BMSCOLLEGEOF ENGINEERING,BANGALORE-19

(Autonomous Institute,AffiliatedtoVTU)

Department Name:

FIRST INTERNALS

CourseCode: 20CS5PCSEG	**CourseTitle: Software Engineering**	
Semester:5th A,B,C	**MaximumMarks:40**	**Date:22/10/2020**
FacultyHandlingtheCourse:	**Latha N.R., Sheetal V.A.**	
Instructions: Internal Choice in PART C only		

PART-A

Total 5 Marks

No.	Question	Marks
1	Assume you are working in software company and you are assigned a government project. This project deals with bids from various people and also access to various government office computers. If one of your relative has applied for a bid and requests you for unauthorized access to the computer systems of government office so that it would help. Discuss the ethical dilemmas that this request raises and the professional and ethical responsibilities of software engineer that you would be violating. State Code of Ethics and Professional Practice as specified by ACM/IEEE-CS joint task force.	5M

PART-B

Total 15 Marks

No.	Question	Marks
2a	Develop a set of use cases that could serve as a basis for understanding the requirements for an Hospital Management system for fully automated operation with the help of a diagram.	5M
2b	Describe the structure of requirement document as specified by IEEE/ANSI.	5M
2c	Classify and explain the Non-functional requirements hierarchy diagram of an interactive system that allows Flight passengers to find flight times from terminals installed in an airport.	5M

PART- C

Total 20 marks

No.	Question	Marks
3a	i) Analyze the Library Management System that catalogues copyrighted articles from various countries and Identify the principal viewpoints which might be taken into account and organize these using a view point hierarchy diagram. ii) Illustrate the different metrics used for specifying non-functional requirements	10M
	OR	
3b	Design a template using structured natural language to capture the requirements for an unattended petrol or gas pump system.	10M
4a	Consider an Online stationary ordering System. •List the actors involved and explain the relevance of each actor. •Prepare the use case diagram for the system. •Prepare the sequence diagram for ordering stationeries and online payment •Identify the Non-functional requirements and draw viewpoint hierarchy diagram	10M
	OR	
4b	i) Differentiate between Software Engineering and System Engineering. ii) Identify the enduring and volatile requirements for an Automatic washing machine that has different programs for different types of clothes.	10M

Software Engineering

Scheme & Solution.

Test-1.

PART-A

1) Code of Ethics and Professional Practice as specified by ACM/IEEE-CS Joint Task force.

1. Public
2. client and employer
3. Product
4. Judgment
5. Management
6. Profession
7. colleagues
8. Self.

Note: Explaination to be done as per scenario given.

PART B

2a) Minimum 5- use-cases for

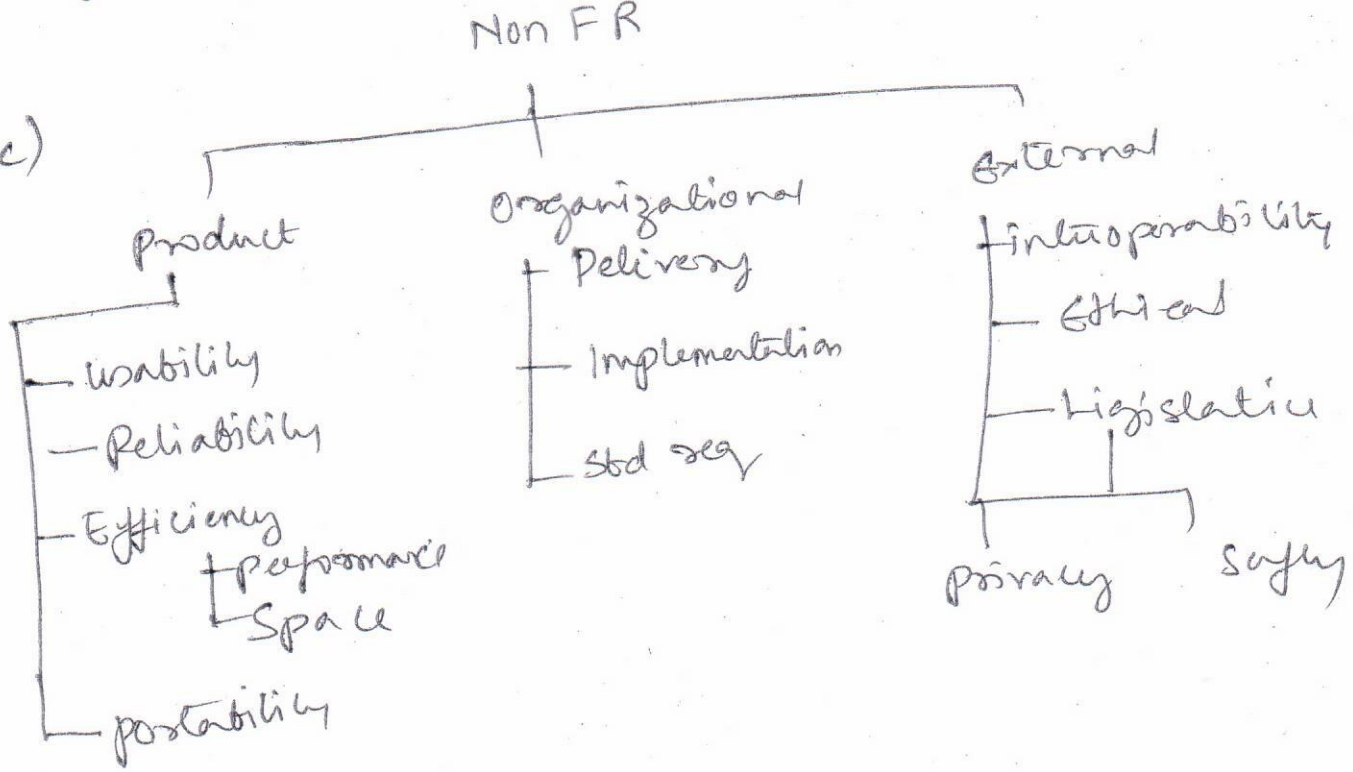
petrol/gas station.
Library Mgnt System
Hospital Mgnt System.

