QUESTIONS

NUMBER ONE

a) Office automation has revolutionised the office environment empowering the office worker to increase their productivity.
   i) Define office automation and show its impact on the business (4 marks)
   ii) Define Desktop Publishing (DTP) and indicate the business applications of the systems? (4 marks)

b) What are the major limitations of manual systems? (4 marks)

c) Modern banking environments have greatly benefited from developments in Electronic Data Interchange (EDI) and electronic funds transfer. Explain EDI and EFT and show their contribution to better business transactions. (4 marks)

d) i) What do you understand by the term Document Image Processing (DIP)? (1 mark)
   ii) Identify the main applications of DIP and state three advantages of using DIP in information management. (4 marks)

NUMBER TWO

Different organisations have adopted different structures for the IT department. Outline the traditional structure of an IS department and explain the main activities of the key sections. (20 marks)

NUMBER THREE

a) Outline the advantages and disadvantages of centralisation and decentralisation of the IS function (6 marks)

b) Outsourcing can be defined as the process of turning partially or fully an organisation’s IT services to external entities. Discuss the merits and demerits of outsourcing the IS function in an organisation. (6 marks)

c) List any FOUR features that would define quality software being developed
d) State the any FOUR rules for system testing (4 marks)

**NUMBER FOUR**

a) Explain how the following concepts of performance and workload measurements are used in assessing the performance of systems. (6 marks)
   i) Response time
   ii) Turnaround time
   iii) Throughput

b) What is the role of computer monitors in measuring the performance of a system? (6 marks)

c) Explain the main types of maintenance that a system may undergo in its lifespan. (8 marks)

**NUMBER FIVE**

a) In delivering information services, there are three alternative approaches to managing the costs of IT. Identify and briefly discuss the three alternatives (9 marks)

b) i) What do you understand by the term feasibility study? (1 mark)
   ii) Briefly explain these areas of feasibility study. (8 marks)

c) Define quality assurance as used in information systems (2 marks)

**NUMBER SIX**

a) The systems development lifecycle (SDLC) is a model that outlines the stages in the development of a system. It acts as a guideline for system development.
Outline the key stages of SDLC. (8 marks)

b) With developments in end user computing in many organisations, it has become increasingly necessary that organisations have information centres. What are the key services provided by these centres? (12 marks)

**NUMBER SEVEN**

a) Define the following terms as they relate to systems testing.
   i) Dynamic and static testing (4 marks)
   ii) Performance testing and usability testing (4 marks)
   iii) Regression testing (2 marks)
   iv) User acceptance testing (2 marks)

b) Computer Aided Software Testing (CAST) provides some of the automated tools to support systems and user acceptance testing.
   i) What areas would CAST be useful? (6 marks)
   ii) State any two problems of CAST. (2 marks)

**NUMBER EIGHT**

a) What is a project? (3 marks)

b) What is the role of the following in project management? (2 marks)
   i) Project manager
   ii) Project sponsor

c) Identify the major challenges facing project management (5 marks)

d) Explain the phases of the project lifecycle. (5 marks)

e) Define the Internet and outline its key services. (5 marks)
NUMBER ONE

a)

i) **Office automation**
   Office automation entails the use of IT to collect, process, store, manipulate and disseminate information. Involves technology for electronic publishing, document management, copying systems, DTP.

   **Effect on Business:**
   - Greater speeds, volumes and accuracy in routine processing.
   - Improved quality of management information.
   - Organisational commitment to continual change.
   - Better customer service.
   - New staff issues.
   - Home-working.

ii) **Desktop Publishing (DTP) and the business applications of the systems**
DTP is the use of office computers to implement computerised typesetting and composition systems. DTP systems pull graphics and text together from other programs. DTP’s main function is to enable the page to be seen as the artwork image for editing and production. Some common DTP packages include: PageMaker, Illustrator, Corel Draw, Photoshop.

   **Business applications of DTP include:**
   i) Design and preparation of the management reports, annual report.
   ii) Design of external documentation e.g. press releases.
   iii) Design of advertisements.
   iv) Publication of in-house magazines.
   v) Design of the organisations standard documentation e.g. order forms.

b) **Major limitations of manual systems**
   1. Lower labour productivity.
   2. Slower processing.
   4. Less accessible information- imagine looking for a physical file in a registry.
5. Difficulty in making corrections and alterations.
7. Bulky handling and storage e.g. in registries - taking up a lot of space.

c) **Electronic Data Interchange (EDI)**
EDI is a form of computer-to-computer data interchange that is a form of electronic mail. It mainly involves business documents and helps in accomplishing transactions e.g. sending invoices. Organisations have an agreed format for the electronic documents so that they are recognised by all parties to the transaction.

