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Roll No:

CS21B059

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INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
CS302L SOFTWARE ENGINEERING

B.TECH
SEMESTER V

TEST 2 (Oct 18 2023)

TIME: 60 Min
MARKS: 65

ANSWER ALL QUESTIONS

Please read the entire question paper before you start! Be agile, crisp and sharp in your answers and write assumptions if any! Your answers should be based on discussions in the lectures rather than textbook-driven! Best ☺ Write your answer in the space provided unless you need extra sheets. Partial credit may be given based on Quality of the content, not Quantity.

Section A. Tick True or False and write a one sentence rationale [justification] - 1 mark each, marks will be given only if justification is correct. (10 marks)

1. T/F - Checkboxes are a good way to present related choices only one of which can be true at a time.

1

False. Multiple can be checked.

Use radio buttons instead.

2. T/F - Including the users/customers in the process of developing requirements will yield a better product.

1

True. Helps understand the requirements better.

3. T/F - Including the users/customers in the process of coding will yield a better software product

1

False: End user may not understand coding principles. Will slow down the process.

4. T/F - It is good to express software design using source code notation

1

False. Use prototypes like wireframes. Easier for all to understand.

- A good explanation of the question in reverse.*
5. T/F - It is often better for the prototype to exceed the final product so that the users can see all the possible options the system could have.

True. Can get customer feedback.

(1)

6. T/F - Informal language is a typical and valid way to write down requirements in the Software Requirements Specification document. → brings ambiguity

(0)

✗ True. Must be in end-user terminology.

(1)

7. T / F - A way to estimate the duration of one very large task is to break it into smaller sub-tasks, estimate each one independently, and add up the estimates. However, this approach is usually not practical because of the difficulty of knowing all the sub-tasks and of unforeseen interactions among them.

True. One task might affect the other, forming a bottleneck.

(1)

False. Coupling - B/w modules

Cohesion - same module.

9. T/F - Git is a decentralized version control system

(1)

True. It is decentralized. Helps with keeping track of updates. ~~(Justification?)~~

10. T/F - Design should happen only after testing

(1)

False. Preliminary designs are made to have an idea for coding, and then can be modified.

Section B. Brief Answer Questions (3M X 10 = 30 marks)

11. Write two user stories for two users in the context of IIT Tirupati's ERP system!

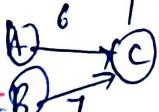
- ① User ^{→ Student} should be able to access the course registration page to register for courses.
- ② Faculty should be able to access the grades of the students to whom they are advised, so they can understand the student's position.
- ③

12. What is the difference between lines of code and function points? What are the advantages and disadvantages of both of them?

Lines of codes - measures the number of lines in a software.
→ adv. easy to understand
→ disadv. vary by language and person

Function points - measures the number of functions the code performs.
→ adv. better understanding of the system's capabilities
→ disadv. many functions, but simple tasks to perform will skew the measurement

13. List three strategies of presenting software estimation!

- ① Gantt chart - Timeline of when each process is performed
- ② PERT model -
$$\frac{(most\ likely\ time) + 4 \times least\ likely\ time + fastest\ time}{6}$$
- ③ Critical path model


CPM - A process may depend on two processes, one may be slower \Rightarrow critical path
- ④ Milestone chart - Clearly label milestones to reach.

Dev-ops concentrates on CI/CD and on site maintenance. Agile is like you adopt to changes very quickly, prefer people more than the process, etc

You have written how Agile can be similar to DevOps

14. Write what is DevOps in one sentence/diagram and how it is different from Agile?



- ① Agile may have multiple iterations inside Dev.
- ② DevOps is a process while Agile is a methodology.

15. What does noise and silence mean in the context of SRS?

- ① Noise - presence of unnecessary/redundant/also duplicate requirements on an SRS
- ② Silence - absence of crucial requirements on an SRS.

16. Write two requirement statements that are inconsistent with each other in IIT Tirupati's ERP system?

- 1) Students are required to register for npTEL courses on ERP
- 2) Students must register for NPTEL courses again on npTEL website.

