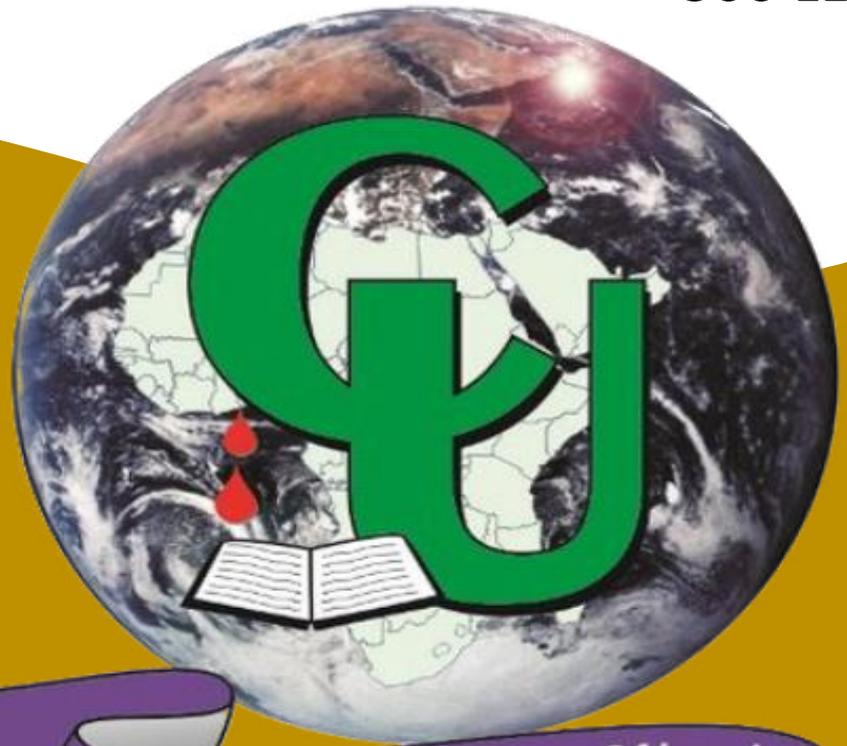


COVENANT UNIVERSITY

OMEGA SEMESTER TUTORIAL KIT
(VOL. 2)

PROGRAMME: ARCHITECTURE
300 LEVEL



Raising A New Generation Of Leaders

DISCLAIMER

The contents of this document are intended for practice and learning 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.

LIST OF COURSES

ARC322: Fundamentals of Interior Designs
ARC323: History of Modern Architecture II
ARC324: Urban Planning & Design II
ARC325: Building Structures IV
*ARC326: Building Components & Methods IV
ARC327: Building Services II
ARC328: Research Methods

***Not included**



COVENANT UNIVERSITY

CANAANLAND, KM 10, IDIROKO ROAD
P.M.B 1023, OTA, OGUN STATE, NIGERIA.

TITLE OF EXAMINATION: B.Sc DEGREE EXAMINATION

COLLEGE: SCIENCE AND TECHNOLOGY

DEPARTMENT: ARCHITECTURE

SESSION: 2015/2016

SEMESTER: OMEGA

COURSE CODE: ARC 322

CREDIT UNIT: 3

COURSE TITLE: FUNDAMENTALS OF INTERIOR DESIGNS

INSTRUCTION: ANSWER ANY FOUR (4) QUESTIONS

- 1a.** Enumerate and discuss the various fields of specialization in interior Design. (12Marks)
- 1b.** List the broad aspects on which interior design specializations are based. (6Marks)
- 2a.** The versatility of an interior designer is judged by the range and scope of services they are capable of rendering in any given scheme. Explain (12Marks)
- 2b.** Discuss in detail the aspects of building design to which interior design pays special attention. (6Marks)
- 3a.** What are the categories of interior design? (6marks)
- 3b.** Mention and discuss with relevant examples how key public interiors spaces are categorized. (12 marks)
- 4a.** State the considerations which determine the classification of the principles of interior design. (6Marks)
- 4b.** Discuss the key tools/elements of one of the considerations above that guarantee maximum workability which is a direct assessment of functionality. (12Marks)
- 5a.** What are the coordinating Elements of interior design and concept. (10 marks)
- 5b.** In clear terms distinguish between the main interest of an interior designer and that of an architect in the actualization of interior design schemes. (8 marks)



COVENANT UNIVERSITY

CANAANLAND, KM 10, IDIROKO ROAD
P.M.B 1023, OTA, OGUN STATE, NIGERIA.

TITLE OF EXAMINATION: B.Sc. EXAMINATION

COLLEGE: SCIENCE & TECHNOLOGY

DEPARTMENT: ARCHITECTURE

SESSION: 2015/2016

SEMESTER: OMEGA

COURSE CODE: ARC 323

CREDIT UNIT: 2

COURSE TITLE: HISTORY OF MODERN ARCHITECTURE II

TIME: 2 HOURS

INSTRUCTION: ANSWER QUESTION No. 1 AND ANY OTHER TWO
QUESTIONS ONLY

1. German admiration of the English Arts and crafts went further to include an attempt at emulating honesty of materials (etc.) in the design of everyday objects.
 - (a) Discuss Hermann Muthesius' contribution to the idea of a new mechanized and German civilization.
 - (b) Outline the major characteristics of Peter Behren's Turbine Factory for AEG in Berlin (1908).
(30 marks)
2. Highlight and explain the architectural ideas found in the works of architects of The Arts and Crafts Tradition.
(20 marks)
3. Describe Hennebique's system in reinforced concrete structures. (20 marks)
4. Write short notes on any two Nigerian Architects you have studied. (20 marks)
5. Write short notes on any two International Architects you have studied. (20 marks)



COVENANT UNIVERSITY

CANAANLAND, KM 10, IDIROKO ROAD

P.M.B 1023, OTA, OGUN STATE, NIGERIA.

TITLE OF EXAMINATION: B.Sc. EXAMINATION

COLLEGE: SCIENCE & TECHNOLOGY

DEPARTMENT: ARCHITECTURE

SESSION: 2015/2016

SEMESTER: OMEGA

COURSE CODE: ARC 323

CREDIT UNIT: 2

COURSE TITLE: HISTORY OF MODERN ARCHITECTURE II

COURSE LECTURERS: DR EDIAE, O. J.

DR ALAGBE, A. O.

MARKING SCHEME

1.(a) Muthesius' contribution (15 MARKS)

- Inherited a concern for the moral power of design to influence people's lives; a sense of integrity in the expression of the nature of materials, a feeling for the dignified embodiment of function and an obsession with the dishonesty of false revivalism.
- Export of the Architect/Artist outlook to design type- forms of a new mechanized and German civilization
- Founder of the Deutsche Werkbund (1907) to forge links between the German industry and the Artists to upgrade the quality of the national product.
- Had his faith in the cultivated industrial elite able to lead the German nation in this mission and in the elevation of a general taste to a position of supremacy in the world markets.
- His belief in the return of fundamental formal qualities which will express architectonically the national German spirit.
- Admiration for the works of Friedrich Schinkel in which was a combination of martial values, impersonal power, scholarship and moral abstraction; all of which were essential to the style of his time.

