Multiverse Victory Project - 2025

MVP 2024
MULTIVERSE VICTORY PROJECT

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General Certificate of Education (Adv. Level) Examination, August 2025

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Information & Communication Technology II

20 **E** **II**

Model Paper 01

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Three hours

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Additional Reading Time - 10 Minutes

Use **additional reading time** to go through the question paper, select the questions and decide on the questions that you give priority in answering.

ITsphere

Index No: .....

Important :

- *This paper consists of **14 pages.***
- *This question paper comprises of two parts, **Part A** and **Part B.** The time allotted for **both parts** is **three hours.***
- *Use of calculators is **not allowed.***

Part A – Structured Essay:

(pages 2 – 6)

- *Answer all the questions **on this paper itself.** Write your answers in the space provided for each question. Note that the space provided is sufficient for your answer and that extensive answers are not expected.*

Part B – Essay

(pages 7 – 8)

- *This part contains **six questions**, of which, **four** are to be answered. Use the papers for this purpose.*
- *At the end of the time allotted for this paper, tie the **two parts together** so that **Part A** is **on top** of **Part B** before handing them over to the Supervisor.*
- *You are permitted to remove **only** **Part B** of the question paper from the Examination Hall.*

For Examiner's Use Only

For the Second Paper		
Part	**Question No.**	**Marks**
A	**1**	
	2	
	3	
	4	
B	**1**	
	2	
	3	
	4	
	5	
	6	
Total		

Final Marks

In Numbers	
In Words	

Code Number

Marking Examiner 1	
Marking Examiner 2	
Marks Checked by	
Supervised by	

Part A – Structured Essay

*Answer **all four** questions on this **paper itself.***

1. (a) Convert the octal number 7401 to Binary.

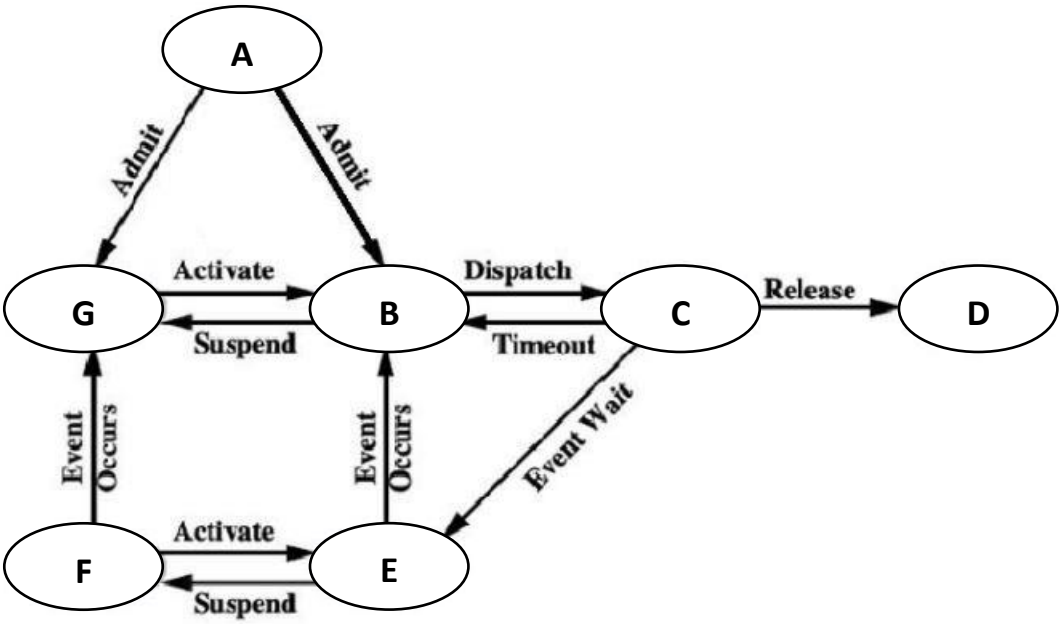
(b) Perform the following 2's complemented binary subtractions and provide the decimal value.

