



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT



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ANONAS COR. PUREZA STREETS, STA. MESA, MANILA





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Engineering Comprehensive Examination



Departmental Examination



Engineering Qualifying Examination



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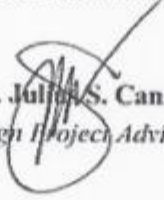


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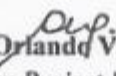
This is to certify that we have supervised the preparation of and read the design project paper proposed by **Arvin R. De La Cruz, Rante L. Cabucoy, Paul Rommel P. Casilla, Francis Tobias A. Derit, and Frederick R. Manlusoc** entitled **Fire Mitigation Turret Utilizing Hydrofluorocarbons with Call and SMS Alert Notification** and that said paper has been submitted for final examination by the Oral Examination Committee.


Engr. **Julius S. Cansino**
Design Project Adviser

As members of the Design Project Committee, we certify that we have examined this paper and hereby recommend that it be accepted as fulfilment of the requirement for the degree in Bachelor of Science in Computer Engineering.



Engr. **Ferdinand O. Natividad**
Design Project Evaluator


Engr. **Pedrito M. Tenerife Jr.**
Design Project Evaluator


Engr. **Orlando V. Pajabera**
Design Project Evaluator

This design project paper is hereby approved and accepted by the College of Engineering as fulfilment of the requirement for the degree in Bachelor of Science in Computer Engineering.


Engr. **Julius S. Cansino**
Chairperson, CpE Department


Dr. **Remedios G. Ado**
Dean, College of Engineering



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
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POLYTECHNIC UNIVERSITY OF THE PHILIPPINES

**FIRE MITIGATION TURRET UTILIZING HYDROCHLOROFLUOROCARBONS
WITH CALL AND SMS ALERT NOTIFICATION**

A Design Project
Presented to the Faculty of
Computer Engineering Department
Polytechnic University of the Philippines
Sta. Mesa, Manila

In Fulfilment of the Requirements for the Degree
Bachelor of Science in Computer Engineering

By:

Rante L. Cabucoy
Paul Rommel P. Casilla
Francis Tobias A. Derit
Frederick R. Manlusoc

March 2019



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
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Republic of the Philippines
 POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
 OFFICE OF THE VICE PRESIDENT FOR ACADEMIC AFFAIRS
 COLLEGE OF ENGINEERING
 DEPARTMENT OF COMPUTER ENGINEERING

**DESIGN PROJECT II
 CONFORMITY FORM**

Title Design: **Fire Mitigation Turret Utilizing Hydrofluorocarbons with Call and SMS Alert Notification**
 Proponents: Arvin R. De La Cruz
 Rante L. Cabucoy
 Paul Rommel P. Casilla
 Francis Tobias A. Derit
 Frederick R. Manlusoc

Thesis Defense Date: September 20, 2018

Mark Received:

PASSED


FAILED

We certify that the above mentioned proponents have successfully complied with our requirements and thus, considered now "PASSED" the oral presentation.


 Engr. Ferdinand O. Natividad
 Design Project Evaluator


 Engr. Pedrito M. Tenerife Jr.
 Design Project Evaluator


 Engr. Orlando V. Pajabera
 Design Project Evaluator


 Engr. Julius S. Cansino
 Design Project Adviser &
 Chairperson, CpE Department

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COMPUTER ENGINEERING DEPARTMENT



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES

ABSTRACT

Title : **Fire Mitigation Turret Utilizing Hydrochlorofluorocarbons
With Call and SMS Alert Notification**

Researcher : De La Cruz, Arvin R., Cabucoy, Rante L., Casilla, Paul Rommel,
Derit, Francis Tobias A., Manlusoc, Frederick R.

Degree : Bachelor of Science in Computer Engineering

Institution : Polytechnic University of the Philippines

Year : 2019

Adviser : Engr. Julius S. Cansino

This project is created in response to the electronic devices that is being damaged when a fire disaster occur. The project sole purpose is to detect the exact location of the fire and extinguish it as soon as possible. The extinguishing agent that will be used is a non-conductive chemical Hydro Chlorofluorocarbon as it is indicated in the Fire Code of the Philippines that the protection of delicate electronic equipment shall be selected from either a carbon dioxide type or a halogenated agent type.

The project consists of numbers of IR Sensors to allow the maximum efficiency of detecting fire in the surrounding area. The responsible in controlling of Solenoid Valve and detecting the intensity of fire is the AMG8833 Thermal Imager. The releasing and interrupting of the HCFC is controlled by the Solenoid Valve.

Keywords: *Fire, Mitigation, Turret, SMS Notification, Hydrochlorofluorocarbons*

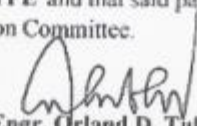


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COMPUTER ENGINEERING DEPARTMENT

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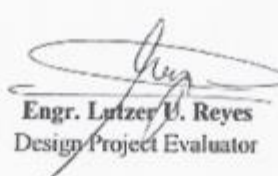
This is to certify that we have supervised the preparation of and read the design project paper proposed by **BRANDON MARK BRUTAS, YNAH GAILE EULOGIO, CHRISTIAN BART SADIWA, JAYSON TOMAS** entitled **AUTOMATED ASPHALT MIXER WITH LOW-DENSITY POLYETHYLENE: A PROTOTYPE** and that said paper has been submitted for final examination by the Oral Examination Committee.

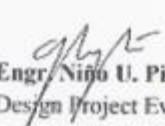

Engr. Pedro M. Tenerife Jr.
Design Project Adviser


Engr. Orland D. Tubola
Design Project Adviser

As members of the Design Project Committee, we certify that we have examined this paper and hereby recommend that it be accepted as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering.



Engr. Rolando A. Yahaguay
Design Project Evaluator


Engr. Lutzer U. Reyes
Design Project Evaluator


Engr. Niño U. Pilueta
Design Project Evaluator

This design project paper is hereby approved and accepted by the College of Engineering as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering.


Engr. Pedro M. Tenerife Jr.
Chairperson, Computer Engineering Department


Engr. Guillermo O. Bernabe
Dean, College of Engineering



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

AUTOMATED ASPHALT MIXER WITH LOW-DENSITY POLYETHYLENE: A
PROTOTYPE

A
Design Project
Presented to the Faculty of
Computer Engineering Department
Polytechnic University of the Philippines
Sta. Mesa, Manila

In Partial Fulfillment
of the Requirements for the Degree
Bachelor of Science in Computer Engineering

by

Brandon Mark Y. Brutas
Christian Bart F. Sadiwa
Jayson P. Tomas
Ynah Gaile M. Eulogio

April 2016



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

Published by
Center of Research and Development
College of Engineering
Polytechnic University of the Philippines
Sta. Mesa, Manila

**AUTOMATED ASPHALT MIXER WITH LOW-DENSITY POLYETHYLENE: A
PROTOTYPE**

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Center of Research and Development and Polytechnic University of the Philippines
College of Engineering Polytechnic University of the Philippines

ISSN



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COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

ABSTRACT

Asphalt mixing nowadays has undeniably improved, by the help of emerging technologies and methodology to administer concrete making. The researchers identified one possible additive that could help produce a quality asphalt mix, additionally introduced automation for convenience yet effective asphalt mix. The design's primary requirement is a microcontroller that could interface all the necessary electrical elements to be used on the prototype. Arduino Mega 2560 fits best, offering generous number of I/O pins enough to establish full control of all the elements. We used stepper motors to fit the required precision of angular vectors within the mechanisms of the linear assembly, used thermocouples to monitor temperature readings and control thermal output as needed. The automation process however could not be perfected from the input of the raw ingredients due to technical constraints like the requirement of weighing procedures which should be automated at could take several alterations to the design. During our experiments we found out that low-density polyethylene and asphalt mixing requires a stable and sustained temperature to produce a quality mix, the sensors have just the right functionality to adhere and the whole system automation.

Keywords: Asphalt Mixer, Hot Asphalt Mix, LDPE, Automation, Concrete Mixing




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COMPUTER ENGINEERING DEPARTMENT

APPROVAL SHEET

This is to certify that I have supervised the preparation of and read the design project paper prepared by de Ramos, Cris Noel M., Diaz, Joncarlo R., Eusebio, Ruby T., Lumibao, Jo-Anna Michelle entitled RAINDROPS VIBRATION SENSING ROOF WITH SOLAR PANEL AS AN ALTERNATIVE DC SOURCE and that the said paper has been submitted for final examination by the Oral Examination Committee.


Engr. Ronald D. Fernando
Adviser

As members of the Design Project Committee, we certify that we have examined this paper and hereby recommend that it be accepted as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering


Engr. Orland D. Tubola
Evaluator


Engr. Allan B. Yerzo
Evaluator


Engr. Kerubin B. Pangilinan
Evaluator

This design project paper is hereby approved and accepted by the College of Engineering as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering


Engr. Pedro M. Tenerife Jr.
Chairperson, CpE Department


Engr. Guillermo O. Bernabe
Dean, College of Engineering



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

RAINDROPS VIBRATION SENSING ROOF WITH SOLAR PANEL
AS AN ALTERNATIVE DC SOURCE

A
Design Project
Presented to the Faculty of
Computer Engineering Department
Polytechnic University of the Philippines
Sta. Mesa, Manila

In Partial Fulfillment
of the Requirements for the Degree
Bachelor of Science in Computer Engineering

By

de Ramos, Cris Noel M.
Diaz, Joncarlo R.
Eusebio, Ruby T.
Lumibao, Jo-Anna Michelle

March 2015



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

RAINDROPS VIBRATION SENSING ROOF WITH SOLAR PANEL AS AN
ALTERNATIVE DC SOURCE

Cris Noel M. De Ramos¹, Joncarlo R. Diaz¹, Ruby T. Eusebio¹, Jo-Anna Michelle Lumibao¹

Engr. Ronald D. Fernando.
Adviser, Department of Computer Engineering, Polytechnic University of the Philippines

*¹Department of Computer Engineering, College of Engineering
Polytechnic University of the Philippines, Sta. Mesa, Manila*

ABSTRACT: Events of power shortage have been a problem in the Philippines since years ago. It can come unexpected or scheduled depending on the electric company that supplies consumers with their power needs. Yet, most power shortage or so-called "black-out" occurs in rainy weather which, by all means, is unfavorable to the public and could bring issues especially on the development of storms from a normal rainfall. Just last July 2014 according to a news post of the ANC on Yahoo Philippines, typhoon 'Glenda' leaves over 5 million Meralco customers in the dark as it brought down power lines and transmission facilities on areas it went through. Such black-outs happen in unannounced manner leaving residents unprepared, no source of electricity and near danger. In this sort of time, source of light and communication are of necessity to be able to seek safety and help from others which require supply of electricity. To counter this, the researchers came up with the project Raindrops Vibration Sensing Roof with Solar Panel as an Alternative DC Source to be able to use rain as an advantage. The prototype is capable of measuring the pressure applied by the raindrops by converting them to an electrical charge with the use of Piezoelectric Transducers installed beneath the roofing materials. In addition, the researchers also installed Solar Panel to the system in order to continually supply the Lead-Acid battery source for electric charge even in the absence of the rain. Microcontroller is used for the controlling and monitoring of the battery charge and limit the electricity supplied by the transducers and panel. According to the observation, charging time to supply the lead acid battery depends on the strength and the intermittence of rainfall and the solar power from the sun. The system was able to charge a mobile phone one at a time by the USB port present in the circuit box of the system and was able to supply enough voltage to light a DC Bulb for up to 4 hours.



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APPROVAL SHEET

This is to certify that I have supervised the preparation and read the design project paper by Mark Angelo A. Lagani, Airish M. Las Pinas, Bill Vincent F. Macion, Marjorie M. Santiago and Antonio Y. Velasco entitled BUILT - IN SHOPPING CART ITEM PRICE WITH BUDGET CALCULATION and that the said paper has been submitted for final examination by the Oral Examination Committee.


Engr. Ferdinand O. Natividad
Design Project Adviser

As members of the Design Project Committee, we certify that we have examined this paper and hereby recommend that it be accepted as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering.


Engr. Ruffin L. Mahaguay
Evaluator


Engr. Orland D. Tubola
Evaluator


Engr. Julius S. Cansino
Evaluator

This design project paper is hereby approved and accepted by the College of Engineering as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering.


Engr. Pedrito H. Tenerife Jr.
Chairman
Computer Engineering Department


Engr. Guillermo O. Bernabe
Dean
College of Engineering



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COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

BUILT-IN SHOPPING CART ITEM PRICE WITH BUDGET CALCULATION

A
Design Project
Presented to the
Faculty of the Computer Engineering
Polytechnic University of the Philippines
Sta. Mesa, Manila

In Partial Fulfillment
Of the Requirements for the Degree
Bachelor of Science in Computer Engineering

By:

LAGGUI, Mark Angelo A.
LAS PIÑAS, Airish M.
MACION, Bill Vincent F.
SANTIAGO, Marjorie M.
VELASCO, Antonio Y.

May 2014



BUILT-IN SHOPPING CART ITEM PRICE WITH BUDGET CALCULATION

MARK ANGELO A. LAGGUI,
AIRISH M. LAS PIÑAS,
BILL VINCENT F. MACION,
MARJORIE M. SANTIAGO
ANTONIO Y. VELASCO

ABSTRACT

In this study, RFID technology is assessed for use in retail stores to replace the typical barcode system. Using this kind of technology, problems like long checkout queues can be solved and the average transaction time spent by shoppers on the checkout lane can be lessened. In other shoppers, especially in the Philippines, another problem is shopping budget management.

The prototype has a RFID antenna used for identifying the items placed in the cart using the RFID tag of each item. The data from the tag will act as an ID of the item, which will be used to retrieve the product details from the server through a wireless network. The list of the cart items will be shown on a tablet PC, as well as the total quantity and the total price of the items. Upon checkout, a cashier ID will be scanned, and then the shopping list and details from the cart will be sent to the POS (point-of-sale) for immediate payment.

Another feature of this cart is the application software, where there is a selection of shopping mode depending on the shopper's financial limit and preferences in monitoring his/her items. An automobile battery serves as the electronic cart's power source for portability purposes and high power sustenance capability.

Keywords. shopping, cart, RFID, budget

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APPROVAL SHEET

This is to certify that I have supervised the preparation of and read the design project paper prepared by **Randall Anthony V. Boudoc, Von Clarence B. Cantada, Ralph Joseph M. Nacu, Gabriel P. Versoza** entitled "*Portable Charger Powered by Water Activated Battery*" and that the said paper has been submitted for final examination by the Oral Examination Committee.


Engr. Julian L. Lorico Jr.
Design Project Adviser

As members of the Design Project Committee, we certify that we have examined the paper and hereby recommended that it be accepted as fulfillment of the requirement for the Degree in Bachelor of Science in Computer Engineering.


Engr. Allan B. Verzo
Evaluator


Engr. Orland D. Tubola
Evaluator


Engr. Nino U. Pilueta
Evaluator

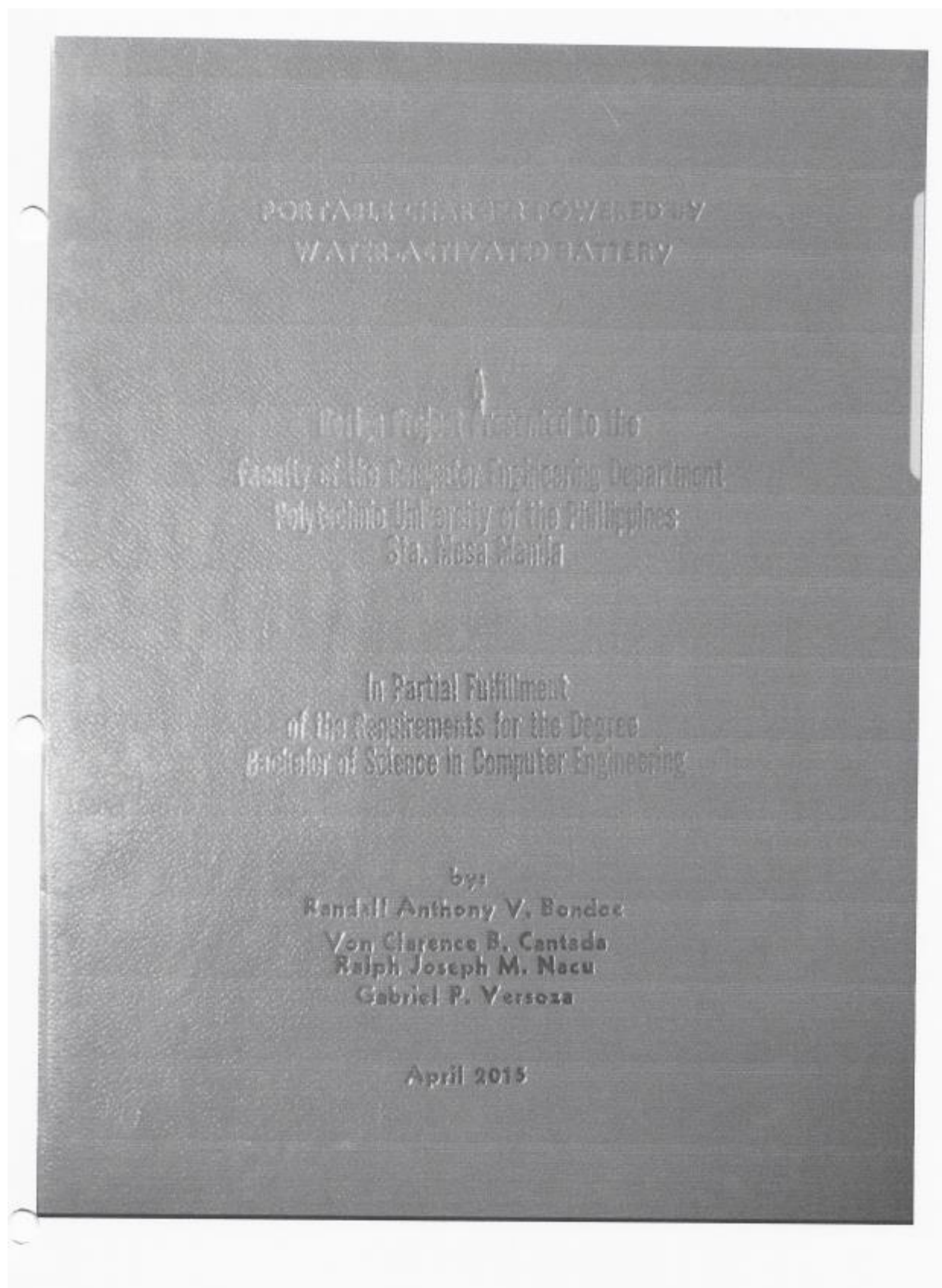
This practicum paper is hereby approved and accepted by the College of Engineering as fulfillment of the requirement for the Degree in Bachelor of Science in Computer Engineering.


Engr. Pedro M. Tenerife Jr.
Chairperson,
Computer Engineering Department


Engr. Guillermo Bernabe
Dean, College of Engineering



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**PORTABLE CHARGER POWERED BY
WATER-ACTIVATED BATTERY**

A
Design Project Presented to the
Faculty of the Computer Engineering Department
Polytechnic University of the Philippines
Sta. Mesa, Manila

In Partial Fulfilment
of the Requirements for the Degree
Bachelor of Science in Computer Engineering

by:

Bondoc, Randall Anthony V.

Cantada Von Clarence B.

Nacu, Ralph Joseph M.

Versoza, Gabriel P.

April 2015



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

Abstract

The device created to charge gadgets/devices using salt water as power source with combination of elements. The proponents used Copper Plates and Galvanized Iron Sheet and salt water to produce voltage and current. After producing a voltage Step- up Booster circuit is used to convert 1.5V to 5V with required current.

The Galvanic Cell will then be used in order to power the DC-DC booster circuit which will output 5V in order to charge low - powered devices. Its design enables the user to pour water into improvised battery to start producing battery.

In the initial testing we used different kinds of salt and liquids, the Galvanic Cell with Epsom salt and water only can produced a raw voltage of 3.75V and 2mA., with salt (normal salt) with water produced a raw voltage 5V and 8mA, and salt with Vinegar with a raw voltage of 5V and 16mA. Also, it is proven that the more salt dissolved in water that is used/poured in Galvanic Cell the higher the Voltage and Current will produce.



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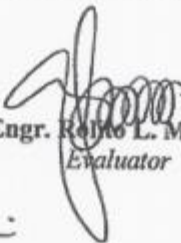
APPROVAL SHEET

This is to certify that I have supervised the presentation of and read the design project paper prepared by **IGNACIO, LAWRENCE M., LANDOY, KAREN P., MOTEA, DAVE ALLEN B., RAFAEL, ARGENE G.** Entitled **FISH CAGES LIGHTING SYSTEM IN ALAMINOS, PANGASINAN UTILIZING HYDROPOWER, SALTWATER AND SOLAR HYBRID RENEWABLE ENERGY RESOURCES** and that the paper has been submitted for final examination by the Oral Examination Committee.


Engr. Pedrito M. Tenerife Jr.
Design Project Adviser

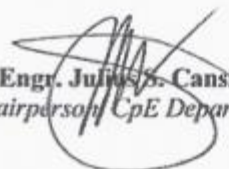
As members of the Design Project Committee, we certify that we have explained this paper and hereby recommend that it be accepted as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering.


Dr. Remedios G. Ado
Evaluator


Engr. Rolito L. Mahaguay
Evaluator


Antonieta D. Evangelista
Evaluator

This design project is hereby approved and accepted by the College of Engineering as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering.


