UNIVERSITY OF JOHANNESBURG

FACULTY OF MANAGEMENT
2014 NOVEMBER EXAMINATION

DEPARTMENT OF APPLIED INFORMATION SYSTEMS

MODULE : **SYSTEMS ANALYSIS AND DESIGN (MODULE B)**

CODE : **BSO11B1**

DATE : **8 NOVEMBER 2014**

DURATION : **2 HOURS**

TOTAL MARKS : **100**

EXAMINER(S) : **MS C SLATTERY (UJ)**

EXTERNAL MODERATOR(S) : **MRS C COETZEE (TUT)**

NUMBER OF PAGES : **10**

INSTRUCTIONS TO CANDIDATES:

- Answer **ALL** questions.
- Question papers must be handed in.
- This is a closed book assessment.
- Read the questions carefully and answer only what is asked.
- Number your answers clearly.
- Write neatly and legibly.
- Structure your answers by using appropriate headings and sub-headings.
- The general University of Johannesburg policies, procedures and rules pertaining to written assessments apply to this assessment.

SECTION A: MULTIPLE CHOICE QUESTIONS (20 Marks)

Please answer all questions for this section in the exam book provided eg 1.1 =A.

Identify the letter of the choice that best completes the statement or answers the question.

1.1 Program documentation ____.

a. contains all the information needed for processing and distributing printed output
b. describes a system's functions and how they are implemented
c. describes the inputs, outputs, and processing logic for all program modules
d. consists of instructions and information to users who will interact with the system

1.2 A systems request form should ____

a. have clear instructions
b. be difficult to understand
c. not include enough space for all required information
d. not indicate what supporting documents are needed

1.3 In a DFD, the Gane and Sarson symbol for a data flow is a ____.

a. rectangle with rounded corners
b. line with a single or double arrowhead
c. flat rectangle that is open on the right side and closed on the left side
d. rectangle, which may be shaded to make it look three-dimensional

1.4 The concept that the quality of the output is only as good as the quality of the input, which sometimes is known as ____, is familiar to IT professionals, who recognize that the best time to avoid problems is when data is entered.

a. bad input, bad output (BIBO)
b. weak hand, weak hold (WHWH
c poor start, poor finish (PSPF)
d garbage in, garbage out (GIGO)

1.5 ____ protects information from unauthorized disclosure and safeguards privacy.

a. Availability
b. Integrity
c. Confidentiality
d Risk management

1.6 In an interview, ____ limit or restrict the response.

a. open-ended questions
b. closed-ended questions
c. leading questions
d. range-of-response questions

1.7 In a ____, one or more powerful servers control the network, and departmental servers control lower levels of processing and network devices.

a. hierarchical network
b. star network
c. bus network
d. ring network

1.8 ____ is the amount of data that can be transferred in a fixed time period.

a. Resolution
b. Dimensionality
c. Topology
d. Bandwidth

1.9 The testing of an individual module is called ____ testing.

a. unit
b. index
c. stub
d. modular

1.10 Because every piece of information should be traceable back to the input data that produced it, a(n) ____ trail must be provided that records the source of each data item and when it entered the system.

a. source
b. index
c. audit
d. control

1.11 Web-based software usually requires additional layers, called ____, to communicate with existing software and legacy systems.

a. freeware
b. shareware
c. public domain software
d. middleware

1.12 The choice between developing versus purchasing software often is called a ____ decision.

a. build or make
b. build or buy
c. transactional
d. subscription

1.13 In a data dictionary, a(n) ____ is the smallest piece of data that has meaning within an information system.

a. field
b. index
c. record
d. pixel

1.14 A feasibility study includes tests for ____ feasibility, which means that a

proposed system will be used effectively after it has been developed.

a. operational
b. technical
c. schedule
d. economic

1.15 When preparing a representative sample from a list of 200 customers who complained about errors in their statements, a ____ could ensure the sample is balanced geographically by selecting five customers from each of four zip codes.

a. systematic sample
b. stratified sample
c. random sample
d. comprehensive sample

