



Provincial Department of Education - NWP

Second Term Test - Grade 12 - 2020

Index No : Information and Communication Technology I Two - Hours

Instructions:

- Answer all the Questions
- Write down your index number in the space provided in the answer sheet.
- In each of the questions 1 to 50, pick one of the alternative from (1), (2), (3), (4), (5) which is correct or most appropriate and mark your response on the answer sheet with a cross (×).

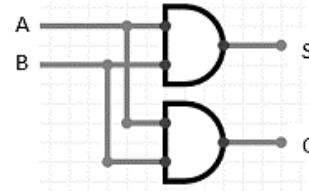
- The correct sequence of the steps of the data processing life cycle is given by,
 - Data processing, Data gathering, Data storing, Data output, Data validation.
 - Data gathering, Data processing, Data storing, Data validation, Data output
 - Data gathering, Data Validation, Data processing, Data output, Data storing
 - Data Validation, Data gathering, Data storing, Data processing, Data output
 - Data Validation, Data gathering , Data processing, Data storing, Data output
- A memory that provides only the sequential access to its data.
 - Cache memory
 - Random Access Memory
 - Magnetic tapes
 - Compact disk
 - Memory Registers
- What is the number equivalent to $3EB_{16}$,
 - 1253_8
 - 7755_{10}
 - 111110101_2
 - 753_8
 - 10101101011_2
- What is the decimal number equivalent to 11011001.101_2 ?
 - 271.65
 - 725.265
 - 217.625
 - 752.62
 - 1725.625
- What is the answer that contains the 8 bit 2's complement values of -13_{10} and 17_{10} respectively,
 - 11110010 , 00010001
 - 11111101 , 00010010
 - 11110011 , 00010010
 - 00001101 , 00001001
 - 11110011 , 00010001
- What is the decimal number equivalent to 1100101_2 ?
 - 145
 - 101
 - 154
 - 135
 - 121

07. Select the standard logical expression from the logical expressions given below.
 $A - Q = AB + ABC + BC$
 $B - Q = ABC + A'BC + AB'C$
 $C - Q = (A+B+C) (A+B'+C) (A+C')$
 1. A Only 2. B Only 3. C Only 4. A and B Only 5. B and C Only
08. What is the most suitable operating system for an automatic diagnosing system?
 1. Single user-single task 2. Single user-Multi task
 3. Real time 4. Multi user-multi task
 5. Multi user-single task
09. In File management, there are three methods that the operating system uses to allocate its file space.
A. Contiguous allocation **B.** Index allocation **C.** Linked allocation
 Among above, what is the method that external fragmentation won't affect?
 1. When using method A only. 2. When using A and B methods only.
 3. When using A and C methods only. 4. When using B and C methods only.
 5. None of the above methods
10. What is the IP address that is not belongs to private IP range among the IP addresses given below?
 1. 10.16.0.100 2. 172.30.50.200 3. 172.31.16.5
 4. 192.169.0.1 5. 192.168.05.01
11. A method that can be used to check the answers of the Multiple choice questions (MCQ) .
 1. Magnetic ink character recognition(MICR)
 2. Optical Character recognition(OCR)
 3. Magnetic tape reader
 4. Barcode reader
 5. Optical mark reader(OMR)
12. Use of online office packages(software's) is belongs to,
 1. WWW 2. Internet 3. IaaS 4. SaaS 5. PaaS
13. What is the hexadecimal value equivalent to the number 374_8 .
 1. $A7B_{16}$ 2. 374_{16} 3. DB_{16} 4. FC_{16} 5. EC_{16}
14. What is the correct statement that include the advantages/disadvantages of the ADSL/DSL connections among the statements given below?
A - DSL connection transmits the data without any data impairments.
B - ADSL connections provided in the normal price range
C - It is easy to set up a DSL connection as well as the correct the errors occurs.
D - ADSL connection provides a high speed internet connection and it allows high speed internet access to the users.
 1. A,B 2. A, B,C 3. A,C,D 4. B C D 5. All A, B, C,D

