

*Moderated O-R
21/02/2024*

THE POLYTECHNIC IBADAN
DEPARTMENT OF COMPUTER ENGINEERING TECHNOLOGY
SECOND SEMESTER 2023/2024 EXAMINATION

COURSE TITLE: Python Programming COURSE CODE: CET 323

CLASS: HND I TIME ALLOWED: 2 Hours

INSTRUCTION: Answer Any Four (4) Questions. You May Use a Pencil for Programming Questions. Credit will be given to any interactive program

QUESTION ONE

- With reference to python, explain and give examples of the following terms
 - Modules
 - Packages
 - Editors(2 marks each)
- With the aid of illustration, explain the use and how to write the following statements
 - Break
 - Continue
 - Return(3 marks each)

QUESTION TWO

Find the output of the following:

a) `L1 = [50,100,150,200,250]`

`START = 1`

`SUM = 0`

`for C in range(START,4):`

`SUM = SUM + L1[C]`

`print(C, ":", SUM)`

`SUM = SUM + L1[0]*10`

`print(SUM)`

b) `words=['cat', 'window', 'veramdar', 'corridor']` Faculty

`for w in words:`

`print(w, len(w), words[w])`

c) `list(range(-10, -100, -30))`

`a = ['Mary', 'had', 'a', 'little', 'lamb']`

`for i in range(len(a)):`

`print(i, a[i])`

(5 marks each)

QUESTION THREE

Write a Program in Python that

a) prompts and accepts the Celsius as an integer and convert to Fahrenheit, the formula is as follows:

$$\text{fahrenheit} = \left(\frac{5}{9}\right)(\text{Celsius} + 32)$$

The Celsius value must be between -50 and 120. If the Celsius value is out of range, the program should display an error message, "Temperature out of range", and terminate.

- Accepts the cost of items and amount tendered and computes the correct change. The program should ensure that the amount exceeds or equals the item cost and, if not, displays an appropriate error message.
- Accepts two integers and prints multiple or not multiple according to whether the first integer number is a multiple of the second or not.

- d) Sums the integers between 1 and 100 but does not include those that are multiple of 5.
 - e) Write a loop that will generate every Nth integer beginning with NOPEN (i.e NOPEN, NOPEN + N, NOPEN + 2N) continue the looping process for all values of I that do not exceed NCLOSE
- (3 marks each)

QUESTION FOUR

Write program:

- a) To prompt for and read the year that a person was born. The year must be between 2000 and 2015 (inclusive). If an invalid entry is read, the program should display the message, "Sorry, that is not a valid year." and re-prompt. If the correct value is not provided after 3 attempts, the program should display the message "Sorry, Program terminated." and terminate. Once a valid year is read, the program should display the year and a message "is a leap year" or "is not a leap year". A year is a leap year if it is a multiple of 4
 - b) That tests the value of age, if the age is less than 18 it displays "youth" as status and assigns 10 as fee otherwise it displays "senior" as status and assigns 25 as a fee.
 - c) That will accept exam score for each student in course CTE 323 and print out the names of those that score above 75% serially.
- (5 marks each)

QUESTION FIVE

Write an interactive Python program that:

- a) Will display the integers that are not multiples of five from 1 to 2000 serially
- b) Prompts the user to enter several integers, the end of which is 1000, and prints the sum of the integers.
- c) Determines and prints the largest of n positive integers input by the user.
- d) That restricts a value to the range of 40 to 75. If a value is below 40 it changes the value to 40, if the value is above 75 it changes the value to 75.
- e) That limits any number in the range 0 to 50 and any value out of the range to 0.

(3 marks each)

QUESTION SIX

- a) A company pays its employees as
 - i. Managers (who receive a fixed weekly salary),
 - ii. Hourly Workers (who receive a fixed hourly wage for up to the first 40 hours they work and one-and-a-half (1.5) times their hourly wage for overtime hours worked),
 - iii. Commission Workers (who receive ₦250 plus 6 percent of their gross weekly sales),
or
 - iv. Pieceworkers (who receive a fixed amount of money per item for each of the items they produce each of piece worker in this company works on only one type of item). Each type of employee has its pay code: Managers have code 1, hourly workers have code 2, commission workers have code 3 and pieceworkers have code 4. Write a program to compute the weekly pay for each employee according to the employee's paycode and also deduct 5% of the calculated pay as Tax. Prompt the user to enter the appropriate facts your program needs to calculate each employee's pay.

(10 marks)

- b) Write an Python program that sums the odd integers between 1 and 100 serially
- (5 marks)

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- d) Sums the integers between 1 and 100 but does not include those that are multiple of 5.
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THE POLYTECHNIC, IBADAN
ELECTRICAL ENGINEERING DEPARTMENT

SECOND SEMESTER EXAMINATION, 2023/2024 ACADEMIC SESSION

Course Title: **CIRCUIT THEORY IV**

Course Code: **EEC 323**

Class: **HND I (COMPUTER ENGR DEPT)**

Time: **2 HRS**

Instruction: (1) Answer any four (4) questions.

(2) Do not be in the examination room with your Handset.

Question One

- (a) Differentiate between Step and Impulse responses. (5mks)
- (b) If the impedance $Z(s) = \frac{2s-3}{s(s-3)}$ for a given circuit, prove that it is equivalent to time response $Z(t) = 1 - e^{3t}$ using partial fraction and inverse Laplace transform. (4mks)
- (c) If after a period of time, the switch of the R-L circuit is opened, use the Laplace transform to determine the steady state current "I" flowing at the instance of opening in figure 1. (6mks)

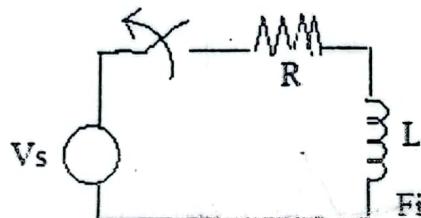


Figure 1

Question Two

- (a) Differentiate between Initial and Final value theorems in circuit application. (5mks)
- (b) The impedance of three elements in series in a circuit is $1 + 2t - \frac{1}{3}t^4$. What is the equivalent impedance value in "s" domain ($Z(s)$) using Laplace transform. (4mks)
- (c) The second order output of a differential circuit is $2\frac{d^2y}{dx^2} + 5\frac{dy}{dx} - 3y = 0$ when, $x = 0, y = 4$ and $\frac{dy}{dx} = 9$. Determine the output time response in terms of "y" using Laplace transform. (6mks)

