



Institute of Information Technology

Jahangirnagar University
Professional Masters in IT

1st Trimester Special Final Examination, Spring 2019

Duration: 3 Hours

Full Marks: 60

Course Code: PMIT - 6111

Course Title: Software Testing & Quality Assurance

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.

- | | | |
|----|---|-----|
| 1. | a) Write the agile manifesto. | 2 |
| | b) Show the XP release cycle. "XP is fun" – why? | 3+2 |
| | c) Show the process of TDD. Write the role of testers in an agile team. | 3+2 |
| 2. | a) Write the stages of testing. Explain smoke testing. | 2+2 |
| | b) What do you test during a structure test? Show a model of the software testing process. | 2+3 |
| | d) Why acceptance testing is important? | 3 |
| 3. | a) Show a testing strategy where you get the maximum testing coverage. | 6 |
| | b) Write difference between:
i. Debugging and testing
ii. Inspections and testing | 3+3 |
| 4. | a) Write an algorithm to find even and odd numbers from a given set of inputs. Design test cases with maximum coverage for it. | 4 |
| | b) Give example of use case based testing. | 4 |
| | c) Give example of BVA and equivalence partition. | 4 |
| 5. | a) Write the states of defects. | 3 |
| | b) Consider the following table and estimate the function points from it. If 5 FP's can be implemented per month and cost/month is BDT 2,50,000/- then find the time and cost required to total FP's. | 4 |

Information Domain Value	Count	Weighting Factor (Simple)
External Inputs (EIs)	5	3
External Outputs (EOs)	7	2
External Inquiries (EQs)	3	3
Internal Logical Files (ILFs)	4	7
External Interface Files (EIFs)	3	5

- | | | |
|----|---|-----|
| 6. | c) Mention the types of defects. Give examples of different priority of defects. | 2+3 |
| | a) Explain Quality Conflicts for an online airline ticket booking system. | 4 |
| | b) Write the quality management activities. How quality management and software development relates with each other? | 3+3 |
| | c) Write the quality goals for requirements. | 2 |
| 7. | a) Show the review process. How review becomes easier for agile methods? | 3+3 |
| | b) Mention some experience-based testing techniques. When it works better? | 2+2 |
| | c) What are the definitions and uses for the program below?
i. read (x, y);
ii. z = x + 2;
iii. if (z < y)
iv. w = x + 1;
else
v. y = y + 1;
vi. print (x, y, w, z); | 2 |



Professional Masters in Information Technology (PMIT)
Institute of Information Technology
Jahangirnagar University

PMIT Special Examination (March-2019)

Course Code: IT-6113
Marks: 60

Title: Mobile Application Development
Time: 3 Hours

Answer any **FIVE** questions

All parts of a particular question must be answered consecutively

- 1(a). What is Android and why it is popular platform? Write some features of Android. 5
(b). What is API? Mention the android version name sequentially. 4
(c). Draw the Android architecture and write the main component used in Android. 3
- 2(a). Sketch the Android and iOS application development. 4
(b). Draw Android activities interface and labeling it. 4
(c). With example show how to use putExtra() and getExtra() for string data. 4
- 3(a). How to setup Android for Eclipse IDE? Describe step by step. 5
(b). Explain how to send the data one activity to another activity in android applications. 2
(c). Explain Android Manifest.xml file in detail. 5
- 4(a). What is SQLite? How does it differ from client-server database management systems? 3
(b). What's the difference between class, method and activity in android? 4
(c). Interpret the following android code line by line.
 `android:layout_height="fill_parent"
 android:orientation="vertical">

<TextView android:id="@+id/text"
 android:textSize="50sp"
 android:textColor="#0832ca"
 android:layout_height="wrap_content"
 android:text="Welcome to IIT-JU"/>

<Button android:id="@+id/button"
 android:layout_width="wrap_content"
 android:text="Hello, This is Button"/>

</LinearLayout>`

- 5(a). Write some of the advantages of the Android platform? 2
- (b). What are the seven lifecycle methods of Android activity and what is their purpose? 5
- (c). Give a typical example of how two UI modules defined by fragments can be combined into one activity for a tablet design, but separated for a handset design. 5
- 6(a). What are the different data types used by Android?. 5
- (b). What are different data storage options available in Android? 5
- (c). Define Dalvik Virtual Machine (DVM). 2
7. Differentiate between the following terms: 12
- i. JDK and IDEs
 - ii. Intent and Service
 - iii. Snackbar and Toasts
 - iv. Fill_parent and Wrap_content
 - v. LinearLayout and RelativeLayout
 - vi. Android.widget and Android.opengl

Institute of Information Technology
 Jahangirnagar University
Professional Masters in IT

1st Semester Special Final Examination

Duration: 3 Hours

Course Code: PMIT - 6307

Semester: Spring 2019

Full Marks: 60

Course Title: Data mining & 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.

1. a) Define Data Mining. List the steps of the Knowledge Discovery in Databases (KDD). 1+2
 b) What is meant by outlier? 2
 c) Discuss (shortly) whether or not each of the following activities is a data mining task. 3
 - i) Computing the total sales of a company.
 - ii) Predicting the outcomes of tossing a (fair) pair of dice.
 - iii) Monitoring the heart rate of a patient for abnormalities.
 d) What is simple random sampling? Is simple random sampling (without replacement) a good approach to sampling? Why or why not? 2+2
2. a) Mention the different types of attributes with necessary example. 3
 b) What is meant by aggregation? What are the purposes of aggregation? Give examples in which aggregation is useful. 2+2+1
 c) What is meant by regression? 2
 d) What summary statistics can be used on nominal attributes? 2
3. a) Define training set and testing set. 2
 b) Discuss disadvantages of testing a model over its training set. 2
 c) Explain the procedure of multi-way and binary splitting for ordinal and continuous attribute. 3
 d) Explain the procedure to compute Entropy of discrete attribute. 3
 e) What are the stopping criteria for tree induction? 2
4. a) Discuss issues that are important to consider when employing a Decision Tree based classification algorithm. 2
 b) Mention three parameters to measures the node impurity. Compare to each other. 3
 c) Consider the decision tree shown in the following figure. Calculate the GINI (children) or weighted average GINI index for each grouping and compare the results. 5