15. What is the decimal number equivalent to $4D5_{16}$?
1. 483
 2. 825
 3. 1237
 4. 1325
 5. 4135
16. Which one of the given below is not a task of an operating system.
1. Process management
 2. Memory management
 3. Providing graphical user interface
 4. File management
 5. Detecting virus
17. A person is trying to steal the user name and password of a company in order to access its information system. To what kind of threat this activity is belongs to?
1. Piracy
 2. phishing
 3. Violating intellectual property laws
 4. virus
 5. unauthorised access
18. Consider the statements regarding the software licences given below. Select the correct statements form them.
- A** – Users get the right of the licensed software.
B – Programme codes are hidden in the license software.
C – Open sources software are free to change and re distribute.
1. B and C only
 2. A and B only
 3. B only
 4. C only
 5. All A,B and C
19. What is the answer that contains the least significant number (LSD) and most significant number (MSD) of 1005.022 respectively?
1. 0 and 2
 2. 2 and 1
 3. 5 and 2
 4. 0 and 5
 5. 0 and 1
20. What is the 2's complement of (-68) ?
1. 1000100
 2. 10111011
 3. 11100101
 4. 10111100
 5. 10100100
21. When using the online registration method for the universities, it is compulsory to enter the private and academic details of the students. What is the most suitable data validation method to be used for this situation?
1. Range check
 2. Format check
 3. Presence check
 4. Data type check
 5. Value check
22. What is the answer of $66_8 - 12_{10}$?
1. 54_8
 2. 41_{10}
 3. 45_8
 4. 50_{10}
 5. 52_8
23. What is the main objective of partitioning a hard disk?
1. Giving more space in the hard disk for the document files
 2. Ease of creating directories and sub directories
 3. Ability to keep the operating system and program files separately
 4. Ease of getting file backups
 5. Ability to store secret documents in a separate place

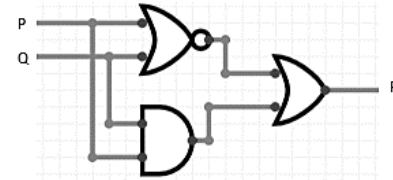
24. What is the incorrect statement about the below logic circuit which take A, B as input and C, S as output?

1. When $A = 1$ and $B = 1$, the output is $C = 1, S = 0$
2. When $A = 1$ and $B = 0$, the output is $C = 0, S = 1$
3. When $A = 0$ and $B = 1$, the output is $C = 0, S = 1$
4. When $A = 0$ and $B = 1$ the output is $C = 0, S = 0$
5. When $A = 0$ and $B = 0$ the output is $C = 0, S = 0$



25. If $P = 1100$ and $Q = 0101$ then the value of the output (R) is,

1. 1111
2. 1101
3. 0110
4. 0000
5. 1100



26. The boolean expression $f_{(ABC)} = A'B + ABC + A'C$ is expressed in the standard SOP form, it is given as,

1. $f_{(ABC)} = A'BC + AB'C + ABC + AB'C' + A'CB'$
2. $f_{(ABC)} = A'BC + A'BC' + ABC + A'BC + A'CB'$
3. $f_{(ABC)} = A'BC + ABC' + ABC + A'BC + A'CB$
4. $f_{(ABC)} = A'BC + A'BC' + ABC + A'BC + ACB'$
5. $f_{(ABC)} = A'BC + A'BC' + AB'C + A'BC' + A'CB'$

27. One of the given below cannot be found in a batch processing system.

1. Data gathered as batches and then processed.
2. Huge amount of data is processed once.
3. Same execution proceed on data and then processed.
4. For processing, No need to have same type of data.
5. Limited interaction between user and the processor.

28. Select the answer that contains the correct groups that is used in K/Map.

A

		AB	00	01	11	10
C	0		1	0	0	0
	1		1	1	1	0

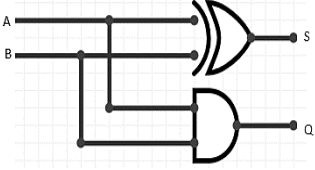
B

		AB	00	01	11	10
C	0		1	1	0	1
	1		0	0	0	1

C

		AB	00	01	11	10
C	0		1	0	0	0
	1		1	1	1	0

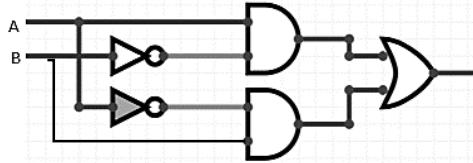
1. A and B only
2. A and C only
3. B and C only
4. All A, B, C are correct
5. Above all A, B, C are incorrect

