



THE NIGERIAN INSTITUTE OF BUILDING

NATIONAL SECRETARIAT

ADPC CAPITAL ESTATE, OPP BRICK CITY BY MOPOL BARRACKS, KUBWA
EXPRESSWAY, KABA DISTRICT, ABUJA

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2019 DECEMBER TECHNOLOGIST/ASSOCIATE EXAMINATION **AE 301: CONSTRUCTION TECHNOLOGY**

INSTRUCTION:

ATTEMPT ANY FOUR (4) QUESTIONS

TIME: 3 HOURS

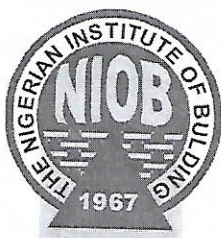
1. Foundation in buildings are defined as, that part of a structure which is in direct contact with the ground support loads in building.
 - i. List and explain the forms of loads any foundation must support (5mks)
 - ii. What conditions could lead to settlements of the foundation (5mks)
 - iii. What are the various forms of foundation available to builders (10mks)
2. (i) What you do understand by the term "Retaining wall" (5mks)
(ii) State the factors that must be considered in the choice, design and/or construction of retaining walls (15mks)
3. With diagrams if applicable, give a detail account of the following
 - i. Basement (5mks)
 - ii. Setting out (5mks)
 - iii. Timbering (5mks)
 - iv. Formwork (5mks)
4. Make a clear distinction between the following:
 - (i) Equal and unequal settlement in building (5mks)
 - (ii) Dead and live loads (5mks)
 - (iii) Mass retaining wall and cantilever retaining walls (5mks)
 - (iv) Load bearing walls and non-load bearing walls (5mks)

5. State the functional requirements of the following:

- (i) Walls (5mks)
- (ii) Roofs (5mks)
- (iii) Floors (5mks)
- (iv) Foundations (5mks)

6. Write short notes on the following:

- (i) Batching of concrete (5mks)
- (ii) Floor finishes
- (iii) Curing of concrete (5mks)
- (iv) Site preparations (5mks)



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**DECEMBER, 2019 PROFESSIONAL TECHNOLOGIST/ASSOCIATE
EXAMINATION
AE 303: BUILDING SERVICES**

INSTRUCTION: ATTEMPT ANY FIVE QUESTION

TIME: 3 HOURS

1. (a). Define Electrical wiring
(b). Using relevant drawing discuss the following:
 - i. Two major methods of Electrical wiring and their merits and demerits
 - ii. Electrical installation layout
- (c).
 - i. State five importance of protective device in electrical installation
 - ii. List five types of protective device
2. (a). Briefly describe gas supply to residential building
(b).
 - i. Explain the term gas carcassing
 - ii. state five precautions necessary during installation of gas service pipe
- (c). Enumerate five factors that can determine ventilation need in reference to gas safety act, 1997
3. Write short note on the following:
 - i. Light levels in buildings
 - ii. Light power density
 - iii. Natural Light and ventilation
 - iv. LED
 - v. Ambient Lighting
 - vi. Luminosity
 - vii. Glare
 - viii. Wire Lettering
 - ix. Colour codes for Wire
 - x. Coaxial cable
4. (a)
 - i. Explain the use of Lifts in buildings
 - ii. Differentiate the operation of AC and DC motor driven Lifts
- (b)
 - i. What is an Escalator
 - ii. An escalator is inclined at 33°, operating with one person per 400mm step at 0.65 m/s. Calculate its capacity per hour.
- (c). Describe chute system in High rise building

5. (a) i. Define Fire
ii. Briefly explain the classification of fire
(b). List and explain Ten causes of fire
(c). i. Enumerate five fixed firefighting facilities
ii. Suggest five conditions that can make the use of fixed fire protection system advisable
6. (a). Explain Air conditioning process
(b). what are the components of a Window and Split system AC units and how do they work
(c). With the aid of a well labeled diagram describe the working process of Chilled water and Cooling tower AC units.
7. Write short notes on the following:
 - (a). Passive cooling
 - (b). Vegetative cooling
 - (c). Evaporative cooling
 - (d). Green roof system



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**DECEMBER, 2019 PROFESSIONAL TECHNOLOGIST/ASSOCIATE
EXAMINATION
AE 304: PRINCIPLES OF CONTRACT LAW AND ARBITRATION**

INSTRUCTION:

Time : 2hours 30minutes.