Question Three

- (a) State five (5) properties of Hurwitz polynomial on synthesizing a passive network. (5mks)
- (b) Synthesize and draw the components arrangement of a circuit with the impedance given as $sZ(s) = \frac{(s+1)(s+3)}{(s+2)(s+4)}$ (5mks)

(2b)

$$Z = 1 + 2s - s^2 + 4s^3$$

$$Z = 2 + 2s + 2s^2 + 3s^3 - s^4 - 4s^5 + 4s^6$$

$$Z = \frac{1}{s^2} + \frac{2}{s} - \frac{1}{s^4}$$

(c) Synthesize the given impedance $Z(s) = \frac{s(s+4)(s+8)}{(s+2)(s+6)}$ and draw the corresponding circuit.

(Hint: Use Long division method)

(5mks)

Question Four

(a) State three (3) uses of Laplace transform in solving circuit problems. (3mks)

(b) State the four (4) procedures in using Kirchoff's laws to solve circuit problems in s-domain. (4mks)

(c) In figure 2, the switch is closed with supply step voltage of V (volts) when the capacitor is initially unchanged. Derive the expression for:

(i) the current "i" through (4mks)

(ii) the voltage "V_c" across the capacitor. (4mks)

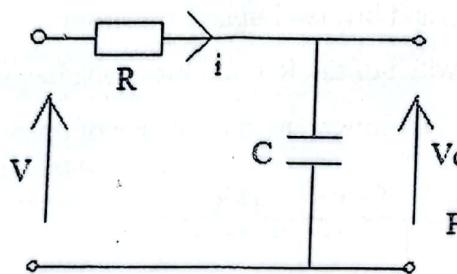


Figure 2

Question Five

(a) A series R-L circuit has a step input V applied to it. Use Laplace transforms to determine an expression for the current "i" flowing in the circuit giving that when time $t = 0$, $i = 0$. (8mks)

(b) A step voltage is applied to a series C-R circuit. When the capacitor is fully charged the circuit is suddenly broken. Deduce an expression for the capacitor voltage during the transient period when the supply is cut off, using Laplace transform. (7mks)

Question Six

Draw the circuit components by synthesizing the circuit impedance and admittance given as:

(i) $Z(s) = \frac{s(s^2+9)}{(s^2+5)(s^2+13)}$ (7mks)

(ii) $Y(s) = \frac{1}{Z(s)} = \frac{s^4+22s^2+40}{s^2+12s}$ (8mks)

Examiner: Bello. S.A.



THE POLYTECHNIC, IBADAN

VOCATIONAL SKILLS AND ENTREPRENEURSHIP STUDY CENTRE (VSESC)

SECOND SEMESTER EXAMINATION, 2023/2024

COURSE: ENTREPRENEURSHIP DEVELOPMENT I

COURSE CODE: EED 326

CLASS: HND I (FT) - FENG, FFMS & FSC

INSTRUCTION: Attempt all the questions. Shade your selected option or answer properly on the OMR sheet provided. Also shade your matric/form and exam numbers appropriately

TIME ALLOWED: 1 Hour.

DAY 11: Friday, 2nd August, 2024

1. The following are required of SMIEIS beneficiaries except
 - A. Provide monthly financial and operational reports to the investing banks before the 15th of the succeeding month
 - B. Comply with the guidelines of the scheme
 - C. Keep up-to-date records on the company's activities under the scheme
 - D. Ensure prudent utilization of funds
 - E. Obtain more funds by way of loans from banks in addition to equity investment under the scheme
2. Which among the listed is a public limited liability company?
A. Glaxosmithkline B. NITEL C. PHCN D. NNPC E. CRIN
3. A good entrepreneur must run a round to contact customers, supplies and other associates. What characteristic of an entrepreneur is this?
A. Creativity B. Drive and Energy
D. Self-confidence E. Result-oriented
C. Leadership
4. Communication is _____
A. The only thing that endures over time exchange information by several methods
B. A process that allows organizations to
C. An oral exchange that requires feedback
D. The means of getting information
E. Processed information
5. The key functions of SEC do not include
 - A. Register and regulate the workings and ventures of capital funds, mergers, acquisitions and all forms of business combinations
 - B. Prepare guidelines organize and coordinate capital market education
 - C. Register the stakeholders prior to sales to the public
 - D. Register and regulate all capital market operations
 - E. Protect the integrity of the securities market against abuses arises from the trading
6. A _____ is a firm that acts as an intermediary between a purchaser and a seller
A. Brokerage B. Debentures C. LDC D. Market agents E. PLC