		Car Type	
		{Sports, Luxury}	{Family}
C0	9	1	C1
	7	3	

		Car Type	
		{Sports}	{Family, Luxury}
C0	8	2	C1
	0	10	

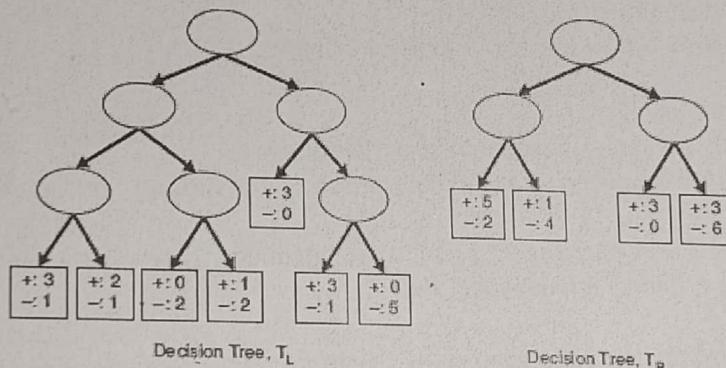
- d) What are the main advantages and disadvantages of Decision Tree classification algorithms? 2
5. a) What is visualization? Explain the procedure of histogram technique. 2+2
 b) Explain the procedure of multi-way and binary splitting for nominal attribute. 3

- c) Consider the following figure. Calculate the entropy gain while splitting on refund attribute. 5

Tid	Refund	Marital Status	Taxable Income	Class
1	Yes	Single	125K	No
2	No	Married	100K	No
3	No	Single	70K	No
4	Yes	Married	120K	No
5	No	Divorced	95K	Yes
6	No	Married	60K	No
7	Yes	Divorced	220K	No
8	No	Single	85K	Yes
9	No	Married	75K	No
10	?	Single	90K	Yes

Missing value

6. a) Explain the procedure to calculate classification error. 2
 b) Consider the binary decision trees (shown in the figure) with training error 4 and 5 penalty term is equal to 0.5. Calculate the generalization error. 5



- c) Write down the algorithm to compute the GINI index for the case of continuous attribute. 3
 d) Consider the following figure. 2

Node N_2	Count
Class=0	1
Class=1	5

Calculate the classification error.

7. a) What is meant by a proximity matrix? 2
 b) Describe the principles and ideas regarding Agglomerative Hierarchical Clustering. 2
 c) Explain the working of the K-means algorithm and its advantages and disadvantages. 3
 d) Explain the problem of selecting good initial points for the K-means algorithm. 3
 e) How do you evaluate K-means clustering? 2

Institute of Information Technology

Jahangirnagar University
Professional Masters in IT

2nd Semester Special Final Examination

Duration: 3 Hours

Course Code: PMIT - 6104

Semester: Spring 2019

Full Marks: 60

Course Title: Database Security

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.

1. a) What is the objective of *data security*? (2)
b) The accounting branch of a large organization requires an application to process expense vouchers. Each voucher must be input by one of many accounting clerks, verified by the clerk's applicable supervisor, then reconciled by an auditor before the reimbursement check is produced.
What *access control technique* should be built into the application to meet the information protection needs and why? (3)
c) In the context of database security, what is *an inference attack*? Give an example of what this means, and list a few common techniques that are used to defend against them. (4)
d) Define "Discretionary Access Control" and illustrate its application through 'privileges'. (3)

2. a) "Once authenticated by the operating system, users can connect to RDBMS more conveniently, even without specifying a user name or password"- this is the usual practice as adopted by major RDBMS.
Do you think any potential threat in this approach in terms of DB security? If so, how to address such threads? (4)
b) What are the two important cases of the *inference problem*? Explain with necessary example. (4)
c) What are the limitations of *Mandatory access Control (MAC)*? (2)
d) What is the inverse of *confidentiality, integrity, and availability* (C.I.A.) triad in risk management? (2)

3. a) What is *Trust Management System*? (2)
b) What are the three components of *Trust Management*? (3)
c) How does *Pretty Good Privacy (PGP)* certificate system works? Explain with necessary figure. (4)
d) What are the challenges in *Trust Management process*? (3)

4. a) What is the main goal of Database-As-Service (DAS) model? (2)
b) How client data are organized in the service provider's Database in DAS setup? (2)
c) Consider the following *Student* table. Explain the procedure to encrypt the GPA column by using *Partition, Identification and Mapping function*. (5)

S_ID	S_Name	Marks_Obtained	GPA
101	Asif	42	D
310	Kamal	66.5	B+
325	Abir	71	A-
425	Rahim	57.5	B-
475	Sabbir	82	A+
510	Sazid	64	B