1. (b) Major characteristics of the Turbine factory, Berlin (15 MARKS)

- Ingenious fusion of the abstracted classical vocabulary and straight forward structural skeletons.
- Had the character of a temple dedicated to some industrial cult.
- An uninterrupted central aisle and an overhead moving gentry necessitating a solution of: Series of elegant, parallel two- sided cranes meeting at the peak of the roof.
- Grand, even ennobling character to the whole building and the effect of a visual lightness and massiveness nobly orchestrated.
- A movement from the functionalist to the expressionist in the evolution of a sober form in the classical German spirit.
- Supports and the entire profile adjusted to give a dignified rhythm and impression of repose.
- The “gentry” shape blended ingeniously with the image of a classical pediment and the repeated exposed steel supports along the side elevation giving the character of a “travee” of classical supports
- The vast areas of glass in the main façade laid flush with the pediment above to give the sense of a thin screen hovering in front of the massive “quoins” which provide a sense of structural stability.

2. The Arts and Crafts (20 MARKS)

- Integration of life and Art, craft and utility (webb, shaw Godwin and Nacmurdo)
- Legacy of domestic architectural ideals
- Practical designs of simple, structural integrity
- Use of indigenous materials
- Emphasis on values of simplicity and honesty
- Ideas of craftsmanship
- Emulation of qualities of vernacular architecture to create emblem of the good simple life.

3. Hennebique’s system in reinforced concrete structures (20 MARKS)

- Enclosed structural frames in concrete suited to open-plan work spaces with large windows
- Slender vertical posts, thin lateral beams on brackets and floor slabs.

- Resulting structures like timber frames.
- Cantilevers, spiral staircase and freely projecting elements and planted roof gardens as exemplified in Hennebique's villa at Borg-la-reine.

4. Any Two Nigerian Architects (20 MARKS)

- * Early life
- * Educational Background
- * Architectural Philosophy
- * Notable Works

5. Any Two International Architects (20 MARKS)

- * Early life
- * Educational Background
- * Architectural Philosophy
- * Notable Works



COVENANT UNIVERSITY

CANAANLAND, KM 10, IDIROKO ROAD
P.M.B 1023, OTA, OGUN STATE, NIGERIA.

TITLE OF EXAMINATION: B.Sc DEGREE EXAMINATION

COLLEGE: CST

DEPARTMENT: ARCHITECTURE

SESSION: 2015/2016

COURSE CODE: ARC 324

COURSE TITLE: URBAN PLANNING AND DESIGN II

SEMESTER: OMEGA

CREDIT UNIT: 3

SECTION A (ANSWER ANY THREE QUESTIONS FROM THIS SECTION)

1. Discuss the evolution of human settlement in the Neolithic Era.
2. (a) Outline and discuss the pre-conditions necessary for the emergence of a village
(b) What are the characteristics of a village?
3. Fully discuss each of the following:
(a) Urban Climate, stating the climatic characteristics that distinguish different built up areas.
(b) Urban Revolution.
(c) Urban Renewal and the factors that led to Urban Renewal.
4. Explain the term Plan Evaluation. Justify the need for monitoring and review after implementation.

SECTION B (ANSWER ONE QUESTION ONLY FROM THIS SECTION)

- 1a. What is Landscape Architecture? (5 marks)
- 1b. State the ultimate purpose of Landscape Architecture and the land areas of interest in the Built Environment. (5marks)
- 1c. Explore in detail the basis on which each of the different shades of landscape architecture are considered. (10marks)
- 2a. Site planning being the most engaged and detailed form of creating order in the landscape by an Architect is effectively carried out in a systematic sequence. Discuss and analyse each step. (20 marks)



COVENANT UNIVERSITY
CANAANLAND, KM 10, IDIROKO ROAD
P.M.B 1023, OTA, OGUN STATE, NIGERIA.

TITLE OF EXAMINATION: B.Sc DEGREE EXAMINATION

COLLEGE: CST

DEPARTMENT: ARCHITECTURE

SESSION: 2015/2016

COURSE CODE: ARC 324

COURSE TITLE: URBAN PLANNING AND DESIGN II

COURSE COORDINATOR: DR EDIAE, O. J.

COURSE LECTURERS: DR EDIAE, O. J.

DR ADUWO, A. B.

SEMESTER: OMEGA

CREDIT UNIT: 3

MARHING SCHEME

No. 1 MAN IN THE NEOLITHIC AGE: (25 Marks)

Quite a number of investigations carried out about the history of man have yielded findings which are helping us to understand how the stages of development of his intelligence have greatly influenced changes in his environmental conditions. Fage (1978) argues that a common knowledge of the world about the existence of man and the emergence of human society stems from the discoveries of Dr Louis leakey's pioneer excavations at Olduvai George in northern Tanzania, in about one-and-half to two million year ago, the basis upon which it was suggested that Africa, indeed, may have been the birthplace of humanity.

Through the findings, an entirely adequate ground was established to show that, the early types of men (Hominids), a little different from us, were first discovered in Africa. These Hominids were about 1.35m tall in the likeness of man, found in small groups on lake shores in savannah countries. They were slightly wiser than apes and could interact easily; however, the small brains behind their massive faces could not let them come to terms quickly with their environment in a manner to maintain a state of equilibrium. Attempts to distinguish themselves from other animals led to eventual emergence of the ability to make crude tools in form of choppers which they used to do some minor works.

About a million years ago, a breakthrough was recorded as man transformed the choppers to double-edged hand axe, scrapper and hammer stone. This invention enhanced man's ability to hunt, improve his food supply by killing animals. Thereafter some other species of man developed all over the world such as the "Neanderthal" in northern Africa, Europe and Asia, and the Rhodesoids in south of the equator in Africa (Fage 1998). The primitive, but useful tools enabled man to wax stronger, and wander across most areas of the world, hunting and gathering fruits which they were eating raw to sustain their lives.

Some eight thousand years ago, the story became different as man discovered "fire" from stone and learned to use it for roasting food items (fruits and animals). This development informed the proactive change from wandering in search for fruits to seed planting in an effort to grow food at a location especially in the Neolithic or New Stone Age. Not quite sooner than man found shelter under trees and in caves did he start making increasing use of most versatile materials like wood, bones, and stones to erect local structures. The spread and expansion of

farming steadily therefore, enlarged the size and complexity of social, groups, which now provide sufficient experience of practical activity that led to the settlement of man over time.

No. 2 PRE-CONDITIONS NECESSARY FOR THE EMERGENCE OF A VILLAGE (25 Marks)

1. The physical environment must be such that would support plant and animal life even to the point of providing agricultural surpluses.
2. The environment must be able to accommodate and support a reasonable population on a relatively little land area.
3. The area should be able to encourage certain level of permanence of settlement in terms of food production through domestication of plants and animals to sustain a complete life cycle.