7. The payment of money from a fund is _____
A. Expenditure B. Disbursement C. Outlay D. Expenses E. Revenue
8. The act of putting aside money for future use is
A. Saving B. Revenue C. Savings D. Income E. Disbursement
9. One of the disadvantages of self-employment is _____
A. Limited responsibility B. No fringe benefits
C. Ability not easily recognized D. Difficulty to implement ideas E. Setting income
10. The money you owe your suppliers who permit you to carry inventory on open account is
A. Long-term Credit B. Equity Funds C. Trade Credit
D. Short-term Credit E. None of the above
11. Project and undertaking can be referred to as enterprises when the following steps except _____ are taken
A. Planning B. Landscaping C. Idea Identification D. Implementation E. Completion of an activity
12. The key difference between all types of enterprises is _____
A. Observed through the progress of the business B. In the reward they provide
C. The size of capital involved in running of the enterprise D. The size of the labour force
E. Dependent on the service they provide
13. The International code employed in the classification of enterprises is
A. ISIC B. ISSC C. IISC D. ICIS E. ICCS
14. Which of these products is classified under manufacturing
A. Grocery B. Fashion C. Home products D. Computer service E. Brokerage
15. An enterprise which involves a total investment between fifty million (#50,000,000) and two hundred million (#200,000,000) Naira excluding land but labour force of between one hundred and one (101) and three hundred (300) workers is referred to as;
A. Large scale industries B. Mega scale industries
C. Small scale industries D. Micro scale industries E. Medium scale industries
16. _____ is synonymous to revenue
A. Income B. Profit C. Expenditure D. Savings E. Saving
17. The only thing that endures over time is
A. Communication B. Periodic risk C. Effective communication
D. None of the above E. All of the above
18. An Entrepreneur that once he set goals, he has to believe in his ability to achieve is said to have _____ characteristic
A. Creativity B. Leadership C. Result oriented D. Risk taking E. Self confidence
19. A good _____ does not finish the sentence of others
A. Leader B. Follower C. Manager D. Listener E. Associates
20. Team work is the _____ of people working together cooperatively, as in a sort team
A. Organization B. Concept C. Perception D. League E. Scope
21. All are major challenges facing Entrepreneurs in Nigeria except
i. Market access problem ii. Lack of Infrastructure iii. Inadequate documentation
iv. Poor landscaping v. Transportation
A. i and iv only B. i and iii C. iv and v only D. All of the above E. None of the above
22. Which of the following statement is correct?
A. Saving is the act of putting aside money for future use

- B. Expenditure is the money received as a result of normal business activities of an individual or a business
C. Saving is money preserved for future use
D. Saving between personal finance refers to accumulated money generated from income
E. Expenditure is synonymous to revenue
23. Retire at age 65 with a personal net worth of #50,000,000 can be attributed to which step of personal financial planning
A. Creating a plan B. Assessment C. Execution D. Setting goals
E. Monitoring and Reassessment
24. Stock exchanges raise fund from the primary segment of the capital market by providing second markets like
A. Cooperative bonds investments B. Stock broker C. Mutual funds D. portfolio
E. Public funds
25. NSE is a
A. Stock regulatory organization B. Stock brokers regulatory organization
C. Self regulatory organization D. Standard regulatory organization
E. Security concerned regulatory organization
26. The following are laws of teamwork except
A. Scoreboard B. Bench C. Goal post D. Chain E. Great challenge
27. The amount of money that a company actually receives during a specific period, including discounts and deductions for returned merchandise is _____
A. Revenue B. Profits C. Income D. Expenditure E. Debenture
28. The dream team has from _____ people, focused on a common target, with interconnected roles, complementary know-how, self-created process that holds all members
A. 2 to 12 B. 3 to 10 C. 3 to 12 D. 4 to 12 E. 5 to 10
29. Beyond Manager's tasks, leader has additional tasks to perform like _____
A. Administrating B. Empowering C. Managing
D. Controlling E. Instructing
30. These are do's of management except _____
A. Playing safe B. Controlling C. Regimenting D. Stifling
E. Doing right things
31. In Economics and finance, portfolio investment represent
A. Passive holders of securities B. Insurance premium
C. Shareholders of the business D. A broker E. Stock broker
32. A _____ completes any necessary legal paper work, obtain the appropriate signatures and collects money from the purchaser to give to the seller
A. Debenture B. Broker C. Shareholder D. Agent E. Intermediary
33. The following are capital market institutions except
A. National Economic Empowerment and Development Strategy
B. Stockbroker/Issuing Houses C. Registrars
D. SEC E. The Nigeria Stock Exchange
34. Which statement is true among the following statements
i. Central Bank of Nigeria is the regulatory apex organization for Nigeria capital market
ii. CBN regulates the money market
iii. SEC regulates Nigeria capital market
iv. NSE dictates the movement of the market
A. i only B. iii only C. i, ii and iii only D. iv only E. ii and iii only
35. According to SEC. 32 (1) of the Investment and Securities Act 1999. 'No person shall transfer issue, sell, offer _____'

- A. Ordinary shares and government bonds B. Securities or investments
C. Corporate bonds or preference shares D. Securities or government bonds
E. Investments and returns on the investment
36. Using world war II analogy, Will Power would be _____
A. The Normandy invasion B. The concentration of force
C. The victory in Europe D. The Maneuvered territory E. The massive trust
37. Which of the following statement is true _____?
A. Persistence is the ability of maintain action regardless of your feelings
B. Persistence of vision comes from persistence of action C. Persistence allows you to keep taking action when you are fully motivated
D. Persistence is synonymous to perseverance
E. Continuing in a course of action without regard to discouragement
38. The data that are available from trade associations or government agencies which include ratios such as stock turnover, cash discount, percentage making etc. are fit for comparing business to other business are gotten from _____
A. Internet B. Industry data C. The library D. Consultants E. Training programmes
39. Information gotten from _____ is free
A. Consultants B. Industry data C. BDS Providers D. Web designers
E. Professional bodies
40. One of the roles of Nigerian Export Promotion Council is
A. Protect the integrity of securities markets against abuses arising from insider
B. Prepare guidelines organize and coordinate local market activities
C. Collect and disseminate local manufacturers and exporters on foreign markets
D. Engage in the developments of small and medium enterprises for the use of raw materials and technology
E. Maintain the stand of exporters to protect against any threat from the locals



THE POLYTECHNIC, IBADAN
DEPARTMENT OF COMPUTER ENGINEERING TECHNOLOGY
SECOND SEMESTER 2023/2024 EXAMINATION

COURSE TITLE: MOBILE AND WIRELESS COMMUNICATION

COURSE CODE: CTE 322

CLASS: HND I

INSTRUCTION: ANSWER ANY FOUR (4) QUESTIONS

TIME ALLOWED: 2 HOURS

QUESTION ONE

- a) Differentiate between the following: 6 mks
- i. FDM and TDM
 - ii. FVC and RVC
 - iii. TDMA and CDMA
- b) A unit gain antenna with a maximum dimension of 1m produces 50W power at 900MHz.
Find: i) the transit power in dBm and dB. ii) the received power at a free space distance of 5m and 100 m. 4 mks
- c) Calculate the first Fresnel zone obstruction height maximum for $F=800\text{MHz}$ 3 mks
- d) Differentiate between Slow Fading and Fast Fading 2 mks