Explanation of use case along with the actors associated with each usecase. w.r.to the

2b) Structure of requirement document as specified by IEEE/ANSI

1. Introduction:
   - Purpose of req document
   - Scope of product
   - def, acronyms and abbreviations
   - reference
   - overview
2. General description:
   - Product perspective
   - prod func
   - user chars
   - General constraints
   - Assumption & dependencies
3. Specific req - func, non-func, interface req's
4. Appendices
5. Index

2c)



Explanation w.r.to Application.

PART-C

3a) i) Software Engg 2.5 Marks
Sytem Engg 2.5 Marks } 5 Marks

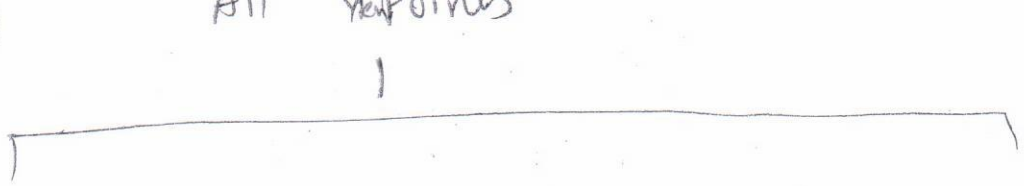
ii) Enduring Requirements — Fixed Requirements
Volatile Requirements — changing Requirements } 5 mark
w.r.to the application given.

OR.

3b) List of actor (any 4) — 1 mark
use cases and actors associated with it. — 2 mark
Sequence diagram. — 2 mark
Non-functional — 2 mark
View point hierarchy — direct VP
indirect VP — 3 mark.
domain VP.

w.r.to the application given.

4a) i)



(w.r.t application given)

ii) Metrics for NFR

1. Speed
2. Size
3. Ease of use
4. Reliability
5. Robustness
6. Portability

OR

4b) Structured Natural Language Template

1. Function
2. Description
3. Input
4. Source
5. Output
6. Destination
7. Action
8. Requires
9. precond'n
10. post cond

Set - 2

BMSCOLLEGEOF ENGINEERING,BANGALORE-19

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Department Name:

SECOND INTERNALS

CourseCode: 20CS5PCSEG	**CourseTitle: Software Engineering**	
Semester:5th A,B,C	**MaximumMarks:40**	**Date:01/12/2020**

FacultyHandlingtheCourse: **Latha N.R., Sheetal V.A.**

Instructions: Internal Choice in PART C only

PART-A
Total 5 Marks

No.	Question	Marks
1	Describe the strategies used for decomposing a sub-system into modules with relevant diagrams	5M

PART-B
Total 15 Marks

No.	Question	Marks
2a	Using the UML graphical notation for object classes, design sequence diagram showing interactions of objects for the following : (i)A group diary and time management system is intended to support the timetabling of meetings and appointments across a group of coworkers. When an appointment is to be made that involves a number of people, the system finds a common slot in each of their diaries and arranges the appointment for that time. If no common slots are available it interacts with the user to rearrange his or her personal diary to make room for the appointment.	5M
2b	Differentiate between the two kinds of concurrent objects.	5M
2c	Analyze the various schemes that help in identifying objects.	5M

