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DEPT: BS COMPUTER SCIENCE

HAZARA UNIVERSITY

Department of CS & IT

Semester: Fall 2024	Assessment: Assignment No.2
Subject: Compiler Construction	Course Code: CS363
Class: BSCS-V(A)	Due Date: 25/01/25

Attempt all questions. Max Marks:5

Assessment will be based on short viva in the questions of the assignment. All students will have to submit Hard Copies as well as upload soft copies.

Question-No.1 Describe the functions of preprocessors and give examples.

Functions of Preprocessors

A preprocessor is a tool that processes the source code before it is compiled by the compiler. It performs several tasks to prepare the code for the next stages of the compilation process. Common functions of preprocessors include:

1. File Inclusion:

Includes the content of other files into the source code. This is often used for including header files.

Example:

```c
#include <stdio.h>
```

This includes the stdio.h header file in the program, which provides declarations for input and output functions.

2. Macro Expansion:
Replaces macros (defined constants or code fragments) with their values or definitions.

Examples:

```c
#define PI 3.14
printf("Value of PI: %f", PI);
```

The preprocessor replaces PI with 3.14 before compilation.

3. Conditional Compilation:
Allows parts of the code to be included or excluded based on conditions.

Example:

```c
#ifdef DEBUG
printf("Debugging is enabled\n");
#endif
```

If DEBUG is defined, the message is included in the code; otherwise, it is excluded.

4. Line Control:
Provides information to the compiler about line numbers or file names, which is useful for debugging.

Example:

```c
#line 100 "example.c"
```

5. Comments Removal:
Removes comments from the source code before it is compiled.

Examples in Context
Below is a sample program illustrating these preprocessor functions:

```c
#include <stdio.h>  // File inclusion
#define PI 3.14     // Macro definition

int main() {
    #ifdef DEBUG
    printf("Debugging is enabled\n");
    #endif

    printf("Value of PI: %f\n", PI);
    return 0;
}
```