Engr. Julius S. Cansino
Chairperson, CpE Department


Engr. Guillermo O. Bernabe
Dean, College of Engineering

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COMPUTER ENGINEERING DEPARTMENT

**FISH CAGES LIGHTING SYSTEM IN ALAMINOS, PANGASINAN UTILIZING
HYDROPOWER, SALTWATER AND SOLAR HYBRID RENEWABLE
ENERGY RESOURCES**

A Design Project
Presented to the Faculty of
Computer Engineering Department
Polytechnic University of the Philippines
Sta. Mesa, Manila

In Partial Fulfillment
of the Requirements for the Degree
Bachelor of Science in Computer Engineering

by:

Lawrence M. Ignacio
Karen P. Landoy
Dave Allen B. Motea
Argene G. Rafael

May 2017

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COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

Abstract


With global race for the use of renewable energy resources to keep up with the demands of this ever-growing technologically progressive world, this design project discovers yet another solution: to fuse the potentials of natural energy resources- Hydropower, Sea Water and Sunlight. In order to provide a lighting system for the Carias Island, it is needed to harness renewable energy to suffice the lightings; solar energy as the most efficient renewable energy can be obtained easily because the place is a wide-spaced area in which the sun's rays are directed. The group materialized the project by collecting all the materials needed and checking out the power harnessed by each renewable energy systems. Comparisons of day-to-day harnessed power are recorded to observe if the power can sustain everyday maintenance of the lighting system. This project is an important step towards shedding light to off-grid places that needed electricity.



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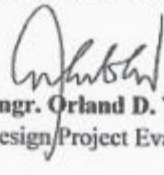
This is to certify that we have supervised the preparation of and read the design project paper proposed by **Johnuel C. Espiritu, Aira F. Ramel, April Rose D. Rosauero and Danica Rose U. Santos** entitled **THE GENERATION OF CATHODE UTILIZING CARBONIZED EGGSHELL IN REPLACEMENT TO MANGANESE DIOXIDE IN BATTERY PRODUCTION** and that said paper has been submitted for final examination by the Oral Examination Committee.


Engr. Florinda H. Oquindo
Design Project Adviser


Engr. Ruffo E. Mahaguay
Design Project Adviser

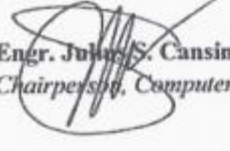
As members of the Design Project Committee, we certify that we have examined this paper and hereby recommend that it be accepted as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering.



Engr. Julius S. Cansino
Design Project Evaluator


Engr. Orland D. Tubola
Design Project Evaluator


Engr. Allan B. Verzo
Design Project Evaluator

This design project paper is hereby approved and accepted by the College of Engineering as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering.


Engr. Julius S. Cansino
Chairperson, Computer Engineering Department


Engr. Guillermo O. Bernabe
Dean, College of Engineering



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

**THE GENERATION OF CATHODE UTILIZING CARBONIZED EGGSHELL IN
REPLACEMENT TO MANGANESE DIOXIDE IN BATTERY PRODUCTION**

A
Design Project
Presented to the Faculty of
Computer Engineering Department
Polytechnic University of the Philippines
Sta. Mesa, Manila

In Partial Fulfillment
of the Requirements for the Degree
Bachelor of Science in Computer Engineering

by:

Espirito, Johnuel C.
Ramel, Aira F.
Rosauo, April Rose D.
Santos, Danica Rose U.

May 2017



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
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Abstract

Chicken egg is one of the most used ingredients in the food industry. Considering this, tons of eggshell waste is to be collected every year. As waste recycling process, pyrolytic eggshell membrane carbonization can produce carbonized eggshell membrane (CEM) materials for battery cathodes. The CEM contains a high interconnectivity porous structure of carbon fiber networks with a controllable surface area and nitrogen content. The electrochemical surface area and nitrogen content. The electrochemical properties of CEM combined with this process have potential applications in providing a new type of sustainable resource for clean energy storage. (Li Z. H., 2014)

Aiming to reduce eggshell waste and produce a new type of sustainable resource for clean energy storage, the "The Generation of Cathode Utilizing Carbonized Eggshell in Replacement to Manganese Dioxide in a Battery Production" was developed.

Keywords: eggshells, pyrolysis, carbonized eggshell membrane

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COMPUTER ENGINEERING DEPARTMENT

APPROVAL SHEET

This is to certify that we have supervised the preparation of and read the design project paper proposed by Alexis Christellene M. Arce, Arvin R. De La Cruz, Kathleen Meriel D. Ortega, Ma. Arianne N. Pabularcon and Ralph Lorenz R. Rafallo entitled *Banana Fiber Decorticator with Wringer* and that said paper has been submitted for final examination by the Oral Examination Committee.

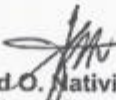

Pedrito M. Tenerife Jr., MIT, MAT
Design Project Adviser

March 17, 2018
Date

As members of the Panel, we certify that we have examined this paper and hereby recommend that it be accepted as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering.



Julian L. Lorico Jr., MBA
Member


Orlando V. Pajabera, MIT
Member


Ferdinand O. Natividad, MSIT
Lead Panel

This design project paper is hereby approved and accepted by the College of Engineering as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering.


Julius S. Cansino, MIT
Chairperson, Computer Engineering Department


Guillermo O. Bernabe, DEM
Dean, College of Engineering



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

BANANA FIBER DECORTICATOR WITH WRINGER

A Design Project
Presented to the Faculty of
Computer Engineering Department
Polytechnic University of the Philippines
Sta. Mesa, Manila

In Partial Fulfillment
of the Requirements for the Degree
Bachelor of Science in Computer Engineering

by:

Alexis Christellene M. Arce
Arvin R. De La Cruz
Kathleen Meriel D. Ortega
Ma. Arianne N. Pabularcon
Ralph Lorenz R. Rafallo

May 2018



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

ABSTRACT

There are a lot of benefits you can get in a banana plant, from its fruit to its pseudo stem. The pseudo stem can produce a natural bast fiber that has a wide range of uses, but there are only 10% of fiber in a pseudo stem and the remaining is consists of water and the skin of the stem that can be used as a fertilizer. The banana fiber can be used in handicrafts, ropes, clothing and other products. It can be used as an alternative for other kind of fibers like abaca fiber, water hyacinth fiber, etc.

In this project, the fiber is extracted from the banana stem using a decortication process where a roller with scratched surface is compressed into a stationary bar. During the decortication process the banana stem is also undergoing the wringing process because it is already being compressed and the fiber loses its water content. With the use of the Banana Fiber Decorticator with Wringer, the recovery rate of the banana fiber increases.

The proponents hoped that this project will be informative to researchers about the decortication and wringing process of a banana fiber from a banana stem.

Keywords

Pseudo stem, bast fiber, handicrafts, decortication process, wringing process



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COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

APPROVAL SHEET


This is to certify that we have supervised the preparation of and read the design project paper proposed by Bas, Cagara, Dacaymat, Valdez and Oquindo entitled SUPRAA: Solar-Powered Ultrasonic Pest Repellent with Android Application and that said paper has been submitted for final examination by the Oral Examination Committee.

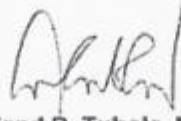

Julian L. Lofico Jr., MBA
Design Project Adviser

March 6 2018
Date

As members of the Panel, we certify that we have examined this paper and hereby recommend that it be accepted as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering.



Arlene B. Canlas, CPE
Member


Lutzer U. Reyes, DBA
Member


Orland D. Tubola, MSECE
Lead Panel

This design project paper is hereby approved and accepted by the College of Engineering as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering.


Julius S. Cansino, MIT
Chairperson, Computer Engineering Department


Guillermo O. Bernabe, DEM
Dean, College of Engineering



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

**SUPRAA: SOLAR-POWERED ULTRASONIC PEST
REPELLENT WITH ANDROID APPLICATION**

A Design Project
Presented to the Faculty of
Computer Engineering Department
Polytechnic University of the Philippines
Sta. Mesa, Manila

In Partial Fulfillment
of the Requirements for the Degree
Bachelor of Science in Computer Engineering

by:

John Tovi U. Bas
Merly Anne C. Cagara
Kyle A. Dacaymat
Dickon S. Valdez
Florinda H. Oquindo

MAY 2018



ABSTRACT

Philippines is an agricultural country, it means that the main source of livelihood of Filipinos depends on cultivating the soil, producing crops, raising livestock to market the resulting products. Plainfields are scattered over rural areas where the crops are planted. Indeed the best example is the rice crops.

Pests are considered as one of the major factors that greatly affects the volume of crops that are produced for the market. Potential good growth of crops are compromised due to damages in its different parts.

Different types of pests occur in different stages of rice crops, and peata by definition, these are not just worms, snails, and crickets. Birds are also considered as pest during first stage and during the last stage of the life cycle of crops.

Our farmers use the traditional pesticides to get rid of the pests but there are side effects that affects the farmers' health. Most of these pesticides are very dangerous when inhaled or ingested. Other pesticides causes cracks to farmer's toenails. Aside from these chemical pesticides, there are other alternative ways to help the farmers get rid of pests. The proponents of this project created an ultrasonic pest repellent utilizing the solar power as its source. The proponents also added trumpet speakers that will serve as deterrent to birds that attacks the crops during first and last stage of its development. The prototype is controlled by an android application. It is where you set a schedule on when will the microcontroller turns on and off the ultrasonic modules and the trumpet speakers.



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COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

APPROVAL SHEET

This is to certify that we have supervised the preparation of and read the design project paper proposed by Patrick Nash DG, Garcia, John Kirk M. Grospe, Patricia G. Navarro and Reina Patricia B. Sun entitled COIN-OPERATED MOBILE SOLAR POWERED CHARGER and that said paper has been submitted for final examination by the Oral Examination Committee.

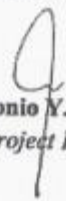

Engr. Florinda H. Oquindo
Design Project Adviser

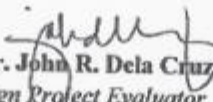
September 20, 2018

Date

As members of the Design Project Committee, we certify that we have examined this paper and hereby recommend that it be accepted as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering.



Engr. Julius S. Cansino
Design Project Evaluator


Dr. Antonio Y. Velasco
Design Project Evaluator


Engr. John R. Dela Cruz
Design Project Evaluator

This design project paper is hereby approved and accepted by the College of Engineering as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering.


Engr. Julius S. Cansino
Chairperson, CpE Department


Engr. Remedios G. Ado
Dean, College of Engineering



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

COIN-OPERATED MOBILE SOLAR POWERED CHARGER

A Design Project
Presented to the Faculty of
Computer Engineering Department
Polytechnic University of the Philippines
Sta. Mesa, Manila

In Partial Fulfillment
of the Requirements for the Degree
Bachelor of Science in Computer Engineering

by:

Patrick Nash DG. Garcia
John Kirk M. Grospe
Patricia G. Navarro
Reina Patricia B. Sun

May 2019



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

ABSTRACT

The purpose of this study is to provide easy access to people who are outside of their homes carrying with them their chargers in need of power outlets to charge their devices because of something that the users need to do urgently if they run out of battery power. The goal is to promote the usage of renewable energy and to give the general people an idea that there can be alternatives to charging a device through a power outlet.

To charge a device, the user needs to input a 5-peso coin or more into the coin slot for the system of the USB ports to fully turn on. As for the AC socket, there are no available coin slots yet. The sunlight then goes through the solar panel as it is being converted to regulated electrical energy to be able to charge a device.

Keywords

Solar Powered Charger, Lithium-Ion Battery




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COMPUTER ENGINEERING DEPARTMENT

APPROVAL SHEET


This is to certify that we have supervised the preparation of and read the design project paper proposed by **LORENZO S. ARCINUE, JULIUS P. BALAIS, LEE ARVI B. REAL, RAMIL L. VILLANUEVA** entitled **DEVELOPMENT OF MAGNET-POWERED GENERATOR WITH CONSUMPTION MONITORING FOR EVACUATION CENTERS** and that said paper has been submitted for final examination by the Oral Examination Committee.

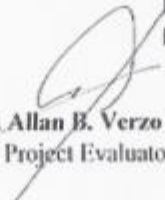

Dr. Remedios G. Ado
Design Project Adviser


Engr. Ronald D. Fernando
Design Project Adviser


As members of the Design Project Committee, we certify that we have examined this paper and hereby recommend that it be accepted as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering.


Engr. Julius S. Cansino
Design Project Evaluator


Engr. Pedrito M. Tenerife Jr.
Design Project Evaluator


Engr. Allan B. Verzo
Design Project Evaluator

This design project paper is hereby approved and accepted by the College of Engineering as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering.


Engr. Pedrito M. Tenerife Jr.
Chairperson, Computer Engineering Department


Engr. Guillermo O. Bernabe
Dean, College of Engineering



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COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

DEVELOPMENT OF MAGNET-POWERED GENERATOR WITH
CONSUMPTION MONITORING FOR EVACUATION CENTERS

A
Design Project
Presented to the Faculty of
Computer Engineering Department
Polytechnic University of the Philippines
Sta. Mesa, Manila

In Partial Fulfillment
of the Requirements for the Degree
Bachelor of Science in Computer Engineering

by:

Lorenzo S. Arcinue
Julius P. Balais
Lee Arvi B. Real
Ramil L. Villanueva

April 2016



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

Published by
Center of Research and Development
College of Engineering
Polytechnic University of the Philippines
Sta. Mesa, Manila

DEVELOPMENT OF MAGNET-POWERED GENERATOR WITH CONSUMPTION
MONITORING FOR EVACUATION CENTERS

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College of Engineering Polytechnic University of the Philippines

ISSN:



ABSTRACT

Electricity is used in many ways to provide different services or necessities however power outage often happens when there are calamities especially typhoons. With electricity as part of our daily lives, power outage is an immense problem which usually happens in times of calamities. Magnet-powered Generator with Consumption Monitoring is a system that aims to provide an alternative source of energy in evacuation centers to give the necessary service for the victims of calamities. Using the concept design of V-gate magnet motor proves to be effective as a source of magnetic energy that is converted to mechanical energy. This provides the rotor its circular movement to turn the generator and thus producing an output voltage. On the other hand, a microcontroller was implemented and programmed in C language to measure the real time power consumption of the machine that will be displayed in a Liquid Crystal Display (LCD). The data can be saved to an SD Card for data record maintenance. The energy can be accumulated from magnet-powered generator and the generated energy can be used to provide power to electrical equipment when power outage happens.

Keywords: Evacuation Centers, V-gate Magnet Motor, Magnet-powered Generator, Rotor, Microcontroller



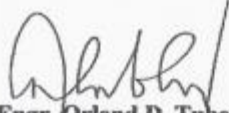
POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT


APPROVAL SHEET


This is to certify that I have supervised the preparation of and read the design project paper prepared by **Jonas B. Fabriag, Rosiliza R. Rioja, Michelle Anne P. Tabirao, Celine Mae Nerel A. Toledo, Remedios G. Ado** entitled **REAL-TIME SMS AND WEB-BASED MONITORING OF PHOTOVOLTAIC CELLS AND BATTERY BANKS** and that the said paper has been submitted for final examination by the Oral Examination Committee.


Engr. Ronald D. Fernando
Design Project Adviser

As members of the Design Project Committee, we certify that we have examined this paper and hereby recommend that it be accepted as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering



Engr. Orland D. Tubola
Evaluator


Engr. Rodolfo F. Talan
Evaluator


Engr. Paul M. Capacungan
Evaluator

This design project paper is hereby approved and accepted by the College of Engineering as fulfillment of the requirement for the degree in Bachelor of Science in Computer Engineering


Engr. Pedrito M. Tenerife Jr.
Chairperson,
Computer Engineering Department


Engr. Guillermo O. Bernabe
Dean, College of Engineering



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

**REAL-TIME SMS AND WEB-BASED MONITORING SYSTEM
OF PHOTOVOLTAIC CELLS AND BATTERY BANKS**

A
Design Project
Presented to the Faculty of the
Computer Engineering Department
Polytechnic University of the Philippines
Sta. Mesa, Manila

In Partial Fulfillment
of the Requirements for the Degree
Bachelor of Science in Computer Engineering

by
Jonas B. Fabriag
Rosiliza R. Rioja
Michelle Anne P. Tabirao
Celine Mae Nerel A. Toledo
Remedios G. Ado

N 1/3



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

REAL-TIME SMS AND WEB-BASED MONITORING SYSTEM OF
PHOTOVOLTAIC CELLS AND BATTERY BANKS

Jonas B. FABRIAG¹, Rosiliza R. RIOJA¹, Michelle Anne P. TABIRAO¹, Celine Mae Nereel A. TOLEDO¹, Remedios G. ADO²

¹*Department of Computer Engineering, College of Engineering
Polytechnic University of the Philippines, Sta. Mesa Manila*

²*Faculty, Department of Computer Engineering, College of Engineering
Polytechnic University of the Philippines, Sta. Mesa Manila*

ABSTRACT: The Real-time SMS and Web-based Monitoring System of Photovoltaic Cells and Battery Banks is a monitoring system for a solar panel system. The study uses voltage and current sensors to measure the voltage, current, power and temperature of the photovoltaic cells and battery banks. The system used Gizduino to transfer data through Ethernet to be stored in the Web server which is the Raspberry Pi. The user can also be updated through an SMS supported by a GSM module. There is also a Cut-off circuit where the connection of the photovoltaic cells and battery banks disconnect when the resulting data is critical. Required data were collected to see the behavior of the photovoltaic cells and battery banks and how the voltage, current, power and temperature affects their performance. The proponents compared the manual and automatic monitoring and the results showed a minimal difference concluding that the automatic monitoring system is efficient.

KEY WORDS: Real-time, SMS Monitoring, Web-based Monitoring, Photovoltaic Cells, Battery Banks



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COMPUTER ENGINEERING DEPARTMENT



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
College of Engineering
CMPE 30022 PROGRAMMING LOGIC AND DESIGN
LONG EXAM 1 ANSWER SHEET

TEST I. MULTIPLE CHOICE:

Name	RAMOS, Loida Anne M	Date	August 6, 2019
Section	BS-COE 1-4	Subject	Programming Logic and Design

SCORE: 40

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Don't fold answersheet. Please read the title to read properly.

(f) Trace table for (b)

Term	Sum
10	0
10+1	10
9	10
9+1	19
8	19
8+1	27
7	27
7+1	34
6	34
6+1	40
5	40
5+1	45
4	45
4+1	49
3	49
3+1	52
2	52

Trace table for (c)

Term	Sum
10	0
10+1	10
9	10
9+1	17
8	17
8+1	27
7	27
7+1	34
6	34
6+1	40
5	40
5+1	45
4	45
4+1	49
3	49
3+1	52
2	52
2+1	54

TEST II.

A.

- (a) The flow chart computes for the sum given the fixed number term that should not be less than one.
- (b) The final value of sum is 52
- (c) If the box labelled 4 will be term ≥ 1 the final value of sum is 54
- (d) 94
- (e) It will not get the final value of "sum" because as the loop goes back to the link between box 0 and 1 the values of term and sum will be reassigned, the loop cannot be finished because the term will remain as 1 and the sum will not be determined.

B. Pseudocode of the given FCD:

```

begin
  IF (N) THEN
    If (condition A is true) then
      do step E
    else
      do step B
      if (condition P is true) then
        begin
          While (condition I is true) then
            do step J
          else
            do step D
        end
      else
        do step G
        do step D
      end
    end
  end
end
  
```

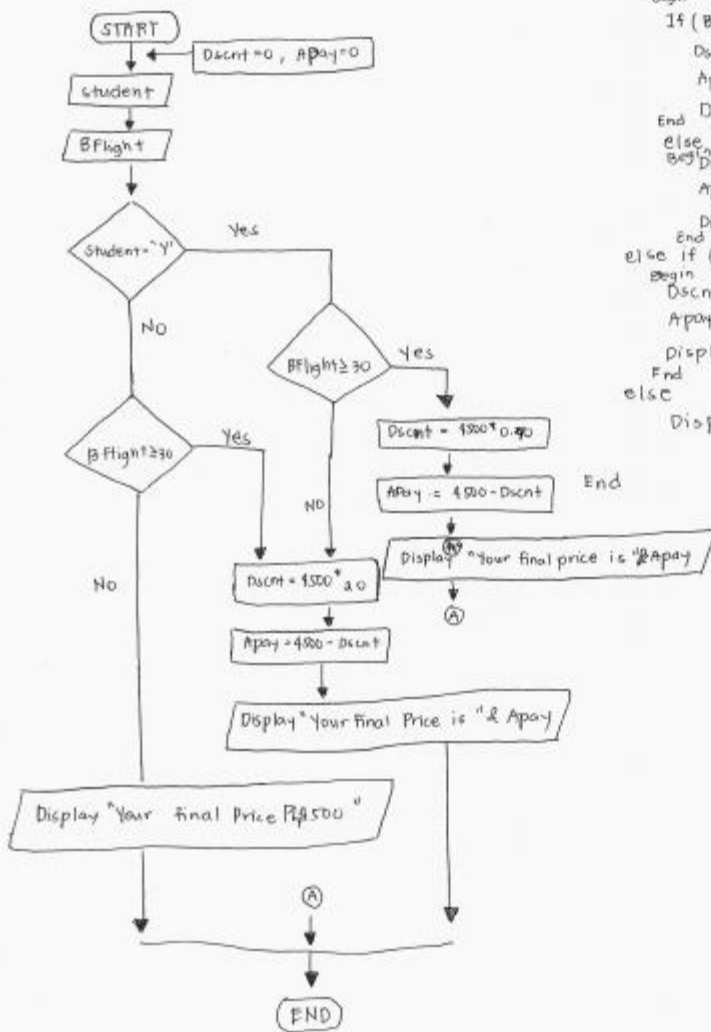


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CMPE 30022 PROGRAMMING LOGIC AND DESIGN
LONG EXAM 1 ANSWER SHEET

C. Flowchart:



C. Pseudocode:

Variables used : Dscnt , Apay are numeric

Begin

Dscnt ← 0 , Apay ← 0

Display " Are you a student ?, 'Y' or 'N' ; "

Accept student

Display " How many days before your flight ? "

Accept BFlight

IF (Student ← 'Y') then

Begin

IF (BFlight ≥ 30) then

Dscnt ← 4500 * 0.40

Apay ← 4500 - Dscnt

End Display " Your final price is " , Apay

else

Dscnt ← 4500 * 0.20

Apay ← 4500 - Dscnt

End Display " Your final price is " , Apay

else IF (BFlight ≥ 30) then

Begin

Dscnt ← 4500 * 0.20

Apay ← 4500 - Dscnt

Display " Your final price is " , Apay

End

else

Display " Your final price is Php4,500 "

End



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COMPUTER ENGINEERING DEPARTMENT
CMPE 30022
JSCANSINO

LONG EXAMINATION 1

1ST SEM SY2019-2020

Name	Section	Score
RAMOS, LOIS ⁰ B. M.	BS CE 1-f	

GENERAL INSTRUCTIONS:

Follow all instructions carefully. Failure to do so will warrant a substantial deduction from your final score.

