**Title: Question Paper FF No. 868**

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| Reg.No. |  |  |  |  |  |  |

Bansilal Ramnath Agarwal Charitable Trust’s

**VISHWAKARMA INSTITUTE OF TECHNOLOGY,PUNE – 411037.**

(An Autonomous Institute Affiliated to University of Pune)

**Examination: ESE**

**Year:** T.Y. **Branch:** Computer/IT

**Subject:** Systems Programming **Subject Code:** CS30114

**Max. Marks:** 100 **Total Pages of Question Paper:** 03

**Day & Date:** **Time: ­­­­­­­­­­­­­­­­­­­­­**3.00 Hrs

**Instructions to Candidate**

1. All questions are compulsory.

2. Neat diagrams must be drawn wherever necessary.

3. Figures to the right indicate full marks.

4. Use of nonprogrammable electronic pocket calculator, mollier charts, steam

tables and statistical table are allowed.

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| **Q. 1.** |  |  | **Attempt the following.** | **Marks**  **(14)** |
|  | **a)** |  | What is the Role of Following Systems Software’s? Also Arrange them in order such that application programs can process in flow from one format to other in step by Step manner?   1. Debugger. 2. Assembler 3. Interpreter 4. Compiler 5. Linker.   **OR** | **4** |
|  | **a)** |  | What are the program generation activities in language processing? Explain with suitable block diagrams; How it works? | **4** |
|  | **b)** |  | How Assembler works? Do we need stack to implement 2-pass Assembler? If Yes; then with the help of suitable example and Generate different Data Structures with Machine code. | **10** |
| **Q. 2.** |  |  | **Attempt the following.** | **(14)** |
|  | **a)** |  | What are the advantages of General Loading scheme over Compiler and go Loader? How General Loader Works?  **OR** | **6** |
|  | **a)** |  | What are the functions of Loader? How absolute loader performs these functions? Support your answer with suitable diagram. | **6** |
|  | **b)** |  | Which are the various phases of Compilation? What is the input and output of each phase? Process the following instruction in **bold** for each phase of compilation.  int a,b,c;  float d;  **a = b + c \* d;** | **8** |
| **Q. 3.** |  |  | **Attempt the following.** | **(14)** |
|  | **a)** |  | List out difference between Linux and DOS assembly. What are the assemblers available for Linux? How Linux Register Format supports in System Call processing?  **OR** | **6** |
|  | **a)** |  | Why we use API and ABI? Compare them and Discuss their role in Linux system. | **6** |
|  | **b)** |  | How paging and segmentation is implemented in Linux? Strengthen you answer with suitable diagram. | **8** |
| **Q. 4.** |  |  | **Attempt the following.** | **(22)** |
|  | **a)** |  | What is the concept of Virtual Device Driver? What are the types of Device Drivers? Compare different Device Drivers in Linux System. | **6** |
|  | **b)** |  | **Attempt any two of the following.** |  |
|  |  | **i)** | Can we encode the following instructions in 16 bits?  The Instructions:  • 15 instructions with 3 addresses  • 14 instructions with 2 addresses  • 31 instructions with 1 address  • 16 instructions with 0 addresses  If yes, Then-  1. Draw the Encoding.  2. Find out How many number of different bit patterns will be generated?  3. Decode the Instructions. | **8** |
|  |  | **ii)** | Establish and elaborate the relation of the following components in the working of device drivers. :  1) Device Stacks.  2) Virtual Device Drivers.  3) Device nodes.  4) Driver stacks. | **8** |
|  |  | **iii)** | A digital computer has a memory unit with 24 bits per word. The instruction set consists of 150 different operations. All instructions have an operation code part (opcode) and an address part (allowing for only one address). Each instruction is stored in one word of memory.  a) How many bits are needed for the opcode?  b) How many bits are left for the address part of the instruction?  c) What is the maximum allowable size for memory?  d) What is the largest unsigned binary number that can be accommodated in one word of memory? | **8** |
| **Q.5.** |  |  | **Attempt the following.** | **(22)** |
|  | **a)** |  | Compare .EXE and .COM file structure. | **6** |
|  | **b)** |  | **Attempt any two of the following.** |  |
|  |  | **i)** | Discuss POST details and POST Sequence. | **8** |
|  |  | **ii)** | What is BIOS? Why we need it? Comment on BIOS routine. | **8** |
|  |  | **iii)** | What is Direct X? Which are the different components of Direct X? Describe its Architecture. | **8** |
| **Q.6.** |  |  | **Attempt the following.** | **(14)** |
|  | **a)**  **a)** |  | How API Compatibility is achieved in different Applications? Discuss with Suitable example.  **OR**  What is pseudo Operation? Write a short note on Instruction Mapping. | **6**  **6** |
|  | **b)** |  | Explain .NET framework architecture with suitable Block Diagram.  **OR** | **8** |
|  | **b)** |  | What are different ways for Memory addressing? Discuss any four with example. | **8** |