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Gampaha Education Zone

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Second Term Evaluation - 2025

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Grade

12

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Subject

Information and Communication Technology II

PART B

PART B - Essay

- **Answer any four questions.** There are 4 pages

5. Consider the following scenario related to degree programs.

(a). Draw an Entity-Relationship (ER) diagram to represent this scenario. Clearly indicate the entities, their attributes, and primary keys. If you make any assumptions, state them clearly.

A newly established university by the government consists of four faculties:

- Faculty of Education
- Faculty of Science
- Faculty of Information Technology
- Faculty of Social Sciences

Each faculty can offer one or more degree programs. The Faculty of Education and the Faculty of Science offer Bachelor of Education and Bachelor of Science degree programs, respectively.

However, the Faculty of Information Technology offers two degree programs:

- Bachelor of Science in Information Technology
- Bachelor of Science in Software Engineering

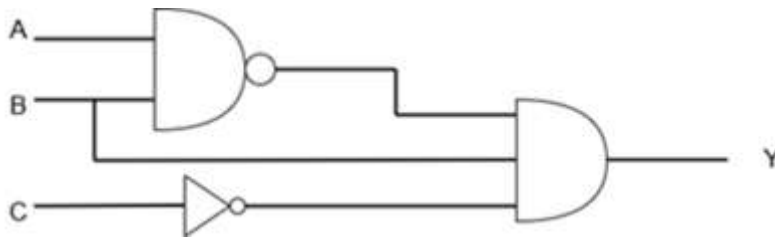
The Faculty of Social Sciences offers a Bachelor of Arts degree. The entire course fee for a degree program must be paid by students at the time of registration. These fees vary between different degree programs.

A student can enroll in only one degree program at a time. Each degree program consists of two types of course units: compulsory and optional. A single course unit can be part of multiple degree programs. The university employs many lecturers, and a lecturer can teach one or more course units. A course unit can be assigned to one or more lecturers. If a course unit is taught by multiple lecturers, the total lecture hours for that course unit are divided among the lecturers. Each faculty, degree program, course unit, lecturer, and student is uniquely identified by the following identifiers respectively: (8 Marks)

- fac_id – Faculty
- degree_id – Degree program
- sub_id – Course unit
- lec_id – Lecturer
- std_id – Student

(b). Convert the above Entity-Relationship (ER) diagram into relational schemas. (7 Marks)

6.



(a)

(i) Draw the complete truth table for the above circuit. (2 marks)

(ii) Write the SOP (Sum-of-Products) expression for the output Y. (1 mark)

(b) Simplify the following Boolean expressions using Karnaugh maps (K-maps). (2 marks)

(i) $Y = C'(A'.B'.D' + D) + AB'C + D'$

(ii) $F = AB'C + A'B'C + A'BC + AB'C' + A'B'C'$

(c) Simplify the following Boolean expressions using Boolean algebra laws. (2 marks)

(i) $Q = (ABC)' + (AB)'C + A'BC' + A(BC)' + AB'C$

(ii) $F = (X + Y') + (X' + (X + Y'))'$

(d) Define what universal logic gates are, and name two logic gates that are considered as universal logic gates. (3 marks)

(e) Draw the half Adder circuit and write its truth table. (2 marks)

(f) Draw SR Flip flop circuit and give for suitable truth table. (3 marks)

7. (a) ABC College is planning to display their exam timetable on the college website. A layout of the web page is given below. Write the appropriate HTML code to create this web page. The hyperlinks at the top-left corner of the page should link to the Login, Students, Teachers, and Contact web pages. **(Marks: 09)**

Log in Students Teachers Contact Us		
Grade 13- 3 rd Term Time Table		
Date	Time	Subject
2025-07-22	7.45a.m. – 10.45a.m.	Biology
	11.15a.m. – 1.15p.m.	
2025-07-23	7.45a.m. – 10.45a.m.	Chemistry
	11.15a.m. – 1.15p.m.	
2025-07-24	7.45 a.m. – 10.15a.m.	General Knowledge
	10.45a.m. – 1.45p.m.	Physics
2025-07-25	7.45a.m. – 9.45a.m.	
2025-07-26	7.45a.m. – 10.45a.m.	General English

- (b) Write the external CSS file to style the following web page according to the conditions given below.

More About lemon



lemon, Small thorny tree or spreading bush (*Citrus limon*) of the rue (or citrus) family and its edible fruit. Under the yellow outer rind or peel is the white, spongy inner peel, the source of commercial pectin. The juicy pulp is acidic and rich in vitamin C and contains smaller amounts of B vitamins. The climates of coastal Italy and California are especially favourable for the cultivation of lemon trees, which in these regions produce fruit 6–10 times a year. Lemon juice enhances many dishes, and lemonade is a popular warm-weather beverage. Lemon by-products are used in beverages (citric acid), fruit jellies (pectin), and furniture polish (lemon oil).

- (i) Center-align the heading text “More About Lemon” and apply the Tahoma font. (2 marks)
- (ii) Set the height of the image to 350 pixels and the width to 200 pixels. (1 mark)
- (iii) Align the image to the right. (1 mark)
- (iv) Set the font color of the first paragraph to blue and the second paragraph to yellow. (1 mark)
- (v) Set the font size of the paragraph text to 18 pixels. (1 mark)

(Total ->15 Marks)

8)

- I. What is cloud computing? Mention its features and advantages. (3 marks)
- II. Name two fields in which cloud computing is used and briefly explain them. (2 marks)
- III. Explain the difference between cloud computing and traditional computing systems. (2 marks)
- IV. Name two cloud computing services. (2 marks)
- V. Explain two security issues related to cloud computing. (2 marks)
- VI. Explain, with examples, two ways in which cloud computing technology is used in your daily life. (2 marks)
- VII. Discuss two potential benefits and challenges of cloud computing technology in the future. (2 marks)

(Total ->15 Marks)

(09)

- i. By using a diagram explain the steps of the data processing life cycle. (2 marks)
- ii. Describe two disadvantages that emerged with the evolution of computer generations. (2 marks)
- iii. "Computer programs are stored in computer memory. The Central Processing Unit (CPU) retrieves one instruction at a time from memory and executes it."
Name the cycle that represents this process, and illustrate the four steps involved using a diagram. (2 marks)
- iv. "Random access memory plays an important role in memory management processes used to enhance computer performance."
Explain what Random access memory is, and describe two differences between Dynamic RAM and Static RAM. (6 marks)
- v. Describe how Information and Communication Technology (ICT) contributes to the social development of a country, using three points. (3 marks)

(Total ->15 Marks)

- (10). (i) Convert the following numbers into decimal. (3 marks)
- (a) 11001.11_2
- (b) 305_8
- (c) $AF.D1_{16}$
- (ii) Convert the following decimal numbers into octal and hexadecimal. (4 marks)
- (a) 32.001
- (b) 11.0011
- (iii) Convert the following binary numbers into octal and hexadecimal. (4 marks)
- (a) 10101010101111_2
- (b) 1111010001110_2
- (iv) In the following number simplification, convert the second number into the base of the first number and then simplify. (4 marks)
- (a) $32 + 57_8$
- (b) $111011_2 + 101_8$

(Total ->15 Marks)