Write everything in non-red ink. No borrowing of pens, erasers etc.

- You are not allowed to leave your seat unless you are through with the exam. If you have any questions, just raise your hand and the instructor or proctor will attend to you.
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GOOD LUCK!!!

TEST I. MULTIPLE CHOICE (50). Choose the letter of the BEST answer. Shade the circle corresponding to your chosen answer. Use the provided answer sheet in answering this subtest. **STRICTLY NO ERASURE or ALTERATIONS**

- People, procedures, software, hardware, and data are the five parts of
 - competency system
 - information technology
 - computer system
 - software system
- Which of the following is an example of connectivity?
 - data
 - Internet
 - hard disk
 - power cord
- Linux is an example of
 - application software
 - operating system
 - browser
 - shareware
- The least powerful, yet the most widely used and fastest-growing type of computer.
 - mainframe computers
 - minicomputers
 - microcomputers
 - supercomputers
- The system component that controls and manipulates data in order to produce information is called the
 - keyboard
 - monitor
 - microprocessor
 - mouse
- These devices translate data and programs that humans can understand into a form that the computer can process.
 - displays
 - output
 - input
 - pointer
- A DVD is an example of a(n)
 - hard disk
 - output device
 - optical disc
 - solid-state storage device
- The smallest unit in a digital system is a
 - byte
 - word
 - bit
 - character
- This type of memory improves processing by acting as a temporary high-speed holding area between the memory and the CPU.
 - RAM
 - cache memory
 - ROM
 - flash memory
- In which digit the value increases in power of two starting with 0 to left of the binary point and decreases to the right of the binary point starting with power -1:
 - Hexadecimal
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 - Binary
 - Octal
- Which system is used in digital computers because all electrical and electronic circuits can be made to respond to the states concept:
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 - Binary number
 - Octal number
 - Decimal number
- After counting 0, 1, 10, 11, the next binary number is
 - 12
 - 100
 - 101
 - 110.
- The number 1000_2 is equivalent to decimal number
 - one thousand
 - eight
 - four
 - sixteen.

1ST SEM SY2019-2020

PROGRAMMING LOGIC AND DESIGN



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COMPUTER ENGINEERING DEPARTMENT

14. The number 100101_2 is equivalent to octal
a. 54 b. 45 c. 37 d. 25
15. The number 178_{10} is equivalent to binary 10110011010_2
a. 111 b. 1110 c. 10000 d. 1111 e. 10110011010
16. The binary equivalent of A_{16} is
a. 1010 b. 1011 c. 1000 d. 1100

. or Nos. 17 – 20, Please refer to the given problem below:

Paolo got his Report Card for the Second Semester SY 2018-2019. His grades are as follows: (represented in binary form)

	64	32	16	8	4	2	1		
ITEFUND	1010101	-	85	INTPROG	1001010	-	79		
FILIONE	1011101	-	93	PHILO	1010110	-	86		
ENGC0M1	1000111	-	71	PHYEDUC	1001111	-	79		
MATHONE	1011100	-	92	VALUED1	1011110	-	94		

17. In what subject did Paolo get his highest grade?
a. ITEFUND b. PHYEDUC c. ENGC0M1 d. INTPROG e. FILIONE
18. If the passing grade is 1001011_2 , in what subject did Paolo get his lowest grade? What is the grade?
a. ENGC0M1, 70 b. INTPROG, 70 c. INTPROG, 74 d. ENGC0M1, 71
19. What is Paolo's average grade express in decimal form?
a. 84.00 b. 84.25 c. 84.50 d. 84.75
20. To apply for the University's Scholarship, the average grade must be 1011000_2 , will Paolo qualify?
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21. A set of instructions that tells the computer how to behave, what to do and derive at a solution to a particular problem is:
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22. A set of logically sequenced instructions that allows to find the solution to a problem is:
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23. The six stages of program development in logical order are:
a. Define, Analyze, Write, Test, Document, Debug
b. Define, Analyze, Develop, Write, Test and Debug, Document
c. Define, Write, Develop, Analyze, Test, Document
d. Define, Develop, Write, Test, Document, Debug
24. Which of the following had executes programming codes line by line, rather than the whole program:
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a. The character Z b. ASCII value of Z
c. Z along with the single inverted commas d. Both A and B
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28. _____ is a procedure or step by step process for solving a problem.
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- a. desk-checking
- b. flowcharting
- c. pseudocoding
- d. testing

31. What is the problem with the following statement? `100=grade`

- a. 100 is not a reasonable grade
- b. 100 should be in quotes
- c. data types don't match
- d. value on the left must be a variable name

32. What might be considered the seventh step of the programming process?

- a. testing
- b. maintaining
- c. replacing
- d. converting

33. A variable name is also called a(n) _____.

- a. placeholder
- b. identifier
- c. constant
- d. hexadecimal

34. In some programming languages, programmers must write a variable _____ telling the compiler what data type is expected for the variable.

- a. name
- b. termination
- c. decision
- d. declaration

35. The following pseudocode is an example of a(n) _____ structure:

```
get number
while number is positive
add to sum
get number
```

- a. sequence
- b. decision
- c. loop
- d. nested

36. The following pseudocode is an example of a(n) _____ structure:

```
get number
get another number
if first number is bigger than second then
print first number
else
print second number
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- a. sequence
- b. decision
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37. The following pseudocode is an example of a(n) _____ structure:

```
get number
get another number
add numbers
print result
```

- a. sequence
- b. decision
- c. loop
- d. nested

38. The following pseudocode is an example of _____.

```
do stepA
do stepB
if conditionC is true then
do stepD
else
do stepE
endif
while conditionF is true
do stepG
endwhile
```

- a. nesting
- b. stacking
- c. posttest
- d. pretest



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39. The following pseudocode reads a number from the user, multiplies it by 2, and prints the result. What program statement should replace the ? to make this program functional and structured?

```
start
get inputNumber
while not eof
calculatedAnswer = inputNumber * 2
print calculatedAnswer
?
endwhile
stop
```

- a. no statement is needed
c. get inputNumber
- b. if done then exit
d. print inputNumber
40. What is another name for a loop structure?
a. execution
c. iteration
- b. selection
d. case
41. You need to calculate the square of a number. What is the input of this problem?
a. Square of the number
c. Number
- b. Cube of the number
d. Input
42. You need to calculate the area of a rectangle. Length and width of the rectangle are given to you. What are the inputs of this problem?
a. Area and length
c. Length and width
- b. Width and area
d. Area
43. Debugging is the process of:
a. Identifying inputs of a problem
b. Removing errors, testing and revising a program to get expected output
c. Identifying output
d. All of the above

44. Assuming that $w = 1$, $x = 2$, $y = 3$, and $z = 4$, the relational expression $z / 2 + w <= y + x - 2$ is evaluated as:
a. true
c. cannot answer due to lack of data

b. false
d. invalid expression

Handwritten: $\frac{4}{2} <= 3$

45. Assuming that $e = 100$, $f = 101$, $g = 102$, and $h = 103$, the relational expression $+h - 3 <= -f + g - e$ is evaluated as:
a. True
c. cannot answer due to lack of data

b. false
d. invalid expression

*Handwritten: $103 <= -101 + 102 - 100$
 $103 <= -100$*

46. The arithmetic expression $6 * 5 / 3 + 5 * 3 + 2 * 4 * -10 / 2$ is equal to
a. 65
c. -15

b. 35
d. -35

Handwritten: $\frac{30}{3} + 15 + \frac{-80}{2}$

47. If $x = -7$ and $y = 7$, what will be the values of x, y, and z after the operation $z = x ++ * --y$?
a. $z=49$, $x = -7$, $y = 6$
c. $z= 56$, $x = -6$, $y = 6$

b. $z = -42$, $x = -6$, $y = 6$
d. $z = -36$, $x = -6$, $y = 7$

48. In $b = 6.6 / a + (2 * a + (3 * c) / a * d) / (2 / n)$; which operation will be performed first?
a. $6.6 / a$
c. $3 * c$

b. $2 * a$
d. $2 / n$



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```
49. start
    get age
    if ( ? )
        display "Teenager age"
    endif
stop
```

Consider the code above. If age is between 13 and 19 then it will display "Teenager age". Which of the following statement can be replaced in (?) correctly?

- a. age > 13 AND age < 19
- b. age >=13 AND age <=19
- c. age < 13 AND age > 19
- d. age > 13 between age age < 19

50. Which of the following is equivalent to the following decision?

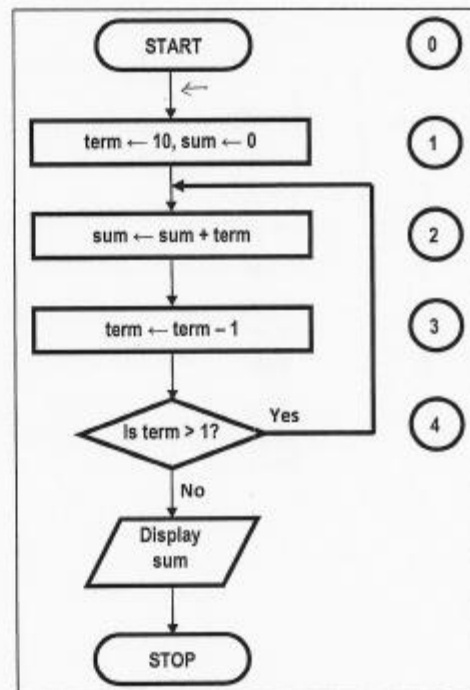
```
if x > 10 then
    if y > 10 then
        display "x"
    endif
endif
```

- a. if x > 10 OR y > 10 then display "x"
- b. if x > 10 AND x > y then display "x"
- c. if x > 10 AND y > 10 then display "x"
- d. if y > x then display "x"

TEST II. FLOWCHART PROFICIENCY.

A. Refer to the flowchart alongside. The numbers shown in circles on the right are labels that will be referred to in the questions below. Answer the following questions.

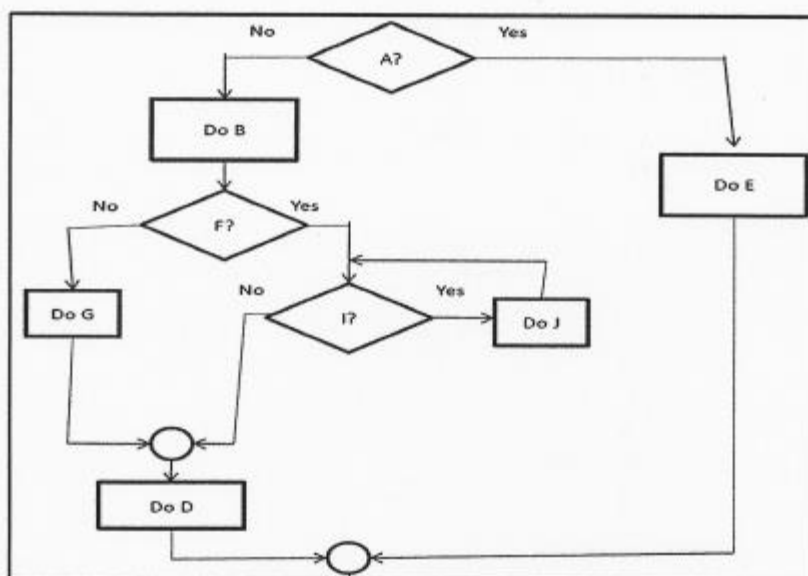
- (a) What does the flowchart do?
- (b) What is the final value of "sum"?
- (c) Suppose the decision box labeled 4 is changed to: "Is term \geq 1?" What will be the final value of "sum"?
- (d) In the given flowchart, suppose the boxes labeled 2 and 3 were interchanged. What will be the final value of "sum"?
- (e) In the given flowchart, suppose the arrow originating from label 4 and terminating at link between labels 1 and 2, were moved so as to now terminate at the link between labels 0 and 1. What will be the final value of "sum"?
- (f) Create the trace table for questions (b) and (c).





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B. Translate the following flowchart into pseudocode:

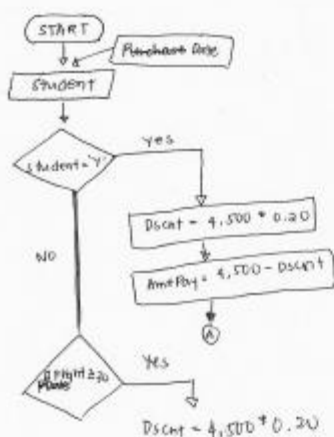


C. The price of a local plane ticket is Php 4,500 by default, but discounts are applied to it based on different criteria. The following rules determine the discount, and hence the final price:

- Students get 20% discount.
- People who purchase in 30 days in advance get 20% discount.

Discount can aggregate, for example a student purchasing 30 days in advance gets a 40% discount. You have to ask the user for input on whether they are a student. Draw a flowchart and pseudocode of your algorithm that will solve the following problem and calculates the final price.

***** TEST ENDS HERE *****





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POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
 College of Engineering
CMPE 30022 PROGRAMMING LOGIC AND DESIGN
 LONG EXAM 1 ANSWER SHEET

TEST I. MULTIPLE CHOICE:

NAME: Ducdine, Gerome Andrew C ID: 18-6-19
 SECTION: BSCE 1-4 SUBJECT: Programming

SCORE: 40

11	○	○	○	○	○	31	○	○	○	○	○
12	○	○	○	○	○	32	○	○	○	○	○
13	○	○	○	○	○	33	○	○	○	○	○
14	○	○	○	○	○	34	○	○	○	○	○
15	○	○	○	○	○	35	○	○	○	○	○
16	○	○	○	○	○	36	○	○	○	○	○
17	○	○	○	○	○	37	○	○	○	○	○
18	○	○	○	○	○	38	○	○	○	○	○
19	○	○	○	○	○	39	○	○	○	○	○
20	○	○	○	○	○	40	○	○	○	○	○

1	○	○	○	○	21	○	○	○	○	41	○	○	○	○
2	○	○	○	○	22	○	○	○	○	42	○	○	○	○
3	○	○	○	○	23	○	○	○	○	43	○	○	○	○
4	○	○	○	○	24	○	○	○	○	44	○	○	○	○
5	○	○	○	○	25	○	○	○	○	45	○	○	○	○
6	○	○	○	○	26	○	○	○	○	46	○	○	○	○
7	○	○	○	○	27	○	○	○	○	47	○	○	○	○
8	○	○	○	○	28	○	○	○	○	48	○	○	○	○
9	○	○	○	○	29	○	○	○	○	49	○	○	○	○
10	○	○	○	○	30	○	○	○	○	50	○	○	○	○

Mark final answer only. Paper must be flat to scan properly.

(f) Trace table for (b)

term	sum
10	0
9	10
2	19
7	27
6	34
5	40
4	45
3	49
2	52
1	54
0	55

Trace table for (c)

term	sum
10	0
9	10
5	19
7	27
6	34
5	40
4	45
3	49
2	52
1	54

TEST II.

A.

- (a) Iterate or loop
- (b) ~~55~~
- (c) ~~39~~
- (d) ~~45~~
- (e) loop will be infinite

B. Pseudocode of the given FCD:

```

if condition A is true then
  Do step E
else
  Do step B
end if
while condition F is true and condition J is true then
  Do step J
else
  do D
end while
If condition F is false and G then
  Do G
  
```

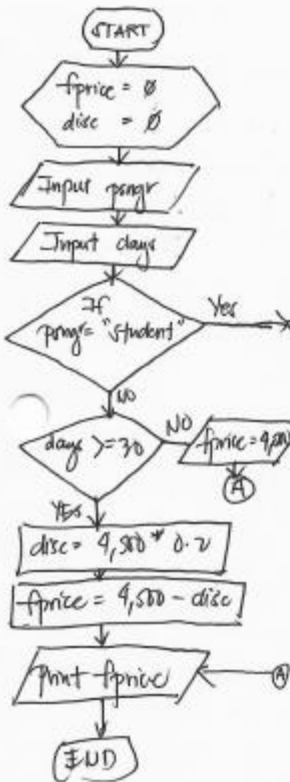


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CMPE 30022 PROGRAMMING LOGIC AND DESIGN
LONG EXAM 1 ANSWER SHEET

C.
Flowchart:



C.
Pseudocode:

```

  Begin
  -fprice, disc are numerical variables
  Input psngr
  Input days
  If psngr = "student" then
  if days >= 30 then
  disc = 9,500 * 0.4
  fprice = 9,500 - disc
  Display fprice
  else
  disc = 9,500 * 0.2
  fprice = 9,500 - disc
  Display fprice
  end if
  end if
  
```

```

  if psngr ≠ "student" and days >= 30 then
  disc = 9,500 * 0.2
  fprice = 9,500 - disc
  Display fprice
  else
  fprice = 9,500
  Display fprice
  end if
  stop
  
```



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COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT
CMPE 30022
JSCANSINO

LONG EXAMINATION 1

1ST SEM SY2019-2020

Name	Section	Score
Ducduc, Gerome Andrew C.	BSCOE 1-4	

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1ST SEM SY2019-2020

PROGRAMMING LOGIC AND DESIGN



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
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COMPUTER ENGINEERING DEPARTMENT

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print result
```

- a. sequence
- b. decision
- c. loop
- d. nested

38. The following pseudocode is an example of ____.

```
do stepA
do stepB
if conditionC is true then
do stepD
else
do stepE
endif
while conditionF is true
do stepG
endwhile
```

- a. nesting
- b. stacking
- c. posttest
- d. pretest



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39. The following pseudocode reads a number from the user, multiplies it by 2, and prints the result. What program statement should replace the ? to make this program functional and structured?

```
start
get inputNumber
while not eof
calculatedAnswer = inputNumber * 2
print calculatedAnswer
?
endwhile
stop
```

- a. no statement is needed
c. get inputNumber
- b. if done then exit
d. print inputNumber
40. What is another name for a loop structure?
a. execution
c. iteration
- b. selection
d. case
41. You need to calculate the square of a number. What is the input of this problem?
a. Square of the number
c. Number
- b. Cube of the number
d. Input
42. You need to calculate the area of a rectangle. Length and width of the rectangle are given to you. What are the inputs of this problem?
a. Area and length
c. Length and width
- b. Width and area
d. Area
43. Debugging is the process of:
a. Identifying inputs of a problem
b. Removing errors, testing and revising a program to get expected output
c. Identifying output
d. All of the above
44. Assuming that $w = 1$, $x = 2$, $y = 3$, and $z = 4$, the relational expression $z / 2 + w <= y + x - 2$ is evaluated as:
a. true
c. cannot answer due to lack of data
- b. false
d. invalid expression
45. Assuming that $e = 100$, $f = 101$, $g = 102$, and $h = 103$, the relational expression $+h - 3 <= -f + g - e$ is evaluated as:
a. True
c. cannot answer due to lack of data
- b. false
d. invalid expression
46. The arithmetic expression $6 * 5 / 3 + 5 * 3 + 2 * 4 * -10 / 2$ is equal to
a. 65
c. -15
- b. 35
d. -35
47. If $x = -7$ and $y = 7$, what will be the values of x , y , and z after the operation $z = x ++ * --y$?
a. $z=49$, $x = -7$, $y = 6$
c. $z= 56$, $x = -6$, $y = 6$
- b. $z = -42$, $x = -6$, $y = 6$
d. $z = -36$, $x = -6$, $y = 7$
48. In $b = 6.6 / a + (2 * a + (3 * c) / a * d) / (2 / n)$; which operation will be performed first?
a. $6.6 / a$
c. $3 * c$
- b. $2 * a$
d. $2 / n$



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```
49. start
    get age
    if ( ? )
        display "Teenager age"
    endif
stop
```

Consider the code above. If age is between 13 and 19 then it will display "Teenager age". Which of the following statement can be replaced in (?) correctly?

- a. age > 13 AND age < 19
- b. age >=13 AND age <=19
- c. age < 13 AND age > 19
- d. age > 13 between age age < 19

50. Which of the following is equivalent to the following decision?

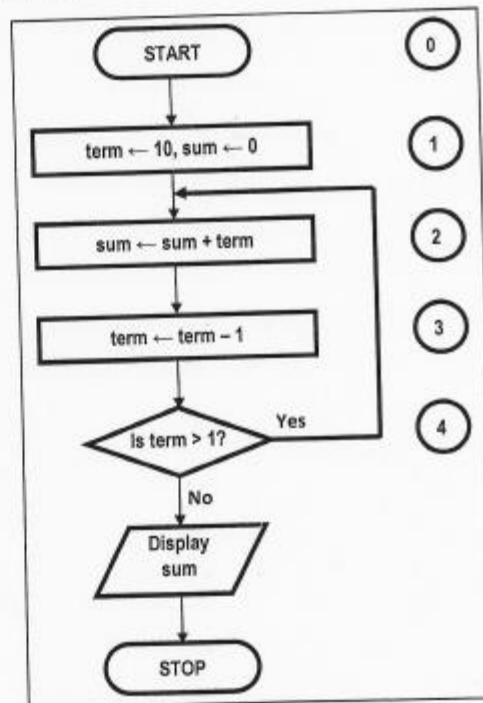
```
if x > 10 then
    if y > 10 then
        display "x"
    endif
endif
```

- a. if x > 10 OR y > 10 then display "x"
- b. if x > 10 AND x > y then display "x"
- c. if x > 10 AND y > 10 then display "x"
- d. if y > x then display "x"

TEST II. FLOWCHART PROFICIENCY.

A. Refer to the flowchart alongside. The numbers shown in circles on the right are labels that will be referred to in the questions below. Answer the following questions.

- (a) What does the flowchart do?
- (b) What is the final value of "sum"?
- (c) Suppose the decision box labeled 4 is changed to: "Is term \geq 17" What will be the final value of "sum"?
- (d) In the given flowchart, suppose the boxes labeled 2 and 3 were interchanged. What will be the final value of "sum"?
- (e) In the given flowchart, suppose the arrow originating from label 4 and terminating at link between labels 1 and 2, were moved so as to now terminate at the link between labels 0 and 1. What will be the final value of "sum"?
- (f) Create the trace table for questions (b) and (c).