Answer four (4) questions. All questions carries equal marks.

1. (a) Contract is consensus in nature. Discuss briefly(10marks)
(b). XYZ Ltd. was planning to relocate its head office to a new large parcel of land in a prime location in FCT, Abuja, which it recently acquired. XYZ invited Archvite Designs, a firm of architects to a meeting and briefed the firm about its plan. Without any further instruction, Archvite Designs forwarded what it described as “a suitable design” to XYZ Ltd. and a bill of N15million for its professional fee. XYZ Ltd. has refused to honour the bill. Archvite Designs is planning to sue XYZ Ltd. Advise the parties. (15marks)
2. (a) What is ADR?(5marks)
(b) What are the types of ADR you know.(5marks)
(d). What is an Arbitration Clause and give an example? (5marks)
(e) Distinguish between Litigation and Arbitration. (10marks)
3. (a). All contracts are agreements, but not all agreements are contracts. Discuss briefly. (10marks)
(b) Magic Paint Limited, a manufacturing of Magic Paint and Allied products advertised thus: “Four litres of Magic Paint will do more than two bucket of others. *Awuf – don jam* correct. Mr. Builder bought 500 of 4lites buckets of the paint on the strength of the advertisement and discovered that the claim of Magic Paint Limited was false. Can Mr. Builder enforce the statement against Magic Paint Limited”? (15marks)
4. (a) Who is an occupier of land? 5marks)
(b). What are the defences available to a defendant where injuries are sustained by a site worker on his construction site? (5 marks)
(c) Distinguish between a servant and an independent contractor? Under what condition will an independent contractor be liable for the act of his servant?(15marks)

5. Write short notes on the followings:

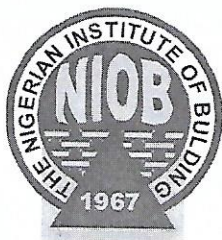
- i. Offer **(5marks)**
- ii. Invitation to treat. **(5marks)**
- iii. Acceptance must not be conditional. **(5 marks)**
- iv. Consideration needs not be adequate, but sufficient. **(5 marks)**
- v. Intention to create legal relation. **(5marks)**

6. (a) What is an Act of God? **(5marks)**

(b) Give two examples of Acts of God that may affect delivery of a construction contract within the contract period. **(5marks).**

(c) With reference to a construction project, differentiate between Contract of Service and Contract for Service **(8marks)**

(d) Who is a visitor to a Construction site? Give two example of visitors **(7marks)**



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**DECEMBER, 2019 PROFESSIONAL TECHNOLOGIST/ASSOCIATE
EXAMINATION
AE 305: MEASUREMENT OF BUILDING WORKS AND ESTIMATING 1**

INSTRUCTION:

TIME: 3HOURS

Attempt all questions in section A and any two from section B

SECTION A

Using drawings 1 & 2

1. Take- off quantities for all works relating to Excavating and Filling in strip foundation
2. Take- off quantities for all works relating to In-situ concrete and formwork to in-situ concrete in strip foundation
3. Take- off quantities for Pitched roof construction.

