

International Islamic University Chittagong

Morality Development Program (MDP)

Semester End Examination, Spring -2022

Semester: 5th

Course Code: **MDP-3505**, Course Title: **Concept on Moral Development-II**

Time: 2.00 hours

Full Marks: 50

Answer any five of the following questions.

1. Explain the concept of recreation in the light of Qur'an and Sunnah. How much the recreation and entertainment is permissible in Islam? What are the guidelines should be followed in Recreation? 10
2. Briefly explain the rules and regulations of dress code for both male and female from Islamic perspective. 10
3. Define malaise? What actions to be taken by Muslims to cure this malaise? Explain. 10
4. What do you mean by Islamic culture? Explain the characteristics of Islamic culture. Distinguish between Islamic culture and western culture. 10
5. Briefly explain the Day of Judgment with reference from Quran and Hadith. 10
6. "Islam ensures peaceful co-existence"-Justify this statement in light of Quran and Sunnah. 10
7. What are the basic human rights in Islam? Explain the rights of women in light of Quran and Sunnah. 10

International Islamic University Chittagong

Center for General Education (CGED)

Semester End Examination, Spring-2022

Course Code: URED-3503 (URED-3101 for LLB)

Course Title: Political Thoughts and Social Behavior

Full Marks: 50

Time: 2:30 Hours

*Answer the following questions
(All questions are of equal value)*

#	Questions	Marks	CLOs	Bloom's taxonomy domain
1	Decide the procedures of marriage and criteria of selecting the bride and the groom according to the holy <i>Qur'an</i> and <i>Sunnah</i> .	10	4	Evaluate
2	Develop a comparative discussion between Islam and other religions regarding women rights. Or Analyze the status of women in Islam and the same given to them by other existing communities.	10	3	Create & Analyze
3	Evaluate the five fundamental principles of Islamic Economic System.	10	5	Evaluate
4	Islamic law has provided mankind with appropriate instructions and guideline regarding dress for man and woman. Elaborate those guidelines after mentioning the purposes of dress in Islam according to the <i>ayah</i> 26 of <i>surah al-a'raf</i> .	10	4	Create
5.	Duties of parents towards their children is more important than the duties of children towards their parents. Explain the statement with proper arguments. Or Write very briefly regarding what we should say in the following situations (any five): a. When we go to bed for asleep b. When we go to the wash room c. When we enter the <i>Masjid</i> d. When we go down by stair / lift or any way e. If a sneezer said ' <i>Alhamdu lillah</i> ' f. If someone gives us <i>salam</i> g. If we want to do something later.	10	3	Evaluate & Create

International Islamic University Chittagong

Department of Computer Science and Engineering

B. Sc. in CSE

Final Exam, Spring-2022

Course Code: CSE 3527

Time: 2 hours 30 minutes

Course Title: Compiler

Full Marks: 50

(i) The figures in the right-hand margin indicate full marks

(ii) Course Outcomes and Bloom's Levels are mentioned in additional Columns

Part A

[Answer the questions from the followings]

1. a) Define LL(1) grammar and LR(k) parser. Why LR parsers are used in compiler design? CLO 2 R 3
1. b) Construct CLR(1) and LALR(1) data flow diagram and parsing table for the following grammar:
 $S \rightarrow CC$
 $C \rightarrow cC$
 $C \rightarrow d$ CLO 2 U 7
2. a) Calculate the LR(0) Parsing for the given grammar-
 $E \rightarrow E + T \mid T$
 $T \rightarrow T * F \mid F$
 $F \rightarrow (E) \mid id$ CLO 3 App 5
2. b) What do you mean by Operator Precedence Grammar?
With the help of following grammar parse the input string:- "id + id * id" \$
 $T \rightarrow T + T \mid T * T \mid id$ CLO 2 E 1+4
=5
- Or,
2. a) For the following sub-problems, consider the following context-free grammar:
- $S \rightarrow AS$ (1)
 $A \rightarrow xAx$ (2)
 $A \rightarrow C$ (3)
 $B \rightarrow yBy$ (4)
 $B \rightarrow C$ (5)
 $C \rightarrow zBz$ (6)
 $C \rightarrow wAw$ (7)
 $C \rightarrow \lambda$ (8)
- CLO 3 App 1+4
=5

i. What are the terminals and non-terminals of this grammar?

ii. Show the derivation of the string $xxxx\$$ starting from S (specify which production you used at each step), and give the parse tree according to that derivation.