29. Consider the below statements regarding the files created in a computer.
- A-** File is a liner sequence of bits.
 - B-** Logical view of a file is the way that users see the file.
 - C-** Physical view of a file is the way that a file is stored in the secondary storage
 - D-** Each file has two parts as file name and the file extension.
- What are the correct statements from the above?
1. A, B
 2. B, C
 3. A, C
 4. B,D
 5. All of the above
30. When the Boolean expression $f_{(ABC)} = (A+B+C') (A'+B+C) (A'+B'+C)$ is expressed in standard POS form, it is given as ,
1. $f_{(ABC)} = (A'B'C') + (A'BC') + (A'BC) + (AB'C) + (ABC)$
 2. $f_{(ABC)} = (A'B'C') + (A'B'C) + (AB'C') + (A'BC') + (ABC)$
 3. $f_{(ABC)} = (A'BC') + (A'B'C) + (ABC') + (A'BC') + (ABC)$
 4. $f_{(ABC)} = (A'B'C') + (A'B'C) + (AB'C') + (A'BC') + (ABC)$
 5. $f_{(ABC)} = (A'B'C') + (AB'C) + (AB'C') + (A'BC') + (ABC)$
31. The first digital computer which is executed using stored programs is known as,
1. ENIAC
 2. MARK1
 3. ABC computer
 4. UNIVAC
 5. EDVAC
32. What is the incorrect statement regarding the world wide web (WWW) from the statements given below.
1. HTTP is the file transfer protocol used in World Wide Web.
 2. For every web site in World Wide Web has a unique web address and it is called internet protocol address (IP address).
 3. Web browser is used to go through the files in web sites.
 4. There can be several web pages in a web site
 5. World Wide Web was initiated in 1991.
33. The values of the A and B inputs are given below. What is the answer that contains the values of the output S and Q respectively of the logical circuit given below?
- A – 0010
B – 0101
- 
1. S – 0101
Q – 0011
 2. S – 0110
Q – 0001
 3. S – 0011
Q – 1100
 4. S – 1001
Q – 1000
 5. S – 1001
Q – 0001
34. In 1890 used punch card concepts to invent
Most suitable words that can be used to fill in the blanks are,
1. Joseph jacquard, Electrical weaving loom
 2. Charles Babbage , Analytical Engine
 3. Howard Aiken, Mark 1
 4. Blesie Pascal, Adding Machine
 5. Herman Hollerith, Electric Mechanical Calculator

35. The software that comes under system software category are,
1. Application software, Operating system, Translators
 2. Operating system, Utility software, General purpose software
 3. Application software, Utility software, Translators
 4. Operating system, Utility software, Translators
 5. Operating system, Application software, Utility software

36. A logic gate that can be used to represent the given logic circuit is,

1. NAND
2. NOR
3. XNOR
4. NOT
5. XOR



37. A memory that synchronizes with the computers system clock.
1. SRAM
 2. DRAM
 3. SDRAM
 4. CMOS
 5. EPROM
38. Data input process is taken place at the moment of the transaction is taking place. This statement is relevant to ,
1. Indirect data input
 2. Direct data input
 3. Offline data input
 4. In the above all 1,2,3 situations.
 5. Online data input
39. The correct statement /statements that include the tasks of the cache memory is/ are,
- A** – It stores the instructions temporarily that are used frequently when executing the programs.
- B** – Level 1 cache memory has the highest speed but less capacity than other two levels.
- C** – Level 3 cache memory has the highest speed and the high capacity than other two levels.
1. A Only
 2. B Only
 3. C Only
 4. A and B Only
 5. A and C Only
40. Who is the developer of the world wide web (WWW) ?
1. Mark Zuckerberg
 2. Tim Berners Le
 3. Steve Jobs
 4. Howard Aiken
 5. No Exact person
41. The idea given by the golden rule of the information is ,
1. The value of the information is increasing with the time.
 2. The value of information is very low at the moment it is created.
 3. It is a graphical representation of data Vs information
 4. The value of information remaining constant after it is created
 5. The value of information is decreasing with the time
42. What is the incorrect statement from the Boolean expressions given below?
1. $A + A = A$
 2. $A + 1 = A$
 3. $A \cdot 0 = 0$
 4. $A + 0 = A$
 5. $A \cdot 1 = A$

43. When using a karnaugh map for simplifying a logical expression, the correct statement /statements regarding that logical expression are,

A – It should be standard logical expression

B - It should be in Sum of product (SOP) form.