- d) Consider the above mentioned ***Student*** table in question 4(c). (3)
 Query: Retrieves all students' name whose marks is greater than 65 and student ID is in between 320 to 450.
5. a) What is meant by "*Data compromise*"? How do you differentiate between positive and negative data compromise? (4)
 b) Consider the table "**Patient**" with the attributes (**Age, Sex, Employer, Social Security Number, Diagnosis Type**). If a malevolent user (who knows the age and employer of Mr. X) wants to obtain information about the diagnosis type of a given patient, Mr. X, how will he (malevolent user) infer the required information from the database? (5)
 c) How do you secure statistical data by *controlling query set size*? (3)
6. a) What happens when two clients try to write into the same *HDFS file*? (2)
 b) If reducers do not start before all mappers finish then why does the progress on MapReduce job shows something like Map(50%) Reduce(10%)? Why reducers progress percentage is displayed when mapper is not finished yet? (2)
 c) Draw the Mapreduce diagram to count the number of words of the following box. (5)
- | |
|---|
| Ball Box Table
Table Table Box
Ball Table Box |
|---|
- d) What is *Inverse Document Frequency*? How does it work? (3)
7. a) How can an image be watermarked? Explain with necessary diagram. (3)
 b) What will happen if you watermark the watermarked image? Could this be regarded as a kind of attack? If so what is its effect? (3)
 c) How do you hide a message into an image LSB steganography method? (4)
 d) Can the steganography be used together with cryptography to enhance information hiding and obscuring? Explain. (2)

Institute of Information Technology
Jahangirnagar University
Professional Masters in IT

Special Final Examination

Duration: 3 Hours

Course Code: PMIT-6311

Semester: Spring 2019

Full Marks: 60

Course Title: Human Computer Interaction

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.

1. a. Discuss the advantages and disadvantages of GUI. [5]
b. Difference between the characteristics of Young and old Adults. [2]
c. Write short note and differentiate between direct and indirect manipulation. [2+3]

2. a. What is meant by user interface design? What is the importance and benefit of good interface design? [1+4]
b. Discuss in detail about structure and functions of menu with suitable illustrations. [4]
c. Write short note on WUI web user interface. [3]

3. a. "A Web interface possesses a number of characteristics, some similar to a GUI interface, and, some different." show it by table. [2+2]
b. Give the characteristics of
 - i. Intranet vs. Internet
 - ii. Printed vs. Webpage

4. a. What are the obstacles encountered in user interface design process? Discuss the impact of human characteristics in design with suitable example. [2+2]
b. Explain the importance of usability with its measures. [4]
c. Is human considerations in design is important. Justify. [4]

5. a. List down the general steps to be performed during business analysis. [3]
b. Define GUI. Why graphical interface is more popular than text interface? [2]
c. Is guidelines and standard important to good design? Explain. [3]
d. With example prove that GUI is object or data oriented. [4]

6. a. Explain the activities in the software lifecycle using the waterfall model [5]
b. What do you mean by Issue-based information system (IBIS)? Draw the structure of gIBIS. [1+2]
c. Show all the paradigms of user interface starting from batch processing to ubiquitous computing. [4]

7. a. What are the stages of Donald Norman's model of interaction? [3]
b. What is WIMP Interface? Explain each components of WIMP Interface. [1+4]
c. How Indirect manipulation is used in offices and industries? Explain with figure and examples. [4]



Institute of Information Technology

Jahangirnagar University
Professional Masters in IT

1st Trimester Final Examination, Fall 2022

Intake: Summer & Fall, 2022

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. What are the basic parts of Scrum? 2+2
b) Mention the agile manifesto. What was the motivation behind this manifesto? 4
c) What is sprint zero? Mention the practice of tester in agile testing. 4
2. a) After modifying a code for error correction which testing you have to apply for rechecking the rest of the code? How this testing works? 3
b) Who should test the software? 3
c) Draw the Agile Testing Quadrants. 3
d) Draw the acceptance testing. 3
3. a) Show the levels of testing. 3
b) Suppose you have to test all individual module of any software system. Which testing strategy you should follow? Explain with example. 4
c) Identify the following types of testing: 1×5=5
 - i. Testing the limits of system e.g. maximum number of users, peak demands, extended operation. **Stress Testing**
 - ii. Test the various software and hardware configurations **Configuration Testing**
 - iii. Exercise all input and output parameters of each component, all components and all calls (each component is called at least once and every component is called by all possible callers.) **Structure Testing**
 - iv. Conducted at sponsor's site (developer is not present) and software gets a realistic workout in target environment. **User Testing**
 - v. The initial testing process exercised to check whether the software under test is ready/stable for further testing.
4. a) Find out if there is any system requirement in the user requirement given below:
“Student Information System” should provide list of students enroll in each semester” 3
b) Why equivalence partitioning and boundary value analysis should be used together? Explain with an example. 4
c) Draw a state transition table for a scenario where a user tries to log in to another session while being logged into another session already. 3
d) When should we follow experience-based techniques testing? 2

5. a) Find the test case point form the following table. To complete the testing within 21 person months how many TCPs should be done in a month? What would be total cost if monthly cost is 50,000/-

Test Case Complexity	Number of Test Case	Adjustment Factor
Simple	50	1
Average	30	2
Complex	20	3

- b) Why we need business analyst in the project? 3
- c) Identify the types of risk, probability and effect of the risks: $1 \times 5 = 5$
- i. Organizational financial problems force reductions in the project budget.
 - ii. Key staff are ill at critical times in the project.
 - iii. Changes to requirements that require major design rework are proposed.
 - iv. The time required to develop the software is underestimated.
 - v. The code generated by software code generation tools is inefficient.
6. a) Write the quality management activities. Show how development process and quality management process works together. 2+2
- b) Mention the problems of quality management for software. For any real-time chatting software what would be the quality conflicts? 2+2
- c) Mention some product and process standard. Write core process of ISO 9001 standard. 2+2
7. a) Suppose there are 70 licensed copies of any application has installed within 3 months. Customers has reported 800 problem during this period. The FP = 40 and true defect identified is 540; total closed defects = 456, defects closed within responses time = 444. $2 \times 4 = 8$
- i. Find PUM.
 - ii. Find defect density
 - iii. Find BMI
 - iv. Find Percent delinquent fixes
- b) Mention the quality factors in McCall's factor model. How correctness can be calculated? 2+2



