

BINDURA UNIVERSITY OF SCIENCE EDUCATION
FACULTY OF SCIENCE AND ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE
BSc HONS DEGREE IN ELECTRONIC ENGINEERING
EEE1204 COMPUTER ENGINEERING AND PROGRAMMING

DURATION 3 HOURS Total marks is 100

Instructions to candidates:

Answer all questions

21 JUN 2023

Question 1

a) The code in Fig.1 is a short program that demonstrates the use of MOV instruction. Explain what each line achieves in assembly language. [10]

- (i) ORG 100h ;
- (ii) MOV AX, 0B800h ;
- (iii) MOV DS, AX ;
- (iv) MOV CL, 'A' ;
- (v) MOV CH, 1101_1111b ;
- (vi) MOV BX, 15Eh ;
- (vii) MOV [BX], CX ;
- (viii) RET ;

Figure 1 :Use of MOV

- b) In zero-address instructions the computer does not use an address field for the instructions ADD and MUL. The PUSH and POP instructions, however, need an address field to specify the operand that communicates with the stack. Evaluate the following c statement using zero-address instructions.

$$X = (A + B) * (C + D) \quad [10]$$

Question 2

Draw the truth table, circuit diagram and generate the equation of the hexadecimal to binary encoder. [20]

Question 3

- a) Identify and explain the four main parts of the Kernel in operating systems. [8]
- b) Given the following declarations determine the output of c programming statements in fig 2: [5]

```
int i=1, j=2, k=3
```

```
(i) i++|++j+k++
```

```
(ii) ++i+j+++++k
```

```
(iii) i--j+---k*2
```

```
(iv) j++*--k-++l
```

```
(v) i+--j+k++
```

Figure 2: Output

- c) Write a program to display the following pattern using for loop. [7]

```
*
* *
* * *
* * * *
* * * * *
```

Figure 3: Image of pascal triagle.

Question 4

Write a program to take input of name, rollno and marks obtained by a student in 4 subjects of 100 marks each and display the name, rollno with percentage score secured. [20]

Question 5

- a) For a new architecture to be worth developing it must have a commercial lifespan of at least 10 years. What long-term factors must designers of a new architecture take into consideration during the design process? [12]
- b) Explain the meaning of the term interrupt in the context of computer hardware and software. [4]
- c) Define the following terms
 - (i) Cache hit. [2]
 - (ii) Cache miss. [2]

*****END OF EXAMINATION*****