QUESTION TWO

- a) Explain the Evolution of Mobile Networks 6 mks
- b) Assume a mobile unit transmit 10W power at a certain place. Express this power in terms of dBm. 3 mks
- c) Find the relationship between any two nearest co-channel cell distance D and the cluster size N. 3 mks
- d) Briefly explain the modification of Hata model over Okumura model. 3 mks

QUESTION THREE

- a) Discuss the Cellular concept 5 mks
- b) Find out the surface area of a regular hexagon with radius R, the surface area of a large hexagon with radius D, and hence compute the total number of cells in this large hexagon. 3 mks
- c) Find the far field distance for a circular antenna with maximum dimension of 1m and operating frequency of 900MHz. 3 mks
- d) Explain Fading effect due to Doppler shift 4 mks

QUESTION FOUR

- a) Using relevant mathematical expressions, explain the relationship between Bandwidth and received power. 4 mks
- b) A total of 33MHz bandwidth is allocated to a FDD cellular system with two 25KHz simplest channels to provide full duplex voice and control channels. Compute the number of channels available per cell if the system uses: i) 4 cell ii) 7 cell iii) 8 cell reuse technique. Assume 1MHz of spectrum is allocated to control channels. Give a distribution of voice and control channel. 5 mks
- c) Briefly explain the Radio transmission techniques. 6 mks

QUESTION FIVE

- a) Briefly explain MS, BS and MSC 6 mks
- b) An aircraft is heading towards a control tower with 500kmph at an elevation of 20° . communication between aircraft and control tower occurs at 900MHz . find out the expected Doppler shift. 4 mks
- c) i. Briefly discuss the Okumura's Propagation Model 2 mks
ii. State two (2) advantages and two (2) disadvantages of the Okumura's model 2 mks
- d) What is meant by frequency Reuse? 1 mk

QUESTION SIX

- a) Write short notes on the following:
i. Reflection
ii. Diffraction
iii. Scattering 6 mks
- b) In a certain cellular system, an average subscriber places two calls per hour during a busy hour and the average holding time is 3 min. each cell has 100 channels, if the blocked calls are cleared, how many subscribers can be serviced by each cell at 2% GoS? 3 mks
- c) Briefly explain the factors influencing Handoffs Process 4 mks
- d) State any two (2) features of TDMA. 2 mks

Examiner: Engr. Busari O. Ayodeji



THE POLYTECHNIC, IBADAN
COMPUTER ENGINEERING TECHNOLOGY DEPARTMENT
2023/24 ACADEMIC SESSION, SECOND SEMESTER EXAMINATION

Modern
method
17/12/2024

Course Title: Control System Engineering I Course Code: EEC 326
Class: HND I Time Allowed: (2½) hours
Instruction: Answer any five (5) Questions

QUESTION ONE

- A. With the aid of Mathematical Illustrations and Theorems write short notes on the following

(i)	Zeros and Poles of Transfer Function (TF)	(3 marks)
(ii)	Types of Systems	(3 marks)
(iii)	Initial and Final Value Theorem	(3 marks)

- ### B. Determine the Poles and Zeros of the Transfer function

$$T.F = \frac{6}{s^3} + 6s^2 + 11s + 6 \quad (4 \text{ marks})$$

- C. Find Transfer Function of systems below

$$(i) \quad \frac{d^2y(t)}{dt^2} + 8\frac{dy(t)}{dt} + 15y(t) = \frac{dx(t)}{dt} + 4x(t)$$

where $x(t)$ and $y(t)$ are input and output respectively

Hence determine the Types and Orders of the systems, then, plot the results on S-plane diagram

(7 marks)

QUESTION TWO

- A. Define the following Terminologies
 (i) Plant (ii) Disturbances (iii) Actuator (iv) Optimization (v) Design
 (5 marks)

B. Compare and Contrast Open-loop and Closed-loop Control System
 (6 marks)

C. Explain in brief Time Constant and DC Gain of Control System
 (2 marks)

D. With a given System $\frac{d^2y(t)}{dt^2} + 9 \frac{dy(t)}{dt} + 20y(t) = 5x(t)$, determine
 the Time Constants and DC gain of the system
 (7 marks)

QUESTION THREE

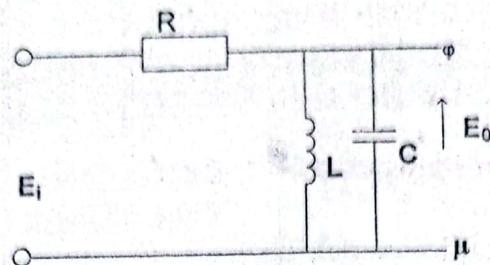
- A. Outline Five (5) properties of Transfer Function (5 marks)
B. Outline two (2) advantages and disadvantages of Transfer Function (2 marks)
C. Develop mathematical models for basic elements in Electrical System (3 marks)
D. Assume basic elements formed a simple electrical system with supply voltage V_a , derive
the basic elements formed a simple electrical system with supply voltage V_a , derive an

expression for the mathematical model in S-domain and find transfer function I/V_a

(4 marks)

(6 marks)

- E. Obtain the transfer function of the circuit shown in fig 2b



QUESTION FOUR

- A. Write short notes on system model (2 marks)
 B. Fig 4 shows Simple Translational and rotational Mechanical systems, find the Transfer Function of the Systems (.8 marks)
 C. if the systems are excited, use their Electrical equivalent to develop Analogous Quantities with Force-Current (F-I) (10marks)

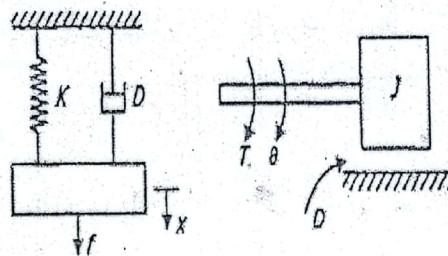


FIG 4

QUESTION FIVE

- (a) Obtain the pole-zero Map of the transfer Function

$$G(s) = \frac{(s-2)(s+2+j4)(s+2-j4)}{(s-3)(s-4)(s+1+j5)(s+1-j5)} \quad (9 \text{ marks})$$