Inconsistency: > only 1 registration should be required for both the parties.

- ③ FFP must show courses which are

I doubt this use case is present in ERP



17. What are the three broad ways of expressing requirements? - Briefly write a sentence on each!

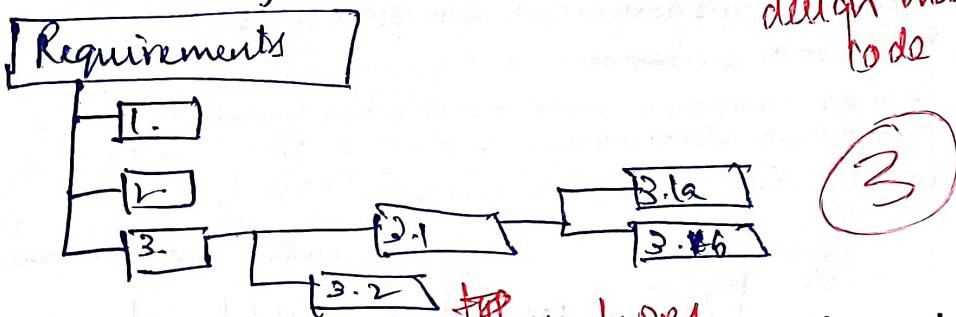
① Business - The business requirement of the software based on a certain use case, perform tasks.

② Functional - The functions that the software must perform

③ Non-functional - The conditions the software system must adhere to (Standards, hardware etc.)

18. Explain what is requirements traceability through a diagram and why it is important?

Requirements traceability is important to organize the requirements to be able to find them quickly and state them during breach of contracts. ↴ w.r.t to what?
design modules / code



19. Two critical tasks in UI design are understand ~~user types~~ and understand ~~user needs~~. Give example for the terms that you write in both blanks!

① User → the characteristics of the user.

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Example: app for registering for Aadhaar

online → many might not be literate
so make the UI easy to follow.

② Tasks → the tasks the user will perform

X

Example: To register for Aadhaar, the UI must be clear, and like buttons to navigate and text should be legible etc.

user req and types of user

20. When designing a system, why is it typically unwise to express designs in terms of code?
Give two reasons that are as different as possible, in one phrase or sentence each.

① Code is ^{not} trivial to understand, and the design must be understandable to by the customer for feedback.

② Design in code might be time-consuming.
Use wireframes, drag-and-drop tools

instead.

③

Section C. Short Answer Questions (5M X 5 = 25 marks)

21. More Requirements!

Give one concrete example of each type of requirement, in one phrase each, or say that none exist for Zoom video conferencing system

(a) Functional, behavioral requirement

Users must be able to present what is on their screen.