SECTION B

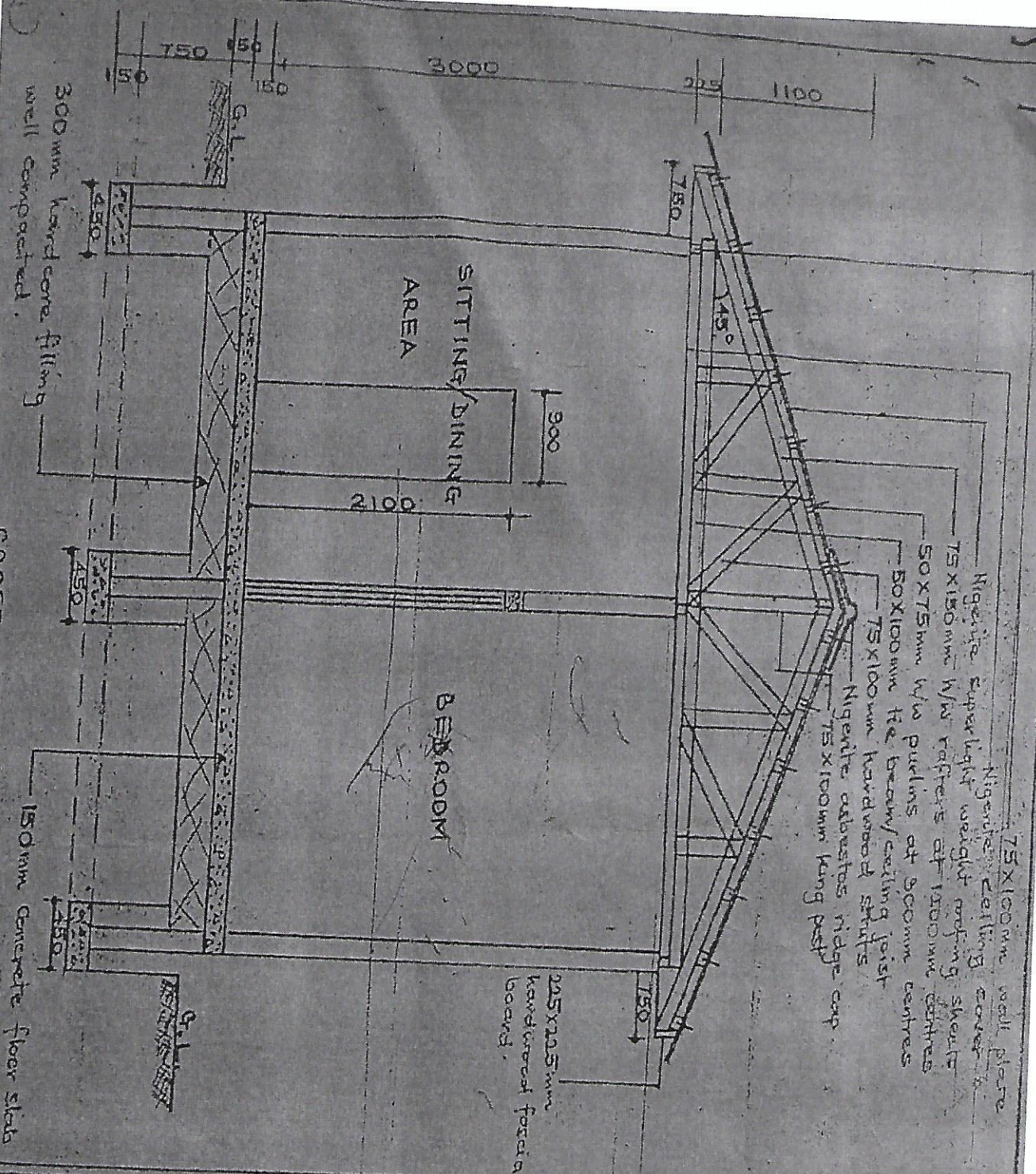
4. Write short notes on the following:
 - a. Bill of quantities
 - b. The process involved in the preparation of Bill of quantities
 - c. Billing
5. Calculate the all in hourly rate for craftsmen using the following information:
Basic salary: trade tested = ₦2,500, Non trade tested = ₦1,750 and Labour = ₦1,200.
National Providence fund = 5%, Gang leadership and pension 6%, Insurance 3%, Tools and Transport 6%, Industrial Training 3% and Housing Leave grant 20%.