- (b) Obtain the Transfer function of fig. 5

(11marks)

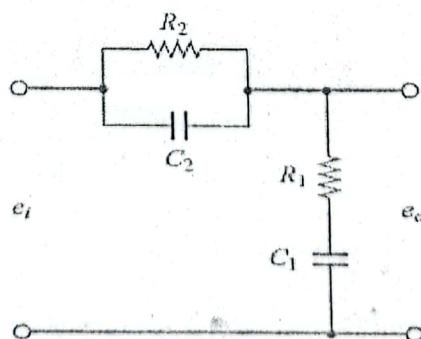


Fig. 5

QUESTION SIX

A. Use block method to find Transfer Function of the System in Fig 6

(6 marks)

B. Given

$$Eb = Kb \frac{\delta\phi}{\delta t}$$

$$La \frac{\delta Ia}{\delta t} + Ra Ia + Eb = Es$$

$$J \frac{\delta^2 \phi}{\delta t^2} + D \frac{\delta \phi}{\delta t} = Tm = Kt Ia$$

Develop

(i) Laplace Transform Equivalence

(3 marks)

(ii) Block Diagram

(7 marks)

(iii) Transfer function $\frac{\phi s}{Es}$

(4 marks)

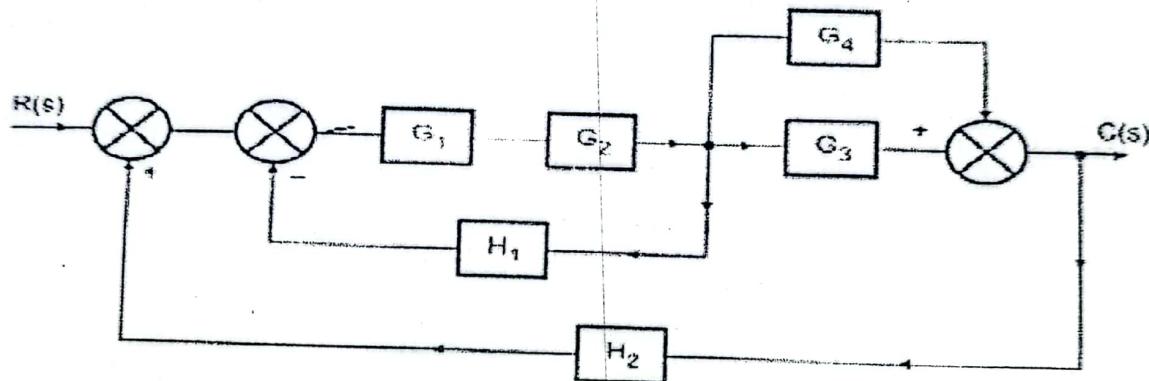


Fig. 6

QUESTION SEVEN

A. Write short notes on

- i. Time response Analysis
- ii. Transient Time response
- iii. Steady State Response

(2marks)

(2marks)

(6 marks)

B. From first principle, tabulate the following Input signals with relevant functions, descriptions, sketches and uses

- 1. Parabolic Signal
- 2. Ramp Signal
- 3. Step Signal
- 4. Impulse Signal

(14marks)

THE POLYTECHNIC, IBADAN
DEPARTMENT OF LANGUAGE AND COMMUNICATION
SECOND SEMESTER EXAMINATION 2023/2024 SESSION

COURSE TITLE: COMMUNICATION IN ENGLISH III

TIME: 2 HOURS

COURSE CODE: GNS 302

CLASS: HND I

OPTION A.

General Instruction: Answer any TWO questions in Section I, ALL questions in Section II and ONE question in Section III.

SECTION I: (Answer any two questions from this section)

- 1a. As the President of the Student Union in your school, write a letter to the Dean, Student Affairs to complain about the lack of necessary amenities and its attendant effects on academic exercise.
- 1b. In your capacity as the Procurement Officer in a newly established organisation, place an order with a company in Lagos for the supply of necessary office equipment.
- 1c. As the Head of Department of a named organisation, write a memo to members of staff, warning them to desist from coming late to work.
- 1d. You discovered damaged goods in the consignment just supplied by the Ewekoro Portland Cement Industry. Write a complaint to the General Manager, detailing the issue and requesting a replacement shipment.

Refugee

SECTION II: Comprehension (Logic) Answer all questions in this section

Read the passage carefully and answer the questions which follow:

In the end, I was duly discharged (from hospital) and sent back relieved, but not cured. A very elaborate belt kept death at arm's length. My congregation was deeply sympathetic, but started making representations for my transfer. Shortly afterwards, the final blow was delivered. The circumstances in which I was forced to retire from the work for which I had sacrificed my youth and strength and hope were so confused and sad that a bitter taste will forever remain. I had toiled for over half a century only to end like this. Somehow, I feel my third courtship had something to do with it, for I drew bitter opposition from some near relations of the lady. The campaign of mudslinging grew to ugly proportion and became an organized campaign to throw me out. Charges were trumped up. I was declared feeble, aged and unable to visit outstations, and probably I was secretly called immoral. These charges were duly handed to the Superintendent Minister. Meanwhile, at Mankessim, angry mobs made the place untenable. I was in the end transferred-nowhere. That was the end. My retirement was skillfully managed by the Chairman and Superintendent Minister, and I went quietly into obscurity with no laurels and no respect; no last-minute fare-well or good speech; no visible means of support save, that which my own sons were hopefully expected to give. For Catechists are

the scum of the earth and command no respect and expect none. They are entitled to no gratuities or pension and when they are strong enough to outlive their usefulness... 'God will provide'

I had worked half a century to bring salvation to other people. It would probably be appropriate to say, 'physician heal thyself'. Sometimes I think we, the workers in the lord's vineyard, have the greatest need of salvation. In the obscurity of retirement, I can now have time to look back on my life and into my soul and try to assess where I failed and try to effect my own salvation.

God indeed never leaves those who believe in him really with desolate. I have my wife with me now. My sons are all securely settled in life and work to support my age. At the throne of God, I hope the Almighty will not deal too harshly with his servant, but in His Infinite mercy will forgive my sins and accept even me.