CHARACTERISTICS OF A VILLAGE

- The community comprises people who are mainly agrarians
-
- As a local territory, it covers relatively small area of land
- The settlement is associated with garden plots located in between houses for the purpose of food production.
- The community is a small collection of very small homogeneous population ranging from six to sixty families or maximum population of five thousand population.
- The spiritual and ritual inclination of people is undefined as each household worships its own god or shrine.
- The social structure of the community allows only, the traditional head and the elders to have responsibility of ensuring morality and social justice among the people
- People in this locality enjoy a feeling of neighbourhood, which encourages collective participation in the execution of community projects like construction of market, road maintenance, etc.
- The community operates periodic market, whereby market days are spaced in time to allow effective demand for commodities produced in the locality.
- On account of financial constrains, the village lacks essential social amenities and services like: electricity, pipe-borne water, telecommunication etc.
- The community experiences poor transport services as activities of people are located within walking distances to ensure proximity and reduce amount of energy on commuting.

No 3. (25 Marks)

(A) **Urban Climate.** This can be described as any set of climatic conditions that prevail in a large metropolitan areas and that differs from the climate of its rural surroundings.

Urban climate are distinguished from those less built-up areas by:

- i. Differences in air temperature
- ii. Humidity
- iii. Wind speed and direction
- iv. Amount of precipitation

These differences are attributable in large part to:

- The altering of natural terrains through construction of large artificial structures and surfaces e.g. tall buildings, paved areas/streets and parking lots affect wind flow, precipitation run-off and energy balance of a location.
- Also characteristics of the atmosphere over urban centres are substantially higher concentration of pollutants such as CO₂, CO, SO₂, HCO, Oxidant and particles matters.

(B) URBAN REVOLUTION

- This is the process by which small non-literate agricultural village are transformed into large, social complex, civilized urban centres.
- The term urban revolution was introduced by V. Gordon Childe an Australian archaeologist.
- The earliest occurrences of urban revolution recorded were in Mesopotamia about 3000BC, Egypt, and northern China. America and Peru also experienced urban revolution in the first millennium A.D.

(C) URBAN RENEWAL

- A comprehensive scheme to redress a complexity of urban problems including unsanitary, deficient or obsolete housing, inadequate transportation, sanitation and other services and facilities, haphazard land use and traffic congestion.
- The term Renewal has its origin in the American housing act of 1945.
- According to Kaufman(1964). It is started as the concept of redevelopment. It has since then been used to embrace much more than redevelopment and has indeed been defined in various ways.
- Greble (1965); is a deliberate effort to change the urban environment through planned, large scale adjustment of existing situation in the city to present and future standard required for urban living and working.
- Gibson and Langtaff (1982) refer to urban renewal as the redevelopment and rehabilitation of the decaying part of towns and cities and this include the central business district of such cities.

THE FACTORS THAT LED TO URBAN RENEWAL

- i. Housing reforms and sanitary and public health measures
- ii. Growing emphasis on slum clearance
- iii. And the relocation of population and industries from congested area to less crowded sites e.g. garden city and new towns movement to Great Britain.

• It is pertinent to note that each country approached renewal according to its means, political and administrative systems e.g. movement of Nigeria capital city from Lagos to Abuja (F. C. T.)

No. 4. PLAN EVALUATION: (25 Marks)

- The idea of evaluation springs from a particular view of the planning process.
- This is realization of a workable plan, alternative plans, even though well-conceived are bound to have different implications on the set goal in terms of short and long term consequences.
- It is necessary to assess their merits, on the basis of the advantages and disadvantages of each.

MONITORING AND REVIEW

- The two elements involved at this final stage have a similar focus.
- They offer approaches which help to assess whether the implementation is successful or has failed completely.
- Monitoring and review are simultaneously carried out and it implies total appraisal of plan regularly, to ascertain the effectiveness of the implementation strategy.
- The two elements involved at this final stage have a similar focus.
- They offer approaches which help to assess whether the implementation is successful or has failed completely.
- Monitoring and review are simultaneously carried out and it implies total appraisal of plan regularly, to ascertain the effectiveness of the implementation strategy.



COVENANT UNIVERSITY

CANAANLAND, KM 10, IDIROKO ROAD
P.M.B 1023, OTA, OGUN STATE, NIGERIA.

TITLE OF EXAMINATION: B.Sc ARCHITECTURE EXAMINATION
COLLEGE: COLLEGE OF SCIENCE AND TECHNOLOGY
DEPARTMENT: ARCHITECTURE
SESSION: 2015/2016 **SEMESTER:** OMEGA
COURSE CODE: ARC 325 **CREDIT UNIT:** 2
COURSE TITLE: BUILDING STRUCTURES IV
INSTRUCTION: ANSWER ONE (1) QUESTION FROM SECTION A AND 2
(TWO) QUESTIONS FROM SECTION B
TIME: 2 HOURS

SECTION A: ANSWER ONE (1) QUESTION IN THIS SECTION

QUESTION 1 (30 marks)

- a. Write short notes on the following
- Curing
 - Hydration
 - Set
 - Placing
- (8 marks)
- b. The ductility of steel makes it an ideal structural material. Discuss (4 marks)
- c. The fact that concrete is available in semi-liquid form makes it a valuable material in building construction. Discuss (6 marks)
- d. A floor slab 150mm thick has three beams at 3500mm intervals. The beams span 9m and are 230mm wide:
- Calculate the effective width of the beams
 - Determine the neutral axis for the T beam if $M=1700\text{KNm}$, $b = 230\text{mm}$, $d = 500\text{mm}$, $f_{cu} = 30\text{N/mm}^2$ (12 marks)

QUESTION 2 (30 marks)

- a. When is a beam balanced and when is it unbalanced. Discuss using appropriate sketches (8 marks)
- b. What are the implications of increasing the water/cement ratio of concrete (2 marks)
- c. A doubly reinforced concrete beam 250mm wide and 600mm deep overall is to resist an external bending moment of 95KNm. Find the amount of tensile and compressive steel required, if the cover = 50mm, $f_{cu} = 30\text{N/mm}^2$, $f_y = 460\text{N/mm}^2$ (20 marks)

SECTION B: ANSWER TWO QUESTION FROM THIS SECTION

QUESTION 3 (20 marks)

- a) Write short notes on
- reinforcement curtailment
 - Tension lap
 - Anchorage
- (6 marks)
- b) A reinforced concrete beam is supported on two walls 250mm thick, spaced at a clear distance of 6m. The beam carries a super-imposed load of 9.8 KN/m and the self-weight of the beam is 2.8125 KN/m. Design the beam for shear using $f_{cu}=20$ concrete and $f_y=415$, $d=407$ mm. (14 marks)

QUESTION 4 (20 marks)

- a) Differentiate between ultimate limit state and serviceability limit state (8 marks)
- b) Calculate the area of reinforcement of a rectangular beam to resist a bending moment equal to 45 kNm if $b = 250$ mm , $d = 415$ mm $f_{cu} = 30$ N/mm², $f_y= 460$ N/mm² (12 marks)

QUESTION 5 (20 marks)

- a) With the aid of relevant sketches explain the following terms:
- Clear Cover
 - End cover
 - Neutral axis
 - Effective Depth
 - Effective cover
 - Lever arm
- (6 marks)
- b) With the aid of appropriate examples and proper illustrations, differentiate between rectangular, T and L beams (6 marks)
- c) A beam (230mm x430mm) is singly reinforced with 3T20 bars. Check for reinforcement adequacy if $f_y= 460$ N/mm² (8 marks)

QUESTION 6 (20 marks)

- a) What is effective width in a flanged beam? Illustrate (6 marks)
- b) Write the expressions for effective widths of T and L beam sections (4 marks)
- c) A beam is to support a cantilever spanning 9m. This cantilever is expected to support characteristic dead load (g_k) of 29kN/m, and a live load (q_k) of 10kN/m. The structural columns are 300mm by 300mm. Estimate the size of the beams. (10 marks)



COVENANT UNIVERSITY

CANAANLAND, KM 10, IDIROKO ROAD
P.M.B 1023, OTA, OGUN STATE, NIGERIA.