1.16 ____ refers to the combination of hardware, software, and services that people use to manage, communicate, and share information.

a. Computer systems
b. Information technology
c. Information systems
d. Computer technology

1.17 Systems analysts use a ____ to graphically represent company operations and information needs.

a. JAD
b. Scrum
c. RAD
d. business process model

1.18 ____ methods include the latest trends in software development.

a. Object-oriented analysis
b. Agile/Adaptive
c. Structured analysis
d. Rapid application development

1.19 In the model of the SDLC shown in the accompanying figure, the purpose of the ____ is to build a logical model of the new system.

a. systems analysis phase
b. systems implementation phase
c. systems design phase
d. systems support and security phase

1.20 Whereas structured analysis treats processes and data as separate components, ____ combines data and the processes that act on the data into things called objects.

a. the MSF
b. the SDLC
c. RUP
d. O-O

[20 Marks]

SECTION B: LONG QUESTIONS (80 Marks)

Please answer all questions for this section in the exam book provided.

QUESTION 1: Phase 1 – Planning

1.1 What information systems are used in business in the 21st century? (4)

1.2 You are applying for a job at an IT firm as a systems analyst:

a. What skills will you need for the job? (3)
b. What will your role in the company be? I.e. what will be expected of you? (3)

1.3 What would strategic planning for an IT project include? (3)

1.4 Describe the purpose of a business case in this phase. (2)

1.5 Provide one outcome of the planning phase. (1)

[16 Marks]

QUESTION 2: Phase 2 – Analysis

2.1 What are the four systems analysis activities? (4)

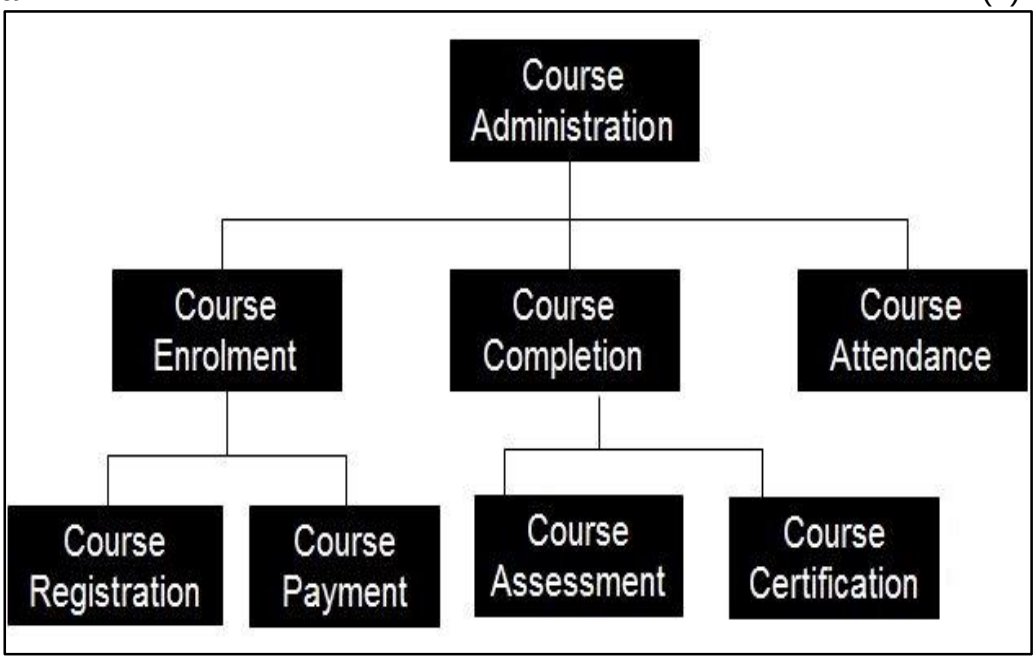
2.2 Top managers expect the IT department to deliver the best possible information system, at the lowest possible cost, in the shortest possible time. To fulfill these expectations, many IT managers have tried to increase user participation in the development process. A popular example of team-based approaches is JAD and RAD.

