

**COVENANT UNIVERSITY
NIGERIA**

*TUTORIAL KIT
OMEGA SEMESTER*

**PROGRAMME: MECHANICAL
ENGINEERING**

COURSE: MCE 541

DISCLAIMER

The contents of this document are intended for practice and leaning purposes at the undergraduate level. The materials are from different sources including the internet and the contributors do not in any way claim authorship or ownership of them. The materials are also not to be used for any commercial purpose.

MCE 541: Engineering Economics

Contributors: Prof. A.O. Inegbemor and Mr. A. Aworinde

- 1) Explain the interest economics play among engineers.
- 2) Engineers form one of the principal spending professions; explain what this statement means in engineering economics.
- 3) Apart from the land itself the most important natural resources that are matter to the community, list them.
- 4) Development of these natural resources depends on what?
- 5) Explain the importance of these resources.
- 6) Explain economic analysis as applied to engineering.
- 7) What purpose economic analysis will provide to the engineers.
- 8) For the most part of the decision whether to employ resources for purpose rather than for another lies not trained engineers. Name whom are responsible for such decision to be made?
- 9) Explain how they will make a wise choice between competing programmes of expenditure.
- 10) Reiterate what World Bank, policies and operations, said about success of modern business?
- 11) Explain the attention of engineers when emphasizing the importance of some of the wider aspects of economic activity.
- 12) What appraisal technique will lead to when engineer's work is concerned in making a reasoned choice between possible alternative.
- 13) What is the vital element in such an evaluation?
- 14) Define what you mean by economic evaluations?
- 15) Why economic evaluation is less concerned with the earnings and revenues and what is it concerned about and where the impact is expected to be.
- 16) Explain financial planning in engineering economics.
- 17) Explain and define what budget, the type of budget and uses.
- 18) Explain the number of risks that are associated with export trade. Also the aid the exporters may get from the government agency against these risks.
- 19) Discuss how manufacturing cost is being subdivided and classified.
- 20) The fixed cost of making a product is N2, 000. 0 and the variable cost is N 10 per unit. The product is sold for N 12 and 2000 units are sold. If the selling price is reduced to N11:
 - i. How many of the products must be sold before the reduced selling price must increase profit.
 - ii. Draw the break-even curve.
 - iii. How much will a company have to charge for an aeroplane of the cost for the design, development and tooling were N225 million, the cost of labour, materials and bought

out parts were N7million per aeroplane and it was believed that: 100 aeroplanes would be sold.

- iv. How much would the company lose if only 75 aeroplanes were sold?
- v. How much will the company gain if 150 aeroplanes were sold.

MODEL ANSWERS TO MCE541

1. The economics activities in the world have witnessed an increasing interest among engineers in the subjects of economics.

The interest has been accompanied by a growing awareness of the important part which the subject play in their everyday affairs and of the people to make the best use of our limited national resources.

3. Apart from the land itself, the most important natural resources include climate and water, fertility of the soil and the presence of useful minerals. To these may be added a topography which favours easy communications.

5. These resources represent the potential for a high standard of living and at any moment their availability is limited in sense that if resource is used for one purpose it is denied to another which must therefore be forgone. Thus competition arises between desirable projects.

7. Its purpose is to provide the engineer with a means of judging the relative economic merits of alternative schemes and of ensuring that available resources shall be used to achieve the desired end With the minimum expenditure of means.

9. If they are to make wise choice between competing programmes of expenditure they must be properly informed by those who cannot only assess the comparative action, but can also evaluate their relative real costs when expressed in terms of the benefits to be secured.

11. In thus emphasizing the importance of some of the wider aspects of economic activities, the attention of engineers is drawn to the need for breadth of vision and better understanding of all the factors which contribute to a successful enterprise.

13. A vital element in such an evaluation is the time pattern of the expenditure of resources in achieving a fixed objective and of the few benefits arising therefore.

15. It is less concerned with the earnings and revenues necessary to meet the obligations of a loan than with those which are necessary to justify the selection of a particular project in prevailing economic environment.

Such an evaluation must take into account the need for carrying out related investment projects and where necessary must examine the impact which the project is likely to have on the regional or national economy.

17. Business exists with specific aims and objectives. These aims and objectives can be achieved through proper planning, control and coordinated execution to pursuit of the aims and objectives resources of the business will be employed.

Therefore, a quantitative document is needed setting out the objectives the targets and the resources with to achieve the targets.

A budget is such a document which defined; is a formal quantitative expression of management plans for a given period. They are frequently described as “estimates”. Budget reflects the management plans in financial terms. It makes management think and plan more systematically.

Types of Budget

- a) Operating budgets (sales and production estimates)
- b) Capital budgets
- c) Cash budgets (cash inflows and outflows)

Uses of Budgets

- a) It is a management tool for measuring success i.e. adequate return on investment
- b) It is used for coordinating activities
- c) Used for motivating employees through participation in budget preparations.
- d) Communicating wishes and aspirations to employees
- e) Used for project planning

Budgets should be flexible because of internal and external environmental influences.

19. The costs of making a product are classified in many ways and they are subdivided depending on the problems that we are attempting to solve:-

One commonly used subdivision is into fixed and variable costs; another is into direct and indirect costs, another is into the cost of direct labour and overheads, while yet another is the cost of direct material and overheads.

Fixed and Variable Costs

In this subdivision of costs, we classify as fixed those which are independent of the number of product made.

The variable costs are those which vary more or less directly, with the number of products made. In some cases we call the fixed costs “non-recurring costs”.

Solution

Fixed costs = N2000.00 = F

Variable cost per unit = N 10 =V

Product selling price per unit = N 12.00 = P

Number of units sold = 2000 = N

$N(P - V) - F = \text{profit/loss}$

$2000(12-10) - 2000 = \text{profit/loss}$

$(2000 \times 2) - 2000 = \text{profit/loss}$

$4000 - 2000 = 2000 = \text{profit}$

If the selling price P is changed to N11, then to find N (i.e. number of units that will be sold) at which the same profit (or more) will be made, we equate the profit above with the following equation:-

$\text{Profit} = N(P - V) - F$

To find $N = \frac{\text{Profit}}{P - V} + F$

$= \frac{2000}{(11-10)} + 2000$

$= 4000$

N= 4000, i.e. 4000units and above must be sold before the reduced selling price must increase profit.