C – It should be in product of sums (POS) form

- 1 A only 2. B only 3. C only 4. A and B only 5. A and C only.

- An Education institute uses several networks and for its one network it is using subnet mask as 255.255.255.240 and one of given host in the particular network IP is 222.1.1.1.

Use the above statement to answer the questions from 43 to 45.

44. What is the class that the IP address of the network belongs to ?

1. Class A 2. Class B 3. Class C 4. Class D 5. Class E

45. How many subnets belong to above network?

1. 16 2. 60 3. 14 4. 30 5. 32

46. The number of bits allocated for the subnets and hosts in the subnet mask respectively,

1. 8,0 2. 6,2 3. 2,6 4. 4,4 5. 1,7

47. What is the suitable broadcast address for a subnet which the IP address is 192.168.0.1 and subnet mask is 255.255.255.248?

1. 255.255.255.0 2. 192.168.0.7 3. 192.168.0.0
4. 255.255.0.0 5. 192.168.0.1

48. What is the last host IP address of a subnet that contain a IP address 192.168.0.1/27?

1. 192.168.0.30 2. 192.168.0.15 3. 192.168.0.7
4. 192.168.0.63 5. 192.168.0.127

49. What is the Application layer protocol used to transfer a short message?

1. SMTP 2. FTP 3. HTTP 4. TFTP 5. TTL

50. What is the method of communication that is used in “Walkie-Talkie”?

1. Simple 2. Half Duplex 3. Full Duplex 4. Parallel 5. None of the above

Index No : Information and Communication Technology II Three Hours

Part –A - Structured essay

- Answer all four questions on the paper itself**

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- The diagram illustrates the Von-Neumann architecture with the following components and data flow:
- Control Unit:** The central processing component.
 - Main Memory:** The storage component for data and instructions.
 - I/O Devices:** Represented by a box on the right, connected to the Main Memory.
 - Step 1:** Fetch instruction from memory. An arrow points from Main Memory to the Control Unit.
 - Step 2:** An arrow points from the Control Unit to the I/O Devices.
 - Step 3:** An arrow points from the I/O Devices to the Control Unit.
 - Step 4:** An arrow points from the I/O Devices to Main Memory.

- (i) Type check

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-

(iii) Range check

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(c) Briefly explain the difference between open source software and proprietary software

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(d) Give 02 advantages of using multi core processors in present computers.

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2) (a) Write 8 bit representation of one's complement of -19.

(b) Write 8 bit representation of two's complement of -19.

(c) Calculate $28 + (-19)$ using 8bit two's complement.

(d) Simplify,

I) $11001_2 + 10111_2$

II) $1011010_2 + 10111_2$

III) 10100_2 OR 1101_2

IV) 10011_2 XOR 11100_2

3) Processes management can be taken as one of the main functions of an operating system.

(a) What is meant by process transition?

(b) Briefly state the function of process control block.

(c) State three information which are kept by a process control block.

(d) I) State the function of context switch and briefly explain the importance of process control block for it.

II) A computer has 32 bit virtual memory and a capacity of a page is 16 KB. Find the number of pages in the virtual memory.

4) a). 1. Explain the function of following commands used in network testing

i. tracert –

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ii. Ping –

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iii. Ipconfig -

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b) What is Modulation? Provide a brief description.

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c) What is a MAC address?(Give an example)

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d) Explain the guided media and unguided media with two examples for each.

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e) Write the difference between Symmetric key encryption and Asymmetric key encryption.