a. Discuss TWO advantages of JAD. (2)
b. Discuss TWO disadvantages of RAD. (2)

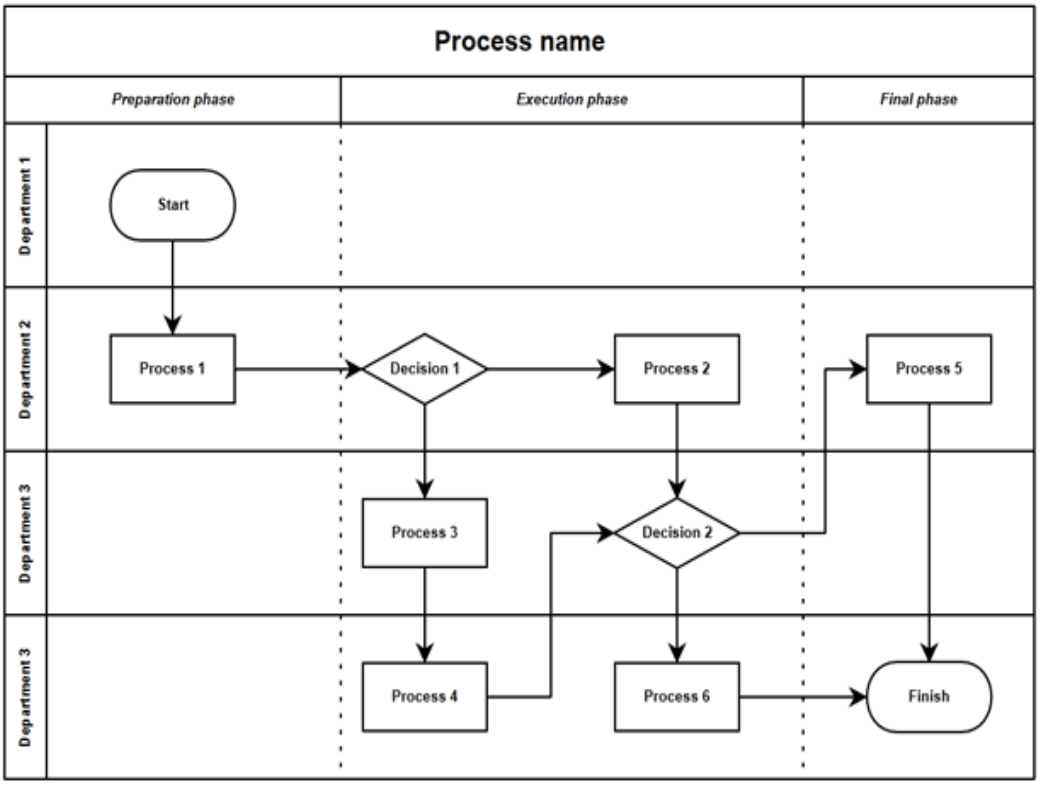
Please Turn Over