Professional Masters in Information Technology (PMIT)
Institute of Information Technology
Jahangirnagar University
PMIT Final Examination (Fall 2022)

Course Code: IT-6113
Marks: 60

Course Title: Mobile Application Development
Time: 3 Hours

Answer any **FIVE** questions

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

- 1 (a) Android is an OS, an open source and a platform - explain why? 4
(b) Draw the Android architecture and write the main component used in an Android application. 4
(c) What is for screen orientation in Android? 2

- 2 (a) What is for AndroidManifest.xml file? Write necessary code for AndroidManifest.xml. 4
(b) Make a list of Android features with their functions. 4
(c) What is for:
 android:textColor="#0832ca"
 android:textSize="30sp" 2

- 3 (a) What is Open Handset Alliance (OHA) and what is its purpose? 4
(b) Sketch the Android App/Project Folder Structure. 4
(c) Differentiate between:
 TextView and ScrollView 2

- 4 (a) What is Android Layout? Briefly describe different types of Layout with respective diagram. 4
(b) What is Android Intent for, and how many types of Intent are? 4
(c) Differentiate between Linear and Relative Layout? 2

- 5 (a) How to create "menu" in Android, what are the different items of "menu"? 4
(b) Which method is used to handle item click event for popup menu (onMenuItemClick())? 4
(c) How to call the method "MenuInflater.inflate()" for "menu"? Write the code. 2

- 6 (a) Which method is used to handle item click event for context menu (onContextItemSelected())? 4
(b) Explain the activities of NotificationCompat, PendingIntent and NotificationManager methods. 4
(c) Write a simple code of Zoom In and Zoom Out for Animation. 2

- 7 (a) How many callback methods are in android? Explain their behavior at different stages in Android. 5
(b) Sketch the entire, visible and foreground lifetimes of android activity or fragment transition during execution. 5



Institute of Information Technology
Jahangirnagar University
Professional Masters in IT

Final Examination

Duration: 3 Hours

Course Code: PMIT 6217

Semester: First Semester

Full Marks: 60

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.

1. a) "There is continuous flow of energy from electrical field to the magnetic field." Explain the statement 4
b) "FDMA wastes bandwidth", How? Explain. Do you agree "TDMA is a complimentary access technique to FDMA"? If you agree then show your logic. 4
c) Mention some open research topics and explain two of them 4

2. a) Explain **IrDA and Zigbee** technologies 4
b) Access points can serve a varying number of computers using DHCP. 4
c) In the GSM800 digital channelized cellular system, the one-way bandwidth of the system is 12.5 MHz. The RF channel spacing is 200 kHz. Eight users share each RF channel and three channels per cell are used for control channels. Calculate the spectral efficiency of modulation (for a dense metropolitan area with small cells) using the following parameters:
 - Area of a cell=8 km²
 - Total coverage area =4000km²
 - Average number of calls per user during the busy hour= 1.2
 - Average holding time of a call=100 seconds
 - Call blocking probability=3%
 - Frequency reuse factor=74

3. a) Hand-off Provides continuity of communication across cells. Explain the statement. Why should we provide a higher priority to handoff calls? 4
b) Explain Spread spectrum multiple access (SSMA). When a user will experience "near-far" problem for SSMA? How can it be mitigated? 4
c) 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

4. a) What is **linear-feedback shift register**? Draw a 4-bit Fibonacci LFSR. 4
b) Draw the Flow Chart of CSMA/CD-Algorithm 4
c) OFDM offers many advantages over single-carrier modulations. mention those advantages 4

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5. a) Show the graph for the probability that a transmitted bit is received in error at the receiver—versus the SNR for three different modulation techniques BPSK QAM16 and QAM 256 4
- b) What do you mean by Multipath propagation? How does it cause harmful interference to the signal? Explain with generating environment for urban area.
- c) Explain frequency reuse pattern. For a hexagonal geometry, evaluate the co-channel reuse ratio is: $q = \sqrt{3N}$. 4
6. a) "Hybrid Modulation systems exist where two characteristics are changed with each new symbol transmitted" Explain with example 4
- 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 $k = q$ " 4
- c) If a normal GS time slot consists of 6 trailing bits, 825 guard bits, 26 training bits, and 2 traffic bursts of 58 bits of data, find the frame efficiency 4
7. a) Calculate S/I ratio for Worst case scenario in three sectors when cluster size N=7 and N=12 4
- b) A city has total population of 5,00,000. A network planar found the behavior of users of the city like: they generate 3 calls/hour with average holding time of 2 minutes. The service provider got the license of BW that can support 36 carriers of GSM. Determine number of sectors of 3/9 cell pattern maintaining GoS of 5%. 4
- c) Explain the Destination-Sequenced Distance Vector (DSDV) Packet Process Algorithm with example. 4



Institute of Information Technology

Jahangirnagar University
Professional Masters in IT

Duration: 3 Hours

1st Semester Final Examination, Fall 2022

Intake: Fall 2022, Summer 2022

Course Code: PMIT - 6307

Full Marks: 60

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]

1. a) Define the term "Data Mining" and give an example where human always use data mining techniques. 4
- b) What are the differences between classification and clustering? 4
- c) In the real life, where do you use association rule? 4

2. a) If you have numerical data i.e. income, you have to standardize them. Write the process of it. 4
- b) For ordinal and nominal data, how do you calculate dissimilarity for a single attribute? 4
- c) In what aspect, you may like decision tree classification? 4

3. a) How a tree-based classification works? What are the advantages of tree-based classification? 4
- b) Suppose you have two variables (Gender and Marital status) to select one in constructing a tree. 4