TITLE OF EXAMINATION: B.Sc ARCHITECTURE EXAMINATION
COLLEGE: COLLEGE OF SCIENCE AND TECHNOLOGY
DEPARTMENT: ARCHITECTURE
SESSION: 2015/2016 **SEMESTER:** OMEGA
COURSE CODE: ARC 427 **CREDIT UNIT:** 2
COURSE TITLE: INTRODUCTION TO PROFESSIONAL PRACTICE
INSTRUCTION: ANSWER ONE (1) QUESTION FROM SECTION A AND 2
(TWO) QUESTIONS FROM SECTION B
TIME: 2 HOURS

SECTION A: ANSWER ONE (1) QUESTION IN THIS SECTION

QUESTION 1 (30 marks)

- List and discuss the three main sections of the Nigerian Institute of Architects Standard form of building Contract (20 marks)
- What makes architecture a professional service? (10 marks)

QUESTION 2 (30 marks)

- To be successful in practice, an architect is expected to create value. How would you do this? (8 marks)
- List and discuss any five instances in the NIA standard form of contract where the architect is specifically empowered to issue instructions (10 marks)
- In the course of rendering services for your client, you are at the stage of final proposal, which will require you to provide production information. What will this include? (12 marks)

SECTION B: ANSWER TWO QUESTION FROM THIS SECTION

QUESTION 3 (20 marks)

- Explain the rationale for standard form of building contract (10 marks)
- According to architects professional ethics and conducts, which rules guide architectural competitions? (10 marks)

QUESTION 4 (20 marks)

- a) As a consulting architect, what will your responsibilities to your clients include? (10 marks)
- b) List and discuss any five instances in the NIA standard form of contract where the architect is specifically empowered to issue instructions (10 marks)

QUESTION 5 (20 marks)

- a) Covenant University is currently constructing a College of the Built Environment where you have been engaged as Resident Architect. The Dean of the college visited the site while you were briefly out of the site and issued directives to the main contractor. What is the status of such directives according to the standard form of building contract? What measures can you take to regularize such directive if you find some propriety in the said directive? (10 marks)
- b) As a budding architect, mention 5 tools that are available for you to market your services, highlighting the advantages of each (10 marks)



COVENANT UNIVERSITY

CANAANLAND, KM 10, IDIROKO ROAD

P.M.B 1023, OTA, OGUN STATE, NIGERIA.

TITLE OF EXAMINATION: B.Sc ARCHITECTURE EXAMINATION
COLLEGE: COLLEGE OF SCIENCE AND TECHNOLOGY
DEPARTMENT: ARCHITECTURE
SESSION: 2015/2016 **SEMESTER:** OMEGA
COURSE CODE: ARC 325 **CREDIT UNIT:** 2
COURSE TITLE: BUILDING STRUCTURES III
COURSE COORDINATOR: DR. A. A. OLUWATAYO
COURSE LECTURERS: DR. A. A. OLUWATAYO/ ARC. G. M. ALALADE

MARKING GUIDES

QUESTION 1 (30 marks)

- a. Write short notes on the following
- Curing- Action taken to maintain favorable moisture and temperature conditions of freshly placed concrete or cementitious materials during a defined period of time following placement. Helps to ensure adequate hydration and proper hardening.
(2 marks)
 - Hydration- The chemical reaction between cement and water that causes concrete or other cement-based materials to harden (2 marks)
 - Set- The condition reached by concrete when plasticity is lost, usually measured in terms of resistance to penetration or deformation. Initial set refers to concrete that has reached first stiffening. Final set occurs when concrete attains full rigidity
(2 marks)
 - Placing- The physical introduction of the concrete mixture into the final location where it is to harden and cure (2 marks)
- b. The ductility of steel makes it an ideal structural material. Discuss
Ductility- can withstand extensive deformation without failure under high tensile stress
(4 marks)
- c. The fact that concrete is available in semi-liquid form makes it a valuable material in building construction. Discuss
- Other materials can be incorporated into it easily to augment its properties (e.g. steel) (2 marks)
 - Can be cast into a wide variety of shapes (2 marks)
 - Casting process allows very effective connections to be provided between elements resulting in enhanced efficiency of structure (2 marks)

- d. A floor slab 150mm thick has three beams at 3500mm intervals. The beams span 9m and are 230mm wide:
- Calculate the effective width of the beams
 - Determine the neutral axis for the T beam if $M=1700\text{KNm}$, $b = 230\text{mm}$, $d = 500\text{mm}$, $f_{cu} = 30\text{N/mm}^2$ **(12 marks)**

QUESTION 2 (30 marks)

- a. When is a beam balanced and when is it unbalanced. Discuss using appropriate sketches
- BALANCED SECTION:-** a section is known as balanced section in which the compressive stress in concrete (in compressive zones) and tensile stress in steel will both reach the maximum permissible values simultaneously. The neutral axis of balanced (or critical) section is known as critical neutral axis (n_c). The area of steel provided is the economical area of steel. Reinforced concrete sections are designed as balanced sections. **(2 marks with sketch)**
 - UNBALANCED SECTION:-**This is a section in which the quantity of steel provided is different from what is required for the balanced section. Unbalanced sections may be of the following two types:
 - under-reinforced section-** if the area of steel provided is less than that required for balanced section, it is known as under-reinforced section. Due to less reinforcement the position of actual neutral axis (x) will shift above the critical neutral axis (x_c) i.e. $x < x_c$. In under-reinforced section steel is fully stressed and concrete is under stressed (i.e. some concrete remains un-utilised). steel being ductile, takes some time to break. This gives sufficient warning before the final collapse of the structure. for this reason and from economy point of view the under-reinforced sections are designed **(3 marks with sketch)**
 - over-reinforced section** If the area of steel provided is more than that required for a balanced section, it is known as over-reinforced section. As the area of steel provided is more, the position of N.A. will shift towards steel, therefore actual axis (x) is below the critical neutral axis (x_c) i.e. $n > n_c$. In this section concrete is fully stressed and steel is under stressed. Under such conditions, the beam will fail initially due to overstressed concrete. Since concrete is brittle, this happens suddenly and explosively without any warning. **(3 marks with sketch)**
- b. What are the implications of increasing the water/cement ratio of concrete
At higher w/c ratios, the space occupied by the additional water above w/c=0.4 will remain as pore space filled with water, or with air if the concrete dries out. Consequently, as the w/c ratio increases, the **porosity of the cement paste in the concrete also increases**. As the porosity increases, **the compressive strength of the concrete will decrease** **(2 marks)**
- c. A doubly reinforced concrete beam 250mm wide and 600mm deep overall is to resist an external bending moment of 95KNm. Find the amount of tensile and compressive steel required, if the cover = 50mm, $f_{cu} = 30\text{N/mm}^2$, $f_y = 460\text{N/mm}^2$ **(20 marks)**