Example: EDIFACT (Electronic Data Interchange For Administration, Commerce and Transport).

- **ELECTRONIC FUNDS TRANSFER (EFT).**
  This is a system whereby a computer user can use his/her computer system to transfer funds to another account from his bank account by sending electronic data to his bank. It must involve the banks themselves.

An example is SWIFT (Society for Worldwide Interbank Financial Telecommunications.)

**ELECTRONIC FUNDS TRANSFER at POINT OF SALE (EFTPOS):**
Aims to handle, electronically, the high volume, low value transactions which make up the bulk of payments by number which banks currently have to handle and process in paper form. EFTPOS systems integrate the retailer’s POS system, which may comprise bar-code scanning or a sophisticated computerised cash register, with an electronic payment system.

d)

i) **Document Image Processing (DIP)**
DIP is an electronic form of filing. In a DIP system, a document is passed through a scanner, translated into digital form and the digitised image is then stored on a storage device usually an optical disk.

ii) **Applications of DIP include:**

   a. Electronic data interchange.
   b. Desktop Publishing.
Advantages of DIP are:
1. Reduced space needed for files. One optical disk can contain 60000 pages of A4.
2. Simultaneous viewing of files by many users.
3. Faster retrieval of files.

**NUMBER TWO**

Traditionally the IS department was divided into three main areas. These were:
- Systems development
- Operations
- Systems support

The managers of these areas were answerable to the information technology manager. The responsibilities of the information technology manager included:
- Giving advice to managers on all issues concerning the information technology department;
- Determining the long-term IT policy and plans of the organisation;
- Liaisons with external parties like auditors and suppliers;
- Setting budgets and deadlines; and
- Selecting and promoting IT staff.

1. **Systems development**
   The systems development manager is responsible for the offline development of systems and their implementation. He assigned projects to the analysis and programming teams.

   **The analysis section**
   Functions include:
   - System investigations;
   - System design;
   - System testing;
   - System implementation; and
   - System maintenance.

   **The programming section**
   Functions included:
   - Writing programs;
   - Testing programs; and
   - Maintaining programs.
System programmers write and maintain system software. Application programmers wrote programs or customised software to carry out specific tasks.

2. Operations
The operations manager is responsible for the efficient day-to-day running of the computer operations and the operating staff. Duties include:
- Planning procedures, schedules and staff timetables;
- Contingency planning;
- Supervision and co-ordination of data collection, preparation, control and computer room operations; and
- Liaising with the IT manager and system development manager.

Data preparation
Data preparation members of staff are responsible for converting data from source documents to computer sensible form. They usually operated a key station to prepare data. Duties were:
- Correctly entering data from source documents and forms;
- Keeping a record of data handled; and
- Reporting problems with data or equipment.

Data control
Data control staff are generally clerks. Duties include:
- Receiving incoming work on time;
- Checking and logging incoming work before passing it to the data preparation staff;
- Dealing with errors and queries on processing; and
- Checking and distributing output.

Computer room
The computer room manager’s duties include:
- Control of work progress as per targets;
- Monitoring machine usage; and
- Arranging for maintenance and repairs.
The shift leader’s duties included:
- Scheduling work for the shift;
- Supervising the work;
- Ensuring a proper operations log was kept; and
- Liaising with the operations manager.
The computer operators control and operate hardware in the computer room. Their duties include:
Starting up equipment;
Running programs;
Loading peripherals with appropriate media; and
Cleaning and simple maintenance of equipment.
The file librarian keeps all files organised and up to date. Typical duties are:
- Keeping records of files and their use;
- Issuing files for authorised use; and
- Storing files securely.

The database section
The database administrator is responsible for the planning, organisation and control of the database. His functions include:
- Co-ordinating database design;
- Controlling access to the database for security and privacy;
- Establishing back-up and recovery procedures;
- Controlling changes to the database;
- Selecting and maintaining database software; and
- Meeting with users to resolve problems and determine changing requirements.

3. Support

The maintenance section
- Fixing software and hardware problems

The network section
The network administrator/controller/manager’s functions include:
- Assignment of user rights;
- Creating and deleting of users;
- Training of users;
- Conflict resolution; and
- Advising managers on planning and acquisition of communication equipment.

NUMBER THREE

a) Centralisation
Advantages of centralisation
- Better security and control
- Better management of information
- Economies of scale e.g. in acquisitions- discounts
- More expert staff
- No redundancy

Disadvantages
- Delayed responses
- Single point of failure
- Over reliance on the head office.