Gender	Marital	Class
M	M	Good
M	U	Bad
M	M	Good
F	U	Bad
F	U	Bad

Gender	Marital	Class
M	U	Good
M	U	Bad
F	M	Good
M	M	Good
F	U	Bad

- 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) When do we use learning curve and ROC curve? 4
 - b) Explain the Ensemble Method of classification. 4
 - c) What is OLAP? Why do researcher use Slicing and Dicing in data analysis? 4

5. a) What are the steps of KNN classification? 4
- b) Why do the most researchers prefer SVM classification? 4
- c) If you have a nominal attribute which has 3 categories and for binary tree classification you have to merge any two categories. Which two will you merge? 4
6. a) Define hierarchical clustering and give an example of this clustering where it is the most useful technique. 4
- b) What are the different types of 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) The distance of k-th neighbor of data points are almost equal" – explain this comment. 4



Institute of Information Technology

Jahangirnagar University
Professional Masters in IT

1st Trimester Final Examination, Fall 2019 [Intake: Fall 2019 & Summer 2019]

Duration: 3 Hours

Full Marks: 60

Course Code: PMIT - 6111

Course Title: Software Testing & Quality Assurance

Do not write anything on the question paper.

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

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1. a) Explain how test driven development works. 4
b) Show the sprint based life cycle of Agile. What are the limitations of sprint? 5
c) Why extreme programming is called extreme? 3

2. a) A web application has several functional components. To test the functionalities which tests are conducted from developers' and users' end? 4
b) Suppose you are building an application for your client. After few iterations you have faced a problem in a program code. But you can't find the source of it. What should you do to identify the error? 4
c) What are the stages of Testing? Identify the following types of testing: 4
i. Testing the limits of system e.g. maximum number of users, peak demands, extended operation.
ii. Test the various software and hardware configurations
iii. Exercise all input and output parameters of each component, all components and all calls (each component is called at least once and every component is called by all possible callers.)
iv. Conducted at sponsor's site (developer is not present) and software gets a realistic workout in target environment.

3. a) Which testing strategy will be appropriate for a four layer call hierarchy of any system? Explain with example. 4
b) Mention the types of interface and interface errors. 4
c) How many types of requirements can be identify for any developing system? Suppose your developing a result processing system for PMIT. Give example of different types of requirements. 4

4. a) Write a program code consisting at least 10 statements including loop or control statements. For any three test cases calculate different types of coverages. 4
b) Draw a state transition table for a scenario where a user tries to log in to another session while being logged into another session already. 3
c) When we use equivalence partitioning? 2
d) Draw a decision table for user login, where user can login if they provide correct username and password. 3

5. a) Identify the priority and severity of the following error: 4
i. The system crashes after you made the payment or when you are not able to add the items to the Cart,
ii. The logo of the company in the front-page is wrong.
iii. A new feature published in Facebook but it is not working properly or not very much liked by the users.
iv. In the email service provider like Yahoo or Gmail, after typing the correct Username and the password, instead of logging in, the system crashes or throws the error message.
v. In the email service provider like Yahoo or Gmail, when you are not allowed to add more than one recipient in the CC section.
vi. In web form you have three options like: "BACK", "NEXT" & "CANCEL". Among them when you press "BACK", you go back to previous page but your information are not found.
vii. Your product name and description have several spelling mistakes.
viii. For each online transaction 1% of payment amount is not added to the payment gateway vendor's account.

b) Identify the terms or states of defects:

- i. A potential defect that has been identified but not validated.
- ii. Assigned to development team but not solved yet.
- iii. If the defect is repeated twice or the defect corresponds to the same concept of the bug
- iv. if the bug persists even after the developer has fixed the bug
- ix. The defect is assigned to development team and further investigation is going on.
- x. The tester re-tests the bug after it got fixed by the developer.
- xi. If the developer feels the defect is not a genuine defect.
- xii. If the present bug is not of a prime priority and if it is expected to get fixed in the next release.

c) From the following table calculate the function point, FP. If any team has productivity/month 5FPs and cost/month 50,000BDT, the estimate the time and cost of the project. 4

Information Domain Value	Count	Weighting factor
External Inputs (EIs)	50	3
External Outputs (EOs)	20	2
External Inquiries (EQs)	30	3
Internal Logical Files (ILFs)	35	7
External Interface Files (EIFs)	10	5

6. a) Draw the risk management process. How risk planning works? 4

b) Identify the types of risk, probability and effect of the risks: 3

- i. Organizational financial problems force reductions in the project budget.
- ii. Key staff are ill at critical times in the project.
- iii. Changes to requirements that require major design rework are proposed.
- iv. The time required to develop the software is underestimated.
- v. The code generated by software code generation tools is inefficient.

c) Show the quality review process. 2

d) Identify the types of faults: 3

- i. Are all program variables initialized before their values are used?
- ii. For each conditional statement, is the condition correct?
- iii. Are compound statements correctly bracketed?
- iv. Are all output variables assigned a value before they are output?
- v. Do formal and actual parameter types match?
- vi. Is space explicitly deallocated after it is no longer required?

7. a) Suppose you are developing a module which can find you the best deal for properties like plots, apartments etc. for buying and selling. Write a test scenario for this module. 4

b) Draw the McCall's quality triangle. 3

c) Write the expressions for the following terms: 5

- i. Defect removal effectiveness
- ii. Availability
- iii. Problems per User-Month
- iv. Percent delinquent fixes
- v. Defect Density



Institute of Information Technology

Jahangirnagar University
Professional Masters in IT

1st Trimester Final Examination, Fall 2019 [Intake: Fall 2019 & Summer 2019]

Duration: 3 Hours

Full Marks: 60

Course Code: PMIT - 6113

Course Title: Mobile Application Development

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.