QUESTION 3 (20 marks)

a) Write short notes on

- i. **reinforcement curtailment**- for the reinforcement bars must be fully anchored into the concrete by extending the bar beyond where they are theoretically no longer needed, but by a distance equal to the greater of
 - 12 times the bar size beyond the centre of the support
 - 12 times the bar size plus $d/2$ from the face of the support (2 marks)
- ii. **Tension lap**- It is most impracticable to construct structural members without joining some of the bars. This is usually achieved by lapping bars. In order to transfer the stress from one bar to another the lap length should be sufficiently long. For **Tension Laps**, the minimum lap length should be equal to the tension anchorage length multiplied by the diameter of the smallest bar:

$$L = L_A \times \Phi$$

Where: Φ is the diameter of the smaller bar

L_A is the anchorage lengths as multiples of bar sizes (2 marks)

- iii. **Anchorage**- Sometimes it is not possible to use straight bars due to the limitation of space, for this reason, anchorage can be achieved in the form of hooks or bends in reinforcements. Where hooks or bends are provided, they should not begin before the centre of the support for (i) or before the $d/2$ from the face of the support for (ii) above (2 marks)

- b) A reinforced concrete beam is supported on two walls 250mm thick, spaced at a clear distance of 6m. The beam carries a super-imposed load of 9.8 KN/m and the self-weight of the beam is 2.8125 KN/m. Design the beam for shear using $f_{cu} = 20$ concrete and $f_y = 415$, $d = 407$ mm. (14 marks)

QUESTION 4 (20 marks)

a) Differentiate between ultimate limit state and serviceability limit state

Ultimate Limit State(ULS)

- Deals with collapse or other forms of structural damage
- ULSD ensures that the structure sustains the design load without collapse with adequate safety factor
- ULS includes:
 - Lose of equilibrium of the structure or part of it
 - Failure due to excessive deformation, rupture, or loss of stability of any part of the structure
- ULS enables the designer calculate the strength of the structure (4 marks)

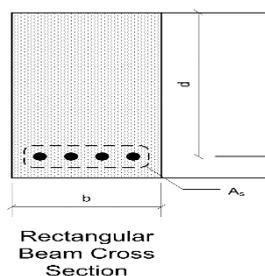
Serviceability Limit State(SLS)

- Models the behaviour of the structure under working load
- State beyond which specified service requirement are no longer met.
- It includes:
 - Deformation or deflections affecting the appearance or effective use of the structure
 - Vibrations causing discomfort to people or structural damage

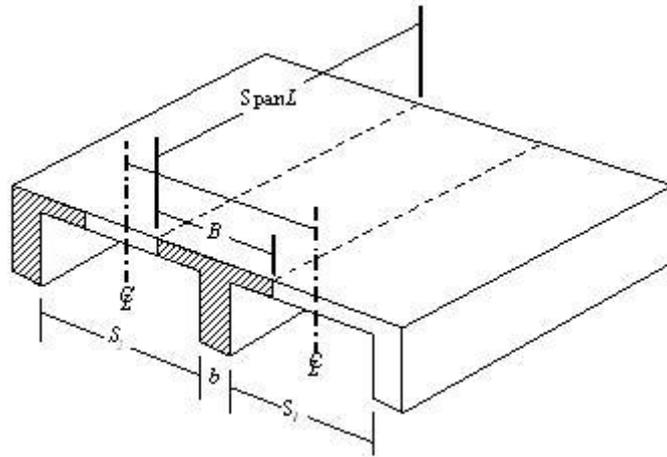
- Cracks on the structure that may likely affect adversely the appearance , durability or water tightness of the structure
(4 marks)
- b) Calculate the area of reinforcement of a rectangular beam to resist a bending moment equal to 45 kNm if $b = 250 \text{ mm}$, $d = 415\text{mm}$ $f_{cu} = 30\text{N/mm}^2$, $f_y= 460\text{N/mm}^2$ (12 marks)

QUESTION 5 (20 marks)

- a) With the aid of relevant sketches explain the following terms:
- i. Clear Cover- The distance between the bottom of the bars and bottom most the edge of the beam is called clear cover.
clear cover = 25mm or dia of main bar, (which ever is greater). (1 mark)
 - ii. End cover- end cover = 2 x dia of bar or 25mm (which ever is greater) (1 mark)
 - iii. Neutral axis- The layer/ lamina where no stress exist is known as neutral axis. it divides the beam section into two zones, compression zone above the neutral axis & tension zone below the neutral axis. (1 mark)
 - iv. Effective Depth- The normal distance from the top edge of beam to the centre of tensile reinforcement is called effective depth. It is denoted by 'd'. (1 mark)
 - i. Effective cover- the distance between centre of tensile reinforcement and the bottom edge of the beam is called effective cover.
effective cover = clear cover + $\frac{1}{2}$ dia of bar. (1 mark)
 - ii. Lever arm- The distance between the resultant compressive force (c) and tensile force (t) is known as lever arm. It is denoted by 'z'. (1 mark)
- b) With the aid of appropriate examples and proper illustrations, differentiate between rectangular, T and L beams



Concrete floor slabs and beams are normally tied together by means of stirrups and bent-up bars if any and then are cast form one mass of concrete. Such a monolithic system will act integrally i.e., it is allowed to assume that part of the slab acts with the beam and they form what is known as a flanged beam.



The part of the slab acting with the beam is called the flange, and it is indicated in.

(2 marks)

each)

- c) A beam (230mm x 430mm) is singly reinforced with 3T20 bars. Check for reinforcement adequacy if $f_y = 460\text{N/mm}^2$

(8 marks)

QUESTION 6 (20 marks)

- a) What is effective width in a flanged beam? Illustrate
 - At the mid-span, it is more economical to design the beams as an **L** or **T** sections by including the adjacent areas of the slab as part of the beam. The actual width of slab that acts together with the beam is referred to as the **effective flange** (6 marks)
- b) Write the expressions for effective widths of T and L beam sections
 the effective flange width should be taken as the smaller between
 (a) the actual flange width and
 (b) the web width plus $l/5$ (for T-beams) or $l/10$ (for L-beams). (4 marks)
- c) A beam is to support a cantilever spanning 9m. This cantilever is expected to support characteristic dead load (g_k) of 29kN/m, and a live load (q_k) of 10kN/m. The structural columns are 300mm by 300mm. Estimate the size of the beams. (10 marks)



COVENANT UNIVERSITY
CANAANLAND, KM 10, IDIROKO ROAD
P.M.B 1023, OTA, OGUN STATE, NIGERIA.

