

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: IT301

Course Name: SOFTWARE ARCHITECTURE AND DESIGN PATTERNS (IT)

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

Marks

- | | | |
|---|---|-----|
| 1 | a) What is a process? Explain process in the context of software engineering. | (4) |
| | b) Explain waterfall model in detail with its advantages and disadvantages. | (6) |
| | c) What are the ways in which flexibility can be achieved in software design? | (5) |
| 2 | a) Explain in detail about spiral model and discuss various activities in each phase. | (6) |
| | b) Explain the role of a software architect in software modelling. | (4) |
| | c) How is time and space efficiency brought in software design? What is its importance? | (5) |
| 3 | a) What is an agile process? Explain the features of agile process models. | (5) |
| | b) What is software architecture? Why is it important? | (5) |
| | c) Explain on the informal methods to bring correctness in a software design. | (5) |

PART B

Answer any two full questions, each carries 15 marks.

- | | | |
|---|--|-----|
| 4 | a) Explain the notations of use case diagram with a simple example. | (3) |
| | b) A hockey league is made up of at least four hockey teams. Each hockey team is composed of six to twelve players, and one player captains the team. A team has a name and a record. Players have a number and a position. Hockey teams play games against each other. Each game has a score and a location. Teams are sometimes lead by a coach. A coach has a level of accreditation and a number of years of experience, and can coach multiple teams. Coaches and players are people, and people have names and addresses.

Draw a class diagram for this information, and be sure to label all associations with appropriate multiplicities. | (6) |
| | c) Explain the need for software architectural styles. List out some of the common architectural styles in use and give examples for each style. | (6) |
| 5 | a) What is the purpose of swim lanes in activity diagram? Explain with an example. | (3) |

- b) Define Event, State and Transition and discuss preparation of State chart diagram (6)
with working of an ATM machine as example.
- c) Explain event based implicit invocation architectural style with examples. List (6)
out its advantages and disadvantages.
- 6 a) Prepare an activity diagram for computing a supermarket bill. There should be a (5)
charge for each delivered item. The total amount should be subject to tax and
service charge of 16% for groups of six or more. Any coupons charge submitted
by the customer is subtracted from bill.
- b) Explain multi-tier distributed style of architecture in detail. (5)
- c) Explain pipe and filter architectural style. In what case will a pipe and filter (5)
architecture becomes a batch sequential system?

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) What are the elements of a design pattern? (5)
- b) Describe the Facade pattern and give an example of its use. (7)
- c) Explain on the applicability, structure and participants of Observer pattern. (8)
- 8 a) Explain on the different approaches to find the design pattern that addresses a (4)
particular design problem.
- b) Explain the following with examples (8)
- i) Adapter pattern
 - ii) Composite pattern
- c) Explain the command pattern in detail. (8)
- 9 a) Briefly explain about creational patterns. Explain about the uses of any two (8)
creational patterns.
- b) Explain the mediator pattern in detail. (5)
- c) Explain the purpose of ATAM. (7)