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Second Team Test – 2020

Information Communication Technology -12 – Part II

Important:

- Answer only four questions in the part – B
- Part – B - Essay

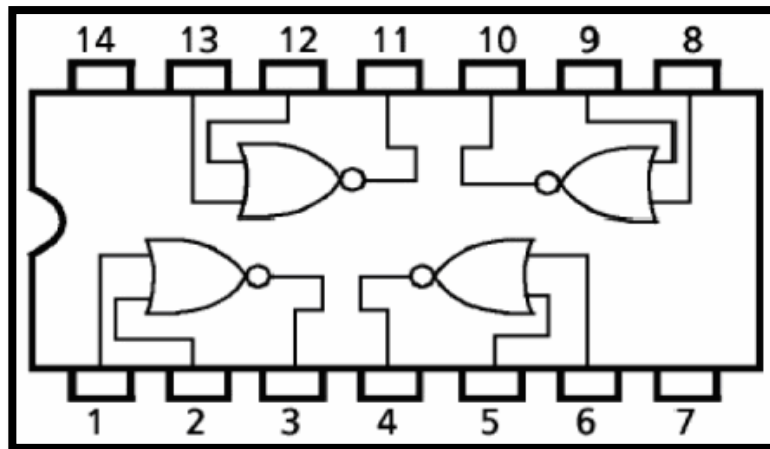
Part B

Essay

01. NWPSS is an organization that keeps valuable items of their customers in an electronic safe complex for the safety. The lock (L) of a safe can either be in locked or unlocked states represented by logical truth values 0 and 1 respectively. This lock has three different key holes L1, L2 and L3 each with a unique key. These three keys are in the custody of three people in the NWPSS, L1 is with the owner of the item (customer) and the other two keys are with the chief executive officer and the Head of the NWPSS organization.

The lock opens when the key of the customer (L1) and at least one key of the other two keys are inserted in to the corresponding key holes. The situation where the corresponding key is properly inserted into any key hole is represented by the logical truth value 1 and all the other situations are represented by the logical truth value 0.

Answer the questions given below assuming that only the following integrate circuit is available.



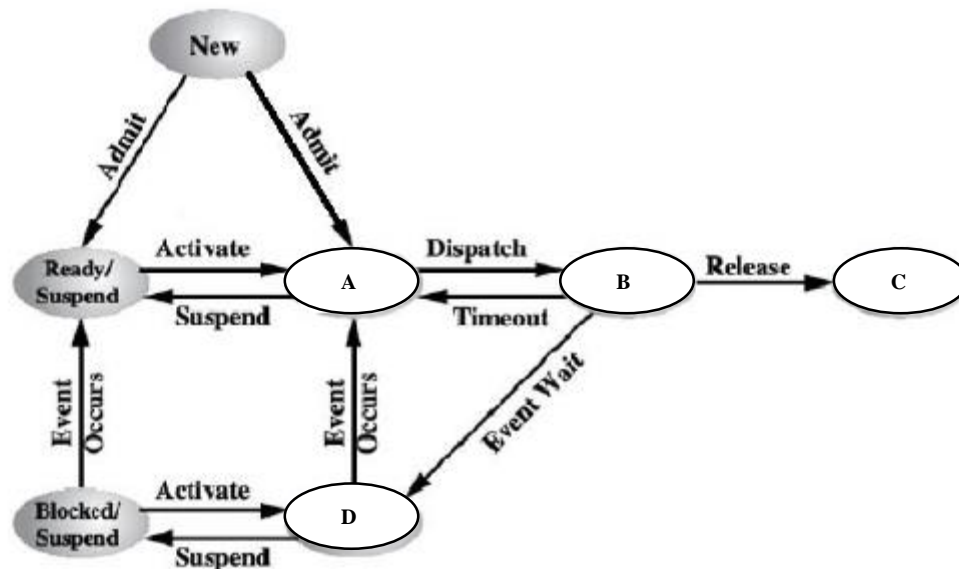
- a) Develop a truth table to show all possible instances of operating the safe to open it. (Show the relevant inputs and the outputs clearly).
- b) State the Boolean logic expression for the truth table to show all possible instances of opening the safe.
- c) Simplify the above part (b) Boolean logic expression only using Boolean algebra. (State the relevant Boolean algebraic rules used for simplification)
- d) Construct the logic circuit for the simplified Boolean logic expression to operate the lock of the safe. (Consider only the given integrated circuit should be used)

02.

