

**COVENANT UNIVERSITY
NIGERIA**

*TUTORIAL KIT
OMEGA SEMESTER*

**PROGRAMME: BUILDING
TECHNOLOGY**

COURSE: BLD 521

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BLD 521: ADVANCED CONSTRUCTION TECHNOLOGY II

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1. Highlight the several classifications of mechanical plants in the construction industry.
2. Write short notes on the following plants financing options.
 - (i) Outright Purchase
 - (ii) Hire Purchase
 - (iii) Credit Purchase
 - (iv) Leasing.
3. Discuss the purpose of plants in the construction industry.
4. Highlight the advantages and disadvantages of the following pile materials types.
 - (i) Wood piles.
 - (ii) Prefabricated concrete piles.
5. Enumerate the necessary elements in formulating a sound plant policy.
6. With the aid of well annotated diagrams where applicable, write short notes on the following roofs over large space.
 - (i) Arches
 - (ii) Fixed Frames.
7. Discuss the uniqueness of the construction industry in comparison with other industries in Nigeria.
8. Write short notes on the following road junction types.
 - (i) roundabout
 - (ii) major/minor junction.
9. Discuss the merits and demerits of hiring mechanical plant for construction works.
10. (i) Explain the term, "Building Failure".
 - (ii) What are the causes of building failure in Nigeria?
11. The vertical alignment of any carriageway is determined by three factors.

List these factors.
12. Itemize the various types of retaining walls you know.
13. Enumerate the key stages that must be present when considering the design of a carriageway.
14. Explain the following terms in road construction:
 - (i) Pegging out
 - (ii) Clearing of the route

- (iii) Earthwork.
- 15. Highlight the various economic factors that can affect the selection of plants and equipment on construction sites.
- 16. With the aid of well annotated diagrams where applicable, discuss the various types of dam construction you know.
- 17. What do you understand by the term, “Depreciation”? State any three methods of depreciation you know.
- 18. Describe, with the aid of neat diagrams, the various types of retaining walls you know.
- 19. Differentiate, with two examples each, between shallow water and deep water.
- 20. Describe in details a typical equipment purchasing appraisal that could be adopted in the construction industry.

ANSWERS

1. Classifications of Mechanical Plants

Mechanical plants can be classified into two major groups, which are:

- (a) According to mobility, and
- (b) According to functions.

According to mobility

- (i) Fixed
- (ii) Mobile
- (iii) Portable

According to function

- (i) Excavating
- (ii) Transportation
- (iii) Hoisting
- (iv) Mixing.

2. Purpose of Plants in the Construction Industry

- (i) To increase the rate of output.
- (ii) To reduce overall project costs.
- (iii) To carry out activities which cannot be done manually or to do them economically.
- (iv) To maintain heavy manual work, thus reducing fatigue and increasing the productivity of manual workers or operatives.
- (v) To maintain a planned rate of production where there is a shortage of either skilled and/or unskilled labour.
- (vi) To maintain the high standards often required by present-day designs and specifications, especially when concerned with structural engineering works.

3. Necessary Elements in Formulating a Sound Plant Policy

- (i) Economic life of various machines.
- (ii) Timing of machine for replacement.
- (iii) Degree of maintenance.
- (iv) Renting, leasing/owing.
- (v) Selection of equipment.
- (vi) Equipment analysis for cost and production.
- (vii) Inventory management.
- (viii) Storage and security.
- (ix) Spare parts stock levels.
- (x) Organization for administering equipment.

4. Uniqueness of the Construction Industry in Comparison to other Industry

- (i) Work is carried out in the open and is subjected to weather interference.
- (ii) Labour in the construction industry is nomadic in nature.
- (iii) Construction work is one-off in nature. That is, there is a period of surplus and a period of drought.
- (iv) Design is separated from construction.
- (v) The industry consists of various professionals, trades and activities.
- (vi) The industry has very poor safety records.

5. Merits and Demerits of Hiring Mechanical Plants

(a) Merits

- (i) Plant can be hired as required and for a short period.
- (ii) Hire firms are responsible for repairs and replacements.
- (iii) Increase in liquidity.
- (iv) Greater efficiency.
- (v) Contractor is not left with expensive plant items after the completion of the contract.
- (vi) Hire rates may include operation, fuel and oil charges.

(b) Demerits

- (i) The plant may not be obtainable from the plant hire firms at the period(s) which suits a particular contract programme. In other words, disappointments may be the case.
- (ii) It is often more costly in the long run to hire than to own.
- (iii) The plant may get to the site of the person hiring it and not functional, thereby wasting time and resources of the borrower.
- (iv) In certain circumstances where a contractor receives an investment grant to aid him in the procurement of plant, such grants may not be obtainable if the plant is hired.

6. The Determining Factors of Vertical Alignment in a Carriageway

- (i) Design speed.

(ii) Road category.

(iii) Site topography.

7. Stages in the Design of a Carriageway

(i) Select design speed.

(ii) Determine stopping distances and forward visibility requirements.

(iii) Determine horizontal geometry.

8. Economic Factors that can affect Plants Selection on Construction Sites

(i) Workload to be undertaken.

(ii) Time allowed in the construction programme for the work.

(iii) The capabilities of the machines and equipment available.

(iv) The various tasks which each of the plants could accomplish.

(v) Transportation cost involved.

(vi) Maintenance facilities required.

(vii) Power availability.

(viii) Access to site.

(ix) Obstruction to operation and adjacent building(s).

9. Depreciation can be described as the loss of value of an item as a result of usage or age.

Examples of methods of depreciation are: Straight line depreciation, sinking fund depreciation, declining balance depreciation, sum of digits method, etc.

10. A shallow water is the one whose depth can be determined with physical eyes. It is the one that is measuring little and that does pose threat to human existence. Examples include stagnant water, water logged area, pond.

A deep water, on the other hand, is the one whose depths cannot be determined with physical eyes. It poses threat to human existence. Examples include river, ocean, lake, sea, etc.