2.3 Identify the tools that diagram represents:

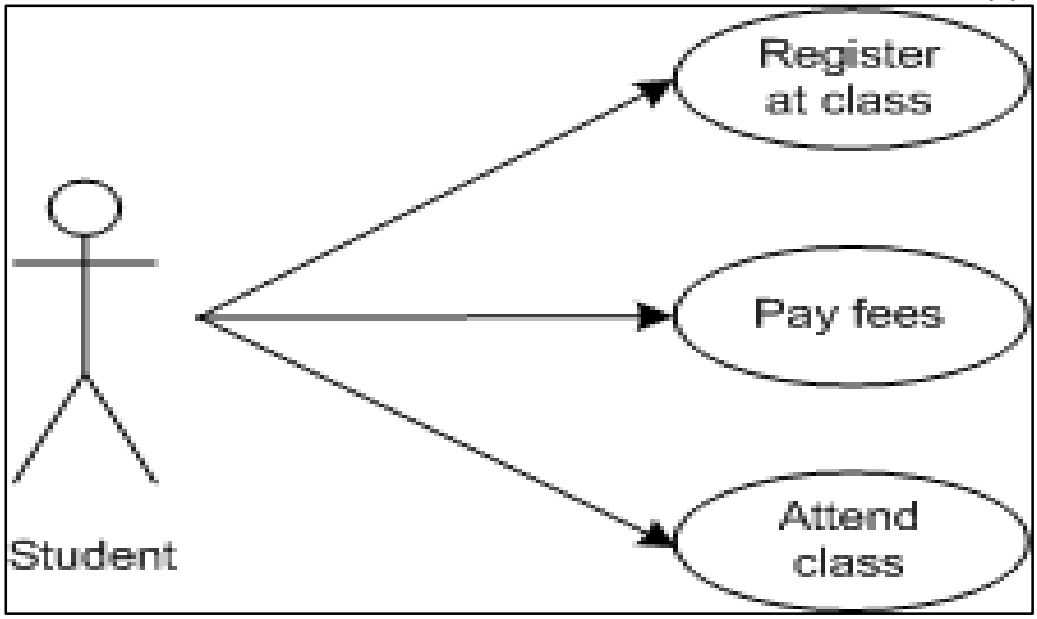
a. (1)



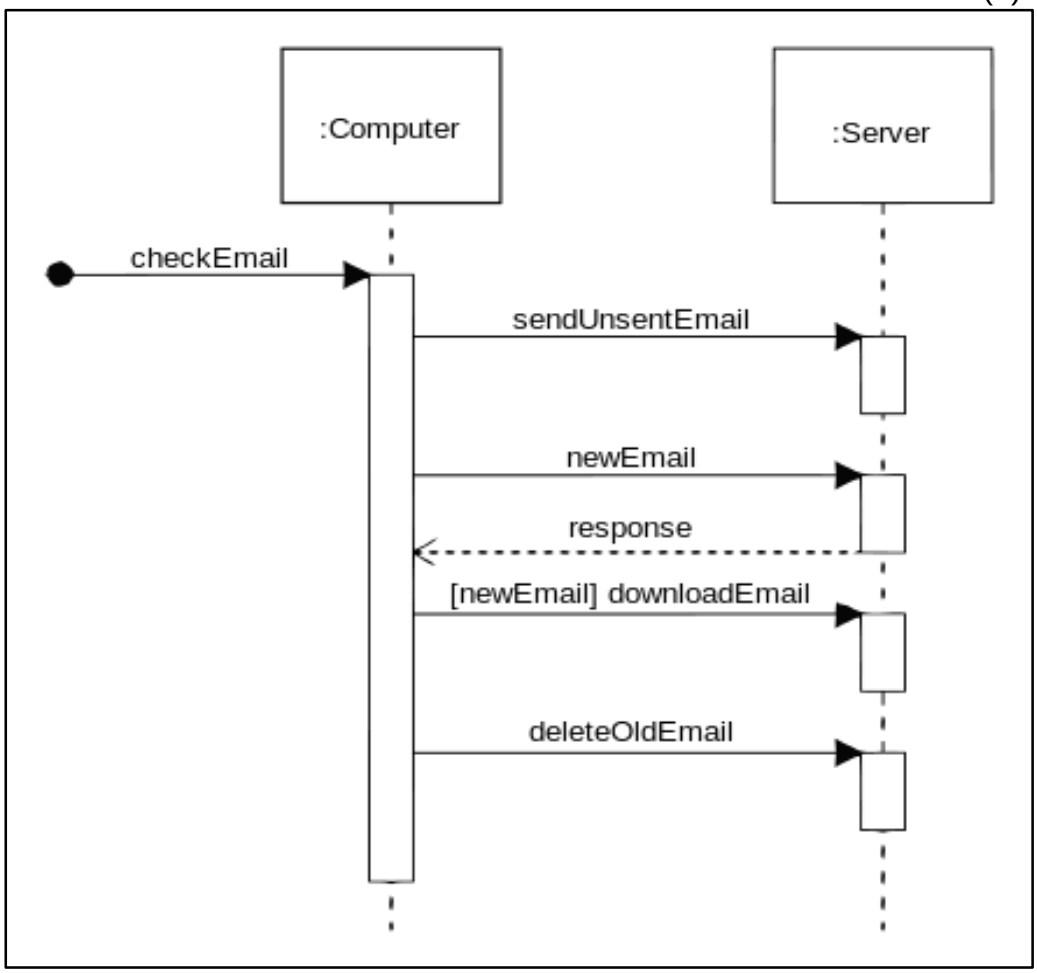
b. (1)