TITLE OF EXAMINATION: B.SC EXAMINATION
COLLEGE: COLLEGE OF SCIENCE & TECHNOLOGY
DEPARTMENT: ARCHITECTURE

SESSION: 2015/2016

SEMESTER: OMEGA

COURSE CODE: ARC 327

CREDIT UNIT: 2

UNITS

COURSE TITLE: BUILDING SERVICES II

TIME:

2HOURS

INSTRUCTION: ANSWER THREE (3) QUESTIONS IN ALL; AND NOT MORE THAN TWO (2) FROM ANY SECTION

Section A:

Question 1:

- (a) What is a duct? **(2 marks)**
- (b) List the factors that affect the ventilation in buildings. **(3^{1/3} marks)**
- (c) What are the functions of the following duct fittings? (i) Vibration Isolators (ii) Stack boots (iii) Volume control Dampers (iv) Smoke/Fire Dampers **(6 marks)**
- (d) Explain how a single duct system works in conditioning a space. **(4 marks)**
- (e) What are the functions of the following central AC components? (i) Air Handling Unit (ii) Duct System (iii) Diffusers. **(8 marks)**

Question 2:

- (a) Define air condition system? **(3^{1/2} marks)**
- (b) Explain and draw all the types of air-conditioning system. **(9marks)**
- (c) What are the conditions/ criteria that determine ventilation in building? **(5marks)**
- (d) What are the reasons for ventilation? **(5marks)**

Section B

Question 3:

- (a) Two buildings 1-Bedroom flat and 3-Bedroom flat have the following common functional spaces:
living/dining, 1w.c. room, 1shower room, 1 small lobby, 1-Bedroom, 1kitchen, 1store, 1terrace, 1 main lobby (9functional spaces). In addition to these, the 3-Bedroom flat has 2 bedrooms, 2 complete toilet (each with bathtub, w.c., and w.h.b.) and 1 lobby (5functional spaces). What significant differences exist between the number of sockets and lighting points in the flats, and what inferences can be drawn from the results? **(11marks)**
- (b) With full explanation of applications, at what maximum duration and at what rate are all occupants of any functional space expected to be evacuated? A ground floor open office of size 50m x 30m that

has four single doors futuristically and strategically positioned is to be converted to an anticipated

restaurant and kitchen. If the restaurant area: kitchen area is 2: 1, what spatial utilization efficiency

can be achieved with the new use. If not full, how might full spatial utilization efficiency be achieved?

(12^{1/8}marks)

Question 4:

(a) Write short notes on: vertical movement in buildings **or** evolution of electricity utility companies in

Nigeria. **(12^{1/8}marks)**

(b) Prepare schematic designs for electricity generation, transmission to supply of buildings. Comment

also on the metering systems and the economy of supplies. **(11marks)**

Question 5:

(a) Explain the term fire protection, and enumerate important ingredients of fire. Also enumerate

important aspects of fire protection, and explain any one of them. How is the knowledge of fire

'safety and protection' important to an architect, building owner and building user **(11marks)**

(b) Explain the acronym ZOP and interpret it on a sketch. A 10m high cylindrical building with diameter

of 50m is continuous with a central tower of diameter 10m that rises 15m above the bigger building;

thus the overall height of the entire complex is 25m. To what height should a single air terminal

protector be raised to economically protect the entire building from effect of lightning? If it is further

raised 5m above this point, what may be the effect of this decision? Determine the reliability offered

by installing in each of the 2 positions. **(12^{1/8}marks)**

Note: Space occupancies for office and restaurant are 10m² per person and 1.2m² per person respectively.



COVENANT UNIVERSITY
CANAANLAND, KM 10, IDIROKO ROAD
P.M.B 1023, OTA, OGUN STATE, NIGERIA

TITLE OF EXAMINATION: B.SC EXAMINATION
COLLEGE: COLLEGE OF SCIENCE & TECHNOLOGY
DEPARTMENT: ARCHITECTURE
SESSION: 2015/2016
COURSE CODE: ARC 327
UNITS

SEMESTER: OMEGA
CREDIT UNIT: 2

COURSE TITLE: BUILDING SERVICES II
TIME: 2 HOURS
INSTRUCTION: ANSWER THREE (3) QUESTIONS IN ALL; AND NOT MORE THAN TWO (2) FROM ANY SECTION

M.S.

Section A:

Question 1:

- (a) What is a duct? **(2 marks)**
- (b) List the factors that affect the ventilation in buildings. **(3^{1/3} marks)**
- (c) What are the functions of the following duct fittings? (i) Vibration Isolators (ii) Stack boots (iii) Volume control Dampers (iv) Smoke/Fire Dampers **(6 marks)**
- (d) Explain how a single duct system works in conditioning a space. **(4 marks)**
- (e) What are the functions of the following central AC components? (i) Air Handling Unit (ii) Duct System (iii) Diffusers. **(8 marks)**

Model Answer

- 1.(a) A DUCT is a tube, pipe, or channel through which something can flow or be carried, e.g. in air-conditioning equipment. Ducts are equipment, tunnels or instruments found in an air conditioning system. Duct is for the purpose of conveying air from one point of a building to another.
- (b) Shape of the buildings, orientation, proximity to other buildings, number and sizes of openings, position of openings.
- (c)(i) **Vibration Isolators** - It allows the air handlers to vibrate without transmitting the vibration to the attached ducts.
- (ii) **Stack Boots** - At bottom of a stack, a stack boot provides a transition from an ordinary large round or rectangular duct to the thin wall.
- (iii) **Volume Control Dampers** - Provides a method of adjusting the volume of air flow to various parts of an air conditioning system.
- (iv) **Smoke/Fire Dampers** - It is a device found in duct work where the duct passes through a firewall/fire curtain. Once smoke is detected within the ducts its activator triggers the motor release

and the smoke damper will automatically close until manually re-opened.

(d) In a single duct, chilled water and hot water are supplied to heating and cooling coils. Hot and cold water are separately supplied to the cooling and heating coil located in the trunk duct of the high velocity system. The cool/warm air produced at the coil is then distributed to the various room units through branch duct. Automatic/manual volume controls are used to regulate the flow of conditioned air at the room unit.

- (e) (i) **Air Handling Unit** - Responsible for cold/hot air generation.
 (ii) **Duct System** - Responsible for transportation of cold/hot air from the point of generation (air handling unit) to the point of need (spaces to be cooled/heated).
 (iii) **Diffusers** - Responsible for air distribution within the area of need.

.....(23
 1/8 marks)

Question 2:

- (a) Define air condition system? (3^{1/8} marks)
 (b) Explain and draw all the types of air-conditioning system. (9marks)
 (c) What are the conditions/ criteria that determine ventilation in building? (5marks)
 (d) What are the reasons for ventilation? (5marks)

Model Answer

2.(a) Air conditioning is defined as the mechanism installed in the building for the purpose of controlling, the temperature, humidity and the cleanliness of air within the building interior. Theoretically, an air-conditioning system consists of centralized equipment that provides an atmosphere with controlled temperature, humidity, and purity at all times, regardless of weather conditions.