 - I. Convert the number A58₁₆ into a binary equivalent and an octal equivalent.
 - II. Convert the binary number 10110.101 into,
 - a) Decimal equivalent
 - b) Octal equivalent
 - III. Simplify
 - a) $10110_2 + 1011_2 + 111_2$
 - b) $11001_2 - 101_2$
 - IV. Convert the number 723 into,
 - a) Binary equivalent
 - b) Octal equivalent
 - c) Hexadecimal equivalent
03.

 - I. Name 04 main components of a modern computer system and briefly describe them.
 - II. Write the 03 main parts of the computer memory and briefly describe one of them.
 - III. “Utility software help to improve the efficiency of a computer.” Name 02 examples for utility software.
 - IV. The use of CRT monitors has rapidly decreased in the present society. State 03 reasons that affect for this.
 - V. A student of grade 12 states that buying a DVD – RW is more profitable than DVD – RAM Write the reasons for this statement.
04.

 - I. Process is basic concept in the modern operating system. What is meant by the term “process”?
 - II. Different factors affect to the process creation and process termination. Introduce what is meant by process management?
 - III. A diagram used to show the process states which can be seen in the process management of an operating system is given below Write the terms suitable to fill the blanks A,B,C and the D in the diagram.



IV. Briefly explain the function of process schedulers and name the types of process schedulers.

V. Assume you have a system with three processes (X, Y, and Z) and a single CPU. A priority-based scheduler runs so that the scheduler runs the highest priority job first. Process X has the highest priority, process Z has the lowest, and Y is in the middle. Indicate the state of the specified process using the states A,B and C in part (iii) above according to the nature of the process X, Y and Z in the following instances.

- Process X is loaded into memory and begins. Process X is in which state here?
- Process X creates Process Y. State the states of process X and the process Y.
- The running process issues an Input / Output request to the disk. What are the states of process X and the process Y?
- Process Y creates Process Z. What are the states of processes X, Y and the Z here?

05. There are four labs (A, B, C, D) in an institute which offers higher diploma education courses on Information Technology. IP address 192.168.12.0/24 has been received with it.

COMPUTER LAB	USAGE	NUMBER OF COMPUTERS
A	Computer diploma(Basic)	20
B	Computer programming	40
C	Graphics designing	45
D	Web developing	35

- The network administrator intends to connect computer laboratories to a network as four separate subnets having an equal number of nodes. Draw a suitable network diagram that illustrates the desired computer network. (No need to show each computer in the subnets)
- Complete the following table using the Network address, Broadcast address, and the usable IP address ranges of devices in each subnet.

SUBNET	NET ADDRESS	BROADCAST ADDRESS	IP RANGE
A			
B			
C			
D			

- Mention a disadvantage occurs if all computers are networked together without sub netting.

06. University grant commission has decided to change the manual system of registering the selected applicants of the University for Different Courses into an online university registration system.

Applicants have to create a user account in the web site of the University grant commission to apply for the university admission. A message is sent mentioning it, to the applicant's mobile number and the e mail after creating the user account properly. After that, the user can log into the account and the application can be downloaded for the registration.

GCE O/L results and the GCE A/L results of the applicants are also separately displayed in the application from the system. A list of all courses which can be applied according the qualifications and the streams followed by the applicants is displayed. Applicants are allowed to select and remove the courses from that list according to their priority order. And also the priority order can be changed until the closing date of the application.

It is believed that the efficient selection of large number of applicants for the suitable courses for different universities in a short period of time with minimum errors could be done using this system. The system allows getting a copy of completed application. As soon as submitting the completed application online, a message is sent to the mobile number and the e mail of the applicant.

An extra selection test is held for some of the courses by each university. An examination fee is charged for it and it can be paid to the university bank account from a branch of a bank.

- I. Introduce, what is an information system?
- II. Write three advantages of using this information system.
- III. Give three functional requirements in the suggest system.
- IV. Give four nonfunctional requirements in the suggest system.
- V. State two methods which could be used to pay the examination fee of the applicants for extra selection tests.