**Decentralisation**
Advantages of decentralisation
- Tailored to local needs
- Better local control
- Restricted breakdowns

Disadvantages
- Uncoordinated information systems
- Lack of free information flows
- Redundancies

b) **Merits and demerits of outsourcing the IS function in an organisation**

Advantages of outsourcing
- Cost control due to fixed prices.
- Greater certainty in long term planning.
- Economies of scale
- New skills and knowledge become available.
- Resources employed can be scaled up or down depending on the needs.

Disadvantages.
- Risks of information confidentiality/ security
- Loss of competitive advantage- trade secrets.
- Getting locked into an unfavourable arrangements- contracts.

c) **Features of quality software:**
- Reasonably bug-free
- Delivered on time
- Written within the budget
- Meets user satisfaction
- Meets quality control standards

d) **Rules for system testing**
- Always test software against a specification- testing without a specification implies there is no need for testing as nothing of value is being tested
- Document the testing process
Use different forms/ techniques of testing - dynamic and static
- Test positively, checking that the software does what it should do and that it does not do what it should not
- Have the right attitude toward testing - it should be a challenge not just a routine

NUMBER FOUR

a) Concepts of performance and workload measurements

Response time
Response time is the overall time between a request for system activity and the delivery of the response.
Response time includes three elements:
- The time necessary to transmit or deliver the request to the system
- The time the system needs to process the results
- The time it takes to transmit or deliver the results back to the user
Response time is critical for user satisfaction

Turnaround time
- Turnaround time measures the efficiency of centralised computer operations, which still are used for certain tasks, such as credit card processing.
- Turnaround time is the amount of time between the arrival of a request at a computer centre and the availability of the output for delivery or transmission.

Throughput
- Throughput measures the efficiency of the computer itself.
- Throughput is the time from the input of a request to the central processor until the output is delivered to the system.

b) The role of computer monitors in measuring the success of the system
This can serve as an automated means of system evaluation. They include:

a) Hardware monitors. These measure the presence or absence of electrical signals in selected computer hardware circuits. They measure idle time or levels of activity in the CPU or peripherals.
b) Software monitors. These interrupt the application in use to record data about it e.g. waiting time during program execution.
c) System logs. These provide useful information on:
- Unexplained variations in job running times
- Excessive machine downtime
- Efficiency of mixed workloads
c) **There are four types of maintenance:**  
**Corrective maintenance**  
This occurs when there is a system failure. The objective is to ensure that the system remains operational.
- Diagnoses and corrects errors in the system
- Investigation, analysis, design, and testing are necessary before a solution is implemented
- Typically, a user submits a systems request form with supporting evidence, if necessary

**Adaptive maintenance**  
This is undertaken in response to anticipated changes in the processing environment to add new capability and enhancements
- Adds enhancements to the system
- An enhancement is a new feature or capability
- Adaptive maintenance often is required in a dynamic business environment
- An adaptive maintenance project is like a mini-SDLC, with similar phases and tasks
- Can be more difficult than new systems development, because of the constraints of an existing system

**Perfective maintenance**  
This occurs to improve the system by eliminating processing inefficiencies or enhancing performance. Involves changing an operational system to make it more efficient, reliable, or maintainable
- Requests for corrective and adaptive maintenance typically come from users, while requests for perfective maintenance typically come from the IS department

**Preventive maintenance**-  
Undertaken to avoid future occurrences that may be detrimental to the system e.g putting a firewall to a system to avoid hacking into the system.

**NUMBER FIVE**

a) **Charge back systems**  
**IT as a corporate overhead**  
IS costs are treated as an administrative overhead. 
Merits:
- Simple and cheap to administer.
- Encourages innovation and experimentation.
- Minimal conflict between IT and user departments
Demerits:
- No incentive to control costs
- No responsible use of IT

**IT charged out on a cost basis (Cost based charge-out)**
Users are charged for the costs of IT in proportion to their usage.

Merits
- Conceptually simple.
- Cost control by responsibility
- Motivation to regulate costs.

Demerits
- Inefficiencies of the IS department may be passed on to users
- Complex to implement in practice.
- Difficulty in determining appropriate cost units.
- Overhead costs of IT department still need to be met.

**Market based charge-out.**
IT department acts as a profit centre.

Merits
- External standards and price available.
- Encourages an entrepreneurial attitude.
- Prices are negotiable.