PART-C
Total 20 marks

No.	Question	Marks
3a	Your customer wants to develop a system for stock information where dealers can access information about companies and can evaluate various investment scenarios using a simulation system. Each dealer uses this simulation in a different way, according to his or her experience and the type of stocks in question. (i) Model architecture for the above system with reasonable assumptions about the system requirements and justify your answer. (ii) Draw Context model and Sequence model	10M
	OR	
3b	(i) Draw a Data flow model showing the interactions involved when a student's registers for a course in a university. Courses may have limited enrolment, so that the registration process must include checks that places are available. Assume that the student accesses an electronic course catalogue to find out about various courses (ii) Draw a state machine model for an automatic intruder alarm and lighting control system.	10M

4a	(i) Giving reasons for your answer based on the type of system being developed, suggest the most appropriate structural model that might be used as a basis for managing the development of the following systems: ➢ Passport Authentication system ➢ A system to control Air traffic controller Explain with neat diagram. (ii) Suggest the most appropriate control model that might be used for the following systems. Provide proper justification for your answers. ➢ An interactive system that allows railway passengers to find train times from terminals installed in stations ➢ A university system that prints marks cards Explain with neat diagram.	10M
	OR	
4b	(ii) Giving reasons for your answer based on the type of system being developed, suggest the most appropriate structural model that might be used as a basis for managing the development of the following systems: ➢ A system that monitors patients in a hospital intensive care unit ➢ A system to control a Air Conditioner unit Explain with neat diagram. (ii) Giving reasons for your answer suggest an appropriated control model for the Following with a neat neat diagram: ➢ An Automated Marks card Generation system ➢ An automated robot floor cleaner Explain with neat diagram.	10M

Set-2

Software Engineering
Scheme & Solution

Tut 2

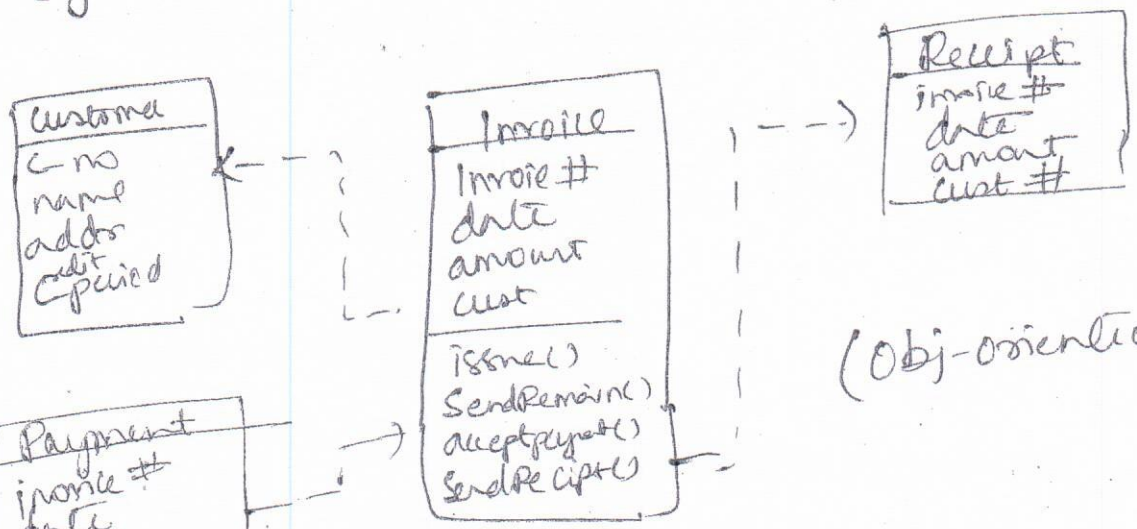
Part A

1. Strategies used for decomposing a sub-sim into modules.
A Sub sim is a sim in its own right whose operation is independent of the services provided by other sub-sim.