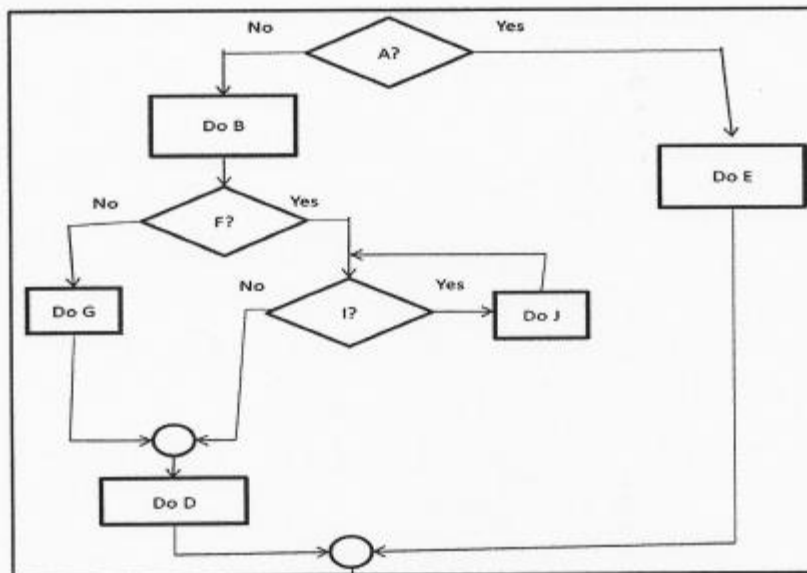


10	0
9	9
8	17
7	24
6	30
5	35
4	39
3	42
2	44
1	45
0	45



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B. Translate the following flowchart into pseudocode:



C. The price of a local plane ticket is Php 4, 500 by default, but discounts are applied to it based on different criteria. The following rules determine the discount, and hence the final price:

- Students get 20% discount.
- People who purchase in 30 days in advance get 20% discount.

Discount can aggregate, for example a student purchasing 30 days in advance gets a 40% discount. You have to ask the user for input on whether they are a student. Draw a flowchart and pseudocode of your algorithm that will solve the following problem and calculates the final price.

***** TEST ENDS HERE *****



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 College of Engineering
 CMPE 30022 PROGRAMMING LOGIC AND DESIGN
 LONG EXAM 1 ANSWER SHEET

TEST I. MULTIPLE CHOICE:

NAME	Windo, Ednan Mirs P.	DATE	Aug. 6, 2019
SECTION	CoE 1-4	SUBJECT	PLD

SCORE: 25

11	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	12	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
12	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	13	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
13	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	14	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
14	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	15	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
15	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	16	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
16	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	17	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
17	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	18	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
18	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	19	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
19	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	20	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E

1	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	21	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
2	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	22	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
3	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	23	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
4	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	24	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
5	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	25	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
6	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	26	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
7	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	27	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
8	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	28	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
9	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	29	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
10	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	30	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E

Open field answer sheet.
 Paper must be full in size printed.

(f) Trace table for (b)

term	sum
10	10
9	19
8	27
7	34
6	40
5	45
4	49
3	52
2	54

Trace table for (c)

term	sum
10	10
9	19
8	27
7	34
6	40
5	45
4	49
3	52
2	54
1	55

TEST II.

A.

- (a) Calculates the sum
- (b) 54
- (c) 55
- (d) 95
- (e) The value of "sum" is infinite

B. Pseudocode of the given FCD:

```

Begin
  If A is true then
    Do E
  else
    Do B
  else if F is true then
    while I is true
      Do J
    else Do D
  else Do G
  
```

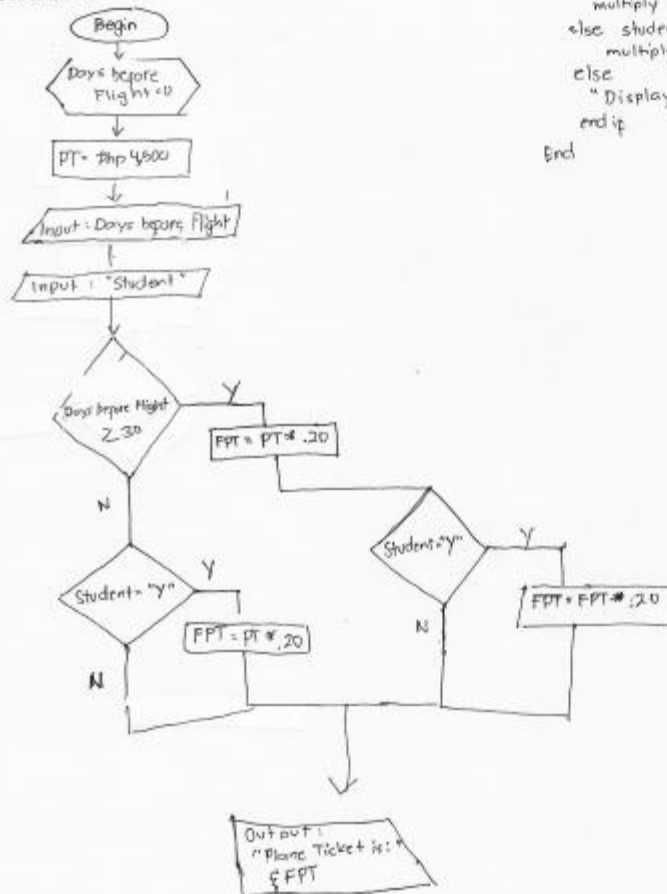


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CMPE 30022 PROGRAMMING LOGIC AND DESIGN
LONG EXAM 1 ANSWER SHEET

C.
Flowchart:



C.
Pseudocode:

```
Begin
variable : PT, FPT
Get number
  "Display" Days before flight
Get student
  "display" Are you a student?
if Days before flight >= 30 then
  multiply PT to .20
else if student = 'y' then
  multiply FPT to .20
else student = 'y'
  multiply PT to .20
else
  "Display" FPT
endif
End
```



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CMPE 30022
JSCANSINO

LONG EXAMINATION 1

1ST SEM SY2019-2020

Name	Section	Score
Viado, Edrian Mirs P.	Co E 1-4	

GENERAL INSTRUCTIONS:

- Follow all instructions carefully. Failure to do so will warrant a substantial deduction from your final score.
Write everything in non-red ink. No borrowing of pens, erasers etc.
- You are not allowed to leave your seat unless you are through with the exam. If you have any questions, just raise your hand and the instructor or proctor will attend to you.
 - Talking to or looking at your seatmate (and his/her paper) is automatically considered as cheating which is subject to very serious sanctions as stipulated in the student handbook.

GOOD LUCK!!!

TEST I. MULTIPLE CHOICE (50). Choose the letter of the BEST answer. Shade the circle corresponding to your chosen answer. Use the provided answer sheet in answering this subtest. **STRICTLY NO ERASURE or ALTERATIONS**

- People, procedures, software, hardware, and data are the five parts of
a. competency system b. information technology c. computer system d. software system
- Which of the following is an example of connectivity?
a. data b. Internet c. hard disk d. power cord
- Linux is an example of
a. application software b. operating system c. browser d. shareware
- The least powerful, yet the most widely used and fastest-growing type of computer.
a. mainframe computers b. minicomputers c. microcomputers d. supercomputers
- The system component that controls and manipulates data in order to produce information is called the
a. keyboard b. monitor c. microprocessor d. mouse
- These devices translate data and programs that humans can understand into a form that the computer can process.
a. displays b. output c. input d. pointer
- A DVD is an example of a(n)
a. hard disk b. output device c. optical disc d. solid-state storage device
- The smallest unit in a digital system is a
a. byte b. word c. bit d. character
- This type of memory improves processing by acting as a temporary high-speed holding area between the memory and the CPU.
a. RAM b. cache memory c. ROM d. flash memory
- In which digit the value increases in power of two starting with 0 to left of the binary point and decreases to the right of the binary point starting with power -1:
a. Hexadecimal b. Decimal c. Binary d. Octal
- Which system is used in digital computers because all electrical and electronic circuits can be made to respond to the states concept:
a. Hexadecimal number b. Binary number c. Octal number d. Decimal number
- After counting 0, 1, 10, 11, the next binary number is
a. 12 b. 100 c. 101 d. 110.
- The number 1000_2 is equivalent to decimal number
a. one thousand b. eight c. four d. sixteen.



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14. The number 100101_2 is equivalent to octal
a. 54 b. 45 c. 37 d. 25
15. The number 178_{10} is equivalent to binary
a. 111 b. 1110 c. 10000 d. 1111
16. The binary equivalent of A_{16} is
a. 1010 b. 1011 c. 1000 d. 1100

For Nos. 17 – 20, Please refer to the given problem below:

Paolo got his Report Card for the Second Semester SY 2018-2019. His grades are as follows: (represented in binary form)

ITEFUND	1010101	INTPROG	1001010
FILIONE	1011101	PHILO	1010110
ENCOM1	1000111	PHYEDUC	1001111
MATHONE	1011100	VALUED1	1011110

17. In what subject did Paolo get his highest grade?
a. ITEFUND b. PHYEDUC c. ENCOM1 d. INTPROG
18. If the passing grade is 1001011, in what subject did Paolo get his lowest grade? What is the grade?
a. ENCOM1, 70 b. INTPROG, 70 c. INTPROG, 74 d. ENCOM1, 71
19. What is Paolo's average grade express in decimal form?
a. 84.00 b. 84.25 c. 84.50 d. 84.75
20. To apply for the University's Scholarship, the average grade must be 1011000_2 , will Paolo qualify?
a. yes b. No c. Maybe d. Uncertain
21. A set of instructions that tells the computer how to behave, what to do and derive at a solution to a particular problem is:
a. Algorithm b. Pseudocode c. Programming d. Program
22. A set of logically sequenced instructions that allows to find the solution to a problem is:
a. Algorithm b. Pseudocode c. Programming d. Program
23. The six stages of program development in logical order are:
a. Define, Analyze, Write, Test, Document, Debug
b. Define, Analyze, Develop, Write, Test and Debug, Document
c. Define, Write, Develop, Analyze, Test, Document
d. Define, Develop, Write, Test, Document, Debug
24. Which of the following had executes programming codes line by line, rather than the whole program:
a. Compiler b. Interpreter c. Executer d. Translator
25. The $ch='z'$ would store in ch
a. The character Z b. ASCII value of Z
c. Z along with the single inverted commas d. Both A and B
26. Which of the following is not a character constant?
a. 'Thank You' b. 'quest videos- IT Learning at its best' c. '23.56e-03' d. All of the above
27. The _____ provides pictorial representation of given problem.
a. Algorithm b. Flowchart c. Pseudocode d. All of these
28. _____ is a procedure or step by step process for solving a problem.
a. Algorithm b. Flowchart c. Pseudocode d. All of these
29. After a programmer plans the logic of a program, she will next _____.
a. understands the problem b. tests the program
c. translates the program d. codes the program



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30. The process of walking through a program's logic on paper before you actually write the program is called _____.

- a. desk-checking
- b. flowcharting
- c. pseudocoding
- d. testing

31. What is the problem with the following statement? 100=grade

- a. 100 is not a reasonable grade
- b. 100 should be in quotes
- c. data types don't match
- d. value on the left must be a variable name

32. What might be considered the seventh step of the programming process?

- a. testing
- b. maintaining
- c. replacing
- d. converting

33. A variable name is also called a(n) _____.

- a. placeholder
- b. identifier
- c. constant
- d. hexadecimal

34. In some programming languages, programmers must write a variable _____ telling the compiler what data type is expected for the variable.

- a. name
- b. termination
- c. decision
- d. declaration

35. The following pseudocode is an example of a(n) _____ structure:

```
get number
while number is positive
add to sum
get number
```

- a. sequence
- b. decision
- c. loop
- d. nested

36. The following pseudocode is an example of a(n) _____ structure:

```
get number
get another number
if first number is bigger than second then
print first number
else
print second number
```

- a. sequence
- b. decision
- c. loop
- d. nested

37. The following pseudocode is an example of a(n) _____ structure:

```
get number
get another number
add numbers
print result
```

- a. sequence
- b. decision
- c. loop
- d. nested

38. The following pseudocode is an example of _____.

```
do stepA
do stepB
if conditionC is true then
do stepD
else
do stepE
endif
while conditionF is true
do stepG
endwhile
```

- a. nesting
- b. stacking
- c. posttest
- d. pretest



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39. The following pseudocode reads a number from the user, multiplies it by 2, and prints the result. What program statement should replace the ? to make this program functional and structured?

```
start
get inputNumber
while not eof
calculatedAnswer = inputNumber * 2
print calculatedAnswer
?
endwhile
stop
```

- a. no statement is needed
b. if done then exit
c. get inputNumber
d. print inputNumber
40. What is another name for a loop structure?
a. execution
b. selection
c. iteration
d. case
41. You need to calculate the square of a number. What is the input of this problem?
a. Square of the number
b. Cube of the number
c. Number
d. Input
42. You need to calculate the area of a rectangle. Length and width of the rectangle are given to you. What are the inputs of this problem?
a. Area and length
b. Width and area
c. Length and width
d. Area
43. Debugging is the process of:
a. Identifying inputs of a problem
b. Removing errors, testing and revising a program to get expected output
c. Identifying output
d. All of the above
44. Assuming that $w = 1$, $x = 2$, $y = 3$, and $z = 4$, the relational expression $z / 2 + w <= y + x - 2$ is evaluated as:
a. true
b. false
c. cannot answer due to lack of data
d. invalid expression
45. Assuming that $e = 100$, $f = 101$, $g = 102$, and $h = 103$, the relational expression $++h - 3 <= --f + g - e$ is evaluated as:
a. True
b. false
c. cannot answer due to lack of data
d. invalid expression
46. The arithmetic expression $6 * 5 / 3 + 5 * 3 + 2 * 4 * -10 / 2$ is equal to
a. 65
b. 35
c. -15
d. -35
47. If $x = -7$ and $y = 7$, what will be the values of x, y, and z after the operation $z = x ++ * --y$?
a. $z=49$, $x = -7$, $y = 6$
b. $z = -42$, $x = -6$, $y = 6$
c. $z= 56$, $x = -6$, $y = 6$
d. $z = -36$, $x = -6$, $y = 7$
48. In $b = 6.6 / a + (2 * a + (3 * c) / a * d) / (2 / n)$; which operation will be performed first?
a. $6.6 / a$
b. $2 * a$
c. $3 * c$
d. $2 / n$



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```
49.  start
      get age
      if ( ? )
          display "Teenager age"
      endif
      stop
```

Consider the code above. If age is between 13 and 19 then it will display "Teenager age". Which of the following statement can be replaced in (?) correctly?

- a. age > 13 AND age < 19 b. age >=13 AND age <=19
c. age < 13 AND age > 19 d. age > 13 between age < 19

50. Which of the following is equivalent to the following decision?

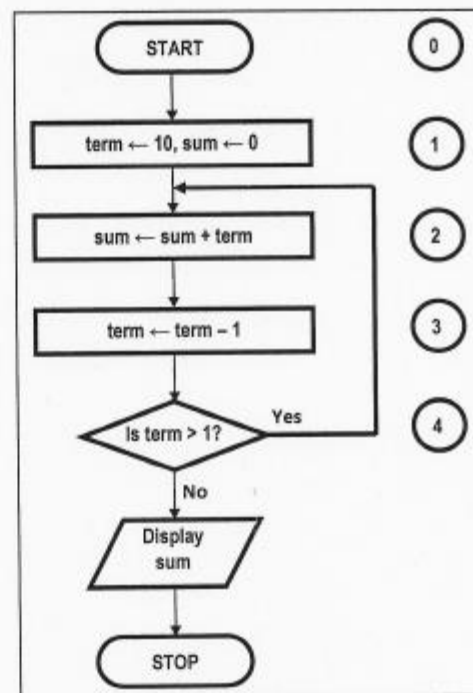
```
if x > 10 then
    if y > 10 then
        display "x"
    endif
endif
```

- a. if x > 10 OR y > 10 then display "x" b. if x > 10 AND x > y then display "x"
c. if x > 10 AND y > 10 then display "x" d. if y > x then display "x"

TEST II. FLOWCHART PROFICIENCY.

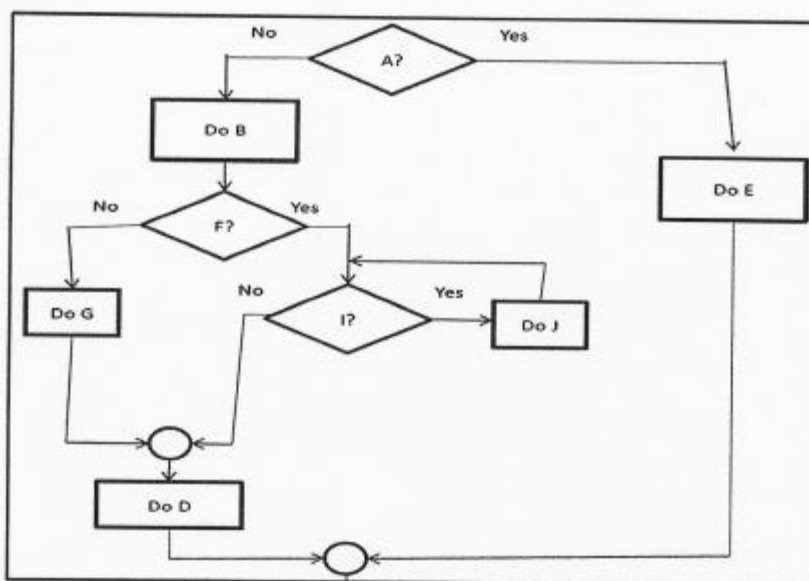
A. Refer to the flowchart alongside. The numbers shown in circles on the right are labels that will be referred to in the questions below. Answer the following questions.

- (a) What does the flowchart do?
(b) What is the final value of "sum"?
(c) Suppose the decision box labeled 4 is changed to: "Is term ≥ 1?" What will be the final value of "sum"?
(d) In the given flowchart, suppose the boxes labeled 2 and 3 were interchanged. What will be the final value of "sum"?
(e) In the given flowchart, suppose the arrow originating from label 4 and terminating at link between labels 1 and 2, were moved so as to now terminate at the link between labels 0 and 1. What will be the final value of "sum"?
(f) Create the trace table for questions (b) and (c).





B. Translate the following flowchart into pseudocode:



C. The price of a local plane ticket is Php 4, 500 by default, but discounts are applied to it based on different criteria. The following rules determine the discount, and hence the final price:

- Students get 20% discount.
- People who purchase in 30 days in advance get 20% discount.

Discount can aggregate, for example a student purchasing 30 days in advance gets a 40% discount. You have to ask the user for input on whether they are a student. Draw a flowchart and pseudocode of your algorithm that will solve the following problem and calculates the final price.

******* TEST ENDS HERE *******



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COMPUTER ENGINEERING DEPARTMENT



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
 College of Engineering
 CMPE 30022 PROGRAMMING LOGIC AND DESIGN
 LONG EXAM 1 ANSWER SHEET

TEST I. MULTIPLE CHOICE:

Name	RONALD JAN B. VY	Date	08-06-19
Section	BSCoE 1-4	Subject	PLD

SCORE: 34

11	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	31	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	24	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	44	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	26	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	46	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	27	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	47	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	28	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	48	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	30	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	50	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Don't fold examination paper until you are notified.

(f) Trace table for (b)

10	10
9	19
8	27
7	34
6	40
5	45
4	49
3	52
2	54
1	54

Trace table for (c)

10	10
9	19
8	27
7	34
6	40
5	45
4	49
3	52
2	54
1	55

TEST II.

- A.
- (a) Loop (for), getting the term/number and add. Then showing the sum of it.
 - (b) The final value of "sum" is 54.
 - (c) The final value of "sum" is 55.
 - (d) The final value of "sum" is 44.
 - (e) The final value of "sum" is infinite.

B. Pseudocode of the given FCD:

```

Begin
  Input L
  Accept L
  If (L="A"), then
    Do E
  Else
    Do B
  If (L="F") then
    while IF (L="E") then
    else
    Do G
  then
  Do D
end
  
```



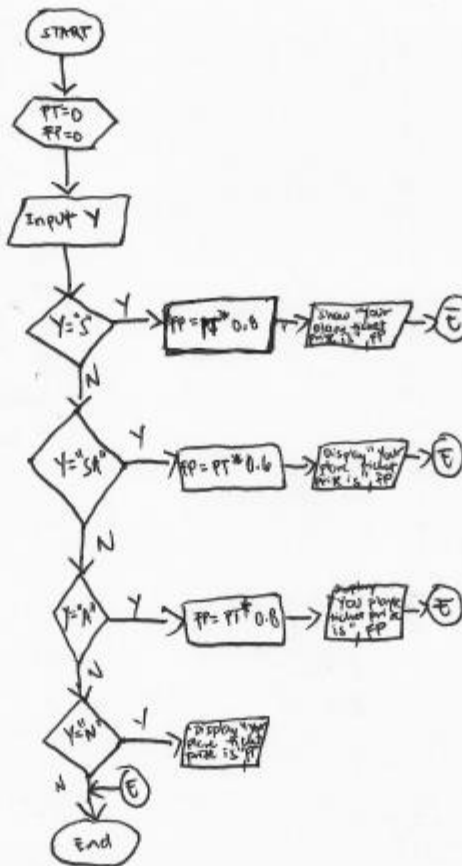
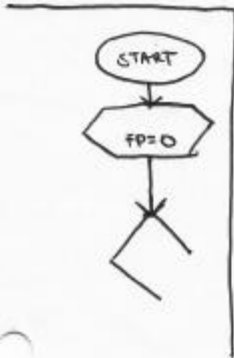
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C.
Pseudocode:

C. Flowchart:



```

Begin
Input PT, Y
Accept PT, Y

If (Y=2), Then
FP = PT * 0.8
display "your
plane ticket price is",
FP
Else
If (Y=3A), Then
FP = PT * 0.6
display "your
plane ticket price is",
FP
Else
If (Y=4), Then
FP = PT * 0.8
display "your
plane ticket price is",
FP
Else
If (Y=5), Then
FP = PT * 0.6
display "your
plane ticket price is",
FP
Else
End
  
```



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CMPE 30022
JSCANSINO

LONG EXAMINATION 1

1ST SEM SY2019-2020

Name	Section	Score
RONALD JAY B. VY	1-4	

GENERAL INSTRUCTIONS:

- Follow all instructions carefully. Failure to do so will warrant a substantial deduction from your final score. Write everything in non-red ink. No borrowing of pens, erasers etc.
- You are not allowed to leave your seat unless you are through with the exam. If you have any questions, just raise your hand and the instructor or proctor will attend to you.
- Talking to or looking at your seatmate (and his/her paper) is automatically considered as cheating which is subject to very serious sanctions as stipulated in the student handbook.

GOOD LUCK!!!

TEST I. MULTIPLE CHOICE (50). Choose the letter of the BEST answer. Shade the circle corresponding to your chosen answer. Use the provided answer sheet in answering this subtest. **STRICTLY NO ERASURE or ALTERATIONS**

- People, procedures, software, hardware, and data are the five parts of
 - competency system
 - information technology
 - computer system
 - software system
- Which of the following is an example of connectivity?
 - data
 - Internet
 - hard disk
 - power cord
- Linux is an example of
 - application software
 - operating system
 - browser
 - shareware
- The least powerful, yet the most widely used and fastest-growing type of computer.
 - mainframe computers
 - minicomputers
 - microcomputers
 - supercomputers
- The system component that controls and manipulates data in order to produce information is called the
 - keyboard
 - monitor
 - microprocessor
 - mouse
- These devices translate data and programs that humans can understand into a form that the computer can process.
 - displays
 - output
 - input
 - pointer
- A DVD is an example of a(n)
 - hard disk
 - output device
 - optical disc
 - solid-state storage device
- The smallest unit in a digital system is a
 - byte
 - word
 - bit
 - character
- This type of memory improves processing by acting as a temporary high-speed holding area between the memory and the CPU.
 - RAM
 - cache memory
 - ROM
 - flash memory
- In which digit the value increases in power of two starting with 0 to left of the binary point and decreases to the right of the binary point starting with power -1:
 - Hexadecimal
 - Decimal
 - Binary
 - Octal
- Which system is used in digital computers because all electrical and electronic circuits can be made to respond to the states concept:
 - Hexadecimal number
 - Binary number
 - Octal number
 - Decimal number
- After counting 0, 1, 10, 11, the next binary number is
 - 12
 - 100
 - 101
 - 110.
- The number 1000_2 is equivalent to decimal number
 - one thousand
 - eight
 - four
 - sixteen.

1ST SEM SY2019-2020

PROGRAMMING LOGIC AND DESIGN



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14. The number 100101_2 is equivalent to octal
a. 54 b. 45 c. 37 d. 25
15. The number 178_{10} is equivalent to binary
a. 111 b. 1110 c. 10000 d. 1111
16. The binary equivalent of A_{16} is
a. 1010 b. 1011 c. 1000 d. 1100

For Nos. 17 – 20, Please refer to the given problem below:

Paolo got his Report Card for the Second Semester SY 2018-2019. His grades are as follows: (represented in binary form)

ITEFUND	$1010101_2 - 85$
FILIONE	$1011101_2 - 95$
ENGC0M1	$1000111_2 - 71$
MATH0NE	$1011100_2 - 92$

INTPROG	$1001010_2 - 74$
PHILO	$1010110_2 - 86$
PHYEDUC	$1001111_2 - 79$
VALUED1	$1011110_2 - 94$

$\frac{39}{8} = 4.875$

17. In what subject did Paolo get his highest grade?
a. ITEFUND b. PHYEDUC c. ENGC0M1 d. INTPROG
18. If the passing grade is 1001011_2 , in what subject did Paolo get his lowest grade? What is the grade?
a. ENGC0M1, 70 b. INTPROG, 70 c. INTPROG, 74 d. ENGC0M1, 71
19. What is Paolo's average grade express in decimal form?
a. 84.00 b. 84.25 c. 84.50 d. 84.75
20. To apply for the University's Scholarship, the average grade must be 1011000_2 , will Paolo qualify? 88%
a. yes b. No c. Maybe d. Uncertain
21. A set of instructions that tells the computer how to behave, what to do and derive at a solution to a particular problem is:
a. Algorithm b. Pseudocode c. Programming d. Program
22. A set of logically sequenced instructions that allows to find the solution to a problem is:
a. Algorithm b. Pseudocode c. Programming d. Program
23. The six stages of program development in logical order are:
a. Define, Analyze, Write, Test, Document, Debug
b. Define, Analyze, Develop, Write, Test and Debug, Document
c. Define, Write, Develop, Analyze, Test, Document
d. Define, Develop, Write, Test, Document, Debug
24. Which of the following had executes programming codes line by line, rather than the whole program:
a. Compiler b. Interpreter c. Executer d. Translator
25. The $ch='z'$ would store in ch
a. The character Z b. ASCII value of Z
c. Z along with the single inverted commas d. Both A and B
26. Which of the following is not a character constant?
a. 'Thank You' b. 'quest videos- IT Learning at its best' c. '23.56e-03' d. All of the above
27. The _____ provides pictorial representation of given problem.
a. Algorithm b. Flowchart c. Pseudocode d. All of these
28. _____ is a procedure or step by step process for solving a problem.
a. Algorithm b. Flowchart c. Pseudocode d. All of these
29. After a programmer plans the logic of a program, she will next _____.
a. understands the problem b. tests the program
c. translates the program d. codes the program



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30. The process of walking through a program's logic on paper before you actually write the program is called _____.

- a. desk-checking
- b. flowcharting
- c. pseudocoding
- d. testing

31. What is the problem with the following statement? 100=grade

- a. 100 is not a reasonable grade
- b. 100 should be in quotes
- c. data types don't match
- d. value on the left must be a variable name

32. What might be considered the seventh step of the programming process?

- a. testing
- b. maintaining
- c. replacing
- d. converting

33. A variable name is also called a(n) _____.

- a. placeholder
- b. identifier
- c. constant
- d. hexadecimal

34. In some programming languages, programmers must write a variable _____ telling the compiler what data type is expected for the variable.

- a. name
- b. termination
- c. decision
- d. declaration

35. The following pseudocode is an example of a(n) _____ structure:

```
get number
while number is positive
add to sum
get number
```

- a. sequence
- b. decision
- c. loop
- d. nested

36. The following pseudocode is an example of a(n) _____ structure:

```
get number
get another number
if first number is bigger than second then
print first number
else
print second number
```

- a. sequence
- b. decision
- c. loop
- d. nested

37. The following pseudocode is an example of a(n) _____ structure:

```
get number
get another number
add numbers
print result
```

- a. sequence
- b. decision
- c. loop
- d. nested

38. The following pseudocode is an example of _____.

```
do stepA
do stepB
if conditionC is true then
do stepD
else
do stepE
endif
while conditionF is true
do stepG
endwhile
```

- a. nesting
- b. stacking
- c. posttest
- d. pretest



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39. The following pseudocode reads a number from the user, multiplies it by 2, and prints the result. What program statement should replace the ? to make this program functional and structured?

```
start
get inputNumber
while not eof
calculatedAnswer = inputNumber * 2
print calculatedAnswer
?
endwhile
stop
```

- a. no statement is needed
c. get inputNumber
- b. if done then exit
d. print inputNumber
40. What is another name for a loop structure?
a. execution
c. iteration
- b. selection
d. case
41. You need to calculate the square of a number. What is the input of this problem?
a. Square of the number
c. Number
- b. Cube of the number
d. Input
42. You need to calculate the area of a rectangle. Length and width of the rectangle are given to you. What are the inputs of this problem?
a. Area and length
c. Length and width
- b. Width and area
d. Area
43. Debugging is the process of:
a. Identifying inputs of a problem
b. Removing errors, testing and revising a program to get expected output
c. Identifying output
d. All of the above
44. Assuming that $w = 1$, $x = 2$, $y = 3$, and $z = 4$, the relational expression $z / 2 + w <= y + x - 2$ is evaluated as:
a. true
c. cannot answer due to lack of data
- b. false
d. invalid expression
45. Assuming that $e = 100$, $f = 101$, $g = 102$, and $h = 103$, the relational expression $++h - 3 <= --f + g - e$ is evaluated as:
a. True
c. cannot answer due to lack of data
- b. false
d. invalid expression
46. The arithmetic expression $6 * 5 / 3 + 5 * 3 + 2 * 4 * -10 / 2$ is equal to
a. 65
c. -15
- b. 35
d. -35
47. If $x = -7$ and $y = 7$, what will be the values of x , y , and z after the operation $z = x ++ * --y$?
a. $z=49$, $x = -7$, $y = 6$
c. $z= -56$, $x = -6$, $y = 6$
- b. $z = -42$, $x = -6$, $y = 6$
d. $z = -36$, $x = -6$, $y = 7$
48. In $b = 6.6 / a + (2 * a + (3 * c) / a * d) / (2 / n)$; which operation will be performed first?
a. $6.6 / a$
c. $3 * c$
- b. $2 * a$
d. $2 / n$



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```
49. start
    get age
    if ( ? )
        display "Teenager age"
    endif
stop
```

Consider the code above. If age is between 13 and 19 then it will display "Teenager age". Which of the following statement can be replaced in (?) correctly?

- a. age > 13 AND age < 19
- b. age >=13 AND age <=19
- c. age < 13 AND age > 19
- d. age > 13 between age age < 19

50. Which of the following is equivalent to the following decision?

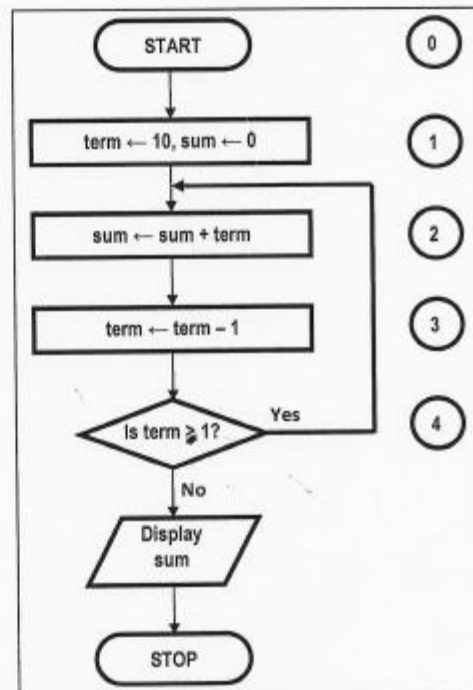
```
if x > 10 then
    if y > 10 then
        display "x"
    endif
endif
```

- a. if x > 10 OR y > 10 then display "x"
- b. if x > 10 AND x > y then display "x"
- c. if x > 10 AND y > 10 then display "x"
- d. if y > x then display "x"

TEST II. FLOWCHART PROFICIENCY.

A. Refer to the flowchart alongside. The numbers shown in circles on the right are labels that will be referred to in the questions below. Answer the following questions.

- (a) What does the flowchart do?
- (b) What is the final value of "sum"?
- (c) Suppose the decision box labeled 4 is changed to: "Is term ≥ 1?" What will be the final value of "sum"?
- (d) In the given flowchart, suppose the boxes labeled 2 and 3 were interchanged. What will be the final value of "sum"?
- (e) In the given flowchart, suppose the arrow originating from label 4 and terminating at link between labels 1 and 2, were moved so as to now terminate at the link between labels 0 and 1. What will be the final value of "sum"?
- (f) Create the trace table for questions (b) and (c).

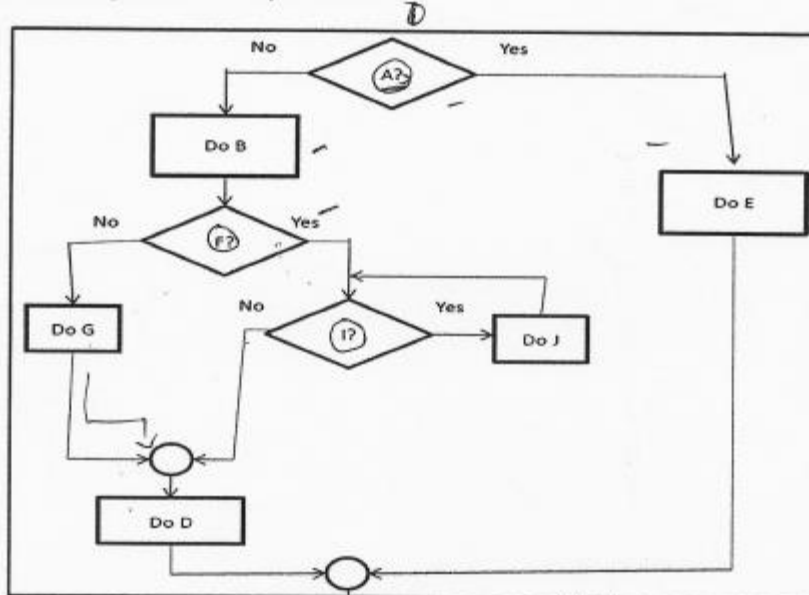


$$\begin{array}{r} 55 \\ - 52 \\ \hline 3 \\ - 8 \\ \hline 49 \end{array}$$



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B. Translate the following flowchart into pseudocode:



C. The price of a local plane ticket is Php 4, 500 by default, but discounts are applied to it based on different criteria. The following rules determine the discount, and hence the final price:

- Students get 20% discount.
- People who purchase in 30 days in advance get 20% discount.

Discount can aggregate, for example a student purchasing 30 days in advance gets a 40% discount. You have to ask the user for input on whether they are a student. Draw a flowchart and pseudocode of your algorithm that will solve the following problem and calculates the final price.

***** TEST ENDS HERE *****





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 CMPE 30022 PROGRAMMING LOGIC AND DESIGN
 LONG EXAM 1 ANSWER SHEET

TEST I. MULTIPLE CHOICE:

NAME	AR THAIN E. ESPANDANTE	Class	9-6-P1
SECTION	AS02 1-4	Subject	Programming Logic and Design

SCORE: 7/6

11	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	31	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	32	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	33	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	34	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	35	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	36	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	37	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	38	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	39	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	40	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

1	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	21	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	22	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	23	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	24	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	25	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	26	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	27	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	28	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	29	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	30	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Do not fill answer bubbles until you are ready to answer the question.

(f) Trace table for (b)

Term	output
10	0
9	0
8	0
7	0
6	0
5	0
4	0
3	0
2	0
1	1

Trace table for (c)

Term	output
9	0
8	0
7	0
6	0
5	0
4	0
3	0
2	0
1	0
0	1

TEST II.

A.

(a) Looping; assigned the term i to 10 and sum as 0 then add both term and sum then the term i if the condition $term > 1$ then;

(b) one (1)

(c) zero (0)

(d) ~~two (2)~~ one (1)

(e) one (1)

→ process will go back to i if no it will proceed to display.

(a) the flowchart assigned term as 10 and sum as 0; next to get the sum of term and sum; next, it minus 1 to the term then have the condition $term > 1$ if the condition is true the process will go back to line 2 if not it will proceed to the display of output.

B. Pseudocode of the given FCD:

```

Get X
if X = A then
  do STEP E
else
  do STEP B
if X = F then
  do condition I
else
  do STEP G
while condition I is true
  do STEP J
else
  do STEP D
end while
  
```

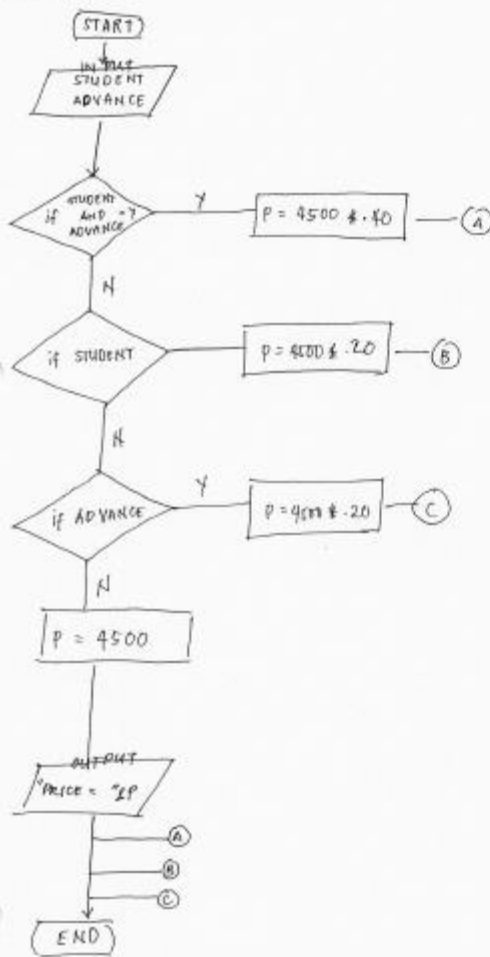


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College of Engineering
CMPE 30022 PROGRAMMING LOGIC AND DESIGN
LONG EXAM 1 ANSWER SHEET

C.
Flowchart:



C.
Pseudocode:

```
begin
  Get STUDENT
  Get ADVANCE

  if (STUDENT = yes AND ADVANCE = yes) then
    do P = 4500 * .40
  else if (STUDENT = yes OR ADVANCE = yes) then
    do P = 4500 * .20
  else
    do P = 4500
  print P
end
```



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COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT
CMPE 30022
JSCANSINO

LONG EXAMINATION 1

1ST SEM SY2019-2020

Name	Section	Score
ARJHANN R. ESTANDANTE	8:41-14	

GENERAL INSTRUCTIONS:

- Follow all instructions carefully. Failure to do so will warrant a substantial deduction from your final score. Write everything in non-red ink. No borrowing of pens, erasers etc.
- You are not allowed to leave your seat unless you are through with the exam. If you have any questions, just raise your hand and the instructor or proctor will attend to you.
- Talking to or looking at your seatmate (and his/her paper) is automatically considered as cheating which is subject to very serious sanctions as stipulated in the student handbook.

GOOD LUCK!!!

TEST I. MULTIPLE CHOICE (50). Choose the letter of the BEST answer. Shade the circle corresponding to your chosen answer. Use the provided answer sheet in answering this subtest. **STRICTLY NO ERASURE or ALTERATIONS**

- People, procedures, software, hardware, and data are the five parts of
a. competency system b. information technology c. computer system d. software system
- Which of the following is an example of connectivity?
a. data b. Internet c. hard disk d. power cord
- Linux is an example of
a. application software b. operating system c. browser d. shareware
- The least powerful, yet the most widely used and fastest-growing type of computer.
a. mainframe computers b. minicomputers c. microcomputers d. supercomputers
- The system component that controls and manipulates data in order to produce information is called the
a. keyboard b. monitor c. microprocessor d. mouse
- These devices translate data and programs that humans can understand into a form that the computer can process.
a. displays b. output c. input d. pointer
- A DVD is an example of a(n)
a. hard disk b. output device c. optical disc d. solid-state storage device
- The smallest unit in a digital system is a
a. byte b. word c. bit d. character
- This type of memory improves processing by acting as a temporary high-speed holding area between the memory and the CPU.
a. RAM b. cache memory c. ROM d. flash memory
- In which digit the value increases in power of two starting with 0 to left of the binary point and decreases to the right of the binary point starting with power -1:
a. Hexadecimal b. Decimal c. Binary d. Octal
- Which system is used in digital computers because all electrical and electronic circuits can be made to respond to the states concept:
a. Hexadecimal number b. Binary number c. Octal number d. Decimal number
- After counting 0, 1, 10, 11, the next binary number is
a. 12 b. 100 c. 101 d. 110.
- The number 1000_2 is equivalent to decimal number
a. one thousand b. eight c. four d. sixteen.

1ST SEM SY2019-2020

PROGRAMMING LOGIC AND DESIGN



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COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

14. The number 100101_2 is equivalent to octal
a. 54 b. 45 c. 37 d. 25

15. The number 178_{10} is equivalent to binary
a. 111 b. 1110 c. 10000 d. 1111

16. The binary equivalent of A_{16} is
a. 1010 b. 1011 c. 1000 d. 1100

For Nos. 17 – 20, Please refer to the given problem below:

Paolo got his Report Card for the Second Semester SY 2018-2019. His grades are as follows: (represented in binary form)

ITEFUND	$1010101_2 = 25$	INTPROG	$1001010_2 = 78$
FILIONE	$1011101_2 = 45$	PHILO	$1010110_2 = 42$
ENGCOM1	$1000111_2 = 35$	PHYEDUC	$1001111_2 = 47$
MATHONE	$1011100_2 = 44$	VALUED1	$1011110_2 = 46$

17. In what subject did Paolo get his highest grade?
a. ITEFUND b. PHYEDUC c. ENGCOM1 d. INTPROG

18. If the passing grade is 1001011_2 , in what subject did Paolo get his lowest grade? What is the grade?
a. ENGCOM1, 70 b. INTPROG, 70 c. INTPROG, 74 d. ENGCOM1, 71

19. What is Paolo's average grade express in decimal form?
a. 84.00 b. 84.25 c. 84.50 d. 84.75

20. To apply for the University's Scholarship, the average grade must be 1011000_2 , will Paolo qualify?
a. yes b. No c. Maybe d. Uncertain

21. A set of instructions that tells the computer how to behave, what to do and derive at a solution to a particular problem is:
a. Algorithm b. Pseudocode c. Programming d. Program

22. A set of logically sequenced instructions that allows to find the solution to a problem is:
a. Algorithm b. Pseudocode c. Programming d. Program

23. The six stages of program development in logical order are:
a. Define, Analyze, Write, Test, Document, Debug
b. Define, Analyze, Develop, Write, Test and Debug, Document
c. Define, Write, Develop, Analyze, Test, Document
d. Define, Develop, Write, Test, Document, Debug

24. Which of the following had executes programming codes line by line, rather than the whole program:
a. Compiler b. Interpreter c. Executer d. Translator

25. The $ch='z'$ would store in ch
a. The character Z b. ASCII value of Z
c. Z along with the single inverted commas d. Both A and B

26. Which of the following is not a character constant?
a. 'Thank You' b. 'quest videos- IT Learning at its best' c. '23.56e-03' d. All of the above

27. The _____ provides pictorial representation of given problem.
a. Algorithm b. Flowchart c. Pseudocode d. All of these

28. _____ is a procedure or step by step process for solving a problem.
a. Algorithm b. Flowchart c. Pseudocode d. All of these

29. After a programmer plans the logic of a program, she will next _____.
a. understands the problem b. tests the program
c. translates the program d. codes the program



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30. The process of walking through a program's logic on paper before you actually write the program is called _____.