Demerits
- No comparable services might exist
- May result in under utilisation of resources
- Management skills may be lacking in IT

a)

i) Feasibility study is a preliminary study carried out to determine if the system development warrants proceeding or not. A system is feasible if it helps the organisation meet its overall objectives.

ii) **Areas of feasibility study**

- **Technical feasibility.** Can the system be constructed using available hardware and software. Consider transaction volumes, file capacities, response times and concurrent users.

- **Operational feasibility.** That the system does not interfere with how the organisation does its business. Consider management responsibilities, chains of command, reporting structures and levels of reorganisation required.
**Social feasibility.** System does not result in a net decline in the interests of stakeholders. Consider personnel policies, job specifications, industrial relations, skill requirements and motivation.

**Economical feasibility.** The proposed benefits of the system exceed its estimated costs. Is the project a good investment?

b) **Quality assurance**

Quality assurance is the term used where a supplier guarantees the quality of goods to be delivered and allows the customer to assess the quality of goods while they are being manufactured. In software development, there is use of structured walkthroughs.

**NUMBER SIX**

a) **The stages outlined by the SDLC model are:**

- **PROBLEM IDENTIFICATION.** Systems are developed to achieve certain specific goals. The identification of a problem and its clear precise definition act as a strong basis for the formulation of the goals of the system.
- **FEASIBILITY STUDY.** This is a preliminary study carried out to determine if the system development warrants proceeding or not. A system is feasible if it helps the organisation meet its overall objectives - economic, technical, social, organisational.
- **SYSTEM INVESTIGATION.** A new system almost inevitably replaces an already existing one. The system investigation is a thorough examination of the existing system as a means of clearly documenting it in totality. Various methods used include interviews, questionnaires, observation and searching documents.
- **SYSTEM ANALYSIS.** This is a thorough examination of the documented system to determine its strengths and weaknesses, opportunities and threats as a means towards providing inputs for the design stage.
- **SYSTEM DESIGN.** This is the development of the logical structure of the new system that will solve the problem defined in the first stage. It occurs at various levels and mirrors the system components namely input, output, processing and files.
- **SYSTEM IMPLEMENTATION.** This is the actual realisation of the system design as a real, working system. Choices need to be made as to whether the system will be constructed or purchased. Other relevant issues are the installation, testing, training, file conversion and the actual changeover.
- **REVIEW AND MAINTENANCE.** Two types of reviews are carried out i.e. the post implementation review and the system evaluation. System
maintenance comes in three forms namely corrective, adaptive, perfective and preventive.

b) Information centres

The concept of a computer support group to provide information workers with guidance and training in computer use as well as hardware and software tools evolved in the 1970s and 1980s. This was aimed at maximising the efficiency and effectiveness of computer processing.

A number of terms have since emerged to describe the service centre ranging from client service centre, resource centre. However the term information centre was coined by IBM Canada and is the most widely used today.

An information centre is designed to support end users in a number of ways. The typical services offered by an information centre include:

1. Problem resolution
   The centre acts as helpdesk for different users who may seek information ranging from simple queries on some of the error messages encountered to appeals for help when systems malfunction. There will always be expert assistance to sort out the problems.

2. Training of users
   This entails enhancing computer literacy among various system users.

   Personnel from the information centre may be handy in introducing users to new programs and also offering specialised skills to other departments during implementation of new programs.

3. Consultation
   The role of a consultant in the information centre is to help end-users plan for effective use of their computing resources, to advise them in ways to
computerise their work, and evaluate proposed computer applications, to assist in product selection and address questions regarding software and hardware.

4. Technical support
This is provided by the centre when user problems are too large or complex to be solved without the aid of technical specialists. Staff may also be asked to audit systems performance, establish back-up and recovery procedures, plan data access, assist with design of security, plan projects or document user requirements. This is an extension of the consultation services.

5. Product support
Software packages may reside at the information centre to provide end-users with the services such as graphics, spreadsheets, decision support, modelling capabilities, financial analysis, database management. Staff may demonstrate how the software is used and sometimes provide a sample problem solution walkthrough.

6. Hardware access
The centre controls the terminals, computers, printers and other equipment. The centre, in some organisations, acts as an in-house computer store. End users can try out the equipment, receive advice about the relative merits of various models from various manufacturers. The centre may provide training, configuration assistance and maintenance of the resources acquired from the centre.
7. **Staffing**
Some information centres provide back up assistance for end users who have a temporary need for information processing personnel.

8. **Computer resource planning and justification**
The centre can help end-users analyse their workloads, make projections of future needs and prepare (and justify) request for additional funding for computer resources. The centre nurtures end user awareness of the importance of standardisation and integration of resources.