2 Strategies used

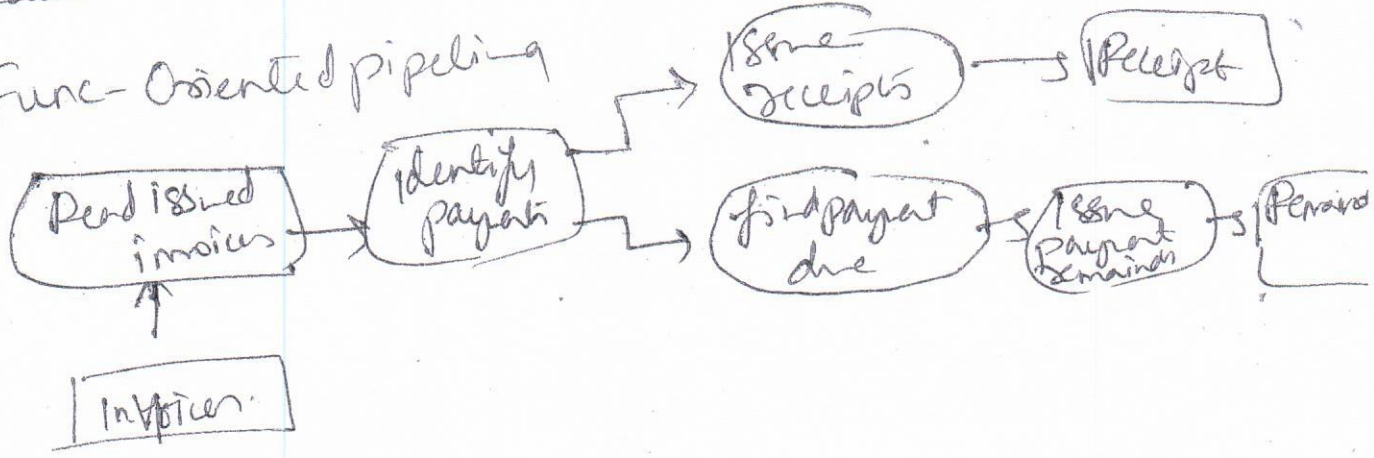
1) An object model where the sim is decomposed into interacting object (object oriented decomposition)
2) A pipeline or dataflow model where the sim is decomposed into functional modules which transform i/p to o/p.
(func oriented pipelining).

1)

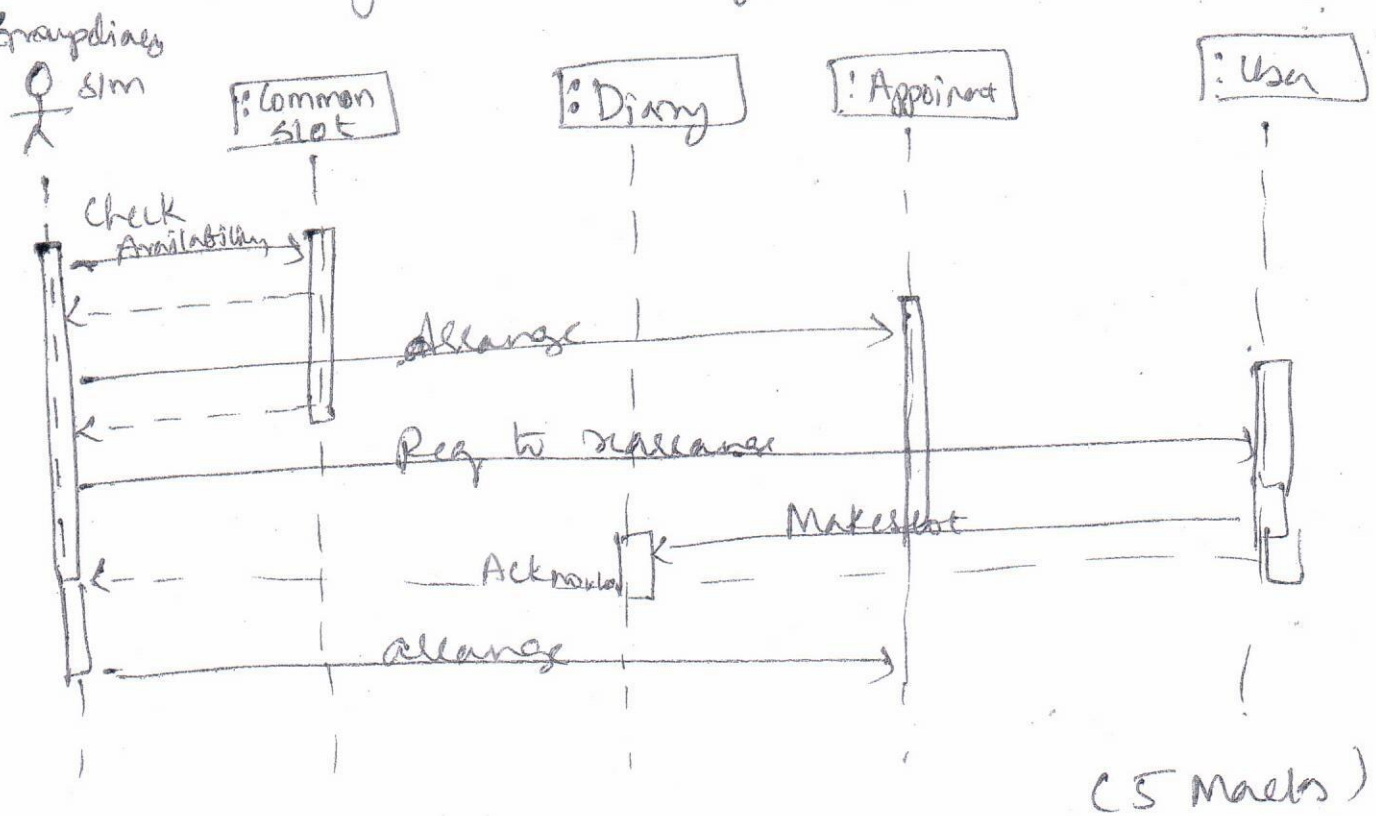


(Obj-oriented decomposition)

2) Func-Oriented pipelining



2a) A Group diary and Time Mgmt Sim



(5 Marks)

2b) Concurrent objects — The nature of objects as self contained entities make them suitable for concurrent implementation

The message-passing model of object communication can be implemented directly if objects are running on separate processors in a distributed sim.