2 b) Construct a CLR parsing table for the given context-free grammar

CLO 2 E 5

$S \rightarrow AA$

$A \rightarrow aA \mid b$

Part B

[Answer the questions from the followings]

3. a) Define the synthesized attributes and inherited attributes with example. Using syntax-directed definition draw the annotated parse tree and dependency graph for the sentence $(3*5+2)*2n$.

CLO 1 C 5

$S \rightarrow En$

$E \rightarrow E + T$

$E \rightarrow T$

$T \rightarrow T * F$

$T \rightarrow F$

$F \rightarrow (E)$

$F \rightarrow \text{digit}$

3. b) Write some examples of top-down parsing and bottom-up parsing. Consider the following grammar-

CLO 2 E 1+4
=5

$E \rightarrow E - E$

$E \rightarrow E \times E$

$E \rightarrow \text{id}$

Parse the input string $\text{id} - \text{id} \times \text{id}$ using a shift-reduce parser.

4. a) What is code optimization? Consider the following code:

CLO 3 App 1+4
=5

$a = b * -c + b * -c$

Write down the Quadruples of the given Code?

4. b) Write quadruple, triples and indirect triples for following expression :

CLO 2 U 5

$(x + y) * (y + z) + (x + y + z)$

5. a) $t1 = 4 * I$
 $t2 = a[t1]$
 $t3 = 4 * I$
 $t4 = b[t3]$
 $t5 = t2 * t4$
 $t6 = \text{prod} + t5$
 $t7 = I + 1$
 $I = t7$
If $I \leq 20$ goto 1

CLO 3 An 5

Write down the DAG to get the above information.

- b) What do you know about the identifying the Basic blocks in target code generation?
What do you know about the Peep hole optimization?

CLO 2 An 3+2=5

Or,

5. a) Consider the following C codes and answer the questions (i) to (iii):-

CLO 3 An 5

```
int a[100], i, n=10, steps=0, temp;
do {i=steps+1
    do {if(a[steps]>a[i]){
        temp=a[steps];
        a[steps]=a[i];
        data[i]=temp;
        i++;
    }while(steps<n);
    steps++;
}while(steps<n);
```

- (i) Translate the C code into three-address code.
(ii) Identify the basic block in three-address code.
(iii) Construct the flow graph from the three-address code.

- b) Draw the syntax tree and DAG for the expression:

CLO 2 An 5

$a+a+a(a*a)+a+a+a*(b-c)+(b-c)*d$

International Islamic University Chittagong
Department of Computer Science & Engineering
B.Sc. in CSE, Semester Final Exam, Spring 2022
Course Code: CSE 3523 Course Title: Microprocessors, Microcontrollers & Embedded Systems
Total Marks: 50 Time: 2.5 Hours
[Answer all the five questions. Figures in the right-hand margin indicate full marks.]

Course Outcomes and Bloom's Levels are mentioned in additional Columns

PART A		CLO	Mark
1(a)	In the early years of computing, the processor has to waste a number of clock cycles just for checking the signal in the system, by this processor will become busy unnecessarily. If any signal came for the process, the processor will take some time to process the signal due to the checking which is known as the polling method. So system performance also will be degraded and the response time of the system will also decrease. Suggest a better process to handle the signal. Explain a general process of it.	3	5
(b)	Can your suggested process in 1(a) be handled in parallel? Explain it.	3	5
OR			
	How interrupt vector type number 80H is applied to the data bus in response to an INTR using three state buffer.		
2(a)	Write short note on: i. L1 and L2 Cache, ii. BOUND	1	4
(b)	Draw the block diagram of 8255A.	1	4
OR			
(c)	Draw and describe the pin out diagram of 8259A programmable interrupt controller. What are the difference between hardware interrupt and software interrupt.	2	4
PART B			
3(a)	Suppose you are building an hardware project named digital alarm clock. Will you use Microprocessor or Microcontroller? Explain the reasons behind it using diagrams.	4	3
(b)	Explain the basic DMA operation with timing diagram	4	4
(c)	Write the differences between IO-mapped I/O and Memory-mapped I/O.	4	3
4(a)	Recently, Amit and Arafat learned about Microcontroller 8051. However, they are unsure of how to access RAM or ROM due to the fact that the device contains both internal and external RAM and ROM. Help them by answering the following questions – i. To interface a 16-bit Memory what port(s) they can use? Describe the port(s). ii. How can they access external RAM with 8 and 16 bits of addressing?	2	6
OR			
	Design a burglar alarm system using 8051 microcontrollers. When a burglar will come to your house then alarm sounds are generated. Draw the circuit diagram of burglar alarm system where port 1 is used as input and port 3 is used as output port. Also draw the flowchart when zone 2 is activated.		
(b)	Describe the architecture of 8051 micro-controller with figure.	1	4
5(a)	Explain why hardware-software co-design is better than traditional design. Describe it with proper diagram.	1	4
OR			
	How can you optimize an embedded system?		
(b)	Draw a general block diagram for an embedded system.	1	3
(c)	Explain interrupt latency and how can we decrease it	1	3

