Institute of Information Technology

Jahangirnagar University

Professional Masters in IT

1st Trimester Final Examination, Spring 2023 **Intake: Fall 2022 & Spring 2023**

Duration: 3 Hours Full Marks: 60

Course Code: PMIT 6111 **Course Title: Software Testing & Quality Assurance**

There are 07 (Seven) questions. Answer any **5 (Five)** of them.
Figures in the right margin indicate marks.

1. a) Draw the sprint cycle. Mention the Scrum activities. 2+2

   b) What are differences between extreme programming and scrum? 4

   c) Answer the following questions very briefly: 1×4=4
      i. What is test automation?
      ii. How pairing can be done for agile testing?
      iii. What is refactoring?
      iv. How sprint backlog can be found from user's stories?

2. a) Mention the two major goals of program testing. Defect testing is concerned with rooting out undesirable system. Give examples of such behaviour. 2+2

   b) Which factors should be considered to write test cases for unit testing? 2

   c) Draw the acceptance testing process. 2

   d) Mention different types of system testing. Write the differences between black box and white box testing. 1+3

3. a) "We begin by 'testing-in-the-small' and move toward 'testing-in-the-large'." How this strategy works for conventioal software and for object-oriented (OO) software? 3

   b) Why we need an incremental strategy for integration testing? If you are testing an OO software product which strategy you should follow and why? 2+2

   c) Identify the following types of testing: 0.5×8=4
      i. The initial testing process exercised to check whether the software under test is ready/stable for further testing.
      ii. Test tolerances for heat, humidity, motion, portability.
      iii. Testing involves examining each requirement and developing a test or tests for it.
      iv. A release of the software is made available to users to allow them to experiment and to raise problems that they discover with the system developers.
      v. Objectives are to detect faults due to interface errors or invalid assumptions about interfaces.
      vi. Where several individual units are integrated to create composite components and the testing should focus on testing component interfaces.
      vii. Tests system's response to presence of errors or loss of data.
      viii. The testing begins by evaluating the correctness and consistency of the analysis and design models

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4. a) 1. Consider the following algorithm given below. Write two test cases, then calculate statement, condition and decision coverages for each test cases.

```
Var CGPA;
If (CGPA>=3.50)
Print "You are selected for Thesis";
Else if (CGPA>=2.00 && CGPA<=3.49)
Print "You are selected for research Project";
Else Print "Apply for an improvement exam";
If (CGPA=4.00)
Then Print "You are selected for Thesis and awarded a stipend";
```

4

b) Mention different types of experience-based testing. Compare experience-based testing and behaviour-based testing. 4

c) When we use decision tables? Draw a decision table on the following condition.
"A tourist will visit Saint Martine Island from Chottogram or from Taknaf. A tourist will visit Saint Martine Island from Taknaf if the day is sunny, sea is calm and ships are available. From Chottogram if sea is calm and ships are available the tourist will get to Saint Martine. Otherwise, tourist cannot go."

5. a) Write the steps of Use-case point test estimation. If the Unadjusted Actor Weights = 30 and Unadjusted Use-Case Weights = 350, then find the total effort. (TEF=0.50). 5

b) Draw the defect life cycle. 3

c) How the following states can be reached by any defect in its life cycle? 1×4=4

i. Reopened
ii. Deferred
iii. Closed
iv. Reject

6. a) Draw the software configuration management process. Mention its activities. 2+1

b) How ISO 9001 certification can be achieved? 4

c) Draw the risk management process. Give example of different kinds of risks. 2+3

7. a) Suppose you have to build a web solution for online project management system. In this system supervisor and project students are two main users. Supervisor can provide project topics and students can enroll under supervisor. 2×3=6

i. Write different types of requirements of this system.
ii. From the functional requirements mentioned in above select two important requirements. Write requirement tests for them.
iii. User requirement "After each submission a report should be generated to evaluated the project". Find the system specifications.

b) Answer the following questions: 1×6=6

i. Give an of high priority and high severity defect.
ii. What is Mainline?
iii. How 'Availability' can be measured?
iv. What is show stopper error?
v. What is parameter interface?
vi. What is refactoring?

