考 試 科 目	新媒介與科技 51511	系所別	數位內容碩士學位學程 創意傳播組	考試時間	2 月 19 日(日) 第一 節

一、虛擬實境(Virtual Reality, VR) 與擴增實境(Augmented Reality, AR) 是目前數位內容領域中，最熱門的媒體。請簡單解釋這兩種媒體的長處與特色。(30%)

二、請從您常用與熟悉的軟體或手機 APP（應用程式、社群網路、遊戲等均可）中挑出三個，寫下你的看法，這三個軟體是否適合轉換為 VR 或 AR 的形式（回答方式：適合 VR、適合 AR、或都不適合），並說明你的理由。(30%)

三、請設計一款 VR 或 AR 之軟體（應用程式、社群網路、遊戲均可）；說明以下：背景分析，功能（可以用草圖或圖表來輔助描述）(40%)

備　　註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。

考試科目	媒介敘事 51512	系所別	數位內容碩士學位學程 創意傳播組	考試時間	2月19日(日)第二節

一、虛擬實境大師麥克爾‧海姆（Heim Michael）教授在「從介面到網路空間 - 虛擬實在的形而上學」（The Metaphysics of Virtual Reality）一文中說到：「未來世界也許不得不再次發掘一下非常古老的形而上學領域，但所用的開掘工具卻是電腦模擬的虛擬實在機：出類拔萃的形而上學機……」，「虛擬實在的本質最終也許不在技術而在藝術，也許是最高層次的藝術，它的最終承諾不是去控制、逃避或娛樂，而是去改變、去贖救我們對實在的知性。」VR虛擬實境藝術，創造了一個現象世界 之外的 形上世界（理型世界），讓被當代哲學忽視的古老形上學，再一次的受到我們的關注。

請你用各種方法（繪畫、文字、圖示等、、、）即興創作出一個在現實世界完全不可能存在的空間，並詳細說明這空間的整體狀態與其內容。（50％）

| 考試科目 | 媒介敘事 515/2 | 系所別 | 數位內容碩士學位學程 | 考試時間 | 2月19日(日)第二節 |

二、

1. 新媒體與科技影響了敘事模式，進而產生新的變革，當敘事價值的實踐離不開媒介時，請試想以新興科技(例如：穿戴式裝置、AR、無人機、微型感應器等)作為說故事媒介，請想像一段故事，寫下文字，並說明(請輔以圖示說明)在何階段，或是何時機，運用何種新興科技？（25%）

2. 請舉例一科技互動作品表現，說明所呈現的敘事手法為何？並請以理論觀點佐證且詳述之。（25%）

| 備　註 | 一、作答於試題上者，不予計分。
二、試題請隨卷繳交。 |

考 試 科 目	計算機概論 51521	系 所 別	數位內容碩士學位學程 資訊技術組	考試時間	2 月 19 日(日) 第 1 節

一、

1. Describe three different multimedia presentations you have experienced. List the various media types that were used in the presentation. (3%) Describe how the presentation was structured: which portions of the presentations were linear, which were interactive, and how it was linked as hypermedia. (3%) Describe how you experienced it and why a multimedia presentation might be more compelling, interesting, or engaging than a presentation that does not use multimedia. Use specific examples from your own experience. (4%)

2. When a multimedia file is too complex for a computer to render, what are the possible approaches that a program designer can do? (5%) Can you briefly describe the technical characteristics that determine the size of a digitized audio file and the size of a digitized video file. (5%)

3. Briefly discuss bitmap images: how they are represented, what types of image they are most suitable for and why, and any advantages or disadvantages. Give three examples of bitmap file types. (5%) Briefly discuss vector images: how they are represented, what types of image they are most suitable for and why, and any advantages or disadvantages. (5%)

4. Briefly describe what HTML, CSS, JavaScript, and plug-ins are, and how they and multimedia elements are incorporated into a web page. (10%)

5. One of the most expensive and time-consuming tasks in organizing a multimedia project is often the content acquisition. List three multimedia project examples and briefly discuss how their content acquisition processes were achieved. (10%)

備 註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。

考 試 科 目	計算機概論51521 (網路與多媒體)	系 所 別	數位內容碩士學位學程 資訊技術組	考試時間	2 月 19 日(日) 第 1 節

三、

以下問題可用中文或英文回答.