- 1 (a) Define Mobile Platform and write some examples of good platform and some features of WAP. 4
(b) Make list of Android platform version, code name with their API level. 4
(c) What is for Android Manifest.xml? What information contain Manifest.xml and R.java files? 4
- 2 (a) What is a "bundle" and "gradle" in Android application? Differentiate between them. 3
(b) What are the different types of "Menu" used in Android? Write the meaning of the following: 3

Element	Description
<menu>	
<item>	
<group>	

- (c) Interpret the following android code line by line. 6

1. @Override

```
public boolean onCreateOptionsMenu(Menu menu) {  
    getMenuInflater().inflate(R.menu.options_menu, menu);  
    return true;
```

2. @Override

```
public void OnInit(int status) {  
    if (status == TextToSpeech.SUCCESS) {  
        int result = textToSpeech.setLanguage(Locale.US);  
        String text = speakText.getText().toString();  
        textToSpeech.speak(text,  
        TextToSpeech.QUEUE_FLUSH, null, null);  
    }  
}
```

3. android:interpolator="@+id/anim/linear_interpolator">
<alpha
 android:duration="2000"
 android:fromAlpha="1.0"
 android:toAlpha="0.1" >
</alpha>

- 3 (a) How many types of Intent – explain with necessary codes and graph? 4
(b) What are the different components and actions that are useful to perform by Intent? 4
(c) Differentiate between Implicit Intent and Explicit Intent. 4
- 4 (a) What is Android Layout? Briefly describe different types of Layout with respective diagram. 4
(b) Make a comparison table among different types of layout. 4
(c) With example explain the following properties used in Layout: orientation, gravity, layout_weight, weightSum, alignParentRight 4
- 5 (a) Write the necessary XML and Java codes for designing a simple calculator. 4
(b) What is listener? Write down some common listener events in Android. 4
(c) What's the difference between class, method and activity in android? 4
- 6 (a) What is for Content Provider in Android and what are different steps to creating a Content Provider? Explain their functionality with diagram. 4
(b) What is for Fragment? Draw the Fragment life cycle method of Android. 4
(c) Define listener and handler with example. What is the difference between listener and handler? 4
- 7 (a) Draw and explain Activity Lifecycle of Android (use necessary code and diagram). 4
(b) Sketch the entire, visible and foreground lifetimes of android activity or fragment transition during execution. 4
(c) How many callback methods are in android? Explain their behavior at different stages in Android. 4



Institute of Information Technology
Jahangirnagar University
Professional Masters in IT

1st Trimester Final Examination, Fall 2019

Duration: 3 Hours

Course Code: PMIT-6217

Intake: Fall 2019 & Summer 2019

Full Marks: 60

Course Title: Wireless Network

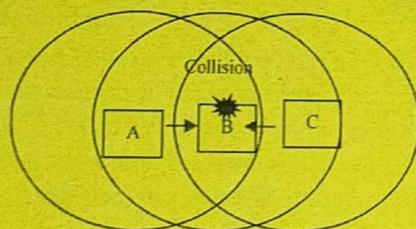
Do not write anything on the question paper.

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

Figures in the right margin indicate marks.

1. a). Mention Wireless Link Characteristics which indicate the important differences from wired link 3
b) "Three alternative transmission techniques are used for infrared data transmission". Mention those transmission techniques and Explain one of them 3
c) "To reduce the packet dropping probability or to enhance throughput of wireless LAN exponential binary backoff algorithm is widely used". Explain the algorithm 6

2. a) Explain Linear-Feedback Shift Register. Now draw a 4-bit Fibonacci LFSR with its state diagram. 5
b) Mention and explain the problem that causes collision at node B. 5



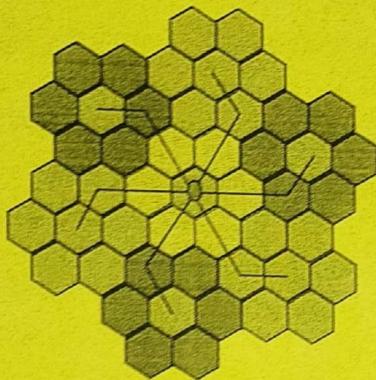
- c) "Sometimes software is not aware of mobility" Explain with example 2

3. a) Explain Gaussian frequency-shift keying 3
b) Explain DS Spectrum Spreading Technique with example. 4
c) A city has total population of 5,00,000. A network planar found the behavior of users of the city like: they generate 3 calls/hour with average holding time of 2 minutes. The service provider got the license of BW that can support 36 carriers of GSM. Determine number of sectors of 3/9 cell pattern maintaining GoS of 3%. 5

4. a) Considering a baseband OFDM transmission model where x_q is the received subcarrier and x_k represents the local oscillator. When integrating received power over one symbol period, T_U , the output of the correlators is zero for any combination, except when $k = q$. Now proof the following equation. 4

$$\sum_{q=0}^{N_c-1} \frac{a_q}{T_U} \int_0^{T_U} e^{-j2\pi(q-k)\frac{1}{T_U}t} dt = \begin{cases} a_k, & k = q \\ 0, & k \neq q \end{cases}$$