2 kinds

Servers — object is implemented as a parallel process with entry points corresponding to object operations. If no calls are made to it the object suspends itself & waits for further request.

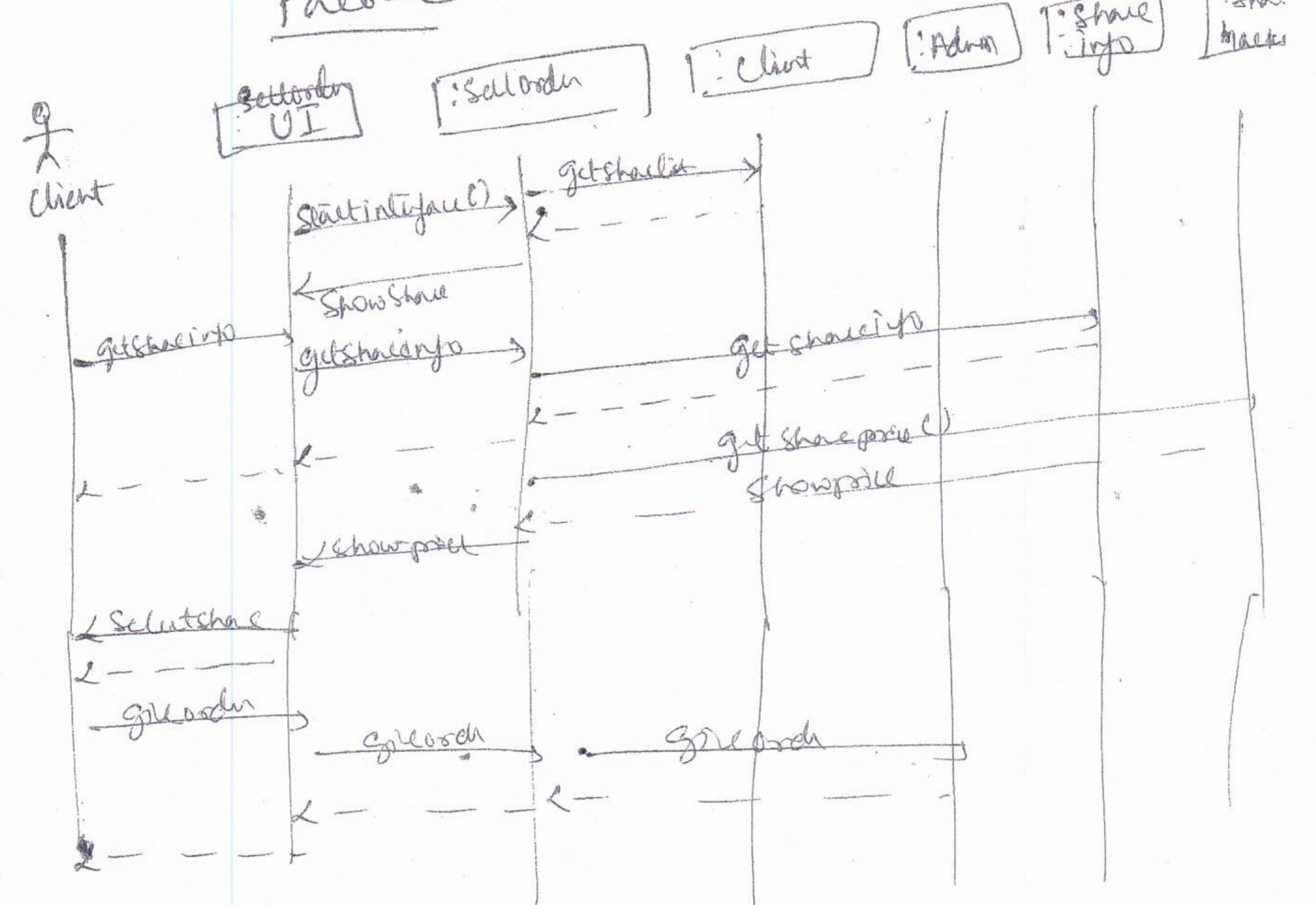
Active objects — Obj are implemented as parallel processes & the internal object state may be changed by the object itself and not simply by ext calls