1. (15 points; 1 points for each) Single Selection Questions

1) Which one of the following binary numbers is equivalent of the Octal value 112?
   (a) 1100110; (b) 1001101; (c) 1001001; (d) 1001010

2) What is the smallest integer represented by 8 bits in two's complement format?
   (a) -127; (b) -128; (c) -255; (d) -256

3) What is the largest integer represented by 8 bits in two's complement format?
   (a) 127; (b) 128; (c) 255; (d) 256

4) Typically speaking, there are five steps to transform a C program stored in a file into a program running in memory: Preprocessing, Assembling, Compiling, Linking, and Loading.
   (a) True; (b) False

5) Data structures queue and stack behave in the same way, and they both allow data items to be inserted into as well as removed from a collection in a First-In, First-Out (FIFO) order.
   (a) True; (b) False

6) Which the following expressions will be TRUE if A and C are both TRUE and B is FALSE?
   (a) A XOR (B XOR C); (b) B XOR A; (c) B OR (NOT A AND C); (d) C AND B

7) Which one of the following techniques is the most similar to the technique of web proxy?
   (a) Cache; (b) Virtual machine; (c) Multi-core processors; (d) Cloud computing

8) Which one of the following sorting algorithms is the most efficient one in the worst case?
   (a) Selection sort; (b) Quick sort; (c) Merge sort; (d) Insertion sort

9) Which one of the following methods is the best way to select a pivot key for quick sort?
   (a) Mode; (b) The largest number; (c) The smallest number; (d) Median

10) Which one of the following programs is NOT a compiler?
    (a) GNU Compiler Collection; (b) Firefox; (c) Javac; (d) Psyco

11) Which one of the following programming languages is NOT an object-oriented programming language?
    (a) Java; (b) Fortran; (c) C#; (d) Python

12) Which one is not a UNIX-based operating system?
    (a) FreeBSD; (b) Solaris; (c) Windows; (d) Mac

13) Which one is not an editor of Linux systems?
    (a) Emacs; (b) Pico; (c) Notepad; (d) Vim

備 註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。

考 試 科 目	計算機概論 51521 (網路與多媒體)	系 所 別	數位內容碩士學位學程 資訊技術組	考試時間	2月19日(日)第1節

14) Why the IP address, 140.119.70.256, is INCORRECT?
   (a) It has too few parts;
   (b) It contains an invalid value;
   (c) The numbers should add up to an even number;
   (d) The last number should end with 254.

15) In the OSI (Open Systems Interconnection), there is 7-layer reference model for communication systems, on which of the following layers are Wi-Fi (IEEE 802.11) and HTTP (Hypertext Transfer Protocol) working respectively?
   (a) Physical Layer and Application Layer
   (b) Physical Layer and Transport Layer
   (c) Network Layer and Application Layer
   (d) Network Layer and Transport Layer

2. (15 points; 3 points for each) Term Explanations. Describe the technical terms in detail.
   1) Internet Browsers
   2) Operating Systems
   3) CPU (Central Processing Unit)
   4) VPN (Virtual Private Network)
   5) DNS (Domain Name System)

3. (6 points) What are the three characteristics of object-oriented programming? Please also describe each of the characteristics in detail.

4. (6 points) Model-View-Controller (MVC) is a popular software architectural pattern for implementing web applications. Please describe the concepts of the design pattern in detail.

5. (4 points; 2 points for each) Digitization.
   1) What is the main difference between Bitmap and Vector images?
   2) Calculate the file size of a true color (24-bit) in Full HD.
      (Hint: 1KB = 1024 bytes; Full HD = 1920 x 1080 pixels)

6. (4 points) Basic Computer Knowledge.
   Please draw the basic PC architecture, which is usually called Von Neumann architecture, and briefly describe each component of the architecture in detail.

