

**B.Tech IT/ CSE 3<sup>rd</sup> Semester**  
**End Term Examination December 2022**  
**(CBCS) (SUBJECTIVE) (OffLine)**

**Paper Code: BIT 203**

Time :- 3 hours

Note: i) Q1 is compulsory. Attempt any four questions from the rest.  
 ii) Attempt all parts of the question together?

**Paper: Software Engineering**

Max. Marks :- 60

<b>Q1</b>	<b>Attempt any five parts. All parts contain equal marks</b>	<b>[20]</b>
i)	What are the two reasons for which the software engineering is important?	
ii)	Explain how prototyping is used for requirements determination.	
iii)	What is the difference between Level 2 and Level 3 of the Capability Maturity Model?	
iv)	How do design patterns impact the quality of a design?	
v)	Discuss the impact of component reuse on maintainability?	
vi)	How does software process facilitates the SDLC?	
<b>Q2</b>	<b>Attempt any Two Parts. All parts contain equal marks</b>	<b>[5+5]</b>
i)	What are the two kinds of software products that are developed by software engineers? What is the critical distinction between them?	
ii)	Legacy systems are not just software systems but are broader sociotechnical systems that include various interrelated parts. Discuss these logical parts of a legacy system.	
iii)	Once a system has been installed and is regularly used, new requirements inevitably emerge. What could be the reasons?	
<b>Q3 a)</b>	<b>Attempt any two parts.</b>	<b>[5+5]</b>
i)	Why CRC card is an effective approach for conceptual Modeling and detailed Design of software application.	
ii)	Suppose you are managing a project which is getting behind schedule. Possible actions include renegotiating the time schedule, adding people to the project and renegotiating quality requirements. In which ways can these actions shorten the time schedule? Can you think of other ways to finish the project on time?	
iii)	Why is requirement engineering a critical stage of the software process? Discuss the three main activities involved in the requirements engineering process.	
	<b>OR</b>	
<b>Q3 b)</b>	Draw the context diagram and first Level DFD for the Hospital Pharmacy System described in the following narrative. In drawing these diagrams, if you discover that the narrative is incomplete make up reasonable explanations to make the story complete. Supply these extra explanations along with the diagrams.  The pharmacy at Mercy Hospital fills medical prescriptions for all hospital patients and distributes these medications to the nurse stations responsible for the patients' care. Prescriptions are written by doctors and sent to the pharmacy. A pharmacy technician reviews each prescription and sends it to the appropriate pharmacy station. Prescriptions for drugs that must be formulated (made on-site) are sent to the lab station, prescriptions for off-the-shelf drugs are sent to the shelving station, and prescriptions for narcotics are sent to the secure station. At each station, a pharmacist reviews the order, checks the patient's file to determine the appropriateness of the prescription, and fills the order if the dosage is at a safe medications or allergies indicated in the patient's file. If the pharmacist does not fill the order, the prescribing doctor is contacted to discuss the situation. In this case, the order may ultimately be filled, or the doctor may write another prescription depending on the outcome of the discussion. Once filled, a prescription label is generated listing the patient's name, the drug type and dosage, an expiration date, and any special instructions. The label is placed on the drug container, and the order is sent to the appropriate nurse station. The patient's admission number, the drug type and amount dispensed, and the cost of the prescription are then sent to the billing department.	

<b>Q4 a)</b>	<b>Attempt any two parts</b>	<b>[5+5]</b>
i)	What are the properties of a design pattern?	
ii)	Distinguish between verification and validation.	
iii)	Why Maintenance of software is required post implementation of Software. Describe the various software maintenance activities.	
	<b>OR</b>	
<b>Q4 b)</b>	Read the following code carefully:	
	<pre> 1 public static void sort (int x []) { 2     for (int i=0; i&lt;x.length-1;i++ { 3         for (int j=i+1; j&lt;x.length; j++ { 4             if (x[i]&gt;x[j]) { 5                 int save = x(i); 6                 x[i] = x[j]; 7                 x[j]=save; 8             } 9         } 10    } 11 }</pre>	
i)	Draw the CFG.	[5]
ii)	Calculate Cyclomatic Complexity	[2]
iii)	Identify the independent path	[3]
<b>Q5 a)</b>		<b>[5+5]</b>
i)	<p>The University is developing Hostel Management System software application for the welfare of the Hostel Resident of the University. After detailed study, the Project Manager of the Team has identified the various modules to be developed and worked out the following input, processing and output parameters in the project:</p> <ul style="list-style-type: none"> <li>i) External Inputs : a) 10 with low complexity b) 15 with average complexity c) 17 with high complexity</li> <li>ii) External outputs: a) 6 with low complexity b) 13 with high complexity</li> <li>iii) External inquiries: a) 3 with low complexity b) 4 with average complexity c) 2 with high complexity</li> <li>iv) Internal logical files: a) 2 with average complexity b) 1 with high complexity</li> <li>v) External Interface files a) 9 with low complexity</li> </ul> <p>In addition to above, the Project Manager has identified the following additional properties that the system must fulfill:</p> <p>There will be Significant data communication, Performance is very critical, The application Designed code may be moderately reusable and System is not designed for multiple installations in different organizations. Other complexity adjustment factors are treated as average.</p> <p>You being the Project Manager of the Development Team, is required to Compute the function points for the project so that the size, cost and efforts for developing the software application may be estimated</p>	
ii)	Suppose that project Hostel Management System has been estimated to be 490 KLOC. Calculate the effort and development time for each of the three modes i.e. organic, semidetached and embedded.	
	<b>OR</b>	
<b>Q5 b)</b>		
i)	What are Cost Drivers in COCOMO Model? How effective are Cost Drivers to calibrate the software development cost?	[5+5]
ii)	What are the various approaches to the Risk Management? Explain the General Lifecycle Approach to Risk Management?	

<b>Q6</b>	<b>Attempt any two parts</b>	<b>[5+5]</b>
i)	Briefly discuss the various level of Software Testing. What type of errors are discovered in each level of Software Testing?	
ii)	Discover ambiguities or omissions in the following statement of requirements for part of a ticket-issuing system:  An automated ticket machine sells rail tickets. Users select their destination and input a credit card and a personal identification number. The rail ticket is issued and their credit card account charged. When the user presses the start button, a menu display of potential destinations is activated, along with a message to the user to select a destination and the type of ticket required. Once a destination has been selected, the ticket price is displayed and customers are asked to input their credit card. Its validity is checked and the user is then asked to input their personal identifier (PIN). When the credit transaction has been validated, the ticket is issued.	
iii)	How does the Size of "existing component" in development of software application contribute to the overall cost of software?	