④

The app should maintain low latency during streaming of videos

(b) Non-functional, behavioral requirements

Zoom must have icons that clearly specify the function of a button. → functional

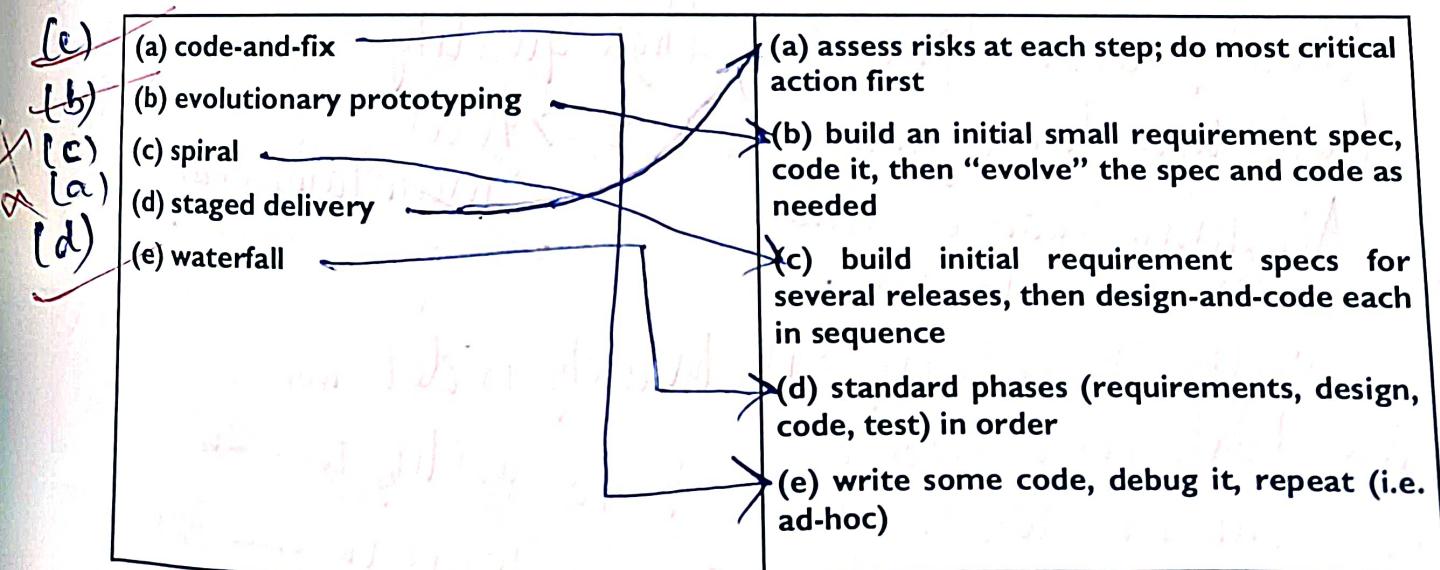
(c) Functional, non-behavioral

Previously joined / frequently joined meeting ID must be visible, and accessible to the user.

(d) Non-functional, non-behavioral

Zoom must run on any operating system.

22. Match each lifecycle model with its definition, by drawing a line connecting them (5 marks)



③

23. Write five characteristics of quality (general) and software quality. Focus on how they differ!

Quality	Software Quality
Must perform the specified tasks perfectly.	Must Perform the specified tasks perfectly. X
Use of a general product is dependent on the user. No error handling mechanism.	Any invalid input given by a user must be handled without crashing.
Formal methods of testing are used (example, construction).	Not always tested through formal methods.
Usually, updated products build upon the original. No maintenance is done for older ones for newer versions.	High quality → good maintainability
Usually products (e.g. car) are built for a specific environment / location and can't be operated at the same efficiency level elsewhere.	Quality is determined by portability too. → Using it on multiple different HW, softw.

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24. Four example requirements from your project (Avoid generic use cases such as login, they will not be considered)

Statement in SRS	User Story
A therapy-based Chatbot must be integrated.	User should be able to interact with a therapy Chatbot to gain some support and advice.
Story-based learning must be present	User should be able to learn about interacting with people with mental health issues through interactive stories.
Recent News in mental health must be displayed	User should be able to browse some of the latest news in mental health to learn more, and be aware.
Customizable profile and theme should be present	User should be able to add a custom profile pic, user bio, and even change the theme between light/dark to have a more immersive and connecting personal experience while learning. Not written as user stories

(3.5)

25. For your project, write down the technical decision you made for R1, which you want to change for R2 and why?

Decision	New Decision and Why?
Hosting with update when new push to Github.	Will change to manual hosting update to make sure bugs don't creep in to the final product.
Profile pic uploading and Abusing hardcoded URL.	A hard-coded URL will be easier for outside sources to obtain. Will be change to random generated soon, without having to hard code.
Changing User scheme.	Need to update the user Mongo JSON schema to allow for community chatting.
Navbar being different in phone / desktop modes.	Will make them similar for smoother development and user experience.
Single JWT for auth.	Will use integrate two for more security.

Using Github
Github Projects
for project
management.

Want to migrate to Jira
for better management
and easier.