6. Build up unit rates for the items of work shown in the table below

item	Description	Qty	Unit	Rate	Amount ₦
A	Excavate topsoil for preservation Average 150mm deep	205	M ²		
B	Excavating trenches not exceeding 1.0m commencing level 300mm below ground level	68	M ³		

7. Prepare an approximate estimate for a seven storey residential building having two basements located in Lekki Lagos on a piled foundation using storey enclosure methods. Use the information below.

Basement area 1	= 190 m ²
Basement area 2	=183 m ²
Ground floor area	=210 m ²
1 st -3 rd floor	=205 m ²
4 th – 7 th floor	=201 m ²
External wall area	=2183 m ²
Ceiling area	=224 m ²
Piling cost	= ₦ 30,000,000
Main building	= ₦ 178,000/ m ² (current price)
Mechanical and Electrical services	= 32% of the main building
External work	= ₦ 108,000,000
Preliminaries 7% and Contingencies 4%	



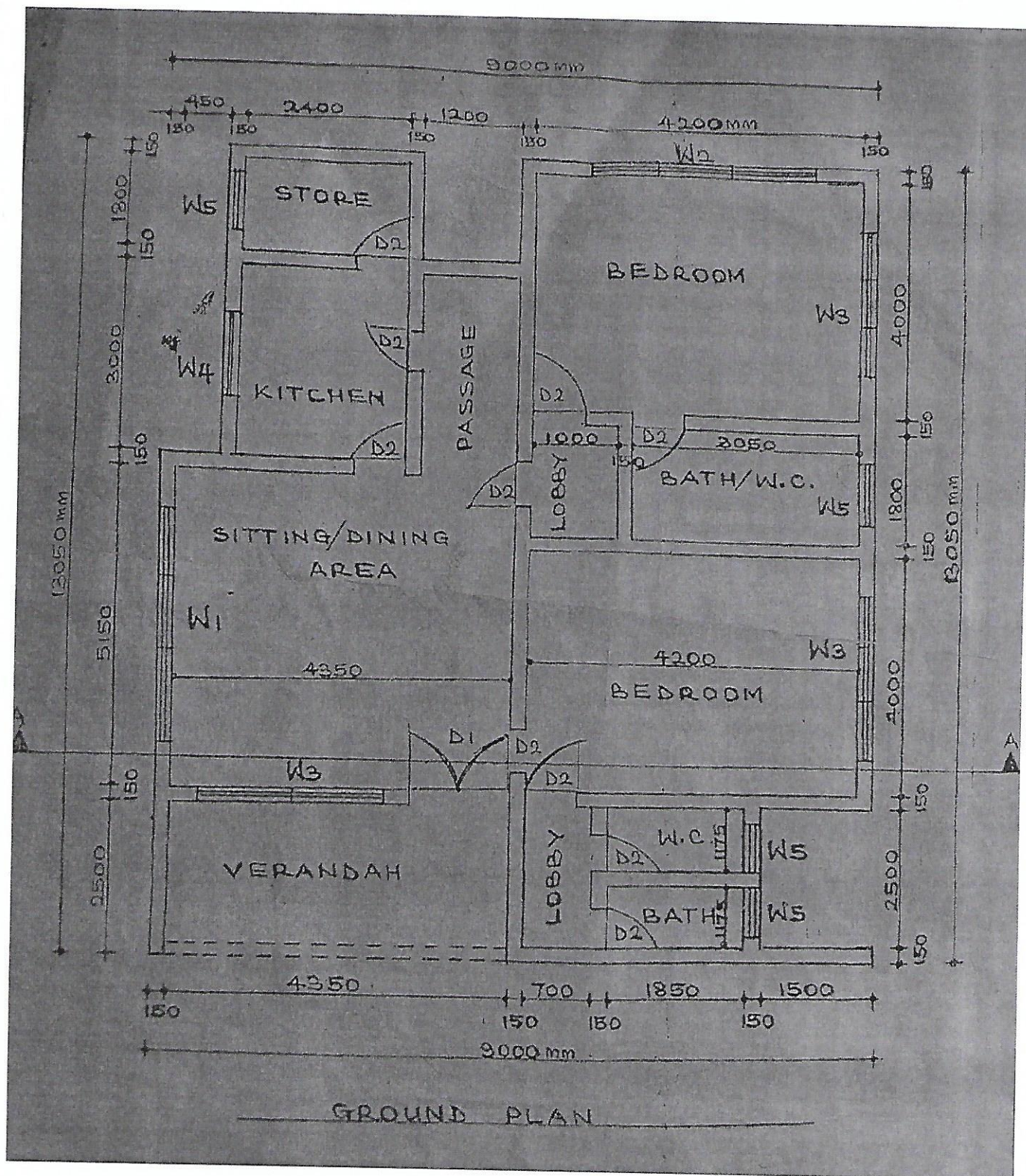
SPECIFICATION

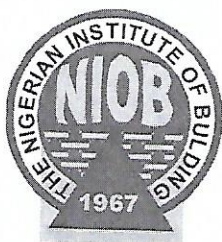
- 1) Mass concrete in form (1:3:6 - 40mm agg.)
- 2) Concrete in floor slab 20mm agg.
- 3) Topsoil to be 150mm
- 4) Cement mortar to be
- 5) Hardcore filling to be
- 6) Concrete floor slab to
- 7) All hollow structure to be 150mm thick
- 8) D.P.C. to be heavy bituminous felt in and 110mm wide

Designed by

Drawn by

Not to scale





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DECEMBER, 2019 PROFESSIONAL TECHNOLOGIST/ASSOCIATE
EXAMINATION
AE 306: CONSTRUCTION ECONOMICS AND MANAGEMENT

INSTRUCTION: ANSWER ANY FOUR QUESTIONS

TIME: 2HOURS

- 1(i) Discuss the importance of the construction industry to the economy of a nation. (13mks)
- (ii) Briefly discuss six (6) challenges facing the construction industry in developing countries (12mks)
- 2 (i) Discuss the nature of the expected relationship between construction professionals, clients and other Stakeholders during project delivery (15mks)
