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Fourth Semester B.E. Degree Examination, July/August 2022 Work Study and Ergonomics

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. With a block diagram, explain the tasks of management. (06 Marks)
- b. Explain how excess work content arises in practice due to products and processes. (06 Marks)
- c. Summarize the basic procedure performed in work study. (08 Marks)

OR

- 2 a. Describe how manufacturing time is made up. (07 Marks)
- b. Define Ineffective time. Explain how management techniques can reduce ineffective time. (08 Marks)
- c. What are the roles of management and worker in successful application of work study. (05 Marks)

Module-2

- 3 a. Illustrate the procedure for construction of string diagram with a neat sketch. (06 Marks)
- b. Briefly describe the Therbligs used in micro motion studies. (09 Marks)
- c. Explain the stages involved in installing the improved method. (05 Marks)

OR

- 4 a. Define method study. State its objectives. (06 Marks)
- b. A simple study sheet recording the movement of a messenger in an office is given below. Compute the travel chart and critically examine it. (06 Marks)

From	1	4	5	8	3	2	6	4	3	7	5	4	1	6	2
To	4	5	8	3	2	6	4	3	7	5	4	1	6	2	8

From	8	5	3	8	4	2	7	1	4	7	5	3	6	1	8
To	5	3	8	4	2	7	1	4	7	5	3	6	1	8	5

- c. Explain the principles of motion economy with respect to the use of human body. (08 Marks)

Module-3

- 5 a. A work sampling analyst observed an activity randomly 500 times. The activity was seen to be taking place 375 times. Find the number of observations to be made for 95% confidence level with an accuracy range of $\pm 5\%$. Also determine the number of observations for 99% confidence level for the same accuracy range. (06 Marks)
- b. Describe the time study equipments with a neat sketch. (08 Marks)
- c. Discuss the factors affecting the rate of working. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Why breaking down of a job into elements is necessary in time study? (06 Marks)
 b. Define Rating. Explain the systems of rating. (08 Marks)
 c. An operator was observed for 20 cycles to perform a job as follows:
 0.52min for 7 cycles
 0.54min for 8 cycles
 0.58min for 5 cycles
 His average performance index was 95%. Regular allowance of 15% and contingency allowance of 5% were given. What is the standard time for the job? Assuming 8 hours work/shift, what would be the production per shift? (06 Marks)

Module-4

- 7 a. Summarize Industrial design and graphics design from ergonomics point of view. (08 Marks)
 b. Explain the biomechanical characteristics with respect to physical activity. (06 Marks)
 c. Discuss the concepts of reasoning and decision making in cognitive ergonomics. (06 Marks)

OR

- 8 a. Explain the Human factors considered in ergonomics. (06 Marks)
 b. How operation research is helpful in ergonomics? (06 Marks)
 c. Explain perception and memory in cognitive ergonomics. (08 Marks)

Module-5

- 9 a. With a neat block diagram, explain the components of man-machine system. (06 Marks)
 b. Describe the various types of displays, with neat sketches. (08 Marks)
 c. Discuss the general checklist in designing displays and controls. (06 Marks)

OR

- 10 a. Explain the factors affecting the effectiveness of displays. (06 Marks)
 b. Describe the various types of controls with neat sketches. (08 Marks)
 c. What are the roles of viewing distance, illumination and angle of view in functioning of displays? (06 Marks)

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