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Professional Masters in Information Technology (PMIT)
Institute of Information Technology
Jahangirnagar University
PMIT Final Examination (Spring: 2023)

Course Code: IT-6113 **Course Title:** Mobile Application Development
Marks: 60 **Time:** 3 Hours

Answer any **FIVE** questions

(All parts of a particular question must be answered consecutively)

1(a)	Graphically explain the Android features.	5
(b)	What are the main folders and files required to implement an application in android studio?	5
(c)	What is Open Handset Alliance (OHA) and what is its purpose?	2
2(a)	How many layers are in Android Architecture? Explain the roles and features of each layers.	5
(b)	What is for string.xml file? Write necessary code for activity_main.xml file.	5
(c)	Differentiate between: android:layout_width="match_parent" android:layout_width="wrap_content"	2
4(a)	Make a list of Android version names, code name with their API levels.	5
(b)	What are the two modes of UI and why they are for?	5
(c)	What is for: android:textColor="#bd82ac" android:textSize="40sp"	2
4(a)	How many callback methods are in android? Explain their behavior at different stages in Android.	6
(b).	Sketch the entire, visible and foreground lifetimes of android activity or fragment transition during execution.	6
5(a)	What is Android Layout? Briefly describe different types of Layout with respective diagram.	6
(b)	Differentiate between Linear and Relative Layout?	3
(c)	What is Android Intent for, and how many types of Intent are?	3
6(a)	What is the method to handle a menu item click events? Write the code.	4
(b)	Which method is used to handle item click event for context menu (onContextItemSelected())?	4
(c)	Difference between context menu and option menu in android.	4
7(a)	Which class, object and properties are used for notification? Write a sample code using these.	4
(b)	Write about Firebase Cloud Messaging and the role of Inflate.	4
(c)	Explain the method setProgress(max, progress, false), and loadAnimation() and startAnimation() methods	4

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Professional Masters in IT

1st Semester Final Examination, Spring 2023

Duration: 3 Hours | **Intake: Spring 2023, Fall 2022**

Full Marks: 60

Course Code: PMIT – 6217 | **Course Title: Wireless Network**

Do not write anything on the question paper.

There are **7 (Seven)** questions. Answer any **5 (Five)** of them.

Figures in the right margin indicate marks.

[Follow the question order]

1.	a)	Explain briefly the propagation of Radio waves through space	3
	b)	Mention some commonly used devices for wireless networking. Describe two of them.	3
	c)	Explain at least 3 limitations of Wireless Networks. Show 6 scenarios which present a specific challenge or problem that comes up when working with wireless equipment.	3
	d)	Explain about IEEE 802.15.4 standard	3
2.	a)	"Wireless LANs can operate in one of two configurations, with a base station and without a base station". Explain this statement.	3
	b)	Explain Infrared LANs mentioning some advantages and disadvantages	3
	c)	"Dynamic selection of the physical-layer modulation technique can be used to adapt the modulation technique to channel conditions." Explain	3
	d)	Explain the Destination-Sequenced Distance Vector (DSDV) Packet Process Algorithm with example. "DSDV is suitable for small networks" Why?	3
3.	a)	Explain Sensor Node Structure	4
	b)	The Low-Energy Adaptive Clustering Hierarchy (LEACH) is an application-specific protocol architecture that aims to prolong network lifetime by periodic re-clustering and change of the network topology. Now explain this Clustering Protocol	4
	c)	To reduce the packet dropping probability or to enhance throughput of wireless LAN exponential binary backoff algorithm is widely used. The access method of MAC protocol of IEEE 802.11 based on exponential binary backoff algorithm can be explained with some steps. Explain those steps.	4
4.	a)	"FDMA wastes bandwidth", How? Explain. Do you agree "TDMA is a complimentary access technique to FDMA"? If you agree then show your logic.	4
	b)	Define Cell Capacity of a TDMA System. Now calculate the capacity and spectral efficiency of a TDMA system using the following parameters: bandwidth efficiency factor η_b= 0.9, bit efficiency (with QPSK) μ=2, voice activity factor v_f=1.0, one-way system bandwidth B_w =12.5 MHz, information bit rate R =16.2 kbps, and frequency reuse factor N = 19.	4