Culled from R.W. Noble, English Comprehension and Summary. U.K 1968.

1. Give this passage a suitable title.
2. In your own opinion, what do you think is the factor responsible for Catechist's dismissal?
3. Describe the Catechist's statement about his retirement judging from his tone.
4. What can you infer from the expression "They are entitled to no gratuities or pension and when they are strong enough to outlive their usefulness" ... "God will provide"
5. In one sentence, without considering the Catechist's sentiment, bring out the fact that led to the Catechist's retirement.
6. What does the Catechist mean by the expression, "God indeed never leaves those who believe in him really desolate"
7. Replace the underlined words in the passage with other appropriate words:
 - a. Mudslinging
 - b. Feeble
 - c. Skillfully
 - d. Obscurity

SECTION III: Project Report Writing. (Answer only one question from this section.)

- 3a (i). What is Project Report?
(ii). Discuss six characteristics of a project report.

OR

- 3b. Discuss three of these concepts in detail.
(a) Questionnaire (b) Literature Review (c) Conclusion and Recommendation
(d) Abstract (e) Interview

OR

- 3c (i). Outline six importance of citation in project report writing.
(ii) Using three hypothetical examples, outline six distinguished features of the APA style of referencing.

Loose leaf
16/07/2024
Moderated Okay.

THE POLYTECHNIC, IBADAN
COMPUTER ENGINEERING TECHNOLOGY DEPARTMENT
SECOND SEMESTER EXAMINATION

SESSION: 2023/2024

CLASS: HND I

COURSE TITLE: COMPUTER HARDWARE SYSTEM DESIGN

COURSE CODE: CTE 321

INSTRUCTION: ANSWER FIVE (5) QUESTIONS.

TIME ALLOWED: 2HRS 30MINS.

QUESTION ONE

(a) Generate Boolean expression for $X(ABC) = 0$, when $C = 1$.

Hence, draw the logic circuit of X .

4mks

(b) Use K-map to simplify X in (a) and draw the logic circuit of the simplified expression.

4mks

(c) With the aid of a block diagram, describe the operation of a typical microprocessor-based computer system showing the internal and external buses.

4mks

QUESTION TWO

(a) Given the truth table for a 3-input logic design (Table1).

i. Generate the Boolean equation and sketch the logic circuit required to implement the Truth Table. 3mks

ii. Simplify the logic design using K-map and sketch the resultant logic circuit. 5mks

(b) Discuss the following memory devices;

(i) PROM (ii) EEPROM (iii) EPROM (iv) Dynamic RAM

4mks

Table 1

A	B	C	X
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

QUESTION THREE

(a) Draw the Symbols and the truth tables of the following logic gates:

4mks

(i) NOT (ii) AND (iii) NOR (iv) EX-NOR

(b) Convert the following numbers to BCD:

4mks

(i) 505_{10} (ii) A37E (iii) 1005_{10} (iv) D_H.

4mks

(c) With the aid of electronic circuit and the truth table, describe TTL NOR circuit.

QUESTION FOUR

- (a) Implement a NOT gate using NOR gates only. 2mks
(b) Three signals, A = 1 0 1 1 0 1, B = 1 1 0 1 0 1 and C= 0 0 0 0 0 0 are fed into a three -input AND gate. 2mks
Sketch the output signal. 4mks
(c) With the aid of electronic circuit and the truth table, describe TTL Inverter circuit. 4mks
(d) With the aid of electronic circuit and the Truth Table, describe TTL NAND circuit. 4mks

QUESTION FIVE

- (a) Use the K-map to simplify function F (ABCD) where,
 $F = \sum (0, 2, 8, 9, 10, 11)$.
Hence, draw the logic circuit of the reduced expression. 6mks
(b) Implement a SR flip-flop using NAND gates only and show its operations with the aid of the Truth Table. 4mks
(c) Mention two (2) importance of circuit simplification. 2mks

QUESTION SIX

- (a) Implement an OR gate using NAND gates only. 3mks
(b) Implement two (2) logic OR and AND gates DRL circuits. 3mks
(c) With the aid of electronic circuits and the Truth Tables, implement two (2) logic gates DTL. 4mks
(d) Mention two (2) limitations of DRL. 2mks

QUESTION SEVEN

- (a) Implement an AND gate using NOR gates only. 3mks
(b) What are the functions of the operating systems? 4mks
(c) Draw the Seven-segment array of LEDs and with the aid of the Truth table, display digits 0-9. 5mks

Pass analysis of the circuit
Efficient use of the circuit



THE POLYTECHNIC, IBADAN
DEPARTMENT OF COMPUTER ENGINEERING TECHNOLOGY
SECOND SEMESTER 2023/2024 EXAMINATION

COURSE TITLE: TESTING METHOD AND RELIABILITY
COURSE CODE: EEC 328
CLASS: HND I
INSTRUCTION: ANSWER ANY FOUR (4) QUESTIONS
TIME ALLOWED: 2 HRS

QUESTION ONE

- a. What is Reliability? 1 mark
- b. Define the following Reliability terms:
i. Lifetime
ii. Failure rate
iii. MTTF
iv. MTBF
v. Observed failure rate
vi. MTTR 6 marks
- c. Describe how Fault Tree Analysis is constructed 5 marks
- d. Draw any three (3) fault tree analysis symbols and state their usage 3 marks

QUESTION TWO

- a. State three (3) advantages and (2) disadvantages of constant failure model 5 marks
- b. State four (4) reasons for producing prototype items of equipment 4 marks
- c. A system consisting of two subsystems has a probability of failure 0.9 for a period of continuous operation of 1151 hours. One subsystem is known to have a mean time between failures of 8000 hrs. Determine
i. The mean time between failures of the second sub-system 4 marks
ii. The reliability of the complete system 2 marks

QUESTION THREE

- a. State the advantages of Weibull Distribution Model 3 marks
- b. Write short notes on the following:
i. Validity 2 marks
ii. Availability 2 marks
iii. Unavailability 2 marks
iv. Catastrophic Failure 2 marks