2c) Schems that help in identifying objects

- Use grammatical approach base on a natural lang description of the sym.
- Base the identification on tangible things in the application domain
- Use a behavioural approach & identify objects based on what participates in what behaviour
- Use a scenario based analysis. The objects, attributes & methods in each scenario are identified

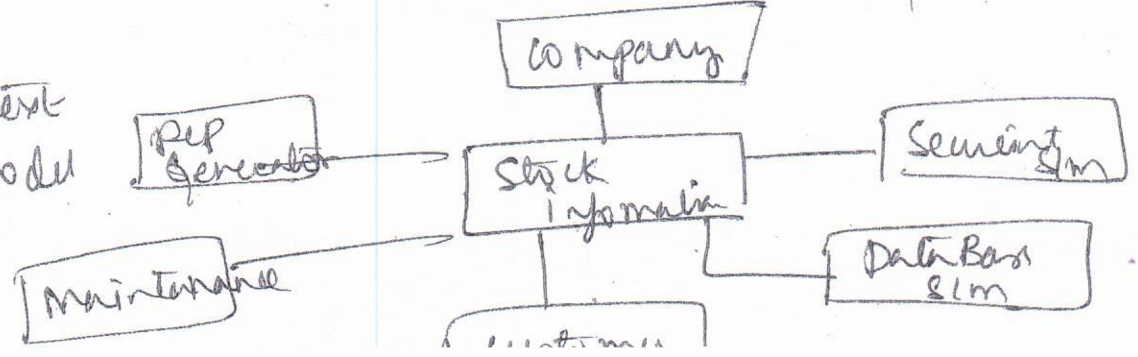
Part-C

3a) ii)



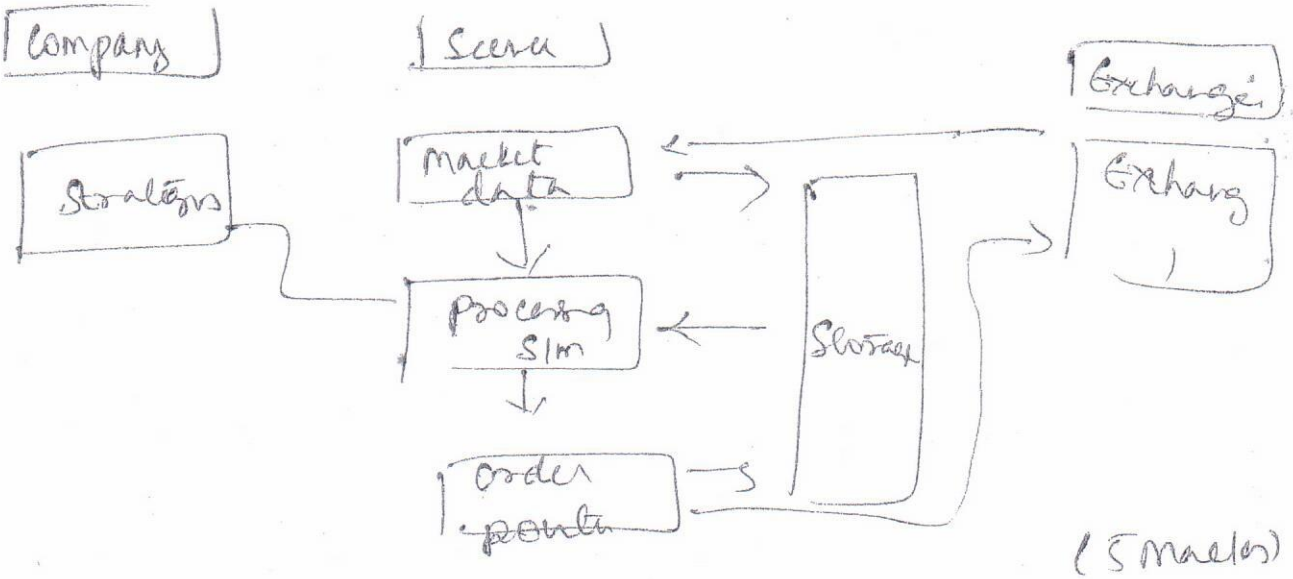
Sequence diagram

Context model



(5 marks)

