# Lab – 1

**Title**:Prepare a hardware and software specification for basic computer system.

**Scenario/Question:**

Baneed works in the Media Department. His work involves in producing videos and images e.g. posters, web graphics and animations film making company. He wants you to produce a system design specification for his new multimedia computer system which he will use to run Macromedia Suite, Adobe Photoshop and Microsoft Office. He would like high tech graphics and sound. The computer system must also be able to store large amounts of images and run quickly as he requires more than one program at a time and often needs to switch between them. In a report explain the choice of components briefly relating them back to the user requirements. It is important that final specification includes all the necessary hardware and software components for the system to work.

Consider:

Internal system unit components: Processors, Fan and heat sink, Motherboard, Hard drive, Power supply unit (PSU)

Internal memory : RAM

Specialized cards: Graphic cards, Sound Card, Network Card

Peripherals: Output devices, Monitor, Printer

Input devices : Mouse, Keyboard, Digital Camera, Scanner

Backing storage: optical media, portable drives

Software Components:

Network Components: Ethernet Connectivity, Wireless Connectivity, Network Storage, Network Security, Backup Solution

**Objectives:**

To prepare hardware and software specification for new multimedia computer system use to run: Macromedia Suite, Adobe Photoshop and Microsoft Office.

**Theory:**

Multimedia has become essential in our digital world, combining text, images, audio, and video to create engaging content for education, entertainment, and business. A basic multimedia computer requires a fast processor and graphics card for smooth performance, at least 8GB RAM for multitasking, SSD storage for quick access to files, a quality display for accurate visuals, and reliable internet connectivity. This setup efficiently handles both media creation and consumption, making it suitable for everyone from students to professionals.

Baneed requires a high-performance multimedia computer system capable of running resource-intensive applications such as the **Macromedia Suite, Adobe Photoshop, and Microsoft Office**. This report outlines the hardware and software components necessary to meet these requirements.

**Hardware Specification:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S.N** | **Product** | **Type** | **Company** | **Size** | **Cost(In NRP)** |
| **1** | Processor | **AMD Ryzen 9 7900X** | AMD | **12 Cores / 24 Threads** | **Rs.85,000** |
| **2** | CPU coller | **DeepCool AK620** | DeepCool | Dual-Tower Air Cooler | **Rs.10,000** |
| **3** | Motherboard | **ASUS TUF B650-PLUS** | ASUS | AM5, DDR5, PCIe 4.0 | **Rs.35,000** |
| **4** | Hard Drive (SSD) | **WD Black SN770 1TB NVMe** | Western Digital | 1TB PCIe 4.0 | **Rs.18,000** |
| **5** | Power supply unit | **Corsair RM750e (750W Gold)** | Corsair | 80+ Gold, Fully Modular | **Rs.20,000** |
| **6** | RAM | **Corsair Vengeance 32GB DDR5** | Corsair | 32GB (2x16GB) 5600MHz | **Rs.30,000** |
| **7** | Graphics card | **NVIDIA RTX 4070 (12GB)** | NVIDIA | Great for 4K editing | **Rs.1,20,000** |
| **8** | Monitor | **Dell S2722QC (27" 4K IPS)** | Dell | 4K, 99% sRGB | **Rs.80,000** |
| **9** | Printer | **Canon PIXMA G6020** | Canon | A4, Ink Tank | **Rs.25,000** |
| **10** | Mouse | **Logitech G502 Hero** | Logitech | Wired (High Precision) | **Rs.7,000** |
| **11** | Keyboard | **Redragon K552 (Mechanical)** | Redragon | Wired, RGB | **Rs.6,000** |
| **12** | Digital Camera | **Canon EOS 250D (24MP)** | Canon | Entry-Level DSLR | **Rs.70,000** |
| **13** | Scanner | **Canon CanoScan LiDE 400** | Canon | A4, 4800 DPI | **Rs.15,000** |
| **14** | Optical Media | **ASUS DRW-24D5MT (DVD Writer)** | ASUS | Basic DVD/CD | **Rs.5,000** |
| **15** | Portable Drives | **Crucial X6 1TB** | Crucial | Portable USB 3.2 | **Rs.12,000** |
| **16** | Sound card | **Onboard (Motherboard Audio)** | ---------------- | Decent for editing | **0 (Included)** |
| **17** | Network card (Wi-Fi/Bluetooth) | **TP-Link Archer TX20E** | TP-Link | Wi-Fi 6 (PCIe) | **Rs.8,000** |

