Ref. No.: Ex/IT/PC/B/T/223/2024

BACHELOR OF INFORMATION TECHNOLOGY ENGG. EXAMINATION, 2024

2nd year, 2nd semester

Software Engineering

Time: 3 Hours | Full Marks: 100

Read the questions carefully and answer accordingly.

CO1: Answer any **2** questions — Full marks: **20**

1A. i) What are the attributes of good software?
ii) Compare evolutionary and throw away prototyping?
iii) What are the Drawbacks of RAD Model?
iv) Which process model leads to software reuse? Why? **(2+3+3+2)**

B. i) With a schematic diagram explain the Incremental software development Model.
ii) Propose a specific software project that would be easily developed using the incremental model. Explain. **(7+3)**

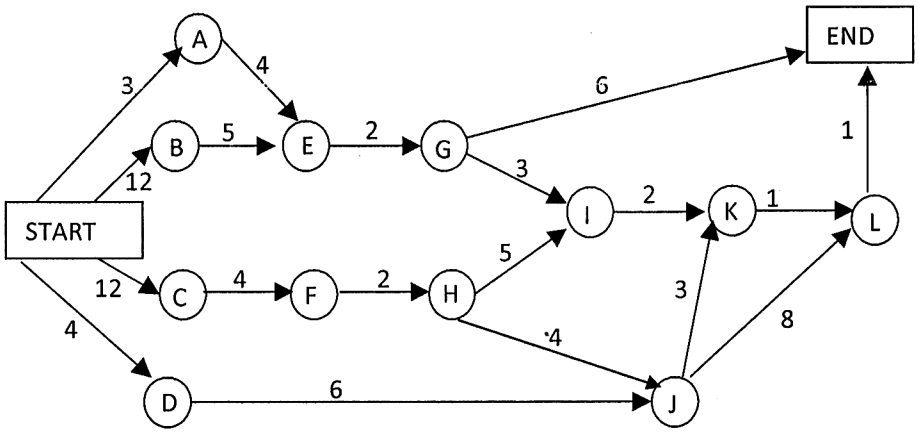
C. i) For developing an advanced spelling/grammar checking component for the word processor, which software process model will you select? And why?
ii) Identify the problem you will face, if you try to develop a large software product without using software engineering principles. **(5+5)**

CO2: Answer any **1** question — Full marks: **15**

2A. i) Without developing an SRS document an organization might face severe problems. Identify those problems.
ii) Explain the Constructive Cost Estimation model.
iii) What is function point metrics? Compute the function point value for a project with the following information:

Number of user inputs: 32 — Number of user outputs: 60
Number of user inquiries: 24 — Number of files: 8
Number of external interfaces: 2 **(3+4+2+6)**

B. i) Write a short note on Rayleigh Curve.
ii) What are the main activities for scheduling a software project?



The above activity network represents events as circles and activities (tasks) as arrows. Events are identified by letters; activities are identified by their 'begin' and 'end' events. The number against each activity is its duration (in days).

ii) Find out the critical path?
iii) Design a Gnatt chat for the above Activity Network. **(4+4+2+5)**

CO3: Answer any 3 questions Full marks: 30

3A. i) Write down the differences between function-oriented and object-oriented design approaches.
ii) When a module is said to have logical cohesion? Why?
iii) A module having high coupling and low cohesion is said to be functionally independent of other modules. Is it true? Explain. **(3+4+3)**

B. Design a DFD of level-1 for the following system.
A supermarket needs to develop the following software to encourage regular customers. For this, the customer needs to supply his/her residence address, telephone number, and the driving license number. Each customer who registers for this scheme is assigned a unique customer number (CN) by the computer. A customer can present his CN to the checkout staff when he makes any purchase. In this case, the value of his purchase is credited against his CN. At the end of each year, the supermarket intends to award surprise gifts to 10 customers who make the highest total purchase over the year. Also, it intends to award a 22 caret gold coin to every customer whose purchase exceeded Rs.10,000. The entries against the CN are reset every year after the prize winners' lists are generated. **(10)**

C. Draw the class diagram for problem given below.
You have been asked to build a management system for a group of archeologists. The group is comprised of multiple teams of researchers. Each team has a letter ID (e.g., team A, team B). Each researcher belongs to one of the teams and has an ID number, a first name, and a last name. There are two types of researchers: field and lab staff. Each field staff member has a favorite region (string). Each lab researcher supports up to 2 field researchers. Some researchers may not be supported by a lab researcher. The company also manages an inventory of equipment. Researchers of any type may check out up to 3 pieces of equipment. Each piece of equipment has a serial number and replacement cost. **(10)**

D. Draw a use case diagram for the Supermarket Prize Scheme described in question 3B. **(10)**

CO4: Answer any **3** questions Full marks: **30**

4A. Write a pseudo code that accepts an arbitrarily long text as input and produces a list of words and their frequency of occurrence as output. Now design the test cases for applying Statement Coverage and the Path Coverage testing technique on it. **(5+5)**

B. i) What is Mutation Testing?
ii) What is Stress testing?
iii) What do you understand by 'Bottom-up Instigation technique'? **(3+3+4)**

C. i) Distinguish between black and white box testing.
ii) Give one examples in which black-box testing might give the impression that "everything's OK," while white-box tests might uncover an error. **(3+7)**

D. i) What are the common approaches in debugging?
ii) Differentiate between the Alpha and Beta testing.
iii) With one example describe what Error Seeding is. **(3+3+4)**

CO5: Answer any **1** question Full marks: **5**

5 A. Describe the different techniques of Software Quality Management.

B. Write a short note on Software Capability Maturity Model.