(b) The different type of air conditioning system includes;
 • Single unit air conditioning system • Multiple unit air conditioning system (split, parallel and linear arrangement • Multiple unit central air conditioning system.
 This type of air conditioning system is usually placed at the building exterior. The main function is to bring fresh air and removes stale air. Single A.C. is used in small spaces and contains one fan making it economical.
 The equipment in the single air conditioning system include: The motor, fan for intake supply and extractor.

(c) Provision for burning and combustion
 Livestock and industrial purposes
 To remove product of respiration and body odour
 To remove contaminant or harmful chemical substances from a buildings
 To remove heat from lighting equipment/ machines from room.
 To create a degree of air movement required for comfort.

(d) The main reason for ventilation is to maintain human comfort, health and user safety.
 To provide acceptable indoor quality air (IQA), it can be done by diluting and removing contaminated air.
 Ventilation is needed for respiration and removal of perspiration and unwanted heat.

.....(23
 1/8 marks)

Section B

Question 3:

(a) Two buildings 1-Bedroom flat and 3-Bedroom flat have the following common functional spaces:

living/dining, 1w.c. room, 1shower room, 1 small lobby, 1-Bedroom, 1kitchen, 1store, 1terrace, 1

main lobby (9functional spaces). In addition to these, the 3-Bedroom flat has 2 bedrooms, 2 complete toilet (each with bathtub, w.c., and w.h.b.) and 1 lobby (5functional spaces). What significant differences exist between the number of sockets and lighting points in the flats, and what

inferences can be drawn from the results? **(11marks)**

(b) With full explanation of applications, at what maximum duration and at what rate are all occupants of

any functional space expected to be evacuated? A ground floor open office of size 50m x 30m that

has four single doors futuristically and strategically positioned is to be converted to an anticipated

restaurant and kitchen. If the restaurant area: kitchen area is 2: 1, what spatial utilization efficiency

can be achieved with the new use. If not full, how might full spatial utilization efficiency be achieved?

(12^{1/3}marks)

Model Answer

3.(a) Tabulation for each flat showing allocation of socket outlets and lighting points

-with range of minimum and maximum and average for the totals

2Tables (complete) @5=10)

Inferences: showing how a contractor can use knowledge of one

to safely estimate the other =.....)**(11 marks)**

(b) With full explanation of applications,

Maximum duration and rate all occupants of any functional space are expected to be evacuated:

Duration(d)= 2.5minutes; Rate (r)=40persons per minute on a single)
queue through a single width door of not less than 900mm wide;)2)

Thus,

maximum of number of persons (p) expected to be evacuated through)
a single door= Duration x Rate of evacuation)
= 2.5minutes x 40pers/min.)
p = 100persons)1)

or

maximum of number of persons (2p) expected to be evacuated through)
a double door= Duration x Rate of evacuation(2r))
= 2.5minutes x 2 x40pers/min.)
p = 200persons)

Hence

200 persons are expected to be evacuated on two queues through a)
double width door of not less than 1800mm wide within the duration) 1)

Also min. number of single door= Maximum capacity/p; or)

Also min. number of single door= Maximum capacity/100;)

Also min. number of double door= Maximum capacity/2p; or)
 min. number of double door= Maximum capacity/200) 1)

Calculations of spatial utilization efficiency showing achievement of)
 60% with the new use.)3)

Full spatial utilization efficiency can be achieved:)

Calculations showing a total of at least 9 single doors or equivalent)

+ sketch of their distribution, by not exceeding max. travelling distance)

-Increase in no. of doors and/or increase in size(s) of existing doors)5)..... (12
^{1/8}marks)

4. (a) Write short notes on: vertical movement in buildings or evolution of electricity utility
 companies in Nigeria. (12^{1/8}marks)

(b) Prepare schematic designs for electricity generation, transmission to supply of buildings.
 Comment

also on the metering systems and the economy of supplies. (11marks)

Model Answer

4. (a) Write short notes on:

vertical movement in buildings or

-ramps

-stairs

-elevators

-escalators

.....) 12)

OR

evolution of electricity utility companies in Nigeria.

-origin

-intermediate

-current situation

-examples of generating and distributing companies

.....) 12)(12

^{1/8}marks)

4.(b) Schematic designs for electricity generation,)
 transmission to supply of small buildings) 4

Schematic designs for electricity generation,)
 transmission to supply of large buildings)4

Comments on the metering systems and the)
 economy of supplies in small buildings)1

Comments on the metering systems and the)1).....(11marks)

5.(a) Explain the term fire protection, and enumerate important ingredients of fire. Also
 enumerate

important aspects of fire protection, and explain any one of them. How is the knowledge of
 fire

'safety and protection' important to an architect, building owner and building user
(11marks)

(b) Explain the acronym ZOP and interpret it on a sketch. A 10m high cylindrical building with diameter of 50m is continuous with a central tower of diameter 10m that rises 15m above the bigger building; thus the overall height of the entire complex is 25m. To what height should a single air terminal protector be raised to economically protect the entire building from effect of lightning? If it is further raised 5m above this point, what may be the effect of this decision? Determine the reliability offered by installing in each of the 2 positions. (12^{1/8}marks)

Model Answer

5. (a) Explain the term fire protection

Fire protection is the study and practice of mitigating the unwanted effects of potentially *'destructive fires'*. It involves the study of the: *'behaviour', 'compartmentalisation', 'suppression'* and *'investigation'* of fire and its related emergencies, as well as the *research* and *development, production, testing* and *application* of *'mitigating systems'*.2.5)

Enumeration of important ingredients of fire

Essential ingredients for propagation and continuation of fire:

- Fuel (something that will burn))
 - Air or oxygen; and)
 - Heat (sufficient to start combustion))
- In the absence of any one of these, there can be no fire.) 1.5)

Enumeration of important aspects of fire protection

Important aspects of fire protection:

- Prevention of fire outbreak)
- Prevention of fire spread from one part of building to another)
- & from one building to another building)
- Means of escape)
- Facilities for fire fighting) 2)

Explanation of one of the important aspects of fire protection:) 1)

Importance of knowledge of fire 'safety and protection' to:)

- an architect.....)
- building owner.....)
- building user.....)

).....(11marks) 3

5. (b) Acronym ZOP= Zone of protection & short explanation + interpretation on a sketch.....) 4)

To what height should a single air terminal protector be raised to economically protect the entire building from effect of lightning?

Sketch on interpretation of data (with or without calculation)- for height)

determination for a single air terminal protector to fully protect the building.....h=10m centrally located above the tower or)

H=35m from based located at the centre of the circles defining the circumferences of the building and/or tower.)....4)

If it is further raised 5m above this point, what may be the effect of this decision?

-With this decision at 15m above the tower, there is flexibility of) positioning the air terminal at any location above the tower.).....2)

Determine the reliability offered by installing in each of the 2 positions.

Reliability of protection systems @ 1st position= 100% or 1.0)

Reliability of protection systems @ 2nd position= 100% or 1.0).....2)..... (12

^{1/8}marks)

Note: Space occupancies for office and restaurant are 10m² per person and 1.2m² per person respectively.

c. Checklist:

i. Respondents are free to give multiple answers.