**Hardware Justification:**

1. **Processor (CPU) – AMD Ryzen 9 7900X :**  
   This 12-core/24-thread CPU delivers excellent multitasking performance for video editing and graphic design.
2. **Graphics Card (GPU) – NVIDIA RTX 4070 :  
   The RTX 4070 provides 12GB of GDDR6X VRAM, which is crucial for 4K video editing and high-resolution Photoshop work. Its CUDA cores and NVENC encoder accelerate rendering in Premiere Pro and DaVinci Resolve.**
3. **RAM – 32GB DDR5 (5600MHz) :  
   32GB of fast DDR5 RAM ensures smooth multitasking between Adobe apps, web browsers, and other tools.**
4. **Storage – 1TB NVMe SSD + 4TB HDD :  
   The 1TB NVMe SSD (WD Black SN770) provides fast boot times and quick access to frequently used applications. The 4TB HDD offers affordable bulk storage for project files and raw footage, keeping the SSD free for active work.**
5. **Network – TP-Link Archer TX20E (Wi-Fi 6) :  
   Wi-Fi 6 provides faster, more stable connections for cloud backups and large file transfers.**
6. **Peripherals – Logitech G502 Mouse, Redragon K552 Keyboard :  
   The G502 mouse offers precision for design work, while the Redragon K552 mechanical keyboard ensures durability and comfort during long editing sessions.**
7. **Digital Camera-Canon EOS 250D :  
   This 24.1MP APS-C DSLR provides excellent image quality for basic photography needs.**
8. **Optical Media-ASUS DRW-24D5MT :  
   While optical drives are becoming obsolete, this DVD burner is included for legacy needs burning project backups, reading old discs, or installing software from physical media.**
9. **Sound Card-Onboard Motherboard Audio :  
   Most modern motherboards (like the ASUS TUF B650-PLUS) include decent onboard audio with 5.1/7.1 channel support. For Baneed’s needs—basic video editing and sound mixing—this is sufficient.**

**Software Specification:**

|  |  |  |  |
| --- | --- | --- | --- |
| **S.N** | **Product** | **Brand Name** | **Version** |
| **1** | Windows 11 Pro | Microsoft | 64-bit (Latest) |
| **2** | **Adobe Creative Cloud plan** | **Adobe** | CC 2025 |
| **3** | Blender | Blender Foundation | 3.6 LTS |
| **4** | Google Drive | Google | 200GB Plan |
| **5** | Bitdefender Total Security | Bitdefender | 2025 |
| **6** | Microsoft 365 Personal | Microsoft | 2025 (Subscription) |
| **7** | 7-Zip | Igor Pavlov | 23.01 |

**Software Justification:**

1. **Windows 11 Pro :**It is the ideal OS for multimedia work due to its full compatibility with Adobe Creative Suite, enhanced security features like BitLocker, and superior multi-monitor support.
2. **Adobe Creative Cloud (2025)** :  
   Its cloud integration and regular AI-powered updates make it indispensable for serious media production.
3. **Blender 3.6 LTS :**It provides a powerful, free alternative for 3D modeling and animation.
4. **Google Drive (200GB) :**Its seamless integration with creative software and easy file sharing capabilities makes it perfect for collaborative projects and secure backups.
5. **Bitdefender Total Security (2025)** :  
   It delivers top-tier protection against malware and ransomware without slowing system performance.
6. **Microsoft 365 Personal :**It combines essential productivity apps with valuable cloud storage.
7. **7-Zip:**Its ability to handle multiple archive formats quickly and without bloat makes it superior to built-in Windows solutions for managing large media files.

**Network Justification:**

|  |  |  |  |
| --- | --- | --- | --- |
| **S.N** | **Component** | **Model** | **Price (NPR)** |
| **1** | **Network Card** | Intel X550-T2 (10G Ethernet) | ₨.46,500 |
| **2** | **Wi-Fi 6E PCIe Adapter** | TP-Link Archer TXE75E | ₨.10,600 |
| **3** | **10G Switch** | QNAP QSW-2104-2T (4-port) | ₨.26,600 |
| **4** | **NAS (24TB RAW)** | Synology DS1821+ (8-bay) | ₨.146,000 |
| **5** | **OM4 Fiber Cable (10m)** | FS.com LC-LC Duplex | ₨.5,300 |
| **6** | **Enterprise Router** | Ubiquiti UDM Pro | ₨.50,500 |
| **7** | **VPN Subscription** | NordVPN Teams (1 year) | ₨.12,000 |
| **8** | **5G Backup Internet** | Huawei 5G CPE Pro 2 | ₨.53,200 |

**Network Justification:**

1. **10G Network Card (Intel X550-T2) :**  
   Enables ultra-fast 10Gbps file transfers for 4K/8K video editing, eliminating bottlenecks when working with large media files.
2. **Wi-Fi 6E Adapter (TP-Link Archer TXE75E) :**  
   Provides high-speed wireless backup (5.4Gbps) for mobility without compromising latency-critical tasks like live streaming.
3. **10G Switch (QNAP QSW-2104-2T) :**  
   Future-proofs your studio with multi-device 10Gbps connectivity, essential for collaborative workflows and NAS access.
4. **OM4 Fiber Cables (LC-LC) :**  
   Delivers interference-free 10Gbps speeds over 550m, ideal for noise-free server room/rack connections.
5. **Enterprise Router (Ubiquiti UDM Pro) :**  
   Combines firewall, VLANs, and traffic shaping to protect creative assets while prioritizing video conference bandwidth.
6. **VPN (NordVPN Teams) :**  
   Encrypts remote access to studio resources, securing client files when working offsite or with freelancers.
7. **5G Backup Internet (Huawei CPE Pro 2) :**  
   Maintains uploads/downloads during ISP outages with 1Gbps+ failover speeds, crucial for cloud backups.

**Conclusion:**

This system design meets Baneed’s requirements for **high-performance multimedia editing, multitasking, and large file storage**. The combination of a **high-end CPU, GPU, fast NVMe storage, and professional peripherals** ensures smooth operation for Adobe Suite, Macromedia applications, and Microsoft Office. Additionally, **network and backup solutions** provide reliability and security for media projects.