International Islamic University Chittagong
Department of Computer Science & Engineering
B.Sc. in CSE, Semester Final Exam, Spring 2022
Course Code: EEE-2421 Course Title: Electrical Drives and Instrumentations
Total Marks: 50 Time: 2.5 Hours

[Answer all the five questions. Figures in the right-hand margin indicate full marks.]

Course Outcomes and Bloom's Levels are mentioned in additional Columns.

PART A

	PLO	CLO	Marks
1.(a) What is induction motor and why is it called?	4	3 C2	2
(b) Explain the operation of capacitor start induction motor with example.	4	3 C2	3

OR

Briefly explain the working principle of the induction motor. Also draw a neat diagram of its exact equivalent circuit.			
(c) Explain how induction motor rotor rotates.	4	3 C2	2
(d) A 3-phase induction motor is wound for 4 poles and is supplied from 50Hz system. Calculate i. Synchronous speed, ii. The rotor speed, when slip is 4% and iii. Rotor frequency when runs at 600rpm.	4	3 C3	3
2.(a) Explain the full step operation of stepper motor and discuss the significance of stepper motor in modern automation industries	4	3 C3	5

OR

Describe Half wave mode Driving technique for Stepper motor with neat diagram.			
(b) Why synchronous motor has no self-starting torque? Write some methods to make SM Self-Starting.	4	3 C3	2.5
(c) Suppose you are working in an industry. You need a motor with constant speed and can operate in lagging to leading power factor for some specific applications. Select an appropriate motor for your desired application and explain the reasons of your selection.	4	3 C3	2.5

PART B

3.(a) Write the process of measuring system with an appropriate example (based on the lab project done by yourself).	2	4 C4	3
(b) What do you understand by the term measurement and instrumentation? Why measurement is so important in our life?		4 C4	3
(c) Explain the significance of Measurement error combinations. If following voltage measurements are considered from two instruments. $V_1 = 90 \pm 3\%$, $V_2 = 80 \pm 5\%$.	2	4 C4	4

Calculate

- the maximum percentage error of two voltage measurements.
- the maximum percentage error in the difference of two voltages.

OR

Explain Common Anode and Common Cathode "7-segment Display" with necessary diagram.	2	4 C4	4
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4.(a) Explain with the help of a functional block diagram, the principle of operation of a digital frequency meter 2 5 5
C4

OR

For the following given data, calculate

2 5 5
C4

- i) Arithmetic mean, ii) Deviation of each value, iii) Algebraic sum of the deviations,
iv) Calculate the average deviation and v) Calculate the standard deviation

Given, $Z_1 = 70.7$, $Z_2 = 71.1$, $Z_3 = 70.2$, $Z_4 = 69.6$ and $Z_5 = 71.7$

- (b) (i) What are the advantages of digital systems over analog?
(ii) Explain the following terms as applied to digital measurement.
(a) Resolution
(b) Sensitivity of digital meter
(c) Accuracy specification of digital meters

2 5 5
C4

5(a) Write a difference between thermocouple, RTD and Thermistor. Suppose you need to measure temperature from -190°C to 450°C , which device will be suitable for measuring.