2 marks

Which of the following would you like to see in a cafeteria? (Check all that apply)

[1] Sandwiches

[2] Cakes and sweets

[3] Soup

[4] Salad Bar

[5] Fruit Bar

[6] Full Course Meals

2 marks

d. Simply dichotomous (yes/no)

(4

marks)

b. Research is not mere information gathering. Discuss

- Scientific inquiry or investigation
- Originates with a question or practical problem.
- It increases knowledge.
- It is systematic.
- It is methodological and ethical.
- Divides the principal problem into more manageable sub problems.
- Guided by the specific research problem, question or hypothesis.
- Accepts certain critical assumptions.
- Requires the collection and interpretation of data in an attempt to resolve the problem that initiated the research.

(8

marks)

c. When is an exploratory research carried out and what does it entail?

a. Undertaken when no previous study exists

(2 marks)

- i. Major purpose is to obtain a general insight or idea about the nature of a phenomenon or key variable or factor in a study
- ii. Findings of such studies form the basis for further research
- iii. Techniques include case studies, observation and reviews of previous

(4 marks for any two points)

QUESTION 2 (30 marks)

a. Why would you carry out a literature review?

- To avoid mistakes done in the past
- To build on the works of others
- To connect research problems to basic disciplines
- To situate research problem in proper theoretical base
- To understand the basic root of the problem
- To situate your study in the context of its contribution to knowledge
- To look at the works of others in related areas
- To describes the relationship between your study and others in the same field or discipline
- To shed light on any gaps in previous research
- To identify areas of previous research to prevent duplication of effort

- To locates your own research within the context of existing works within an acceptable conceptual and theoretical framework
- To suggest methods of dealing with the problem

(16 marks for any

8)

b. A researcher noted that he had carried out a cohort study. What does this imply? How is it different from a panel study?

i. Cohort study-

1. specific population is studied repeatedly as well,
2. focus on same population each time data is collected
3. centre around how given groups with a common characteristic view social phenomena over time.
4. observes subjects in a similar group based on region, age, or common experiences

4 Marks for any 2 points

ii. Panel study-

1. utilize the same sample from the same population over time
2. relates characteristic of samples to changes observes over time
3. usually involves a somewhat random sample of subjects
4. tracks opinions of the exact same respondents repeatedly

4 Marks for any 2 points

c. In the course of literature you found a study that reported the results of an ex-post facto experiment. What does this imply?

- Experimental study on situations that the researcher has no control over
- No intervention used
- Different categories in existence are investigated (2 marks each for 3 points)

QUESTION 3 (20 marks)

a) Compare and contrast integrative review and systematic review

a. Integrative Review

- i. Draws conclusions from many separate studies
- ii. Involves meta-analysis (taking a large body of quantitative findings and conducting statistical analysis to integrate findings) or meta-synthesis (integrating findings of multiple qualitative research studies)

(4 marks for 2 points)

b. Systematic Review

- i. Starts from research questions
- ii. Identify, critically evaluate and synthesise all available literature on a particular subject area
- iii. Inclusion or exclusion criteria for selecting literature
- iv. Specific methods are used in evaluating the literature

(8 marks for 4

points)

b) A case study research can be carried out for suitability or pragmatic reasons. Discuss

1. Suitability

- a. Typical instance
- b. Extreme instance
- c. Test site for theory (4 marks for 2 points)
- d. Least likely instance

2. Pragmatic
 - a. Convenience
 - b. Intrinsically interesting (4 marks for 2 points)

QUESTION 4 (20 marks)

- a) As a researcher, you can adopt one of two positions (philosophies). Discuss these positions, highlighting the main characteristics, and when a researcher can adopt each of the positions.

a. Positivist

- i. Quantitative', 'Objectivist', 'Scientific', 'Experimentalist' or 'Traditionalist
- ii. Seeks out the facts or causes of any social phenomena in a systematic way.
- iii. Seeks to identify, measure and evaluate any phenomena and to provide rational explanation for it.
- iv. Attempts to establish causal links and relationships between the different elements (or variables) of the subject and relate them to a particular theory or practice.
- v. Based on the belief that people do respond to stimulus or forces, rules (norms) external to themselves and that these can be discovered, identified and described using rational, systematic and deductive processes.

(8 marks for 4 points)

b. Phenomenological

- i. 'Qualitative', 'Subjectivist', 'Humanistic' or 'Interpretative
- ii. From the perspective that human behaviour is not as easily measured as phenomena in the natural sciences.
- iii. Human motivation is shaped by factors that are not always observable, e.g. inner thought processes, motivation, personal meanings on events.

(4 marks for 2 points)

- b) Differentiate between systematic and stratified sampling

• **Stratified-**

- i. Divide population into groups that differ in important ways
- ii. Basis for grouping must be known before sampling
- iii. Select random sample from within each group

• **Systematic**

- i. Here the idea is to sample every 1 in n from the sample frame. You simply decide what n should be, based on sample size requirements, for example 1 in 10. You randomly select a starting point on your sample frame and then select every 10th person from the list
- ii. Each element has an equal probability of selection, but combinations of elements have different probabilities. (2 marks each for 4 points)

QUESTION 5 (20 marks)

a) Compare and contrast action and ethnographic researches

i. Action Research

- i. Researcher participates in a given situation to monitor and evaluate results
- ii. The researcher introduces new information or intervention and observes responses
- iii. Purpose is to improve a situation
- iv. Often conducted by practitioners in order to improve practice
- v. Requires active cooperation between researcher and population to be studied
- vi. There is lack of control over the project's pace and direction
- vii. There is possibility of conflict of interest
- viii. The researcher is solely responsible for ethics
- ix. Used in education, religious and community groups **(5 marks for 5 points)**

ii. Ethnography

- i. Study of a group in detail
- ii. Researcher becomes a part of the situation to be studied in order to explain it from the view of an insider
- iii. Researcher shares in the experiences
- iv. Used in studying how behaviours reflect the **culture of a group**
- v. Used to gain access to the past in order to give meaning to events
- vi. Lack theories
- vii. Necessitates participant observation
- viii. May be Participative Enquiry
 1. Where research is carried out within one's own group
- ix. Essence is to obtain a holistic picture as much as possible
- x. Emphasis is on documenting day to day experiences and observations
- xi. Tools are mostly observation, interviews and artifacts
- xii. Small number of cases are investigated in details
- xiii. The researcher only reports without making judgment

(5 marks for 5 points)

b) You have been informed by your supervisor that your study requires an experiment, instead of a survey. What are the likely reasons?

Experimental Studies

- i. Carried out in carefully controlled environment to determine causal relationships
- ii. Used to know the extent to which a factor contributes to a problem.
- iii. Used to assess an intervention's effect is solving a problem even when cause is known.

(4 marks for 2 points)

Surveys

- i. Results generalizable to wider samples
- ii. Focus on naturally occurring patterns.
- iii. The use of statistics to clarify patterns
- iv. Selects samples that are representative and unbiased
- v. Measurement of specific variables with use of questionnaires or interviews.
- vi. Also quantitative research approach.

(6 marks for 3 points)