備　　　註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。

考 試 科 目	程式設計與資料結構 51522	系 所 別	數位內容碩士學位學程/資訊技術組	考 試 時 間	2 月 19 日(日) 第 二 節

資料結構

1. (10%) 當一個四位數正整數的個位數四次方和等於該四位數正整數，則該數稱為 Cherry Number。例如 $1634 = 1^4 + 6^4 + 3^4 + 4^4$。請設計一程式依序列出所有 Cherry Number。(可使用任何語言或 pseudo code，但請先註明)。

2. (24%) 請基於下列 C 語言程式碼骨架，使用 Link List 來實作一個 Stack，只需寫作註記(A),(B), 與(C) 的部份。

```c
struct Node{
    int data;
    struct Node *next;
};

typedef struct Node Stack_Node;
typedef Stack_Node *Linked_Stack;
Linked_Stack top=NULL;
int isEmpty();
void push(int);
int pop();

int isEmpty(){
    // (A)
}
void push(int data){
    // (B)
}
int pop(){
    // (C)
}
```
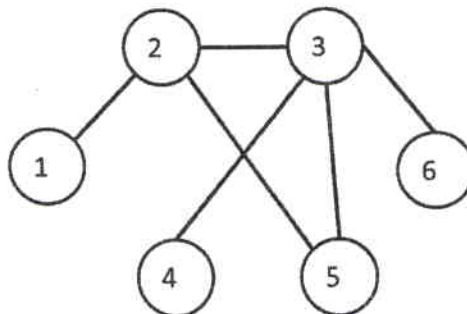
3. (10%) Graph Representation

   (1)請分別以 Linked List 與 Adjacency Matrix 表達下列 Graph

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(2)下表比較了以 Linked List 與 Adjacency Matrix 表達 Graph，請填寫下列表格中(A)~(F)來完成這張表。

	Adjacency Matrix	Linked List
新增刪除 vertex 較容易或 較困難?	(A)	(B)
存取 edge 的複雜度	(C)	(D)
計算 vertex 的 in-degree 較容易或較困難?	(E)	(F)

4. (6%) 假設某個 Tree 結構以 post order 進行 traverse 時，內容為 DBGEHJFCA，in-order traverse 時為 DBAEGCHFJ，請畫出此樹。

考 試 科 目	程式設計與資料結構 系所別	數位內容碩士學位學程/	考試時間	2 月 19 日 (日) 第 二 節
	S1522	資訊技術組		

可用中文或英文回答

1. (10%) Write the output of the following program and point out the error if any in the console.log()

```
class SS extends Array {
  constructor() {
    super();
  }

  top() {
    return this[this.length - 1];
  }
}

class Triple {
  static triple(n) {
    /* The Logical OR operator returns the value of its second operand, if the
first one is falsy, otherwise the value of the first operand is returned. */
    n = n || 1;
    return n * 3;
  }
}

class BiggerTriple extends Triple {
  static triple(n) {
    return super.triple(n) * super.triple(n);
  }
}

var tp = new Triple();
var s = new SS();
s.push("world");
s.push("hello");
console.log(s.top());
console.log(Triple.triple());
console.log(Triple.triple(6));
```

備 註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。

考 試 科 目	程式設計與資料結構 51522	系所別	數位內容碩士學位學程/ 資訊技術組	考試時間	2月19日(日)第二節

```
console.log(BiggerTriple.triple(3));
console.log(tp.triple());
```

2. (10%) List two programming languages that you are familiar with. Explain the characteristics of these programming languages.

3. (15%) For a positive integer n, let f(n) denote the sum of the digits of n when represented in base 10. It is easy to see that the sequence of numbers n, f(n), f(f(n)), f(f(f(n))), ... eventually becomes a single digit number that repeats forever. Let this single digit be denoted g(n).

   For example, consider n = 1234567892. Then:
   f(n) = 1+2+3+4+5+6+7+8+9+2 = 47
   f(f(n)) = 4+7 = 11
   f(f(f(n))) = 1+1 = 2
   Therefore, g(1234567892) = 2.

   Write a function in any programming language that will accept a single positive integer n at most 2,000,000,000 and return a single digit number that is denoted g(n).

4. (15%) Taiwan railway online booking system often crashes in the frenzy of pre-holiday bookings. Your task is to design a system to solve this problem. Explain your idea.

備　　註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。