(i) 01000 – 01001

(ii) 01100 – 00011

(c) Add 20 and (-15) using 2's complement.

2. (a) Consider the following diagram.



Write down the most appropriate process state for each blank.

A - …….

B - …….

C - …….

D - …….

E - ……

F - ……

G - ……

(b) "A process can be moved to state E during a process execution". Do you agree with this statement?

(c) Describe why is a process moved to the state "E" and how it happens during an execution.

3. (a) What is a Firewall in Computer Network?

(b) A computer network in a MAN consists of two subnetworks and each subnetwork consists of 3 hosts. The network is facilitated with internet and creates IP addresses for each host automatically. Draw the network diagram for the above scenario.

(c) List three disadvantages of a computer network.

4. (a) List three differences between manual data processing and automated data processing.

(b) Briefly describe following terms.

(i) Data type check

(ii) Presence check

(iii) Range check

(c) Data can be gathered using many techniques. Write down 3 ways of fact-finding techniques.

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තොරතුරු හා සන්නිවේදන තාක්ෂණය II Information & Communication Technology II	20	E	II	Model Paper 01

Part B

❖ *Answer any **four** questions only.*

1. (a) Describe the difference between data and information.

(b) Briefly describe the batch processing and real time processing.

(c) Briefly explain following terms.

(i) Mobile communication

(ii) Mobile computing

(d) Explain how ICT helps in education system based on following categories.

(i) Simulations

(ii) Distance Learning

(iii) Individualized Learning

2. (a) Briefly explain the following solid-state storages and the technologies use.

(i) HDD

(ii) SSD

(b) Explain Sequential Access and Random Access. Draw a sketch to provide how each access happens.

(c) List characteristics and technologies used in following printers.

(i) Dot matrix printer

(ii) Inkjet printer

(iii) Laser printer

(iv) Graphic plotter

(d) Draw the fetch – execute cycle and briefly describe each unit.

3. Consider the following problem.

A chemical process gives out a warning signal (W = 1) when the process operates incorrectly. A logic circuit (network) is used to monitor the process and to determine whether W = 1.

INPUTS	BINARY VALUES	Description of plant status
C	**1**	Chemical rate = 20 litres/second
	0	Chemical rate < 20 litres/second
T	**1**	Temperature = 91ºC
	0	Temperature > 91ºC
X	**1**	Concentration > 5M
	0	Concentration = 5M

A warning signal (W = 1) will be generated if:either (I) Chemical rate < 20 litres/second

or (II) Temperature > 91ºC and Concentration > 5M

or (III) Chemical rate = 20 litres/second and Temperature > 91C.

(a) Draw the logic circuit and truth table to show all the possible situations when the stop signal could be received.

(b) Obtain the Boolean expression from the truth table and simplify it using Boolean algebraic laws. (Show all the **laws and theorems** used.)

(c) Draw a logic circuit for the simplified Boolean expression using **only NAND** gates.

4. (a) Describe the following terms.

(i) Long – term scheduler

(ii) Medium – term scheduler

(iii) Short – term scheduler

(b) Calculate the wastage in a text file space due to incomplete filling of the last cluster for a file size of 16 800 bits. Assume that a cluster has a size of 512 bytes).

(c) Copy down the following table and provide three differences.

Long – Term Scheduler	Medium – Term Scheduler	Short – Term Scheduler

5. Perform the following calculations.

(a) Show 108.625 decimal number in IEEE standard.

(b) Copy the following table to provide your answers.

	Type of device	**Usage**
Light Pen		
Multimedia Projector		
USB		
GPU		

(c) Briefly describe the utility software and provide two examples.

6. Following bit patterns are representing some portion of digital data. Draw the encoding patterns according to each technique.

	0	1	0	1	1	1	0	1	0	0	0	1	0	1	1
Bipolar - AMI															
NRZ_L															
NRZ-I															
Manchester															
Differential Manchester															

(b) What is analog modulation and write 3 analog modulation techniques.

(c) What is Multiplexing and list 2 advantages of Multiplexing.