3 5 5
C4

- (b) During experiments with a copper-constantan thermocouple it was found that $c = 3.75 \times 10^{-2} \text{ mV/}^\circ\text{C}$ and $k = 4.5 \times 10^{-5} \text{ mV/}^\circ\text{C}^2$. If $T_1 = 1000^\circ\text{C}$ and the cold junction T_2 is kept in ice, compute the resultant electromotive force.

1 5 2
C3

OR

How Electricity is produced in a PV Panel? Write the prospects of Solar energy in Bangladesh.

1 5 2
C3

- (c) What is transducer? Why Transducer is important? Explain different optoelectronic transducer in brief.

1 5 3
C3

International Islamic University Chittagong (IIUC)
Dept. of Computer Science & Engineering (CSE)
Final Examination: Spring-2021
Program: B.Sc. in CSE

Course Code: CSE-3529
 Time: 2.5 Hours

Course Title: System Analysis & Design.
 Full Marks: 50

All questions should be answered.

Group A

- CO3 1.(a) The passenger is required to fill in a reservation form giving details of his journey. The counter clerk ensures whether the place is available. If so, entries are made in the register, tickets are prepared, amount is computed and cash is accepted. A booking statement is prepared in triplicate from the reservation register. One copy of it is retained as office copy, the other is pasted on the compartment and the third is passing on to the train conductor. Besides booking statement, cash statement is prepared at the end of each shift. Prepare a DFD to describe this situation., Give the following terms for the above "Railway Reservation System": (i) Input design of the system (ii) Draw Data Flow Diagram (DFD) (iii) Draw context free diagram (iv) Output design of the system 5
- CO3 1.(b) Construct a decision tree and calculate Expected Value (EV) based on the values in the table below: Formula: $EV = \sum P(X_i) \times X_i$ 5

Alternatives	Growing	Declining
Stocks	70	-13
Mutual Funds	53	-5
Bonds	20	20
Probability	0.4	0.6

Or

- CO3 1.(a) When CASE keyword is used in Structure English? Describe with example. Name the popular CASE tools. State the advantages and Disadvantages of Indexed Sequential File Organization and Direct File Organization 5
- CO3 1(b) Draw a decision tree and decision table for a project management 5
- CO3 2.(a) What is input design and its objectives 3
- CO3 2.(b) What is form design? Objectives of good form design. 4
- CO3 2.(c) What is database design? What is the logical design of a database? 3

Group B

- CO3 3.(a) What is system testing? Is testing compulsory for a system or not? Justify your answer 3
- CO3 3.(b) What is white box testing and black box testing? Describe with example. 5
- CO3 3.(c) What are the difference between Alpha testing and Beta testing? 2
- CO4 4.(a) What is system maintenance? Why it is necessary? 3
- CO4 4.(b) Discuss the process of system maintenance. 3
- CO4 4.(c) What are the types of system maintenance? Distinguish between adaptive and corrective maintenance? 4
- CO2 5.(a) Write some criteria for software selection and hardware selection 2
- CO2 5.(b) What is Threats? Briefly discuss about physical threat and non-physical threat. 4
- CO2 5.(c) Write short notes on the following: i) Network security ii) End-point security iii) Internet security iv) Cloud security 4
- Or
- CO2 5.(a) What is meant by "Project Management"? Why it is needed? Write short note on: (i) PERT (iii) ROI 3
- CO2 5.(b) Prepare Data Dictionary entries for i) The data elements Basic Pay, Professional Tax ii) The data stores Salary Summary File, Arrears Files iii) The data flows Earning details, Deduction details 4
- CO2 5.(c) Write the importance of documentation in software development, 3

International Islamic University Chittagong
Department of Computer Science and Engineering