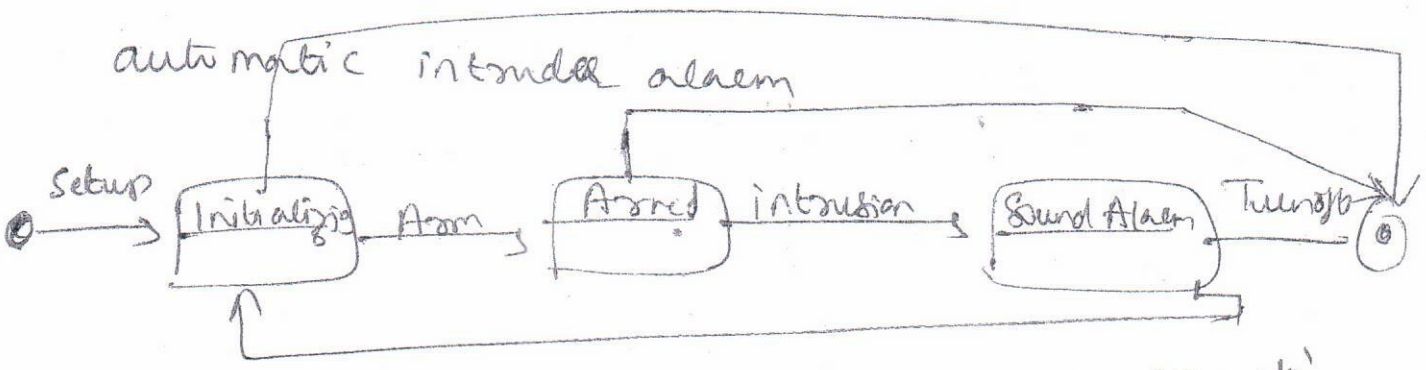
i)



(5 marks)

Or

3b) As in Set-1 (5 marks)



(5 marks)

4a)(i) Structural model

- passport Authentication Sim — Repository Model
- A Sim to control Air traffic control — Layered Model
- railway passenger find train times — Call-deliver
- A university Sim that prints marks cards.

(i) Structural model

- A Sim monitors patients in ICU — Manager, Call-deliver, client Array, Repository
- A Sim to control a Air condition unit — Layered.

Control model

(ii) An Automated Marks card Generation Sim — Call-deliver

An auto mated robot floor cleaner — Interrupt driven.

Set-1

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Department Name:

THIRD INTERNALS

CourseCode: 20CS5PCSEG	**CourseTitle: Software Engineering**	
Semester:5th A,B,C	**MaximumMarks:40**	**Date:05/01/2021**

FacultyHandlingtheCourse: **Latha N.R., Sheetal V.A.**

Instructions: Internal Choice in PART C only

PART-A

Total 5 Marks

No.	Question	Marks
1	Describe the basic principles that guide software project scheduling	5M

PART-B

Total 15 Marks

No.	Question	Marks
2a	Analyze the tools that might be used in testing workbench	5M
2b	The Management of an organization has asked you to carry out a system assessment on 15 legacy systems they have. The results of that assessment is to be used for deciding whether the system is obsolete and that it should be replaced by a new system. Show the assessment of each of these systems by plotting it on a chart relative to business value and system quality and explain.	5M
2c	Analyze the different roles involved in the inspection process.	5M

PART-C

Total 20 marks

No.	Question	Marks
3a	a) The estimated cost of a project is $10,000 and the project will contain 60 Function Point (FP). Calculate the cost of a FP and the duration required in person-months if the teams' average productivity is 13FP/pm. b) Draw flow graph for path testing with an example	10M
	OR	
3b	a) If a team produces 500 lines of code per month at a burdened labor rate of $9200 per month. Calculate the project cost and estimated effort in person-months for developing a library system which spans 15000 LOC. b) Differentiate between White-box and Black-box testing.	10M
4a	a) If a team produces 250 lines of code per month at a burdened labor rate of $10200 per month. Calculate the project cost and estimated effort in person-months for developing a library system which spans 21000 LOC. b) Design a Task Network for Library Management system assuming the tasks involved and also show milestones.	10M
	OR	

4b	a) If an organizations productivity is 8 FP/pm based on a burdened labor rate of $6000 per month. Calculate (i) Cost per FP (ii) Estimated effort in person-months (iii)Estimated project cost if total number of FP's are 580. b) Differentiate between problem based estimation and process based estimation	10M

Set-1

Software Engineering (20CS5PCSEG)