- c. Briefly explain the four (4) basic probability rules in relation to reliability calculation
4 marks

QUESTION FOUR

- a. Define the term "Specification" 1 mark
- b. State three (3) items of information that should be included in specifications? 3 marks
- c. What are the purposes of specifications? 4 marks
- d. An integrated circuit (IC) chips has a constant failure rate of 0.04/thousand hours.
- What is the probability that it will operate satisfactorily for at least 20,000 hours 2 marks
- Calculate 1000 hours reliability of component consisting of four chips connected in
- Series 2 marks
 - Parallel 3 marks

QUESTION FIVE

- a. Explain the necessity for pre-production testing. 3 marks
- b. Describe the bathtub curve 6 marks
- c. The Mean Time Between Failure of three subsystems of a system are 4000, 6000 and 8000 hours respectively. Determine
- The failure rate of each subsystem 2 marks
 - The failure rate of the complete system 2 marks
 - The mean time between failure of the complete system 2 marks

QUESTION SIX

- a. What is Redundancy? 1 mark
- b. Describe the following types of redundancy
- Hot redundancy
 - Cold redundancy
 - K-out-of-n redundancy 6 marks
- c. Differentiate between major failure and minor failure 2 marks
- d. A system consists of four elements in series. The following are the exponential distributions of their time to failure rates: $\lambda_1 = 8 \times 10^{-6}$, $\lambda_2 = 6 \times 10^{-6}$, $\lambda_3 = 9 \times 10^{-6}$, $\lambda_4 = 2 \times 10^{-6}$. Calculate
- The failure rate of the system 2 marks
 - The mean time to failure 2 marks
 - The probability of failure during the time t= 500 hours of operation 2 marks

EXAMINER: ENGR. A. A. ONI

**THE POLYTECHNIC, IBADAN
ELECTRICAL ENGINEERING DEPARTMENT
FIRST SEMESTER EXAMINATION, 2024/2025 SESSION**

Course Title: CIRCUIT THEORY III (COMPUTER ENGINEERING)

Class: HND I

Instruction: Answer any four (4) questions.

Course Code: EEC 313

Time: 2 HRS

Question One

a. Differentiate between the following terms:

i. An Integrator and a Differentiator

4mks

ii. Inverting and Non-inverting amplifiers

4mks

b. If Op Amp has an inputs $V_1 = 10\cos 2t \text{ mV}$ and $V_2 = 0.5t \text{ mV}$. Find V_0 in the Op Amp circuit assuming $V_0(0) = 0$ and it's a summing-up integrator. $R_1 = 100k\Omega, R_2 = 0.1\mu\text{F}$

4mks

c. A differentiator has $R = 100k\Omega$ and $C = 0.1 \mu\text{F}$. Given that $V_i = 1.25t \text{ V}$, find V_0 .

3mks

Question Two

a. Differentiate the terms with the aid of equations only, the RC series a.c and RL series a.c series and RLC series a.c circuits' impedances.

3mks

b. A coil of inductance 159.2mH and resistance 20Ω is connected in series with a 60Ω resistor to a $240\text{V}, 50\text{Hz}$ supply. Determine,

iii. The circuit impedance

ii. The circuit current

v. Circuit phase angle

iv. The p.d across the 60Ω resistor

vii. The p.d across the coil

vi. Draw the circuit phasor diagram of all voltages.

12mks

Question Three

a. Define an Operational Amplifier

3mks

b. Draw and label completely, the structure and equivalent circuit diagram of a typical Operational Amplifier.

5mks

c. A 741 Op Amp has an open loop voltage gain of 2×10^5 , input resistance of $2M\Omega$ and an output resistance of 50Ω . Figure 1 depicts the Op Amp circuit. Find the close loop gain V_o/V_s .

7mks

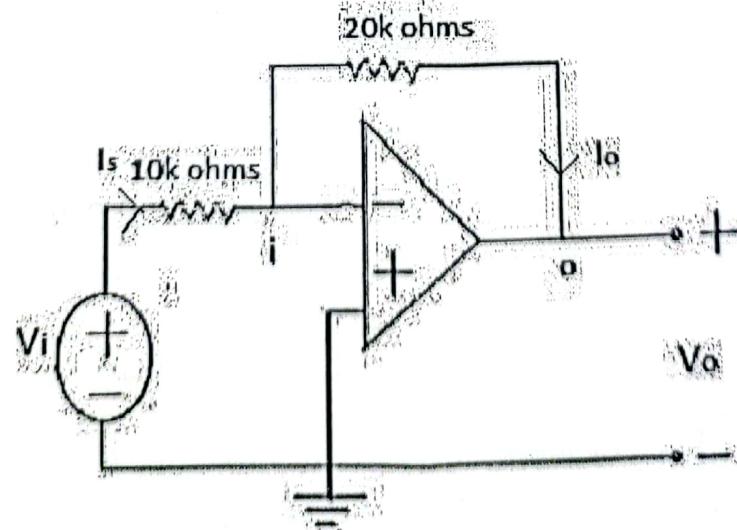


figure 1

... is an inverting amplifier circuit that

Question Four

- a. Define a Summing Amplifier
 b. Draw the circuit diagram of a Summing amplifier with three inputs and derive the equation for the output voltage "V".
 c. Find V_o and I_o in figure 2. 7mks