- a. desk-checking
- b. flowcharting
- c. pseudocoding
- d. testing

31. What is the problem with the following statement? 100=grade

- a. 100 is not a reasonable grade
- b. 100 should be in quotes
- c. data types don't match
- d. value on the left must be a variable name

32. What might be considered the seventh step of the programming process?

- a. testing
- b. maintaining
- c. replacing
- d. converting

33. A variable name is also called a(n) _____.

- a. placeholder
- b. identifier
- c. constant
- d. hexadecimal

34. In some programming languages, programmers must write a variable _____ telling the compiler what data type is expected for the variable.

- a. name
- b. termination
- c. decision
- d. declaration

35. The following pseudocode is an example of a(n) _____ structure:

```
get number
while number is positive
add to sum
get number
```

- a. sequence
- b. decision
- c. loop
- d. nested

36. The following pseudocode is an example of a(n) _____ structure:

```
get number
get another number
if first number is bigger than second then
print first number
else
print second number
```

- a. sequence
- b. decision
- c. loop
- d. nested

37. The following pseudocode is an example of a(n) _____ structure:

```
get number
get another number
add numbers
print result
```

- a. sequence
- b. decision
- c. loop
- d. nested

38. The following pseudocode is an example of _____.

```
do stepA
do stepB
if conditionC is true then
do stepD
else
do stepE
endif
while conditionF is true
do stepG
endwhile
```

- a. nesting
- b. stacking
- c. posttest
- d. pretest



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39. The following pseudocode reads a number from the user, multiplies it by 2, and prints the result. What program statement should replace the ? to make this program functional and structured?

```
start
get inputNumber
while not eof
calculatedAnswer = inputNumber * 2
print calculatedAnswer
?
endwhile
stop
```

- a. no statement is needed
c. get inputNumber
b. if done then exit
d. print inputNumber

40. What is another name for a loop structure?

- a. execution
c. iteration
b. selection
d. case

41. You need to calculate the square of a number. What is the input of this problem?

- a. Square of the number
c. Number
b. Cube of the number
d. Input

42. You need to calculate the area of a rectangle. Length and width of the rectangle are given to you. What are the inputs of this problem?

- a. Area and length
c. Length and width
b. Width and area
d. Area

43. Debugging is the process of:

- a. Identifying inputs of a problem
b. Removing errors, testing and revising a program to get expected output
c. Identifying output
d. All of the above

$$\frac{4}{3} <= 3$$

44. Assuming that $w = 1$, $x = 2$, $y = 3$, and $z = 4$, the relational expression $z / 2 + w <= y + x - 2$ is evaluated as:

- a. true
c. cannot answer due to lack of data
b. false
d. invalid expression

$$\frac{103-9}{100} <= -101 + 02 - 100$$

45. Assuming that $e = 100$, $f = 101$, $g = 102$, and $h = 103$, the relational expression $++h - 3 <= --f + g - e$ is evaluated as:

- a. True
c. cannot answer due to lack of data
b. false
d. invalid expression

$$10 + 15 - 40 - \frac{80}{2} - 40$$

46. The arithmetic expression $6 * 5 / 3 + 5 * 3 + 2 * 4 * -10 / 2$ is equal to

- a. 65
c. -15
b. 35
d. -35

$$10 + 15 + \frac{2 * 10}{2} - \frac{80}{2}$$

47. If $x = -7$ and $y = 7$, what will be the values of x , y , and z after the operation $z = x ++ * --y$?

- a. $z=49$, $x = -7$, $y = 6$
c. $z= 56$, $x = -6$, $y = 6$
b. $z = -42$, $x = -6$, $y = 6$
d. $z = -36$, $x = -6$, $y = 7$

$$-1$$
$$-40$$
$$\frac{15}{-35}$$

48. In $b = 6.6 / a + (2 * a + (3 * c) / a * d) / (2 / n)$; which operation will be performed first?

- a. $6.6 / a$
c. $3 * c$
b. $2 * a$
d. $2 / n$



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```

49. start
    get age
    if ( ? )
        display "Teenager age"
    endif
stop
  
```

Consider the code above. If age is between 13 and 19 then it will display "Teenager age". Which of the following statement can be replaced in (?) correctly?

- a. age > 13 AND age < 19
- b. age >=13 AND age <=19
- c. age < 13 AND age > 19
- d. age > 13 between age age < 19

50. Which of the following is equivalent to the following decision?

```

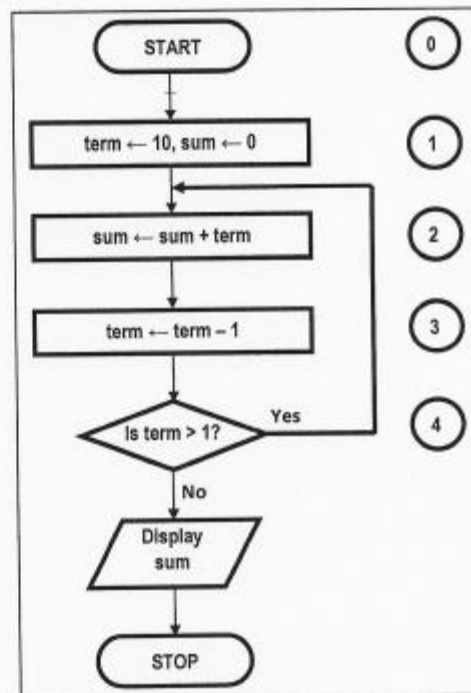
if x > 10 then
  if y > 10 then
    display "x"
  endif
endif
  
```

- a. if x > 10 OR y > 10 then display "x"
- b. if x > 10 AND x > y then display "x"
- c. if x > 10 AND y > 10 then display "x"
- d. if y > x then display "x"

TEST II. FLOWCHART PROFICIENCY.

A. Refer to the flowchart alongside. The numbers shown in circles on the right are labels that will be referred to in the questions below. Answer the following questions.

- (a) What does the flowchart do? *Looping*
- (b) What is the final value of "sum"? *10*
- (c) Suppose the decision box labeled 4 is changed to: "Is term ≥ 1?" What will be the final value of "sum"? *9*
- (d) In the given flowchart, suppose the boxes labeled 2 and 3 were interchanged. What will be the final value of "sum"? *16*
- (e) In the given flowchart, suppose the arrow originating from label 4 and terminating at link between labels 1 and 2, were moved so as to now terminate at the link between labels 0 and 1. What will be the final value of "sum"? *1*
- (f) Create the trace table for questions (b) and (c).



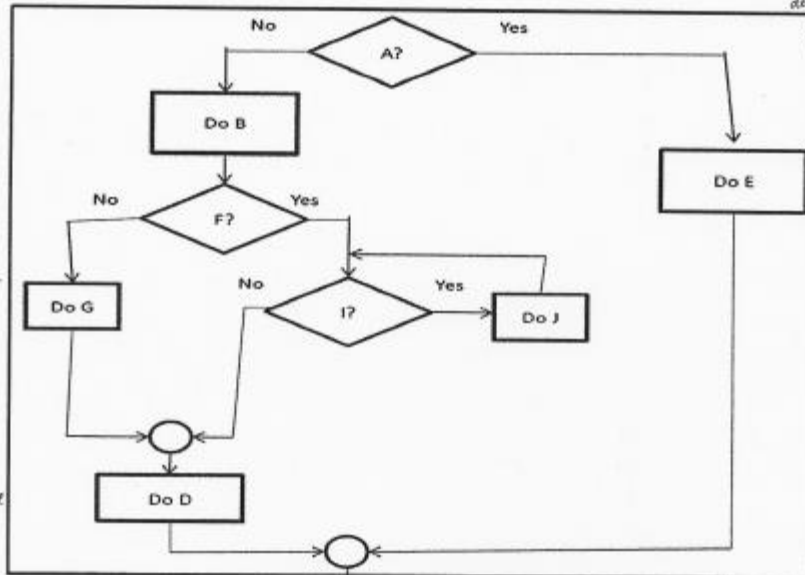
TERM	OUTPUT	OUTPUT
10	0 + 10	0
9	0 + 9	0
8	0 + 8	0
7	0 + 7	0
6	0 + 6	0
5	0 + 5	0
4	0 + 4	0
3	0 + 3	0
2	0 + 2	0
1	0 + 1	0

Process
10 - 1
0 + 9 = 9
≥ 1



B. Translate the following flowchart into pseudocode:

~~if A~~
get A
(condition A is true then do E
else do step B
if get A
if condition A is true then do step E
else do step B
if condition B is true then do step J
else do step G

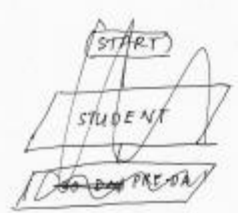


get x
if x = A then do step E
else do step B
if x = F then do condition I
do step G
if condition I is true then do step J
else do step D
while condition I is true do step J
else do step D
end while

C. The price of a local plane ticket is Php 4, 500 by default, but discounts are applied to it based on different criteria. The following rules determine the discount, and hence the final price:

- Students get 20% discount.
- People who purchase in 30 days in advance get 20% discount.

Discount can aggregate, for example a student purchasing 30 days in advance gets a 40% discount. You have to ask the user for input on whether they are a student. Draw a flowchart and pseudocode of your algorithm that will solve the following problem and calculates the final price.



***** TEST ENDS HERE *****
START
ADVANCE Y price = 4500 * .40
STUDENT Y price = 4,500 * .20
N
ADVANCE Y price = 4,500 * .20
N
4,500
END

PSEUDOCODE
get Student
get Advance
if Student = Yes
then
P = 4,500 * .20
else if Advance = Yes
then
P = 4500
else if Advance = Yes
then
P = 4500 * .20
else if (Student = Yes AND Advance = Yes)
then
P = 4500 * .40
else
P = 4500





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CMPE 30022 PROGRAMMING LOGIC AND DESIGN
LONG EXAM 1 ANSWER SHEET

TEST I. MULTIPLE CHOICE:

Name	SEGA MIVEL UERANNO	Date	8/6/19
Section	CPE 1-4	Subject	PLD

SCORE: 38

11	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	<input type="radio"/>
12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(f) Trace table for (b)

TERM = 10	SUM = 0	TERM = 9	SUM = 10
TERM = 9	SUM = 10	TERM = 8	SUM = 19
TERM = 8	SUM = 19	TERM = 7	SUM = 27
TERM = 7	SUM = 27	TERM = 6	SUM = 34
TERM = 6	SUM = 34	TERM = 5	SUM = 40
TERM = 5	SUM = 40	TERM = 4	SUM = 45
TERM = 4	SUM = 45	TERM = 3	SUM = 49
TERM = 3	SUM = 49	TERM = 2	SUM = 52
TERM = 2	SUM = 52	TERM = 1	SUM = 54
1 > 1	NO		SUM = 54
TERM = 1			

Trace table for (c)

TERM = 10	SUM = 0	TERM = 9	SUM = 10
TERM = 9	SUM = 10	TERM = 8	SUM = 19
TERM = 8	SUM = 19	TERM = 7	SUM = 27
TERM = 7	SUM = 27	TERM = 6	SUM = 34
TERM = 6	SUM = 34	TERM = 5	SUM = 40
TERM = 5	SUM = 40	TERM = 4	SUM = 45
TERM = 4	SUM = 45	TERM = 3	SUM = 49
TERM = 3	SUM = 49	TERM = 2	SUM = 52
TERM = 2	SUM = 52	TERM = 1	SUM = 54
TERM = 1	SUM = 54	TERM = 0	SUM = 55

TEST II.

A.

- (a) THE FLOWCHART ADDS ALL THE NUMBERS FROM 2 - 10 (TWO TO TEN).
- (b) THE FINAL VALUE OF "SUM" IS 54
- (c) IF THE DECISION WOULD BE LABELED "IS TERM ≥ 1" THEN THE SUM WOULD BE "55"
- (d) IF IT IS INTERCHANGED, THEN THE SUM WOULD BE "44"
- (e) IF YOU MOVE THE ARROW INTO POINTS 0 & 1 THEN THE SUM WILL STILL BE THE SAME IT IS "54"

B. Pseudocode of the given FCD:

```

IF CONDITION A IS TRUE THEN
  DO E
ELSE
  DO B
  IF CONDITION F IS TRUE THEN
    DO CONDITION I
  ELSE
    DO G
    IF CONDITION I IS TRUE THEN
      DO J
    ELSE
      DO D
END
  
```

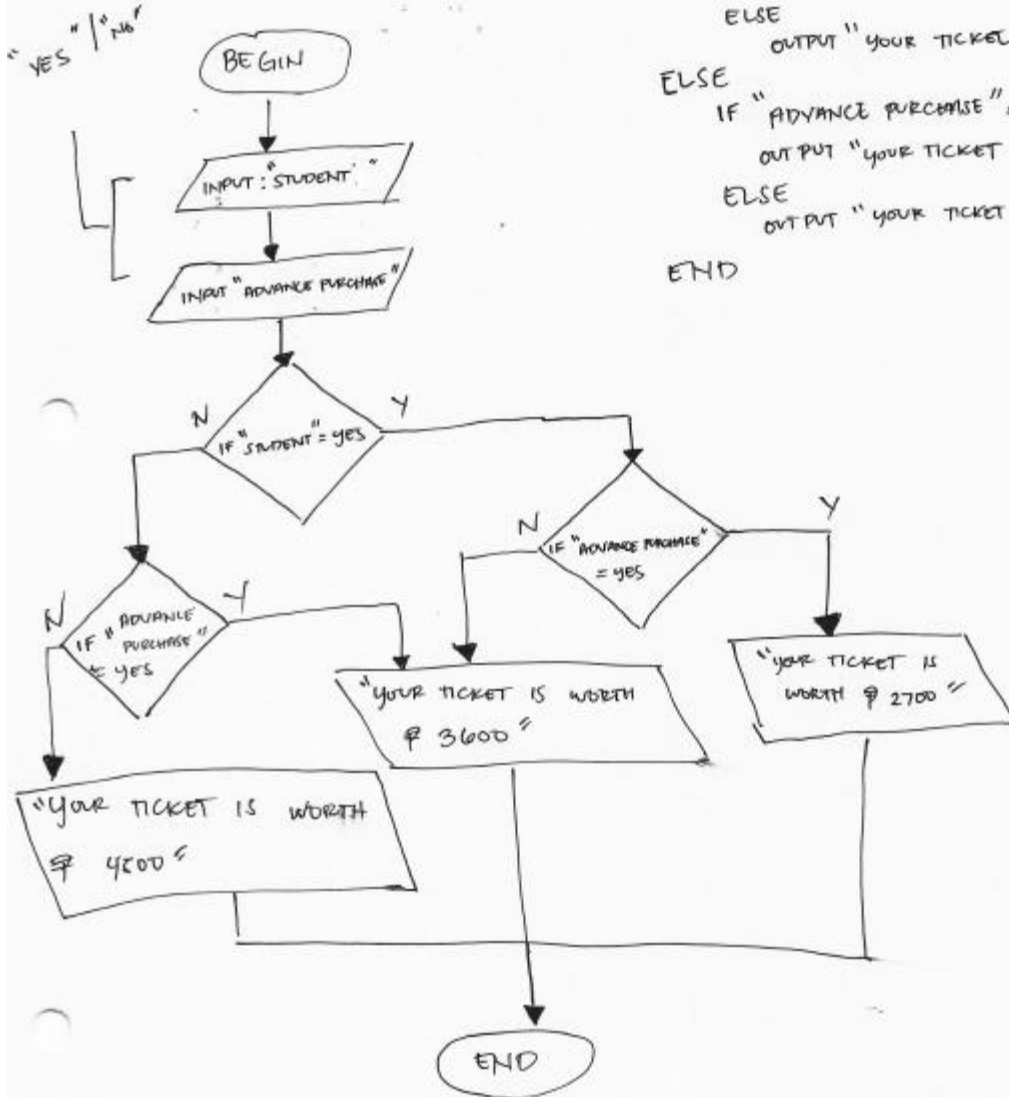


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LONG EXAM 1 ANSWER SHEET

C. Flowchart:



C. Pseudocode:

```
BEGIN
INPUT "STUDENT"
INPUT "ADVANCE PURCHASE"
IF "STUDENT" = "YES" THEN
    IF "ADVANCE PURCHASE" = "YES" THEN
        OUTPUT "YOUR TICKET IS WORTH ₱ 2700"
    ELSE
        OUTPUT "YOUR TICKET IS WORTH ₱ 3600"
    ELSE
        IF "ADVANCE PURCHASE" = "YES" THEN
            OUTPUT "YOUR TICKET IS WORTH ₱ 3600"
        ELSE
            OUTPUT "YOUR TICKET IS WORTH ₱ 4000"
        END
    END
END
```



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CMPE 30022
JSCANSINO

LONG EXAMINATION 1

1ST SEM SY2019-2020

Name	Section	Score
SEIYA MIBUEL SANCHEZ GURANGO	B.Sc.P.E 1-4	

GENERAL INSTRUCTIONS:

- Follow all instructions carefully. Failure to do so will warrant a substantial deduction from your final score. Write everything in non-red ink. No borrowing of pens, erasers etc.
- You are not allowed to leave your seat unless you are through with the exam. If you have any questions, just raise your hand and the instructor or proctor will attend to you.
- Talking to or looking at your seatmate (and his/her paper) is automatically considered as cheating which is subject to very serious sanctions as stipulated in the student handbook.

GOOD LUCK!!!

TEST I. MULTIPLE CHOICE (50). Choose the letter of the BEST answer. Shade the circle corresponding to your chosen answer. Use the provided answer sheet in answering this subtest. **STRICTLY NO ERASURE or ALTERATIONS**

- People, procedures, software, hardware, and data are the five parts of
a. competency system b. information technology c. computer system d. software system
- Which of the following is an example of connectivity?
a. data b. Internet c. hard disk d. power cord
- Linux is an example of
a. application software b. operating system c. browser d. shareware
- The least powerful, yet the most widely used and fastest-growing type of computer.
a. mainframe computers b. minicomputers c. microcomputers d. supercomputers
- The system component that controls and manipulates data in order to produce information is called the
 a. keyboard b. monitor c. microprocessor d. mouse
- These devices translate data and programs that humans can understand into a form that the computer can process.
a. displays b. output c. input d. pointer
- A DVD is an example of a(n)
a. hard disk b. output device c. optical disc d. solid-state storage device
- The smallest unit in a digital system is a
a. byte b. word c. bit d. character
- This type of memory improves processing by acting as a temporary high-speed holding area between the memory and the CPU.
 a. RAM b. cache memory c. ROM d. flash memory
- In which digit the value increases in power of two starting with 0 to left of the binary point and decreases to the right of the binary point starting with power -1:
a. Hexadecimal b. Decimal c. Binary d. Octal
- Which system is used in digital computers because all electrical and electronic circuits can be made to respond to the states concept:
a. Hexadecimal number b. Binary number c. Octal number d. Decimal number
- After counting 0, 1, 10, 11, the next binary number is
a. 12 b. 100 c. 101 d. 110.
- The number 1000_2 is equivalent to decimal number
a. one thousand b. eight c. four d. sixteen.

1ST SEM SY2019-2020

PROGRAMMING LOGIC AND DESIGN



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30. The process of walking through a program's logic on paper before you actually write the program is called

- a. desk-checking
 b. flowcharting
 c. pseudocoding
 d. testing

31. What is the problem with the following statement? 100=grade

- a. 100 is not a reasonable grade
 b. 100 should be in quotes
 c. data types don't match
 d. value on the left must be a variable name

32. What might be considered the seventh step of the programming process?

- a. testing
 b. maintaining
 c. replacing
 d. converting

33. A variable name is also called a(n) ____.

- a. placeholder
 b. identifier
 c. constant
 d. hexadecimal

34. In some programming languages, programmers must write a variable ____ telling the compiler what data type is expected for the variable.

- a. name
 b. termination
 c. decision
 d. declaration

35. The following pseudocode is an example of a(n) ____ structure:

```
get number
while number is positive
add to sum
get number
```

- a. sequence
 b. decision
 c. loop
 d. nested

36. The following pseudocode is an example of a(n) ____ structure:

```
get number
get another number
if first number is bigger than second then
print first number
else
print second number
```

- a. sequence
 b. decision
 c. loop
 d. nested

37. The following pseudocode is an example of a(n) ____ structure:

```
get number
get another number
add numbers
print result
```

- a. sequence
 b. decision
 c. loop
 d. nested

38. The following pseudocode is an example of ____.

```
do stepA
do stepB
if conditionC is true then
do stepD
else
do stepE
endif
while conditionF is true
do stepG
endwhile
```

- a. nesting
 b. stacking
 c. posttest
 d. pretest



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39. The following pseudocode reads a number from the user, multiplies it by 2, and prints the result. What program statement should replace the ? to make this program functional and structured?