- b) Let Shift Parameters are $i = 2$, $j = 1$ taking number of co-channel interference $j=6$, propagation constant $\gamma=4$. Calculate Carrier Interference C/I.
- c) An urban area has a population of two million residents. Two computing trunked mobile networks (A and B) provide cellular service in this area. System A has 394 cells with 19 channels each, system B has 98 cells with 60 channels each. Find the number of users that can be supported at 2% blocking. If each user averages two calls per hour at an average call duration of three minutes. Also compute the market penetration of each cellular provider. 6
5. a) What is Peak to Average Power Ratio (PAPR) 2
 b) Ad-hoc networks have several types of applications. Explain four of them. 4
 c) Explain Cluster-Head Gateway Switch Routing Protocol 6
6. a) Draw and describe three main component of Sensor Node Structure 4
 b) Show the steps of DEEP Clustering Algorithm 4
 c) Calculate Reuse Distance from the given cellular network using Pythagoras formula. 4



7. a) Draw GSM Architecture. 2
 b) Describe the steps of relevant call flows in case of authentication. 2
 c) A certain city has an area of 1400 square miles and is covered by a cellular system using a seven cell reuse pattern. Each cell has a radius of 3 miles and the city is allocated 30 MHz of spectrum with a full duplex channel bandwidth of 60 KHz. Assume a GOS of 2% for an Erlang B system is specified. If the offered traffic per user is 0.03 Erlangs, compute (i) the number of cells in the service area, (ii) the number of channels per cells, (iii) Traffic intensity of each cell, (iv) the maximum carried traffic 8



Institute of Information Technology

Jahangirnagar University
Professional Masters in IT

1st Trimester Final Examination, Fall 2019

Intake: Fall 2019 & Summer 2019

Duration: 3 Hours

Full Marks: 60

Course Code: PMIT-6307

Course Title: Data Mining & 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.

1. a) Define Data Mining? What are limitations of data mining? Write the differences between association rule discovery and sequential pattern discovery? 4
b) What are the difference between classification and clustering in data mining? 4
c) Why do we use test data in mining? 4

2. a) Define the terms: Why do we reduce dimensionality before applying mining techniques? 4
b) What are the factors which affect data purity? Write the actions that you can take to impure your data? 4
c) What do you mean by OLAP? Write the application of slicing and dicing? 4

3. a) Why and when do we use Gini coefficient or entropy? Write the Hunt's algorithm for decision tree. 4
b) Suppose you have two variables (A and B) to select one in constructing a tree. Under variable A distribution of class variable are 5 Cheat and 15 No Cheat in one hand and in other hand it is 3, 10, whereas under variable B it is 4, 6 in one hand and 12, 8 in other hand respectively. Which variable you should select? Use Gini coefficient or entropy to give your answer. 4
c) If an attribute, like marital status (married, single and divorce), has three different values and you have to construct binary tree what will you have to do? 4

4. a) What do you mean by similarity and dissimilarity? Write on Euclidean distance and jaccard coefficient. 4
b) What is ROC curve? What are the use of ROC curve? 4
c) Consider a 2-class problem (cancer yes, cancer no) where actual number of yes was 6990 and number of no was 3010. Using the diagnostic machine it was found number of yes 5710 and number of no was 4290. Is this machine efficient and reliable? Calculate different parameters of validation and comment on the results. 4

5. a) What are the steps of KNN classification? 4
b) Give an example of the application of clustering? 4
c) What are the advantages of SVM classification? 4

6. a) What do you mean by clustering? What are the different types of clusters? 4
b) Write the steps of K-means clustering in your own words sequentially. 4
c) Write two limitations of k-means clustering. How can we minimize these limitations? 4

7. a) What do you mean by centroid in k-means clustering 4
b) How do we estimate epsilon (EPS) and minimum points (MinPoints) in Density Based Clustering? 4
c) In hierarchical clustering we have to calculate distance between two clusters, how do we calculate this distance? 4



Institute of Information Technology
Jahangirnagar University
Professional Masters in IT

1st Trimester Final Examination, Summer 2019 [Intake: Summer 2019 & Spring 2019]

Duration: 3 Hours

Full Marks: 60

Course Code: PMIT - 6111

Course Title: Software Testing & Quality Assurance

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.

-
1. a) How the scrum based testing works? Why customer involvement is important? 4
b) Show a model of the software testing process. Write the initial testing process exercised to check whether the software under test is ready/stable for further testing. 4
c) Why continuous integration is important for agile development? Show the agile testing process. 4
2. a) Write difference between regression testing and smoke testing. 4
b) Suppose you have to test a web based software for any domain. Identify some functional requirements of your software solution. Write 5 sample test cases based on the requirements. 4
c) Identify the following terms: 2
i. Where individual program units or object classes are tested.
ii. Test what happens if large amounts of data are handled.
iii. Tests system's response to presence of errors or loss of data.
iv. An approach to program development in which you inter-leave testing and code development.
- d) Fill in the blanks with appropriate term(s): 2
i. If _____ are good, review all the time.
ii. As soon as the work on a task is complete, it is _____ into the whole system.
iii. Entire team is involved in all activities of an _____.
iv. Development testing, where the system is tested during development to discover bugs and defects.
3. a) How defects can be classified from QA and developers perspectives? Write the parameters of defect tracking process. 4
b) From the following table calculate the function point, FP. If any team has productivity/month 5FPs and cost/month 50,000BDT, the estimate the time and cost of the project. 4

Information Domain Value	Count	Weighting factor
External Inputs (EIs)	50	3
External Outputs (EOs)	20	2
External Inquiries (EQs)	30	3
Internal Logical Files (ILFs)	35	7
External Interface Files (EIFs)	10	5

- c) List the components of test case. Calculate the test case point for the following data: 4

Type of Test cases	No. of test cases	Test case Point	Total Factor
Simple	16	6	0.25
Average	10	8	
Complex	8	12	