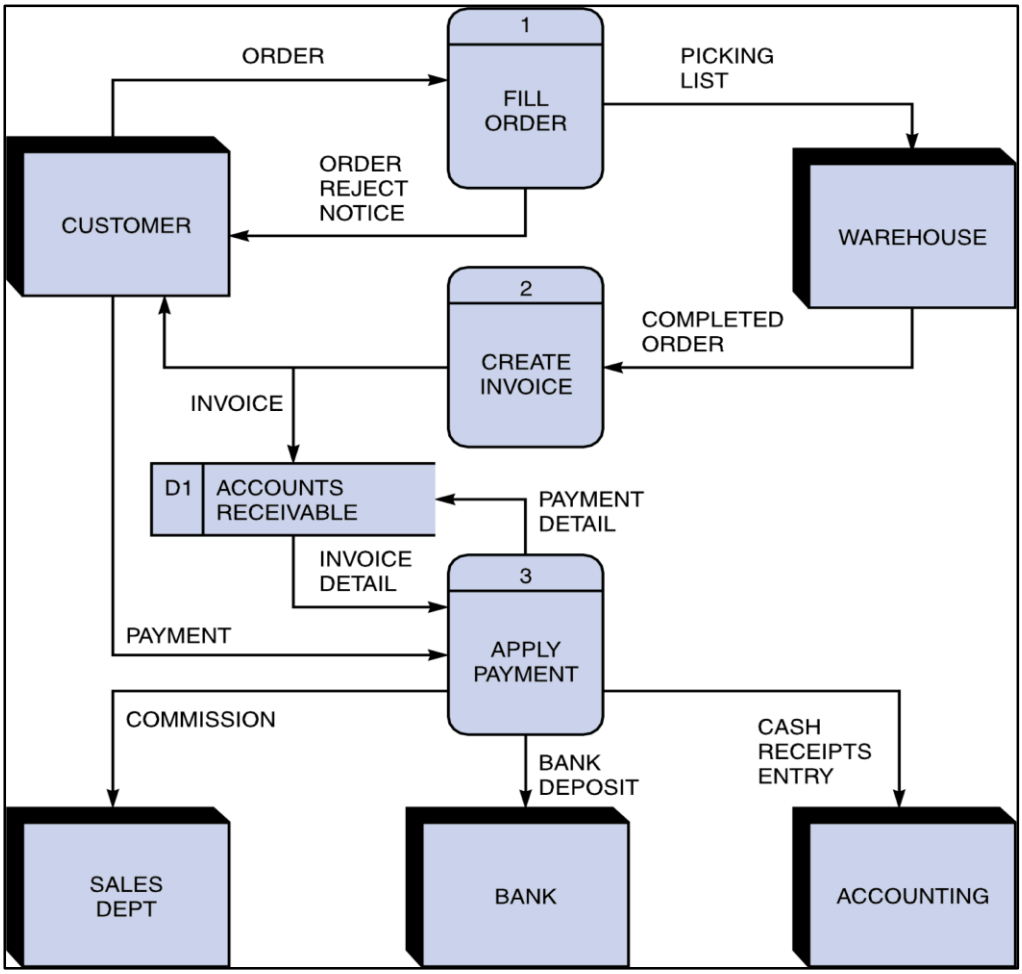
c. (1)


Register at class
Pay fees
Attend class
Student

d. (1)


:Computer
:Server
checkEmail
sendUnsentEmail
newEmail
response
[newEmail] downloadEmail
deleteOldEmail