```
start
get inputNumber
while not eof
calculatedAnswer = inputNumber * 2
print calculatedAnswer
?
endwhile
stop
```

- a. no statement is needed
- b. if done then exit
- c. get inputNumber
- d. print inputNumber

40. What is another name for a loop structure?

- a. execution
- b. selection
- c. iteration
- d. case

41. You need to calculate the square of a number. What is the input of this problem?

- a. Square of the number
- b. Cube of the number
- c. Number
- d. Input

42. You need to calculate the area of a rectangle. Length and width of the rectangle are given to you. What are the inputs of this problem?

- a. Area and length
- b. Width and area
- c. Length and width
- d. Area

43. Debugging is the process of:

- a. Identifying inputs of a problem
- b. Removing errors, testing and revising a program to get expected output
- c. Identifying output
- d. All of the above

$$3 \leq 3$$
$$2 \frac{4}{2} + w \leq y + x - 2$$

44. Assuming that $w = 1$, $x = 2$, $y = 3$, and $z = 4$, the relational expression $z / 2 + w \leq y + x - 2$ is evaluated as:

- a. true
- b. false
- c. cannot answer due to lack of data
- d. invalid expression

$$10 \leq 2$$

45. Assuming that $e = 100$, $f = 101$, $g = 102$, and $h = 103$, the relational expression $+ + h - 3 \leq - f + g - e$ is evaluated as:

- a. True
- b. false
- c. cannot answer due to lack of data
- d. invalid expression

46. The arithmetic expression $6 * 5 / 3 + 5 * 3 + 2 * 4 * -10 / 2$ is equal to

- a. 65
- b. 35
- c. 15
- d. -35

$$6 \left(\frac{5}{3} \right) + 5 \times 3 + 2 \times 4 \times \left(\frac{-10}{2} \right)$$
$$\frac{20}{3} + 15 + 6 \times \frac{-10}{2}$$
$$10 + + -40 = -30$$

47. If $x = -7$ and $y = 7$, what will be the values of x , y , and z after the operation $z = x ++ * --y$?

- a. $z = 49$, $x = -7$, $y = 6$
- b. $z = -42$, $x = -6$, $y = 6$
- c. $z = 56$, $x = -6$, $y = 6$
- d. $z = -36$, $x = -6$, $y = 7$

$$-7 ++ * --7$$
$$-7$$

48. In $b = 6.6 / a + (2 * a + (3 * c) / a * d) / (2 / n)$; which operation will be performed first?

- a. $6.6 / a$
- b. $2 * a$
- c. $3 * c$
- d. $2 / n$

$$b = \frac{6.6}{a} + \left(2a + \left(\frac{3c}{ad} \right) \right) / \frac{2}{n}$$



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```
49. start
    get age
    if ( ? )
        display "Teenager age"
    endif
stop
```

Consider the code above. If age is between 13 and 19 then it will display "Teenager age". Which of the following statement can be replaced in (?) correctly?

- a. age > 13 AND age < 19
- b. age >=13 AND age <=19
- c. age < 13 AND age > 19
- d. age > 13 between age age < 19

50. Which of the following is equivalent to the following decision?

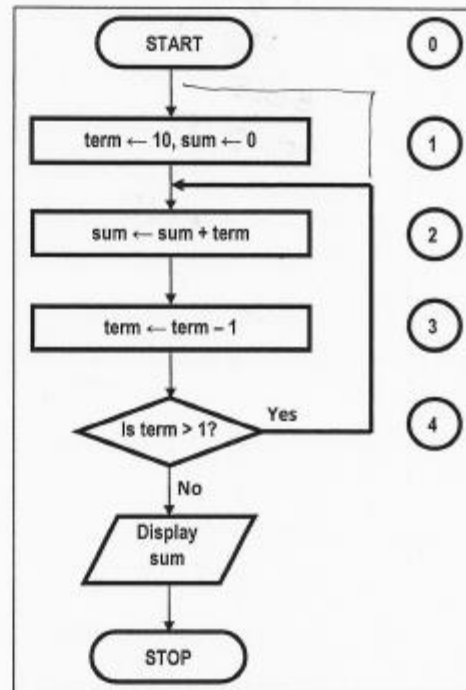
```
if x > 10 then
    if y > 10 then
        display "x"
    endif
endif
```

- a. if x > 10 OR y > 10 then display "x"
- b. if x > 10 AND x > y then display "x"
- c. if x > 10 AND y > 10 then display "x"
- d. if y > x then display "x"

TEST II. FLOWCHART PROFICIENCY.

A. Refer to the flowchart alongside. The numbers shown in circles on the right are labels that will be referred to in the questions below. Answer the following questions.

- (a) What does the flowchart do?
- (b) What is the final value of "sum"?
- (c) Suppose the decision box labeled 4 is changed to: "Is term ≥ 1?" What will be the final value of "sum"?
- (d) In the given flowchart, suppose the boxes labeled 2 and 3 were interchanged. What will be the final value of "sum"?
- (e) In the given flowchart, suppose the arrow originating from label 4 and terminating at link between labels 1 and 2, were moved so as to now terminate at the link between labels 0 and 1. What will be the final value of "sum"?
- (f) Create the trace table for questions (b) and (c).

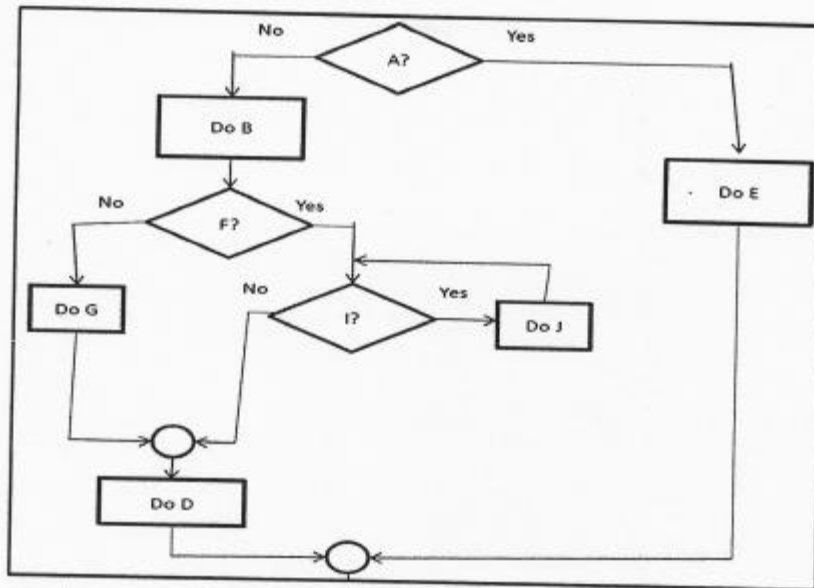


Handwritten notes: 4, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0, 5



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B. Translate the following flowchart into pseudocode:

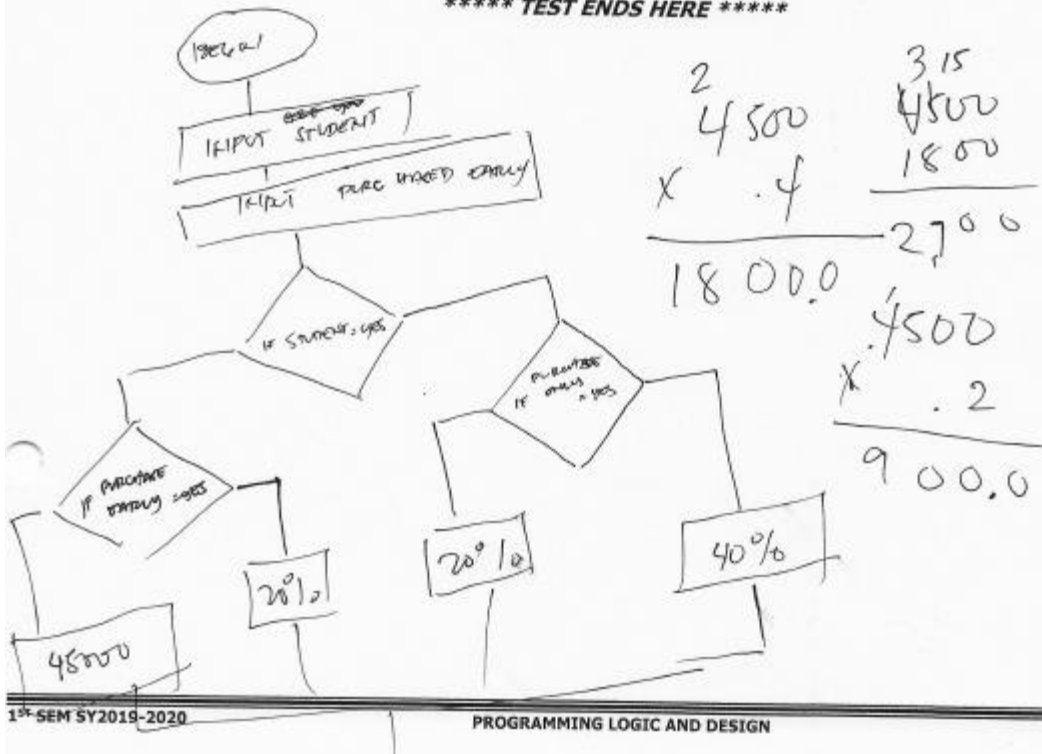


C. The price of a local plane ticket is Php 4, 500 by default, but discounts are applied to it based on different criteria. The following rules determine the discount, and hence the final price:

- Students get 20% discount.
- People who purchase in 30 days in advance get 20% discount.

Discount can aggregate, for example a student purchasing 30 days in advance gets a 40% discount. You have to ask the user for input on whether they are a student. Draw a flowchart and pseudocode of your algorithm that will solve the following problem and calculates the final price.

***** TEST ENDS HERE *****





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CMPE 30022 PROGRAMMING LOGIC AND DESIGN
LONG EXAM 1 ANSWER SHEET

TEST I. MULTIPLE CHOICE:

NAME: Garcia, Jose Alexander Date: 06/06/2019
Section: BSCE 1-4 Subject: CMPE 30022

SCORE:

28

11	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	31	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
12	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	32	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
13	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	33	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
14	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	34	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
15	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	35	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
16	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	36	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
17	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	37	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
18	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	38	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
19	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	39	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
20	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	40	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E

1	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	21	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
2	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	22	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
3	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	23	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
4	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	24	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
5	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	25	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
6	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	26	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
7	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	27	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
8	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	28	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
9	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	29	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
10	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	30	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E

PLEASE USE ANSWER KEY.
Please check for this to your privacy.

(f) Trace table for (b)

10	10
9	19
8	27
7	34
6	40
5	45
4	49
3	52
2	54

Trace table for (c)

10	10
9	19
8	27
7	34
6	40
5	45
4	49
3	52
2	54
1	55

TEST II.

A.

- (a) Find the Total sum of the sum and term.
- (b) 54 is the final value.
- (c) 55 is the final value.
- (d) 44 is the final value.
- (e) The value of the sum is infinity.

B. Pseudocode of the given FCD:

```

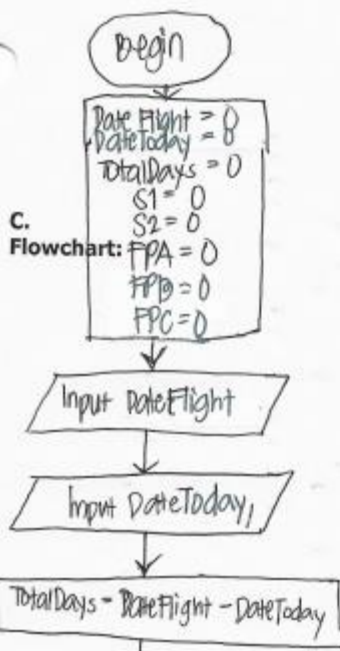
begin
  IF A is true then
    DO E
  ELSE
    DO B
    1. IF F is true then
      1. while I is true then
        DO J
      endwhile
    ELSE
      DO G
    EndIF
  EndIF
  DO D
End
  
```



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LONG EXAM 1 ANSWER SHEET



C. Pseudocode:

Variables TotalDays, FPA, FPB, FPC, DateFlight, DateToday are numeric
Variables S1, S2 are string.

```

    Begin
      Display "Date of Flight:"
      Accept DateFlight
      Display "Date Today:"
      Accept DateToday
      TotalDays = DateFlight - DateToday
      If TotalDays >= 30 then
        Display "Student?:"
        Accept S1
        If "YES" then
          FPB = 4500 - (4500 * 0.40)
          Display "Final Price: ", FPB
        Else
          FPA = 4500 - (4500 * 0.20)
          Display "Final Price: ", FPA
        EndIf
      Else
        Display "student?:"
        Accept S2
        If "YES" then
          FPC = 4500 - (4500 * 0.20)
          Display "Final Price: ", FPC
        Else
          Display "Final Price: 4500"
        EndIf
      EndIf
    End
  
```



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CMPE 30022
JSCANSINO

LONG EXAMINATION 1

1ST SEM SY2019-2020

Name	Section	Score
------	---------	-------

GENERAL INSTRUCTIONS:

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- Talking to or looking at your seatmate (and his/her paper) is automatically considered as cheating which is subject to very serious sanctions as stipulated in the student handbook.

GOOD LUCK!!!

TEST I. MULTIPLE CHOICE (50). Choose the letter of the BEST answer. Shade the circle corresponding to your chosen answer. Use the provided answer sheet in answering this subtest. **STRICTLY NO ERASURE or ALTERATIONS**

- People, procedures, software, hardware, and data are the five parts of
 - competency system
 - information technology
 - computer system
 - software system
- Which of the following is an example of connectivity?
 - data
 - Internet
 - hard disk
 - power cord
- Linux is an example of
 - application software
 - operating system
 - browser
 - shareware
- The least powerful, yet the most widely used and fastest-growing type of computer.
 - mainframe computers
 - minicomputers
 - microcomputers
 - supercomputers
- The system component that controls and manipulates data in order to produce information is called the
 - keyboard
 - monitor
 - microprocessor
 - mouse
- These devices translate data and programs that humans can understand into a form that the computer can process.
 - displays
 - output
 - input
 - pointer
- A DVD is an example of a(n)
 - hard disk
 - output device
 - optical disc
 - solid-state storage device
- The smallest unit in a digital system is a
 - byte
 - word
 - bit
 - character
- This type of memory improves processing by acting as a temporary high-speed holding area between the memory and the CPU.
 - RAM
 - cache memory
 - ROM
 - flash memory
- In which digit the value increases in power of two starting with 0 to left of the binary point and decreases to the right of the binary point starting with power -1:
 - Hexadecimal
 - Decimal
 - Binary
 - Octal
- Which system is used in digital computers because all electrical and electronic circuits can be made to respond to the states concept:
 - Hexadecimal number
 - Binary number
 - Octal number
 - Decimal number
- After counting 0, 1, 10, 11, the next binary number is
 - 12
 - 100
 - 101
 - 110.
- The number 1000_2 is equivalent to decimal number
 - one thousand
 - eight
 - four
 - sixteen.

1ST SEM SY2019-2020

PROGRAMMING LOGIC AND DESIGN



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COMPUTER ENGINEERING DEPARTMENT

14. The number 100101_2 is equivalent to octal
a. 54 $4 \ 5 \ 45$ c. 37 d. 25

15. The number 178_{10} is equivalent to binary
a. 111 b. 1110 c. 10000 d. 1111

16. The binary equivalent of A_{16} is
a. 1010 b. 1011 c. 1000 d. 1100

For Nos. 17 – 20, Please refer to the given problem below:

Paolo got his Report Card for the Second Semester SY 2018-2019. His grades are as follows: (represented in binary form)

ITEFUND	$1010101 = 85$	INTPROG	$1001010 = 74$
FILIONE	$1011101 = 93$	PHILO	$1010110 = 86$
ENGC0M1	$1000111 = 71$	PHYEDUC	$1001111 = 79$
MATHONE	$1011100 = 92$	VALUED1	$1011110 = 94$

17. In what subject did Paolo get his highest grade?
a. ITEFUND b. PHYEDUC c. ENGC0M1 d. INTPROG

18. If the passing grade is 100101_2 , in what subject did Paolo get his lowest grade? What is the grade?
a. ENGC0M1, 70 b. INTPROG, 70 c. INTPROG, 74 d. ENGC0M1, 71

19. What is Paolo's average grade express in decimal form?
a. 84.00 b. 84.25 c. 84.50 d. 84.75

20. To apply for the University's Scholarship, the average grade must be 1011000_2 , will Paolo qualify?
a. yes b. No c. Maybe d. Uncertain

21. A set of instructions that tells the computer how to behave, what to do and derive at a solution to a particular problem is:
a. Algorithm b. Pseudocode c. Programming d. Program

22. A set of logically sequenced instructions that allows to find the solution to a problem is:
a. Algorithm b. Pseudocode c. Programming d. Program

23. The six stages of program development in logical order are:
a. Define, Analyze, Write, Test, Document, Debug
b. Define, Analyze, Develop, Write, Test and Debug, Document
c. Define, Write, Develop, Analyze, Test, Document
d. Define, Develop, Write, Test, Document, Debug

24. Which of the following had executes programming codes line by line, rather than the whole program:
a. Compiler b. Interpreter c. Executer d. Translator

25. The $ch='z'$ would store in ch
a. The character Z b. ASCII value of Z
c. Z along with the single inverted commas d. Both A and B

26. Which of the following is not a character constant?
a. 'Thank You' b. 'quest videos- IT Learning at its best' c. '23.56e-03' d. All of the above

27. The _____ provides pictorial representation of given problem.
a. Algorithm b. Flowchart c. Pseudocode d. All of these

28. _____ is a procedure or step by step process for solving a problem.
a. Algorithm b. Flowchart c. Pseudocode d. All of these

29. After a programmer plans the logic of a program, she will next _____.
a. understands the problem b. tests the program
c. translates the program d. codes the program



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30. The process of walking through a program's logic on paper before you actually write the program is called ____.
- a. desk-checking
c. pseudocoding
b. flowcharting
d. testing
31. What is the problem with the following statement? 100=grade
- a. 100 is not a reasonable grade
c. data types don't match
b. 100 should be in quotes
d. value on the left must be a variable name
32. ____ might be considered the seventh step of the programming process?
- a. testing
c. replacing
b. maintaining
d. converting
33. A variable name is also called a(n) ____.
- a. placeholder
c. constant
b. identifier
d. hexadecimal
34. In some programming languages, programmers must write a variable ____ telling the compiler what data type is expected for the variable.
- a. name
c. decision
b. termination
d. declaratory
35. The following pseudocode is an example of a(n) ____ structure:
- ```
get number;
while number is positive
add to sum
get number
```
- a. sequence  
c. loop  
b. decision  
d. nested
36. The following pseudocode is an example of a(n) \_\_\_\_ structure:
- ```
get number
get another number
if first number is bigger than second then
    print first number
else
    print second number
```
- a. sequence
c. loop
b. decision
d. nested
37. The following pseudocode is an example of a(n) ____ structure:
- ```
get number
get another number
add numbers
print result
```
- a. sequence  
c. loop  
b. decision  
d. nested
38. The following pseudocode is an example of \_\_\_\_.
- ```
do stepA
do stepB
if conditionC is true then
    do stepD
else
    do stepE
endif
while conditionF is true
    do stepG
endwhile
```
- a. nesting
c. posttest
b. stacking
d. pretest



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39. The following pseudocode reads a number from the user, multiplies it by 2, and prints the result. What program statement should replace the ? to make this program functional and structured?

```
start
get inputNumber
while not eof
calculatedAnswer = inputNumber * 2
print calculatedAnswer
?
endwhile
stop
```

- a. no statement is needed
c. get inputNumber

- b. if done then exit
d. print inputNumber

40. What is another name for a loop structure?

- a. execution
c. iteration

- b. selection
d. case

41. You need to calculate the square of a number. What is the input of this problem?

- a. Square of the number
c. Number

- b. Cube of the number
d. Input

42. You need to calculate the area of a rectangle. Length and width of the rectangle are given to you. What are the inputs of this problem?