Part-A

1) Basic principles that guide S/w project scheduling

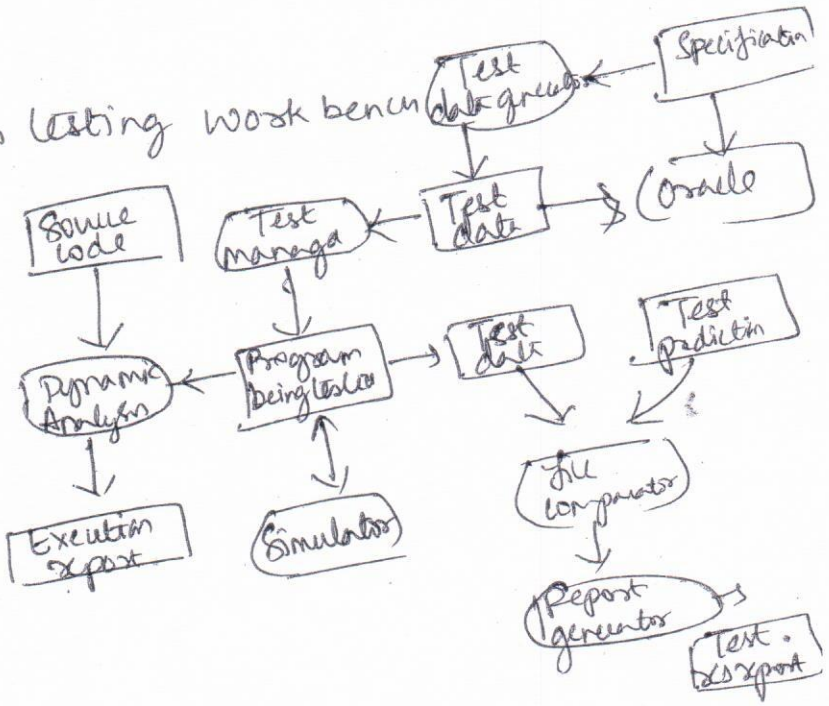
- Compartmentalization
- Interdependency
- Time allocation
- Effort validation.
- Defined responsibilities
- Defined Outcomes
- defined milestones.

(5 Marks)

Part-B

2a) Tools that is used in testing work bench

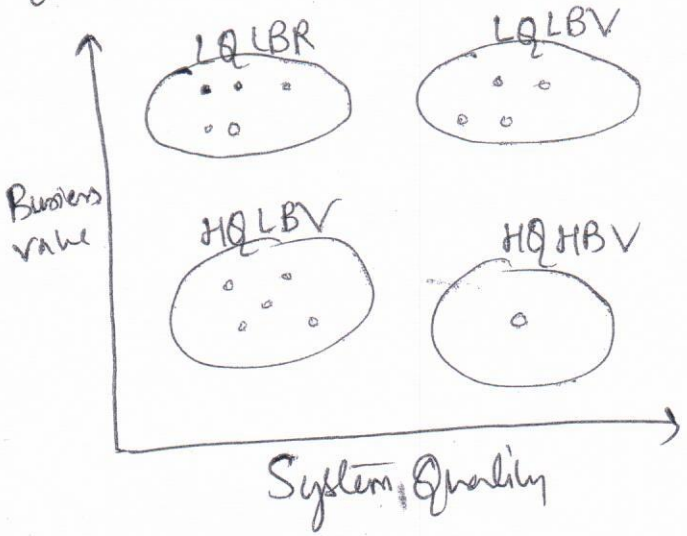
1. Test manager
2. Test data generator
3. Oracle
4. File comparator
5. Report generator
6. Dynamic analyser
7. Simulator.



(5 Marks)

2b) System Assessment on IS Legacy S/w.

1. Low Quality low Business Rate
2. Low Quality High business value
3. High Quality, low business value
4. High Quality, high business value



2c) Roles in Inspection Process

1. Author of owner
2. Inspector
3. Reader
4. Scribe
5. Chairman or moderator
6. Chief moderator

Part C

3a) a) Estimated cost $10,000

Total FP 60

Average productivity = 13FP/pm.

Labour rate per month =

CPFF = Lrate / Avg prod. $\frac{10000}{60} = \$167$

Duration $\frac{60}{13} = 4.61$ months

b) Data flow graph for BS

path testing shows the no of independent path to be tested

or

(5+5=10 marks)

3b) a) 500 LOC

Labour rate $9200 per month

Total LOC = 15000

1) Cost per LOC = 9200/500 = $18.4

2) Total proj cost = 15000 × 18.4 = $276000

3) effort in PM = 15000/500 = 30 PM

b)

White box	Black Box
Any 5 diff.	

(5+5=10 marks)

~~Set-1~~

4a) a) Avg prod = 250 LOC Pmonth

Labourrate = 10200

Cost per LOC = LR / Avg prod

= 10200 / 250 = $40.8.

Total cost = 21000 × 40.8 = $8,56,800

effort in PM = 21000 / 250 = 84

b) Task N/w

Showing various tasks, Milestone and diagram

(5+5 = 10 marks.

or

4b) Avg prod 8FP/M

Labourrate = $6000 PM

FP count = 580

1. Cost / FP = 6000 / 8 = $750

2. 580 / 8 = 72.5 ≈ 75 personmonth

3. 580 × 750 = $435000 Total cost

b) problem based estimation

Process based estimation

Explaination

(5+5) = 10 marks)

Note : Please do not write Back side Pages

Q. No.		Marks