

*KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI.
COLLEGE OF ENGINEERING*

Department of Mechanical Engineering

*B.Sc. Engineering, Supplementary Mid- Semester Examination, 2011/2012
Third Year*

ME. 392 – INDUSTRIAL ENGINEERING & ERGONOMICS

23rd APRIL, 2012

TIME - 1 HOUR

INDEX NUMBER: _____

COURSE: _____

***INSTRUCTIONS: CIRCLE THE CORRECT ANSWER OF QUESTIONS 1-28 ON THE QUESTION PAPER AND
SHADE ON THE SCANNABLE FORM. THEN ANSWER QUESTIONS 29 – 31 ON THE QUESTION
PAPER.***

1. A time study is generally conducted with a stop watch.
 - a) Either on the job site or by analyzing a video tape of the job.
 - b) By timing a worker instantaneously for many observations.
 - c) By timing several workers doing a job.
 - d) By using standard data tables
2. In Methods Engineering, the information from forecasting is useful in
 - a) Doing a motion study
 - b) Determining the economic viability of doing a method study.
 - c) Planning a layout problem.
 - d) all of the above.

3. A preliminary work sample of an operation indicates the following:

Number of times operator is working	60
Number of times operator is idle	40
Total number of preliminary observations	100

What is the required sample size for a 95% confidence level with a 5% accuracy?

- a) 369
 - b) 384
 - c) 150
 - d) 380
4. Select is classified as a (an) _____ therblig.
 - a. effective
 - b. good
 - c. objective
 - d. ineffective
5. Operations analysis, as part of methods study, deals with
 - a. analysing the layout for an operation.
 - b. checking all operations in a company to ascertain if they are correctly performed by employees.
 - c. applying the questioning attitude to a method.
 - d. taking all operation of a method through a series of ten points of scrutiny.
6. A time study of a production operation yielded an average time of 9.00 min per product, a performance rating of 0.90 and allowances of 50 min per 8-hr shift. What is the standard time for this operation?
 - a) 10.1
 - b) 8.1
 - c) 9.0
 - d) 9.04
7. Standard time is defined as
 - a) the time it takes a well trained worker to perform a series of tasks under ordinary conditions, allowing for rest periods, fatigue and other unavoidable delays.
 - b) the time it takes a well trained worker to perform a task under ordinary conditions, allowing for rest periods, fatigue and other unavoidable delays.
 - c) the time it takes a new worker to perform a task under ordinary conditions, allowing for rest periods, fatigue and other avoidable delays.
 - d) the time it takes a well trained worker to perform a task under normal conditions, allowing for avoidable delays.
8. As a methods engineer, what chart will you **first** draw if you were asked to analyse a method?

- a. *flow process chart*
 - b. *operator process chart*
 - c. *operation process chart*
 - d. *gang process chart*
9. *The least preferred method of establishing labour standards is*
- a) *Time studies*
 - b) *Work sampling*
 - c) *Historical times standards*
 - d) *Predetermined time standards*
10. *In operation analysis the ten factors that are considered include*
- i. *the design of the part*
 - ii. *the purpose of the operation*
 - iii. *the operator*
 - iv. *setup and tools*
 - v. *working conditions*
- a) *i, ii, iii only*
 - b) *i, ii and iv only*
 - c) *i, ii, iii, iv only*
 - d) *i, ii, iv and v only*
11. *The stopclocks used for time studies are*
- a. *continuous*
 - b. *snapback*
 - c. *electronic/digital*
 - d. *all of the above*
12. *Methods analysis focuses on:*
- a. *the design of machines used to perform a task*
 - b. *how a task is accomplished*
 - c. *the raw materials that are consumed in performing a task*
 - d. *reducing the number of steps required to perform a task*
13. *Methods Engineering is the process that*
- a. *continuously improves the way that methods are performed.*
 - b. *produces designs for new work processes.*
 - c. *Reduces the labour input of a job.*
 - d. *None of the above.*
14. *Riveting a transistor board in an assembly process is assigned an MTM value of 70.0 TMU, based on industry data standards, before riveting, a worker must reach 0.4 m. for a small part (17.0 TMU), grasp the part (9.1 TMU), move the part to the assembly (27.0 TMU), and position the transistor (32.3TMU). What is the standard time for this task in minutes (1 TMU = 0.0006 minute)*
- a) *102.3 min*
 - b) *155.4 min.*
 - c) *0.0932 min.*
 - d) *0.5118 min.*
15. *Methods Engineering is done at least :*
- a) *Once during the life span of a method.*
 - b) *Twice before a method is implemented.*
 - c) *Twice during the life of a method.*
 - d) *Once a year during the life of a method.*
16. *A fundamental building block in most organizations is :*