- a. Area and length
c. Length and width

- b. Width and area
d. Area

43. Debugging is the process of:

- a. Identifying inputs of a problem
b. Removing errors, testing and revising a program to get expected output
c. Identifying output
d. All of the above

44. Assuming that $w = 1$, $x = 2$, $y = 3$, and $z = 4$, the relational expression $z / 2 + w <= y + x - 2$ is evaluated as:

- a. true
c. cannot answer due to lack of data

- b. false
d. invalid expression

45. Assuming that $e = 100$, $f = 101$, $g = 102$, and $h = 103$, the relational expression $+h - 3 <= -f + g - e$ is evaluated as:

- a. True
c. cannot answer due to lack of data

- b. false
d. invalid expression

46. The arithmetic expression $6 * 5 / 3 + 5 * 3 + 2 * 4 * -10 / 2$ is equal to

- a. 65
c. -15

- b. 35
d. -35

47. If $x = -7$ and $y = 7$, what will be the values of x , y , and z after the operation $z = x ++ * --y$?

- a. $z = 49$, $x = -7$, $y = 6$
c. $z = 56$, $x = -6$, $y = 6$

- b. $z = -42$, $x = -6$, $y = 6$
d. $z = -36$, $x = -6$, $y = 7$

48. In $b = 6.6 / a + (2 * a + (3 * c) / a * d) / (2 / n)$; which operation will be performed first?

- a. $6.6 / a$
c. $3 * c$

- b. $2 * a$
d. $2 / n$



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```
49. start
    get age
    if ( ? )
        display "Teenager age"
    endif
stop
```

Consider the code above. If age is between 13 and 19 then it will display "Teenager age". Which of the following statement can be replaced in (?) correctly?

- a. age > 13 AND age < 19
- b. age >=13 AND age <=19
- c. age < 13 AND age > 19
- d. age > 13 between age age < 19

50. Which of the following is equivalent to the following decision?

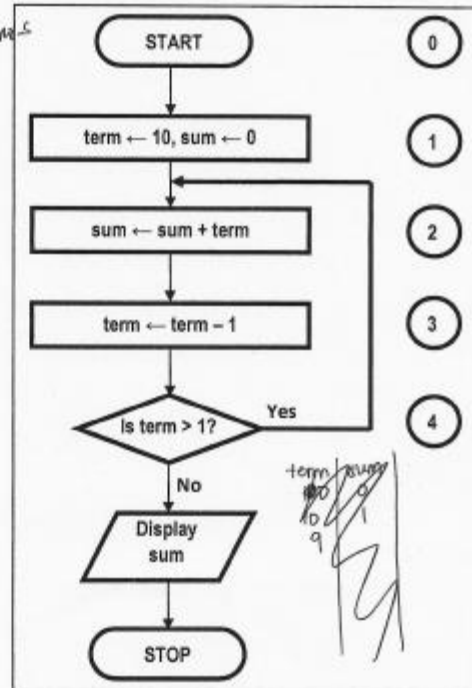
```
if x > 10 then
    if y > 10 then
        display "x"
    endif
endif
```

- a. if x > 10 OR y > 10 then display "x"
- b. if x > 10 AND x > y then display "x"
- c. if x > 10 AND y > 10 then display "x"
- d. if y > x then display "x"

TEST II. FLOWCHART PROFICIENCY.

A. Refer to the flowchart alongside. The numbers shown in circles on the right are labels that will be referred to in the questions below. Answer the following questions.

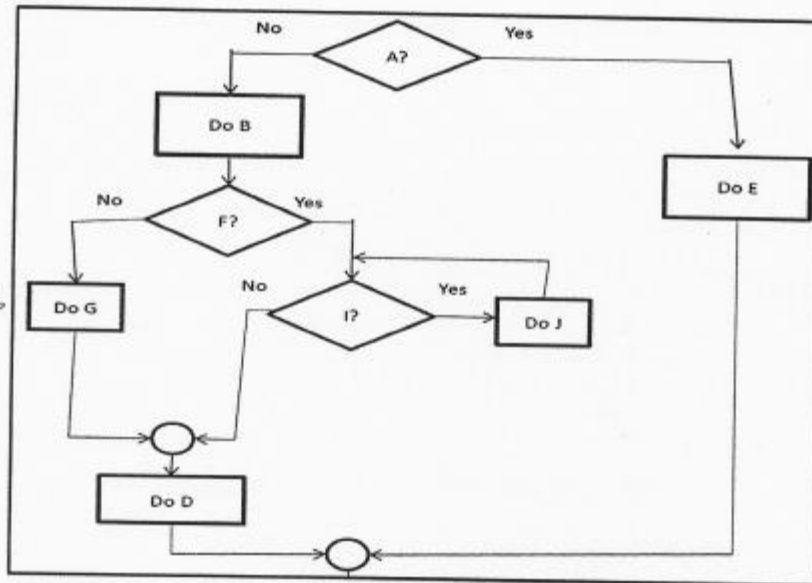
- (a) What does the flowchart do? *Find the sum of terms*
- (b) What is the final value of "sum"?
- (c) Suppose the decision box labeled 4 is changed to: "Is term ≥ 1?" What will be the final value of "sum"?
- (d) In the given flowchart, suppose the boxes labeled 2 and 3 were interchanged. What will be the final value of "sum"?
- (e) In the given flowchart, suppose the arrow originating from label 4 and terminating at link between labels 1 and 2, were moved so as to now terminate at the link between labels 0 and 1. What will be the final value of "sum"?
- (f) Create the trace table for questions (b) and (c).



9
17
24
30
35
39
42
44

B. Translate the following flowchart into pseudocode:

if A then
begin
do E
end
else
begin
do B
end
if F then
while I do
begin
do J
end
end
else
do G
end
do D
and
end

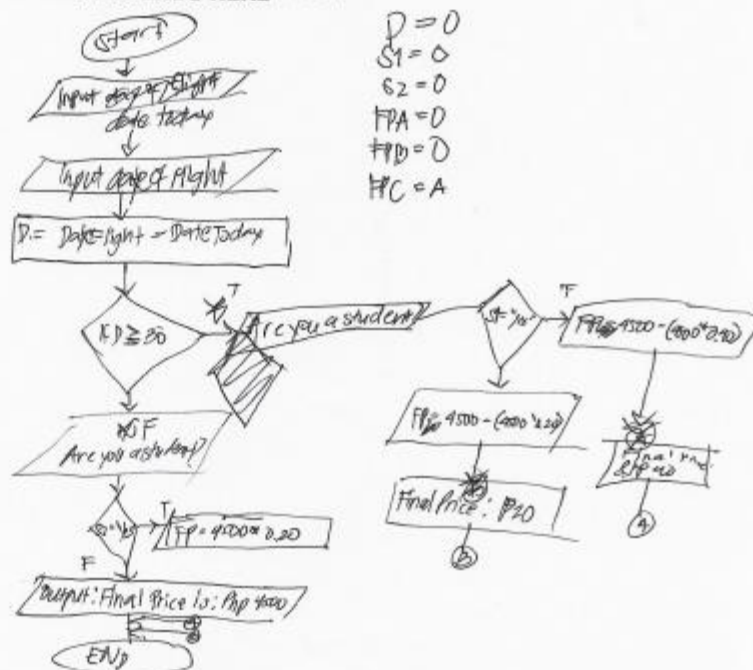


C. The price of a local plane ticket is Php 4,500 by default, but discounts are applied to it based on different criteria. The following rules determine the discount, and hence the final price:

- Students get 20% discount.
- People who purchase in 30 days in advance get 20% discount.

Discount can aggregate, for example a student purchasing 30 days in advance gets a 40% discount. You have to ask the user for input on whether they are a student. Draw a flowchart and pseudocode of your algorithm that will solve the following problem and calculates the final price.

***** TEST ENDS HERE *****





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 College of Engineering
 CMPE 30022 PROGRAMMING LOGIC AND DESIGN
 LONG EXAM 1 ANSWER SHEET

TEST I. MULTIPLE CHOICE:

NAME: VALENZUELA, Carl Alexis Date: Aug 6, 2019
 SECTION: BSCE 1-4 Subject: PLD

SCORE: 44

11	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	31	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	31	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
12	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	32	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	32	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
13	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	33	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	33	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
14	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	34	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	34	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
15	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	35	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	35	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
16	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	36	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	36	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
17	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	37	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	37	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
18	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	38	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	38	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
19	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	39	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	39	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
20	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	40	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	40	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E

1	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	21	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	41	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
2	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	22	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	42	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
3	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	23	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	43	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
4	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	24	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	44	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
5	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	25	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	45	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
6	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	26	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	46	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
7	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	27	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	47	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
8	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	28	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	48	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
9	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	29	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	49	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E
10	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	30	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	50	<input type="radio"/>	A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E

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(f) Trace table for (b)

term	Sum
10	10
9	19
8	27
7	34
6	40
5	45
4	49
3	52
2	54

Trace table for (c)

Term	Sum
10	0
9	10
8	24
7	34
6	40
5	45
4	49
3	52
2	54
1	55

TEST II.

A.

- (a) The flowchart is getting the sum of the variable name term with a starting value of 0, that adds the previous value to the present value of the variable and outputs the sum.
- (b) The final value of "sum" is **54**.
- (c) The final value of "sum" is **95**.
- (d) The final value of "sum" is **44**.
- (e) The final value of "sum" is **0**.
There will be an error executing this program.

B. Pseudocode of the given FCD:

```

if (A) then
  Do E
else
  Do B
  if (F) then
    while (E) then
      Do S
    else
      else
        Do G
  Do D
  
```

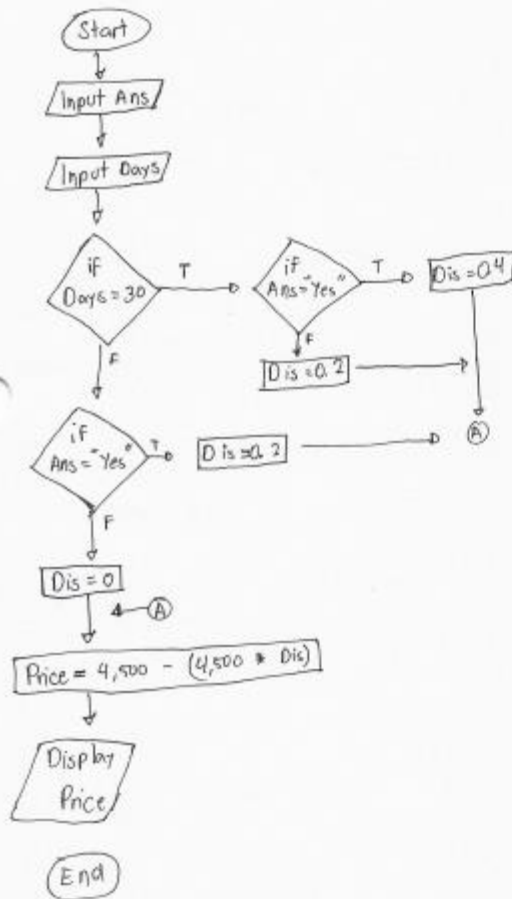


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CMPE 30022 PROGRAMMING LOGIC AND DESIGN
LONG EXAM 1 ANSWER SHEET

C. Flowchart:



C. Pseudocode:

Variables Used:

Days, Dis, and Price are numericals
Ans is string

```
Begin
  Display "Are you a student?"
  Accept Ans
  Display "How many days do you purchase the
  ticket in advanced?"
  Accept Days
  if (Days = 30) then
    if (Ans = "Yes") then
      Dis = 0.4
    else
      Dis = 0.2
  else if (Ans = "Yes") then
    Dis = 0.2
  else
    Dis = 0
  Price = 4,500 - (4,500 * Dis)
  Display "Your ticket Price is ", Price
End
```



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CMPE 30022
JSCANSINO

LONG EXAMINATION 1

1ST SEM SY2019-2020

Name	Section	Score
VALENZUELA, Carl Alexis G.	CSCE 14	

GENERAL INSTRUCTIONS:

- Follow all instructions carefully. Failure to do so will warrant a substantial deduction from your final score. Write everything in non-red ink. No borrowing of pens, erasers etc.
- You are not allowed to leave your seat unless you are through with the exam. If you have any questions, just raise your hand and the instructor or proctor will attend to you.
- Talking to or looking at your seatmate (and his/her paper) is automatically considered as cheating which is subject to very serious sanctions as stipulated in the student handbook.

GOOD LUCK!!!

TEST I. MULTIPLE CHOICE (50). Choose the letter of the BEST answer. Shade the circle corresponding to your chosen answer. Use the provided answer sheet in answering this subtest. **STRICTLY NO ERASURE or ALTERATIONS**

- People, procedures, software, hardware, and data are the five parts of
 - competency system
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 - computer system
 - software system
- Which of the following is an example of connectivity?
 - data
 - Internet
 - hard disk
 - power cord
- Linux is an example of
 - application software
 - operating system
 - browser
 - shareware
- The least powerful, yet the most widely used and fastest-growing type of computer.
 - mainframe computers
 - minicomputers
 - microcomputers
 - supercomputers
- The system component that controls and manipulates data in order to produce information is called the
 - keyboard
 - monitor
 - microprocessor
 - mouse
- These devices translate data and programs that humans can understand into a form that the computer can process.
 - displays
 - output
 - input
 - pointer
- A DVD is an example of a(n)
 - hard disk
 - output device
 - optical disc
 - solid-state storage device
- The smallest unit in a digital system is a
 - byte
 - word
 - bit
 - character
- This type of memory improves processing by acting as a temporary high-speed holding area between the memory and the CPU.
 - RAM
 - cache memory
 - ROM
 - flash memory
- In which digit the value increases in power of two starting with 0 to left of the binary point and decreases to the right of the binary point starting with power -1:
 - Hexadecimal
 - Decimal
 - Binary
 - Octal
- Which system is used in digital computers because all electrical and electronic circuits can be made to respond to the states concept:
 - Hexadecimal number
 - Binary number
 - Octal number
 - Decimal number
- After counting 0, 1, 10, 11, the next binary number is
 - 12
 - 100
 - 101
 - 110.
- The number 1000_2 is equivalent to decimal number
 - one thousand
 - eight
 - four
 - sixteen.

1ST SEM SY2019-2020

PROGRAMMING LOGIC AND DESIGN



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14. The number 100101_2 is equivalent to octal
a. 54 b. 45 c. 37 d. 25
15. The number 178_{10} is equivalent to binary
a. 111 b. 1110 c. 10000 d. 1111
16. The binary equivalent of A_{16} is
a. 1010 b. 1011 c. 1000 d. 1100

For Nos. 17 – 20, Please refer to the given problem below:

Paolo got his Report Card for the Second Semester SY 2018-2019. His grades are as follows: (represented in binary form)

85	ITEFUND	1010101	99	INTPROG	1001010
43	FILIONE	1011101	94	PHILO	1010110
91	ENGCOM1	1000111	79	PHYEDUC	1001111
92	MATHONE	1011100	99	VALUED1	1011110

17. In what subject did Paolo get his highest grade?
a. ITEFUND b. PHYEDUC c. ENGCOM1 d. INTPROG
18. If the passing grade is 1001011_2 , in what subject did Paolo get his lowest grade? What is the grade?
a. ENGCOM1, 70 b. INTPROG, 70 c. INTPROG, 74 d. ENGCOM1, 71
19. What is Paolo's average grade express in decimal form?
a. 84.00 b. 84.25 c. 84.50 d. 84.75
20. To apply for the University's Scholarship, the average grade must be 1011000_2 , will Paolo qualify?
a. yes b. No c. Maybe d. Uncertain
21. A set of instructions that tells the computer how to behave, what to do and derive at a solution to a particular problem is:
a. Algorithm b. Pseudocode c. Programming d. Program
22. A set of logically sequenced instructions that allows to find the solution to a problem is:
a. Algorithm b. Pseudocode c. Programming d. Program
23. The six stages of program development in logical order are:
a. Define, Analyze, Write, Test, Document, Debug
b. Define, Analyze, Develop, Write, Test and Debug, Document
c. Define, Write, Develop, Analyze, Test, Document
d. Define, Develop, Write, Test, Document, Debug
24. Which of the following had executes programming codes line by line, rather than the whole program:
a. Compiler b. Interpreter c. Executer d. Translator
25. The $ch='z'$ would store in ch
a. The character Z b. ASCII value of Z
c. Z along with the single inverted commas d. Both A and B
26. Which of the following is not a character constant?
a. 'Thank You' b. 'quest videos- IT Learning at its best' c. '23.56e-03' d. All of the above
27. The _____ provides pictorial representation of given problem.
a. Algorithm b. Flowchart c. Pseudocode d. All of these
28. _____ is a procedure or step by step process for solving a problem.
a. Algorithm b. Flowchart c. Pseudocode d. All of these
29. After a programmer plans the logic of a program, she will next _____.
a. understands the problem b. tests the program
c. translates the program d. codes the program



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30. The process of walking through a program's logic on paper before you actually write the program is called ____.
- a. desk-checking
 - b. flowcharting
 - c. pseudocoding
 - d. testing
31. What is the problem with the following statement? `100=grade`
- a. 100 is not a reasonable grade
 - b. 100 should be in quotes
 - c. data types don't match
 - d. value on the left must be a variable name
32. What might be considered the seventh step of the programming process?
- a. testing
 - b. maintaining
 - c. replacing
 - d. converting
33. A variable name is also called a(n) ____.
- a. placeholder
 - b. identifier
 - c. constant
 - d. hexadecimal
34. In some programming languages, programmers must write a variable ____ telling the compiler what data type is expected for the variable.
- a. name
 - b. termination
 - c. decision
 - d. declaration
35. The following pseudocode is an example of a(n) ____ structure:
- ```
get number
while number is positive
add to sum
get number
```
- a. sequence
  - b. decision
  - c. loop
  - d. nested
36. The following pseudocode is an example of a(n) \_\_\_\_ structure:
- ```
get number
get another number
if first number is bigger than second then
print first number
else
print second number
```
- a. sequence
 - b. decision
 - c. loop
 - d. nested
37. The following pseudocode is an example of a(n) ____ structure:
- ```
get number
get another number
add numbers
print result
```
- a. sequence
  - b. decision
  - c. loop
  - d. nested
38. The following pseudocode is an example of \_\_\_\_.
- ```
do stepA
do stepB
if conditionC is true then
do stepD
else
do stepE
endif
while conditionF is true
do stepG
endwhile
```
- a. nesting
 - b. stacking
 - c. posttest
 - d. pretest



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39. The following pseudocode reads a number from the user, multiplies it by 2, and prints the result. What program statement should replace the ? to make this program functional and structured?

```
start
get inputNumber
while not eof
calculatedAnswer = inputNumber * 2
print calculatedAnswer
?
endwhile
stop
```

- a. no statement is needed
c. get inputNumber
- b. if done then exit
d. print inputNumber
40. What is another name for a loop structure?
a. execution
c. iteration
- b. selection
d. case
41. You need to calculate the square of a number. What is the input of this problem?
a. Square of the number
c. Number
- b. Cube of the number
d. Input
42. You need to calculate the area of a rectangle. Length and width of the rectangle are given to you. What are the inputs of this problem?
a. Area and length
c. Length and width
- b. Width and area
d. Area
43. Debugging is the process of:
a. Identifying inputs of a problem
b. Removing errors, testing and revising a program to get expected output
c. Identifying output
d. All of the above
44. Assuming that $w = 1$, $x = 2$, $y = 3$, and $z = 4$, the relational expression $z / 2 + w \leq y + x - 2$ is evaluated as:
a. true
c. cannot answer due to lack of data
- b. false
d. invalid expression
45. Assuming that $e = 100$, $f = 101$, $g = 102$, and $h = 103$, the relational expression $++h - 3 \leq --f + g - e$ is evaluated as:
a. True
c. cannot answer due to lack of data
- b. false
d. invalid expression
46. The arithmetic expression $6 * 5 / 3 + 5 * 3 + 2 * 4 * -10 / 2$ is equal to
a. 65
c. -15
- b. 35
d. -35
47. If $x = -7$ and $y = 7$, what will be the values of x, y, and z after the operation $z = x ++ * --y$?
a. z=49, x = -7, y =6
c. z- 56, x = -6, y = 6
- b. z = -42, x = -6, y =6
d. z = -36, x = -6, y = 7
48. In $b = 6.6 / a + (2 * a + (3 * c) / a * d) / (2 / n)$; which operation will be performed first?
a. 6.6 / a
c. 3 * c
- b. 2 * a
d. 2 / n



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```
49. start
    get age
    if ( ? )
        display "Teenager age"
    endif
stop
```

Consider the code above. If age is between 13 and 19 then it will display "Teenager age". Which of the following statement can be replaced in (?) correctly?

- a. age > 13 AND age < 19
- b. age >=13 AND age <=19
- c. age < 13 AND age > 19
- d. age > 13 between age age < 19

50. Which of the following is equivalent to the following decision?

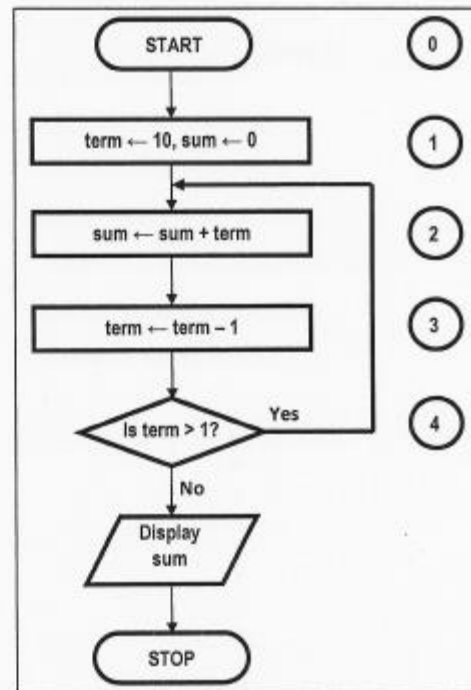
```
if x > 10 then
    if y > 10 then
        display "x"
    endif
endif
```

- a. if x > 10 OR y > 10 then display "x"
- b. if x > 10 AND x > y then display "x"
- c. if x > 10 AND y > 10 then display "x"
- d. if y > x then display "x"

TEST II. FLOWCHART PROFICIENCY.

A. Refer to the flowchart alongside. The numbers shown in circles on the right are labels that will be referred to in the questions below. Answer the following questions.

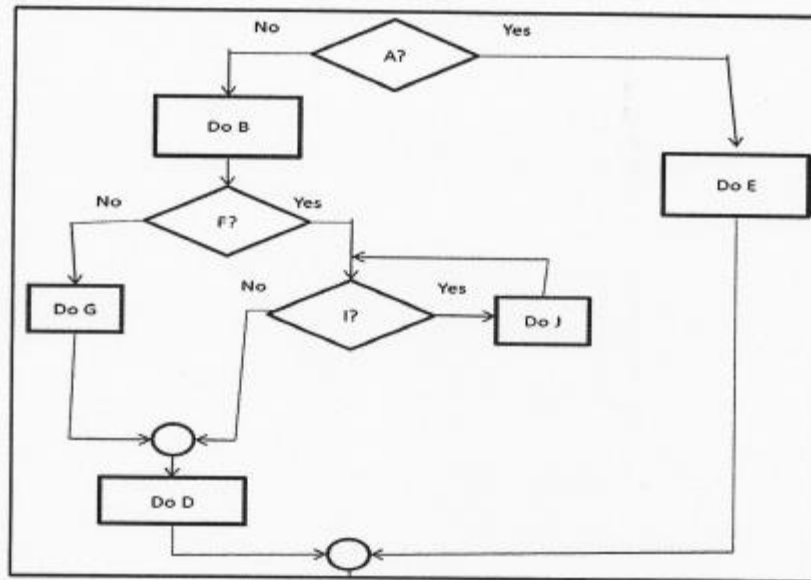
- (a) What does the flowchart do?
- (b) What is the final value of "sum"?
- (c) Suppose the decision box labeled 4 is changed to: "Is term \geq 1?" What will be the final value of "sum"?
- (d) In the given flowchart, suppose the boxes labeled 2 and 3 were interchanged. What will be the final value of "sum"?
- (e) In the given flowchart, suppose the arrow originating from label 4 and terminating at link between labels 1 and 2, were moved so as to now terminate at the link between labels 0 and 1. What will be the final value of "sum"?
- (f) Create the trace table for questions (b) and (c).





B. Translate the following flowchart into pseudocode:

Begin
 Variables Use
 if (A) then
 Do E
 else
 Do B
 if (F) then
 while (I) then
 Do J
 else else
 Do G
 else
 Do D



C. The price of a local plane ticket is Php 4, 500 by default, but discounts are applied to it based on different criteria. The following rules determine the discount, and hence the final price:

- Students get 20% discount.
- People who purchase in 30 days in advance get 20% discount.

Discount can aggregate, for example a student purchasing 30 days in advance gets a 40% discount. You have to ask the user for input on whether they are a student. Draw a flowchart and pseudocode of your algorithm that will solve the following problem and calculates the final price.

Start
 ***** TEST ENDS HERE *****
 Input Answer1
 Input Answer2
 If Answer1 = "Yes" 20%
 If Answer2 = 30 20%