- (ii) Highlight any five (5) factors which can facilitate the expected relationship among stakeholders for project success. (10mks)
- 3(i) The quality and quantity of landed property demanded and supplied at a given place and time can be influenced by certain factors. Briefly discuss five (5) of such factors (10mks)
- (ii) The concept of "Elasticity" is crucial for business decision-making and also for forecasting future demand policies, based on the sensitivity of change in quantity demanded due to the change in price, income or price of the related goods. Write short notes on five (5) **determinants of Elasticity of demand** (15mks)
- 4 (i) Discuss the necessity of the choice and description of suitable material to cost control at design stage of development project. (10mks)
- (ii) Discuss with adequate illustration how "plan shape" and "size of building" can have serious effect on the cost of construction (15mks)
- 5(i) The criteria for selection and utilisation of mechanical equipment for sustainable on site construction are based on, Socio-economic criteria, Engineering criteria and Environmental criteria. Discuss any three (3) sub factors under each of the three main criteria (13mks)
- (ii) Labour management practices globally include the following activities: Manpower Planning, Recruitment, Selection, Training and Developing, Motivation and Safety and Health at work . Briefly discuss the nature of four (4) of these activities in building industry (12mks)

- 6(i) Budgets are useful as tools of control to the extent that they, permit, monitoring, measurement, evaluation, regulation and correction of enterprise activity along desired predetermined directions. What are the essential elements of budgetary control. (15mks)
- (ii) Discuss Five (5) disadvantages of localisation of industries in a particular area or region (10mks)