2.4 Draw a context diagram for the following DFD level 0: (5)



2.5 Provide two options when deciding on development of a system. (2)

2.6 Provide two items that you would consider in a cost benefit analysis, when making a decision about the development strategy. (2)

2.7 What is the deliverable of this phase? (1)

[22 Marks]

QUESTION 3: Phase 3 – Design

3.1 Explain what a UI is. (2)

3.2 Provide three habits of successful interface designers? (3)

3.3 Describe the goal of the design phase. (2)

3.4 What role does security and control play in terms of input and output in user interface design?

a. Provide two types of security and control for input. (2)
b. Provide two types of security and control for output. (2)

3.5 There are nine items on the architecture checklist, list and explain three of the architecture items. (6)

3.6 What are the two requirements of an architecture? (2)

3.7 What is the outcome of this phase? (1)

[20 Marks]

QUESTION 4: Phase 4 – Implementation

Matching

Identify the letter of the choice that best matches the phrase or definition. Eg 4.1 =A

a. training plan
b. status flag
c. control
d. parallel
e. release plan
f. pseudocode
g. operational
h. top-down
i. phased
j. data conversion

4.1 When planning a program or set of programs, most analysts use this kind of approach, which proceeds from a general design to a detailed structure.

4.2 In a structure chart, typically this kind of module directs lower-level modules.

4.3 In XP, specifies when user stories will be implemented.

4.4 Passing this down from a control module generally is regarded as poor design, because logic problems in the control module can affect logic and coding in the subordinate module.

4.5 Because this is not language-specific, it can be used to describe a software module in plain English without requiring strict syntax rules.

4.6 A separate test environment is necessary to maintain system security and integrity and protect this kind of environment.

4.7 This should be considered early in the systems development process.

4.8 Depending on the system, this can be done before, during, or after the operational environment is complete.

4.9 This kind of operation is an inappropriate changeover method when the two systems perform different functions or if the new system involves a new method of business operations.

4.10 With this kind of operation, part of the system is given to all users.

[10 Marks]

QUESTION 5: Phase 5 – Support and Security

5.1 Provide and explain two types of user support. (4)

5.2 Explain four maintenance techniques (4)

5.3 Describe the role that the systems analyst plays in maintenance. (2)

5.4 What should this phase produce? (2)

[12 Marks]

Total 100 Marks

BSO11B1 November Exam- MEMORANDUM

SECTION A: MULTIPLE CHOICE QUESTIONS

1.1 ANS: C PTS: 1 REF: 469

1.2 ANS: A PTS: 1 REF: 59

1.3 ANS: B PTS: 1 REF: 18

1.4 ANS: D PTS: 1 REF: 319

1.5 ANS: C PTS: 1 REF: 524

1.6 ANS: B PTS: 1 REF: 150

1.7 ANS: A PTS: 1 REF: 425

1.8 ANS: D PTS: 1 REF: 419

1.9 ANS: A PTS: 1 REF: 466

1.10 ANS: C PTS: 1 REF: 330

1.11 ANS: D PTS: 1 REF: 262

1.12 ANS: B PTS: 1 REF: 266

1.13 ANS: A PTS: 1 REF: 197

1.14 ANS: A PTS: 1 REF: 62

1.15 ANS: B PTS: 1 REF: 158

1.16 ANS: C PTS: 1 REF: 4

1.17 ANS: D PTS: 1 REF: 13

1.18 ANS: B PTS: 1 REF: 21

1.19 ANS: A PTS: 1 REF: 23

1.20 ANS: D PTS: 1 REF: 2

SECTION B: LONG QUESTIONS

<u>QUESTION 1</u>: Phase 1 – Planning

1.1 4 Marks

ANY 4
Enterprise computing systems
Transaction processing systems
Business support systems
Knowledge management systems
User productivity systems

1.2 You are applying for a job at an IT firm as a systems analyst:

a. 3 Marks

Communication Skills
Business Skills
Critical Thinking Skills

b. 3 Marks

Analysts build a series of models, diagrams, and decision tables and uses other descriptive tools and techniques