- a. *The Employees*
 - b. *The choice of CEO*
 - c. *The design of work and how long it takes*
 - d. *The building of a good foundation*
17. *The pioneers of Work Study in the earlier part of the last century were:*
- a) *Frank and Lillian Therbligs*
 - b) *The Gilbreths and Frederick Winslow Taylor*
 - c) *Henry Ford and H.B. Maynard*
 - d) *Bill Gates and Benjamin Niebel*
18. *Who is responsible for developing work methods in organizations?*
- a) *I. E. Department*
 - b) *Consulting firms specializing in methods designs*
 - c) *Aiding workers to design their own jobs*
 - d) *a, b & c.*
- 19) *The choice of charting method to use depends on :*
- a) *The preference of the one charting*
 - b) *The chart most frequently used by the organization*
 - c) *The activity level of the task or method*
 - d) *The type of equipment being used.*
- 20) *The purpose of doing work measurement is to determine*
- a) *how a work method should be done*
 - b) *the most efficient way to accomplish the method*
 - c) *how long it takes to accomplish the method*
 - d) *which worker to accomplish the method.*
- 21) *All organizations need some form of standard time estimates to do all **except** :*
- a) *scheduling and incentive pay*
 - b) *planning and budgeting*
 - c) *determining the method use*
 - d) *Setting of work standards.*
- 22) *A structured procedure for observing measuring, and improving work methods is known as*
- a) *methods analysis*
 - b) *operations analysis*
 - c) *work measurement*
 - d) *work sampling*
- 23) *The objective in studying the overall production system or operation is to*
- a) *Identify delays, transport distances processes and processing time requirements*
 - b) *Minimize idle time and balance the cost of worker and machine idle time.*
 - c) *Identify points of delays, storage points, points of inspection, transport distances and processing time requirements.*
 - d) *To access team effort.*
- 24) *A method that has three elements was timed through five cycles and yielded the following results for one of the elements:*

	<i>Cycle observed (in minutes)</i>					<i>Performance rating</i>
<i>Job element</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	
<i>Element C</i>	<i>8</i>	<i>10</i>	<i>9</i>	<i>21</i>	<i>11</i>	<i>120%</i>

What is the average time for this element C?

- a. 11.8 min.
- b. 7.6 min.
- c. 9.5 min.
- d. 10 min

25) A major assumption of stability of large demand is important for using which of the following layout types?

- a) product
- b) cellular
- c) process
- d) fixed position

26) Cellular layouts

- a) are used in metal fabrication and assembly work
- b) allocates dissimilar machines into cells to work on products that have similar shapes and processing requirements
- c) try to gain the benefits of product layout in job-shop layout
- d) all of the above

27) What charts are used in developing overall production systems or operations?

- a) Simo charts and Operation Process chart
- b) Operator process chart and Flow process chart
- c) Flow process chart and Gang process chart.
- d) Flow process chart and Operation process chart

28) An Operator Process chart is used to analyze

- a) a worker in a fixed workplace
- b) a worker interacting with his equipment
- c) a worker interacting with other workers.
- d) a complete operation.

29). What process charts are utilised when one wants to study overall production system? Draw the combination of two charts that gives almost all information about the complete process.

30) *What process charts are utilised when one wants to study work being done by groups of workers? Draw one of them.*

31). *Draw a From-To Chart and say when it is used.*

