

(2 ½ Hours)

[Total Marks : 60]

N.B. : (1) All questions are **compulsory**.(2) **Figures** to the **right** indicate **full** marks.(3) Draw **neat** diagrams wherever **necessary**.

(4) Symbols have usual meanings unless otherwise stated.

(5) Use of **non-programmable** calculator is allowed.

1. (a) Attempt any **one**:---
 - (i) Explain with an example , the use of entity and architecture as a fundamental VHDL unit. **8**
 - (ii) Briefly explain the different types of modeling in VHDL. **8**
- (b) Attempt any **one**:---
 - (i) Write a short note on process sensitivity list **4**
 - (ii) Explain with correct syntax, the CASE statement used in VHDL **4**
2. (a) Attempt any **one**:---
 - (i) Briefly explain physical data types in VHDL? Give one example of predefined physical type. **8**
 - (ii) What is an attribute in VHDL? Explain value array attributes in detail. **8**
- (b) Attempt any **one**:---
 - (i) Explain with a suitable example, ARRAY composite data type in VHDL. **4**
 - (ii) Explain the differences between Function and Procedure subprograms in VHDL. **4**
3. (a) Attempt any **one**:---
 - (i) Write a note on USB descriptors. **8**
 - (ii) Describe the process of detection and identification of speed of connected device by USB host port. **8**
- (b) Attempt any **one**:---
 - (i) Explain the following status codes : NAK, NYET. **4**
 - (ii) State the functional description of Polyswitch device used in USB 2.0. **4**

4. (a) Attempt any **one**:---
- (i) With the help of a block diagram, explain in detail, the working of a 1-Wire interface. **8**
 - (ii) With the help of a block diagram, explain in detail, the working of Serial Peripheral Interface (SPI) bus. **8**
- (b) Attempt any **one**:---
- (i) What are the various wireless network topologies commonly used by ZigBee technology? Explain the advantage of Mesh technology in communication. **4**
 - (ii) Explain the following terms used in I²C communication: **4**
 - 1) Start and Stop Conditions, 2) Byte Format
5. Attempt any **four**:---
- (a) Write an entity NAND2 for two input NAND gate with input ports x and y and output port z of type bit. **3**
 - (b) Briefly explain the NEXT statement used in VHDL. **3**
 - (c) Explain the concept of deferred constants in VHDL. **3**
 - (d) Briefly explain what is port mapping in VHDL. **3**
 - (e) Draw the diagram of tier star topology of USB system. **3**
 - (f) Write a note on isochronous transfers. **3**
 - (g) Write a short note on Infra-red Data Association (IrDA). **3**
 - (h) Distinguish between External Communication interfaces RS232 and RS485. **3**