An effective analyst will involve users in every step of the development process

1.3 3 Marks

The project supports overall business strategy and operational needs
The project scope is well-defined and clearly stated
The project goals are realistic, achievable, and tied to specific statements, assumptions, constraints, factors, and other inputs

1.4 2 Marks

A business case should describe the project clearly, provide the justification to proceed, and estimate the project's financial impact

1.5 1 Mark

Purpose of this phase is to perform a preliminary investigation – a critical step

<u>QUESTION 2</u>: Phase 2 – Analysis

2.1 4 Marks
Requirements Modeling

Data and Process Modeling
Object Modeling
Development Strategies

2.2 7 Marks

a. JAD- Joint Application Development
RAD- Rapid Application Development
(2)

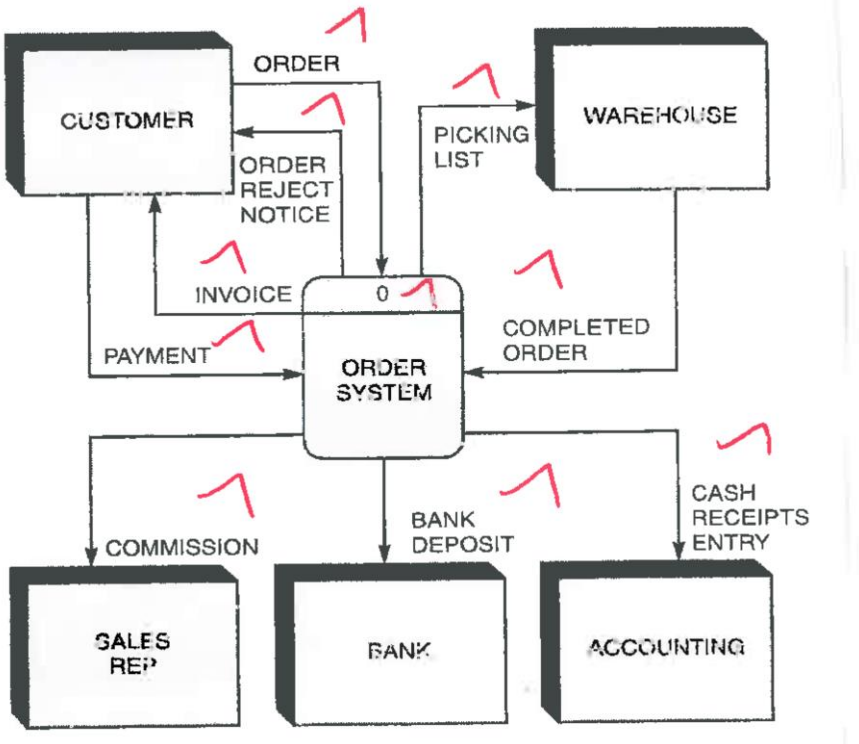
b. Any 2
JAD allows key users to participate effectively
Users more likely to feel a sense of ownership
Produces a more accurate statement of system requirements
(2)

c. Does not emphasize strategic business needs
System might work well in short term but miss long-term objectives
Less time to develop quality, consistency, and design standards
(3)

2.3 4 Marks

a. FDD- Functional Decomposition Diagram
b. BPM- Business Process Model
c. Use Case diagram
d. Sequence Diagram

2.4 5 Marks- ½ for each data flow and the process =5; each missing entity = -½



2.5 2 Marks

In house development or outsourcing the development

2.6 2 Marks

Any 2

- **List each development strategy being considered**
- **Identify all costs and benefits for each alternative (Be sure to indicate when costs will be incurred and benefits realized)**
- **Consider future growth and the need for scalability**
- **Include support costs for hardware and software**
- **Analyze various software licensing options, including fixed fees and formulas based on the number of users or transactions**
- **Apply the financial analysis tools to each alternative**
- **Study the results and prepare a report to management**