B. Sc. in CSE Final Term Examination, Spring 2022

Course Code: CSE 3528

Course Title: Compiler Lab

Total marks: 50

Time: 3 hours

GROUP A

1. Define Left factoring and Left recursion. 5 CLO1
 Consider the following grammar
 $E \rightarrow E + T \mid T$
 $T \rightarrow T * F \mid F$
 $F \rightarrow (E) \mid id$
 After removing the left recursion and the left factoring what will be the Rules?
2. Calculate the First and Follow functions for the given grammar- 5 CLO2
 $S \rightarrow ACB \mid CbB \mid Ba$
 $A \rightarrow da \mid BC$
 $B \rightarrow g \mid \epsilon$
 $C \rightarrow h \mid \epsilon$
3. Calculate the LR(0) Parsing for the given grammar- 5 CLO3
 $E \rightarrow E + T \mid T$
 $T \rightarrow T * F \mid F$
 $F \rightarrow (E) \mid id$
4. What do you mean by Operator Precedence Grammar? 5 CLO2
 With the help of following grammar parse the input string:- "id + id * id "\$
 $T \rightarrow T + T \mid T * T \mid id$
5. For the following sub-problems, consider the following context-free grammar: 5

S	\rightarrow	A^*A^*	(1)
A	\rightarrow	xAx	(2)
A	\rightarrow	C	(3)
B	\rightarrow	yBy	(4)
B	\rightarrow	C	(5)
C	\rightarrow	zBz	(6)
C	\rightarrow	wAw	(7)
C	\rightarrow	λ	(8)

 - i. What are the terminals and non-terminals of this grammar?
 - ii. Show the derivation of the string xxx\$ starting from S (specify which production you used at each step), and give the parse tree according to that derivation.
6. Construct a CLR parsing table for the given context-free grammar 5 CLO3
 $S \rightarrow AA$
 $A \rightarrow aA \mid b$

GROUP B

7. Viva

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Bismillahir Rahmanir Rahimi
International Islamic University Chittagong
Department of Computer Science & Engineering
B. Sc. in CSE Semester Final Examination, Spring 2022
Course Code: CSE 3521 Course Title: Computer Architecture
Total marks: 50 Time: 2.5 hours

[Answer all the questions; Separate answer script must be used for Group-A and Group-B.]

Group-A

- | | | |
|--|---|-----|
| 1.a) What are the basic elements in an MIPS data path implementation? | 3 | CO1 |
| b) Suppose you are given an instruction <code>sub \$s2,\$t2,\$t3</code> . Describe the complete operation of the datapath using the instruction with a figure. | 4 | CO1 |
| c) Why a single-cycle implementation is not used? justify the answer | 3 | CO2 |
| 2.a) Design a single cycle data path for handling R-type instruction of MIPS. | 3 | CO1 |
| b) Describe all temporary register and multiplexors of Multicycle Datapath | 4 | CO2 |
| c) Do you think that the functions of memory data register and instruction register are the same? If not then how? | 3 | CO3 |
| Or, | | |
| 2. a) Are instruction and microinstruction same? If not then why? | 3 | CO1 |
| b) Illustrate the following instruction with three bus and two bus CPU system and explain which is better?
<code>ADD R3, R2, R1</code> | 4 | CO2 |
| c) Set the control words for the following microinstructions:
i) <code>SUB R1, R2, R0</code> , ii) <code>MAR ← PC</code> | 3 | CO3 |

Group-B

- | | | |
|--|---|-----|
| 3.a) Does any Pipeline Stall arise here for the following instructions, explain:
<code>MUL R1, R2, R3</code>
<code>SUB R3, R1, R4</code>
<code>ADD R4, R5, R6</code> | 4 | CO2 |
| b) Which is advantageous between sequential processing and pipeline processing, explain? | 2 | CO2 |
| c) How does data dependency effect in pipelining? | 4 | CO2 |
| 4.a) Suppose you have 6 I/O devices in your computer. An output operation will be performed to the Device 4 (could be the keyboard) in the case of shared I/O arrangement. Explain with diagram how the operation will be performed. | 5 | CO3 |
| b) Suppose you would like to bi-pass the CPU to perform a job. How a DMA can work in this regard? | 5 | CO1 |
| 5.a) What is DMA controller? Describe the working principle of DMA controller. | 3 | CO1 |
| b) What is TLB? How can you reduce page fault explain logically? | 3 | CO3 |
| c) Write short note on handshaking protocol. | 4 | CO1 |
| Or, | | |
| 5a) Write short note on memory hierarchy. | 3 | CO1 |
| b) Define <i>cache hit</i> , <i>cache miss</i> , <i>hit rate</i> , <i>tag</i> in caching. | 4 | CO1 |
| c) Suppose you would like to bi-pass the CPU to perform a job. How a DMA can work in this regard? | 3 | CO3 |