2mks

6mks

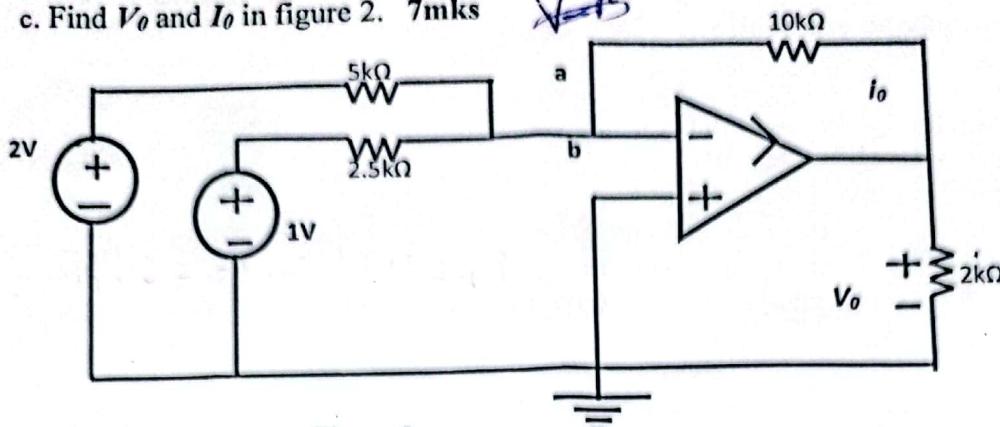


Figure 2

Question Five

- a. What is a Source-free circuit?
 b. Differentiate with the aid of diagrams and equations only, the source-free RC and source-free RL circuits.
 c. Find I_0 , V_o , and I for all time (that is, when $t < 0$ and $t > 0$) in Figure 3.

3mks

4mks

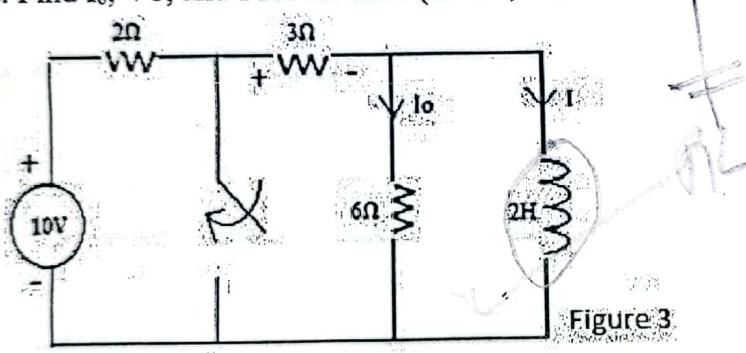


Figure 3

$$V_C = V_0 e^{-\frac{t}{RC}}$$

$$P = \frac{V^2}{R} = \frac{V_0^2}{R}$$

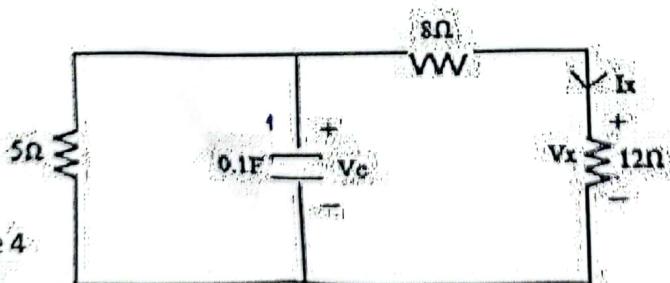
8mks

3mks

- a. Distinguish between Natural Response and Time Constant of a circuit.
 b. Find V_c , V_x , and i_x for $t > 0$ in Figure 4.

$$V_0 = 15V$$

Figure 4



$$R_L$$

$$V_L = I_0 R e^{-\frac{t}{L}}$$

5mks

$$P = I^2 R e^{-\frac{t}{L}}$$

7mks

- c. If the switch in Figure 4 has been closed for a long time and opens at $t = 0$, find $V(t)$ for $t > 0$. Calculate the energy stored in the capacitor.

Examiner: Bello, S.A

188/28

THE POLYTECHNIC, IBADAN

DEPARTMENT OF COMPUTER ENGINEERING TECHNOLOGY

FIRST SEMESTER EXAMINATION

COURSE TITLE: COMPUTER ARCHITECTURE II

COURSE CODE: CTE 433

CLASS: HND 1 COMPUTER ENGINEERING

INSTRUCTION: ANSWER ANY FIVE (5) QUESTIONS

TIME ALLOWED: 2 ½ Hrs

QUESTION ONE

- a) i. Define Interrupt, Hence, List any two (2) types of interrupt in Computer System Operations. 3 marks
- b) State and describe the unique attribute of the cache memory that differentiates it from other memories in the Computer. 2 marks
- c) State the objective behind designing a memory hierarchical system. 2 marks
- d) With relevant diagram describe the Von Neumann's machine. 6 marks
- e) State two (2) advantages of registers over main memory. 2 marks

QUESTION TWO

- a) With the aid of a block diagram, describe the operation of a Computer system 6 marks
- b) Differentiate between opcode and operand. 2 marks
- c) Using appropriate examples, Enumerate any two (2) types of operands. 2 marks
- d) Describe the basic CPU registers. 5 marks

QUESTION THREE

- a) List four (4) I/O interfaces and the devices that connect to each of them. 4 marks
- b) With relevant diagram, discuss and show the interconnection of the basic unit of the computer system 6 marks
- c) Describe the FedEx Instruction Cycle 5 marks

QUESTION FOUR

- a) Briefly Discuss the role of Control Unit in the Computer System 2 marks
- b) With respect to the CPU's internal bus organization, describe with the aid of a well labeled diagram:
 - i. One-bus organization 4 marks
 - ii. Two-bus organization 4 marks
 - iii. Three-bus organization 4 marks
- c) Define Computer Architecture 1 mark

QUESTION FIVE

- a) Using diagram only, describe the memory's hierarchical system. 2 marks
- b) Discuss the Classification of Computer Memory 6 marks
- c) With the aid of a well labeled diagram, define the Datapath and state two (2) major Components. 6 marks
- d) Explain the concept of a "a stored-program digital computer" 1 mark

QUESTION SIX

- a) Give a brief description of the common flags in the condition code register 5 marks
- b) Illustrate with the aid of diagram, the concept of pipelining. 4 marks
- c) Discuss the memory parameters 6 marks

QUESTION SEVEN

- a) Compare and Contrast RAM and Cache 2 marks
- b) With respect to the microprocessor's read/write operation, describe how MAR and MDR are used. 6 marks
- c) Describe the Computer bus, hence discuss the type of computer bus 5 marks
- d) Explain the function of the following instruction cycle parameters:
 - i. Fetch 1 mark
 - ii. Decode and Addressing Mode 1 mark

EXAMINER: Engr. O. A. Busari