of a diagram explain systematic random sampling. (05)
- 4B)** Classify the types of data and types of scales. Explain with examples. (05)
- 5A)** What are the components of Research Design? Explain their importance to experimental research using Design of Experiments. (05)
- 5B)** Explain the components of a typical journal paper. (05)
- 6)** Compare and contrast ANN and System Dynamics Modelling & Simulation with appropriate research problems. (10)