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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Fifth Semester, B.E. - Industrial and Production Engineering

Semester End Examination; Dec - 2016/Jan - 2017

Work Study and Ergonomics

Time: 3 hrs

Max. Marks: 100

Note: i) Answer FIVE full questions selecting ONE full question from each unit.

UNIT - I

- 1 a. List and explain the basic needs of the people. 10
- b. A factory decides to introduce incentive scheme. The basic rate is Rs. 200/hr. The standard time for the task is 8 hours while the worker completes the task in 4 hours. Determine the earnings under; 6
- i) Halsey plan ii) Halsey weir plan iii) Rowan Plan.
- c. "There are certain qualifications and qualities which are essential or success of work study practitioner" What are those? 4
- 2 a. Discuss about the "Work content added by inefficient methods of manufacture or operation" How management technique can reduce these? 12
- b. Distinguish clearly between the time rate and piece rate of wage rate practice. 4
- c. "Work study is a tool which can be applied everywhere". Define this statement. 4

UNIT - II

- 3 a. How do you select the work to be studied? Explain. 8
- b. Distinguish clearly between the following : 6
- i) Flow process chart men type and flow process chart material type.
- ii) String diagram and Flow diagram.
- c. Construct an outline process chart for an activity "Assembly of a wheel of your motor cycle" State your assumptions. 6
- 4 a. Outline the primary questions used in examination of an activity. 6
- b. Write the classification of movements. 6
- c. Construct two-handed process chart for "sharpening Pencil by a sharpener" State your assumptions. 8

UNIT - III

- 5 a. "Work measurement may start a chain reaction throughout the organization". Justify this statement. 6
- b. An activity was observed for 8 trials. The following times were observed: 0.35, 0.38, 0.34, 0.37, 0.35, 0.36, 0.34 and 0.35 min. The average rating for the operator was 120%. 6
- Find the standard time for the activity if the allowance given was 12% of the Basic time.

- c. Define DTS. Describe the various motions of basic PTS. 8
- 6 a. What are the steps in making a Time study? 8
- b. A sampling study was conducted in workshops of highly productive machines. Downtime was recorded as 2.5%. Determine the number of observations required for the study for a 95% confidence level and an accuracy of $\pm 5\%$. 6
- c. Explain the following : 6
- i) R100C ii) M200B iii) T 305.

UNIT - IV

- 7 a. Elaborate the “Consequences of Not using ergonomics”. 6
- b. List the factors for improving performance. 8
- c. State the rules for body postures for carrying out the physical activities. 6
- 8 a. Compare the design and use of Traditional and present day tool/machines. 6
- b. Summarize the work-station analysis procedure. 8
- c. What are the functions performed better by a man provided they are not highly complex? 6

UNIT - V

- 9 a. Name the common displays in a car. 6
- b. Sketch the design of a chair. 6
- c. Outline the criteria of Ergonomic lighting. 8
- 10 a. Analyze the factors or causes of fatigue. 8
- b. Classify the Basic types of controls. 6
- c. Assess the effects of exposure to vibrations on human being/worker. 6

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