2.7 1 Mark

The deliverable is a specification document

<u>QUESTION 3</u>: Phase 3 – Design

3.1 2 Marks

Any 2 Points

A user interface (UI) describes how users interact with a computer system, and consists of all the hardware, software, screens, menus, functions, output, and features that affect two-way communications between the user and the computer

3.2 3 Marks

Any 3

1. **Understand the Business**
2. **Maximize Graphical Effectiveness**
3. **Think Like a User**
4. **User Models and Prototypes**
5. **Focus on Usability**
6. **Invite Feedback**
7. **Document Everything**

3.3 2 Marks

The goal of systems design is to build a system that is effective, reliable, and maintainable

3.4 4 Marks

Any 2 from here

- **Input must be correct, complete, and secure**

- **Every piece of information should be traceable back to the input data that produced it**
- **Procedures needed for handling source documents to ensure that data is not lost before it enters the system**
- **Audit trail files and reports should be stored and saved**

Any 2 from here

- **Output must be accurate, complete, current, and secure**
- **Output security protects privacy rights and shields the organization's proprietary data from theft or unauthorized access**
- **Use specific procedures to ensure that the output is delivered to authorized recipients only**
- **Shred sensitive reports, out-of-date reports, and output from aborted print runs**

3.5 6 Marks

Any 3 and the explanation

- **Corporate organization and culture**
  - **An information system must perform well in a company's organization and culture**
- **Enterprise resource planning (ERP)**
  - **Establish a company-wide strategy for using IT that includes a specific architecture, standards for data, processing, network, and user interface design**
- **Initial Cost and TCO**
  - **TCO includes tangible purchases, fees, and contracts called hard costs**
- **Scalability**
  - **A system's ability to expand, change, or downsize easily to meet the changing needs of a business enterprise**
- **Web Integration**
  - **Will the application be part of an e-commerce strategy and what is the degree of integration with other Web-based components**
- **Legacy Systems**
  - **A new system might have to interface with one or more legacy systems, which are older systems that use outdated technology, but still are functional**
- **Processing Options**
  - **Will the system process data online or in batches?**
- **Security Issues**
  - **Security threats and defenses are a major concern to a systems analyst**
- **Corporate Portals**

- **Provide access for customers, employees, suppliers, and the public**
- **A well-designed portal can integrate with various other systems and provide a consistent look and feel**

3.6 2 Marks
An architecture requires servers and clients

3.7 1 Mark
Create a physical model that satisfies all documented requirements

QUESTION 4: Phase 4 – Implementation

4.1 ANS: H PTS: 1 REF: 456

4.2 ANS: C PTS: 1 REF: 456

4.3 ANS: E PTS: 1 REF: 464

4.4 ANS: B PTS: 1 REF: 458

4.5 ANS: F PTS: 1 REF: 454

4.6 ANS: G PTS: 1 REF: 475

4.7 ANS: A PTS: 1 REF: 476

4.8 ANS: J PTS: 1 REF: 484

4.9 ANS: D PTS: 1 REF: 486

4.10 ANS: I PTS: 1 REF: 486

QUESTION 5: Phase 5 – Support and Security

5.1 4 Marks
User Training (any 1)
- New employees must be trained on the company's information systems
- IT Department may develop a user training package
- Training users about system changes is similar to initial training
- Objective is to show users how the system can help them perform their jobs

Service Desks (Help Desk) (any 1)
- Enhance productivity and improve utilization of a company's information resources
- The help desk is a central contact point for all IT maintenance activities

5.2 4 Marks

- **Corrective Maintenance**
  - Diagnoses and corrects errors in an operational system
- **Adaptive Maintenance**
  - Adds enhancements to an operational system and makes the system easier to use
- **Perfective Maintenance**
  - Involves changing an operational system to makes it more efficient, reliable and maintainable
- **Preventive Maintenance**
  - Requires analysis of areas where trouble is likely to occur

5.3 2 Marks

The systems analysts and programmers are a part of the maintenance team

5.4 2 Marks

A well-designed system must be secure, reliable, maintainable, and scalable