Ganpat University

M. Tech. III Sem. (AMT and CAD/CAM) Regular Examination Dec. 2013

3ME301/3ME311 Research Methodology

Time: 3 hr **Marks: 70**

Instructions:

(1) All questions are compulsory.
(2) Right figure indicate full marks.
(3) Only scientific calculator is allowed.

SECTION-I

Que.1 Attempt the followings.

(a) What do you mean by research? Explain its significance in modern times. **[4]**

(b) Distinguish between Research methods and Research methodology. **[4]**

(c) Explain different characteristics of research. **[4]**

OR

Que.1 Attempt the followings.

(a) "Empirical research in India in particular creates so many problems for the researchers". State the problems that are usually faced by such researchers. Also enlist the solutions to overcome these problems. **[4]**

(b) What are the different criterions for good research and state the qualities of a good research. **[4]**

(c) Explain what content should be included in research proposal? Also enlist the important aspects which are normally considered in research proposals. **[4]**

Que.2 Attempt the followings.

(a) What do you mean by research problem? State the components of a research problem. Explain the points normally observed by researchers in selecting a research problem. **[4]**

(b) What do you mean by research design? Explain important concepts relating to research design. **[4]**

(c) Explain and illustrate the Latin square design as research designs. **[3]**

OR

Que.2 Attempt the followings.

(a) "Research design in exploratory studies must be flexible but in descriptive studies, it must minimise bias and maximise reliability." Discuss. **[5]**

(b) Explain the problem formulation of your research work on which you are doing your dissertation. Also write the objectives of your research work. **[6]**

Que.3 Attempt the followings (Any three). **[12]**

(a) Explain the steps involved in sample design.

(b) Explain brain storming method as a problem solving technique used for idea generation.

(c) What is the meaning of measurement in research? What difference does it make whether we measure in terms of a nominal, ordinal, interval or ratio scale? Explain giving examples.

(d) Examine the merits and limitations of the observation method in collecting material. Illustrate your answer with suitable examples.

SECTION-II

Que.4 Attempt the followings.

(a) "Processing of data implies editing, coding, classification and tabulation". Describe in brief these four operation pointing out the significance of each in context of research study. **[4]**

(b) Distinguish between the followings: **[4]**
(1) Confidence level and significance level
(2) Random sampling and non-random sampling

(c) The procedure of testing hypothesis requires a researcher to adopt several steps. Describe in brier all such steps. **[4]**

OR

Que.4 Attempt the followings.

(a) From a random sample of 36 New Delhi civil service personnel, the mean age and the sample standard deviation were found to be 40 years and 4.5 years respectively. Construct a 95 per cent confidence interval for the mean age of civil servants in New Delhi. **[4]**

(b) 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: **[8]**

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 as well as A- test for your answer.

Que.5 Attempt the followings.

(a) Develop the first four terms of the Taylor series expression of the function $f(x) = e^x$ about the point $x = 0$. **[5]**

(b) Write a Matlab script file to plot a circle with user defined input radius. **[5]**

(c) Write Matlab functions of the followings: **[1]**
(1) inv()
(2) eig()

OR

Que.5 Attempt the followings.

(a) Write a brief note on the task of interpretation' in the context of research methodology. **[3]**

(b) What do you mean by ANOCOVA? Write assumptions and describe the technique of ANOCOVA. **[4]**

(c) Explain the significance of a research report and narrate the various steps involved in writing such a report. **[4]**

Que.6 Attempt the followings (Any three). **[12]**

(a) What is Taguchi Method? Explain the procedure of Taguchi Method for implementation.

(b) What is Design of Experiment? Why DOE required. Explain with example.

(c) What do you mean by case study method as a data collection method? Also enlist characteristics, assumptions and major phases involved in case study method.

(d) What do you mean by mathematical modelling? Explain steps in model building with proper illustration.

END OF PAPER