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c) State some gains of Spread Spectrum Multiple Access technique. Whether CDM Direct Sequence Spread Spectrum system or not? Explain

5. a) Define PN Sequences. Draw a 16-bit Fibonacci linear-feedback shift register. If the seed is 1010110011100110. Find the PN sequences for four rounds. 4

b) Define Quadrature amplitude modulation (QAM). How many bits are represented by each symbol in 64-QAM? Sketch a constellation diagram for 64-QAM. 4

c) Explain Gaussian frequency-shift keying 4

6. a) Explain OFDM Versus FDM. How do OFDM Subcarriers Work? 6

b) Draw a baseband OFDM transmission model. Proof the statement "When integrating received power over one symbol period, T_U, the output of the correlators is zero for any combination, except when $k = q$" 6

7. a) Define Cell Clusters. What do you mean by frequency reuse pattern. Explain the relationship between D and R from the equation: $D = \sqrt{3NR}$ 6

b) Calculate the signal to interference ratio (S/I) from the worst-case scenario for co-channel interference if cluster sizes are N=7 and N=12. 6

If we assume the reuse distance D is same for six interfering cells then S/I=? for the same sizes

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Professional Masters in IT

1st Semester Final Examination, Spring 2023

Duration: 3 Hours | **Intake: Spring 2023, Fall 2022**

Full Marks: 60

Course Code: PMIT – 6307 | **Course Title: Data Mining and Knowledge Discovery**

Do not write anything on the question paper.

There are **7 (Seven)** questions. Answer any **5 (Five)** of them.

Figures in the right margin indicate marks.

[Follow the question order]

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1. a) Define the term "Data Mining" and give an example where we frequently use data mining techniques. 4

   b) Write an example of descriptive data mining. Explain why it is different from predictive data mining. 4

   c) What are the sequential steps in doing classification of a set of data? 4

2. a) What do you mean by discretization of data? If you have occupation data like Job, Business, unemployed etc. How will you make it binary? 4

   b) What do you mean by similarity of two data point? 4

Name	Age	Income
Asad	45	10,000
Karim	43	9,997
Rahim	44	9,995

   Who is more similar with Asad?

   c) In case of ordinal and nominal data what is the calculation of similarity? 4

3. a) How a tree-based classification works? What are the advantages of tree-based classification? 4

   b) Suppose you have two variables (occupation and gender to select one in constructing a tree. 4

Occupation	Gender	Cheat
Job	Male	Yes
Business	Female	No
-----	-----	-----
Business	Male	No

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Data from the above table are summarized as follows:

Occupation		Gender	
Job	Business	Male	Female
Cheat =Yes: 5 Cheat= No: 15	Cheat =Yes: 3 Cheat= No: 10	Cheat =Yes: 3 Cheat= No: 7	Cheat =Yes: 6 Cheat= No: 8

Which variable you should select? Use Gini coefficient or entropy to give your answer.

c). Define the terms: True positive and False Negative and F-measure 4

4. a) Data may be affected by various kind of reasons. These reasons we may define as data quality problems. 4

b) Why EDA is necessary for data mining? What is the main advantage of using learning curve? 4

c) What is OLAP? Why do researcher use Slicing and Dicing in data analysis? 4

5. a) If you have a data set and you have to perform KNN classification, what are the steps you will follow? 4

b) Why do most researchers prefers SVM classification? 4

c) Among Tree-based classification and Rule-based classification, which one will you prefer and why? 4

6. a) Define hierarchical clustering and give an example of this clustering where it is the most useful technique. 4

b) Write the steps of k-means clustering. 4

c) Write some limitations of k-means clustering. How can you overcome these limitations? 4

7. a) What is the basic principle of DBSCAN clustering? Write the usefulness of this clustering. 4

b) Explain with a pictorial example of Core Point, Noise Point and Border Point. 4

c) In DBSCAN clustering, how will you decide EPS and max points? 4

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