9. **New service evaluation**
The centre staff assesses the user needs and when new products (hardware and software) come on the market, they help in evaluation as per the user needs and identify those that will be useful to enhance end user self-sufficiency and productivity. If necessary, the centre may then initiate a proposal to management for the acquisition of the product.

10. **Administrative services**
These services include promotion of the information centre activities, introduction of new users to the information centre, new product announcement, accounting and billing for centre use, equipment maintenance and service and keeping a library of computer-related material.
In its modern day applications, the information centre has become synonymous with the information technology department. In many instances it is more than a helpdesk.

**NUMBER SEVEN**

a)

i) **Dynamic and static testing**
   Static testing involves evaluating a system or component based on its form, structure and content. No execution is conducted.

   Dynamic testing is the testing performed by executing a program.

ii) **Performance testing and usability testing**
   Performance testing is conducted to evaluate the compliance of a system or component with specified performance requirements. Usability testing is conducted to evaluate how an operator interacts with the system.

iii) **Regression testing**
   Regression testing involves re-testing software that has been modified to fix “bugs”. It also aims to ensure that no other previously working functions have failed due to the changes.

iv) **User acceptance testing**
   User acceptance testing is carried out to determine whether or not a system meets previously defined acceptance criteria. The user department usually conducts it.

   Objectives include:
   - Finding software errors;
   - Finding out user demands; and
   - Evaluating operational procedures.

b) **Computer Aided Software Testing help ease the burden of system testing**
   Potential uses include:
   - Repeating test executions;
   - Performance assessment;
   - Simulating interfaces;
- Checking test results;
- Debugging; and
- Static and dynamic analysis.

Problems in using CAST include:
- Misunderstanding the test scope and the method;
- Poor selection and implementation of tools; and
- Poor quality CAST tools.

**NUMBER EIGHT**

a) **Project**
   A project is a sequence of unique, complex and connected activities having one goal or purpose and that must be completed by a specific time within budget and according to specifications. A project is an undertaking with a defined start and end that is carried out to meet established goals within scheduled cost, time and quality objectives.

   Project management co-ordinates the resources necessary to complete projects successfully. It is the combination of systems, techniques and people used to control and monitor project activities.

b) **The role of the following in project management:**
   Project management is the process of defining, planning, monitoring and controlling the development of an acceptable system a minimum cost within a specified time frame.

   **A project manager** is a senior analyst who uses planning, staffing, organising, scheduling, directing, and controlling skills to ensure the success of a project.

   **Project sponsor.** Accountable for the resources invested in the project.

c) **Challenges facing projects include:**
   - Team building;
   - Expected and unexpected problems;
   - Delayed benefits;
   - Use of specialists; and
   - Conflicts.

d) **Phases of the project lifecycle**
   This refers to the major time periods through which a project passes. The major project phases are
1 Defining phase. Deciding whether the project should begin and committing to do so. The stages here are:
   A. Initiation stage. Establishing terms of reference and appropriate management structure.
   B. Formation stage. Selecting the project personnel.
   C. Objective setting. Project objectives should be SMART.

2 Planning phase. Aims to devise a workable scheme to accomplish the overall project goal.
   A. Task planning stage. Breakdown of the project into manageable tasks.
   B. Feasibility and fact-finding stage. A feasibility study is a formal study to decide what kind of system should be developed to meet the needs of the organisation.
   C. Position analysis, options generation and options evaluation. Use of SWOT analysis to determine the organisation’s current position and available future options.

3 Implementing phase. Co-ordinating people and other resources to carry out the project plan.
   A. Design and development stage. Specification and construction/sourcing of the actual system.
   B. Implementation stage. Installation or making the developed system available for use.

4 Controlling phase. Monitoring and measuring progress and taking corrective action to ensure project objectives are met.

5 Completing phase. Involves formalising acceptance of the project and bringing it to an orderly end. May entail:
   • Checking that all products are complete and delivered.
   • Checking on the status of any outstanding requests for change.
   • Checking that all project issues have been cleared.
   • Approval of the project completion report.
   • Arranging for a post-implementation review.

e) The Internet
The Internet is a collection of linked network systems spanning the globe. Connection is facilitated via an Internet Service Provider (ISP). The user is registered as an Internet subscriber and pays a small monthly fee together with local telephone call charges.
What are some of the products of the NET?
 Email services- yahoo, hotmail
 Search engines
 File transfer (ftp)
 Newsgroups and chats
 World wide web (WWW)