4. a) What is software standard? Identify the following types of standard:
- Design review form
 - Submission of new code for system building
 - Version release process
 - Project plan format
- b) Mention the process of ISO 9001. Identify the following types of errors:
- Have all constants been named?
 - Is each loop certain to terminate?
 - Are all input variables used?
 - If a linked structure is modified, have all links been correctly reassigned?
- c) How agile makes inspection and review easier?
5. a) How correctness and efficiency can be obtained for software product.
- b) Explain the relation between customer problem and customer satisfaction?
- c) Mention the software fitness for purposes. Mention the quality assurance components.
6. a) Draw the risk management process. Identify the following types of risk:
- Reusable software components contain defects that mean they cannot be reused as planned.
 - Key staff are ill and unavailable at critical times.
 - The code generated by software code generation tools is inefficient.
 - The time required to develop the software is underestimated.
- b) Identify the probability and effects of the following risk:
- It is impossible to recruit staff with the skills required for the project
 - Changes to requirements that require major design rework are proposed
 - The organization is restructured so that different management are responsible for the project
 - The database used in the system cannot process as many transactions per second as expected
 - The time required to develop the software is underestimated
 - Customers fail to understand the impact of requirements changes
 - The rate of defect repair is underestimated
 - Organizational financial problems force reductions in the project budget
- c) Draw the change management process. Write the factors of change analysis.
7. a) Write some test cases for the following use case.
- | | |
|----------------------|---|
| Use Case Name | Order goods |
| Goal: | To order goods from the system. |
| Actor(s): | Customer
Operator |
| Preconditions: | 1. The customer is registered to order goods.
2. The customer has entered registration details e.g. user name (i.e. is logged on to the ordering section). |
| Main flow of events: | 1. The customer enters Order Goods section.
2. The system displays the customer's account detail.
3. For each desired product, the customer enters its identity.
4. The customer provides delivery details.
5. The system calculates and displays the price of the goods ordered.
6. The customer submits payment details.
7. The system confirms the result of transaction.
8. The operator collects the detail of the order.
9. The operator processes the order. |
| Post conditions: | Order details are entered on the system and the order processed. |

Suppose you have to create a password with minimum 6 characters and maximum 10 characters. Any invalid situation. 4

- c) Consider following block of code and find different coverages for different test cases.

```
#include <stdio.h>
int main()
{
    int number1, number2;
    printf("Enter two integers: ");
    scanf("%d %d", &number1, &number2);
    //checks if two integers are equal.
    if(number1 == number2)
    {
        printf("Result: %d = %d", number1, number2);
    }
    //checks if number1 is greater than number2.
    else if (number1 > number2)
    {
        printf("Result: %d > %d", number1, number2);
    }
    // if both test expression is false
    else
    {
        printf("Result: %d < %d", number1, number2);
    }
    return 0;
}
```

Professional Masters in Information Technology (PMIT)
Institute of Information Technology
Jahangirnagar University



PMIT Final Examination
Fall Semester: 2019

Course Code: IT-6113
Marks: 60

Course Title: Mobile Application Development
Time: 3 Hours

Answer any **FIVE** questions
All parts of a particular question must be answered consecutively

- | | |
|---|---|
| 1(a) Where use SP and DP in Android? Write some features of Android. | 4 |
| (b) Define Mobile Platform and write some examples of good platform and some features of WAP. | 4 |
| (c) What is for Android Manifest.xml? What information contain Manifest.xml and R.java files? | 4 |
| 2(a) Draw the Android architecture and write the main component used an Android application. | 5 |
| (b) Make list of Android platform version, code name with their API level. | 5 |
| (c) What is Padding and Gravity in Android? | 2 |
| 3(a) What is a "bundle" and Intent in Android application? Differentiate between Bundle and Intent. | 4 |
| (b) Describe the following folders and files of Android. | 4 |

res

drawable

layout

activity_main.xml

mipmap

values

Text Fields (EditText)

Plain Text

Password

Password (Numeric)

E-mail

Phone

Postal Address

- (c) Explain background of the following code: 4

```
@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);

    loginButton = (Button) findViewById(R.id.loginButtonId);
    textView = (TextView) findViewById(R.id.textViewId);

    loginButton.setOnClickListener(new View.OnClickListener() {
```

- | | |
|---|---|
| 4(a) Explain Activity Lifecycle used in Android (use necessary code and diagram). | 4 |
| (b) What is listener? Write down some common listener events in Android. | 4 |
| (c) What's the difference between class, method and activity in android? | 4 |
| 5(a) Define the Fragment. Draw the Fragment life cycle method of Android. | 4 |
| (b) Write the necessary XML and Java codes for designing a simple calculator. | 4 |
| (c) What is SQLite? How does it differ from client-server database management systems? | 4 |
| 6(a) What is Android Layout? Briefly describe different types of Layout with respective image/diagram. | 4 |
| (b) With example explain the following properties used in Layout:
orientation, gravity, layout_weight, weightSum, alignParentRight | 4 |
| (c) Make a comparison table among different Android Layouts? | 4 |
| 7(a) Define listener and handler with example. What is the difference between listener and handler? | 4 |
| (b) How to send the data from one Activity to Another Activity in Android applications- explain step by step. | 4 |
| (c) Write the meaning of the following: | 4 |

```
public void onClick(View view)
<?xml version="1.0" encoding="utf-8"?>
public class MainActivity extends AppCompatActivity
    loginButton = (Button) findViewById(R.id.loginButtonId);
    category android:name="android.intent.category.LAUNCHER"
    xmlns:android="http://schemas.android.com/apk/res/android"?
```



INSTITUTE OF INFORMATION TECHNOLOGY
JAHANGIRNAGAR UNIVERSITY
PMIT 1ST SEMESTER FINAL EXAMINATION-AUGUST 2019
PRE-REQUISITE BATCH

COURSE CODE: IT-6217
TOTAL MARKS: 60

COURSE TITLE: WIRELESS NETWORK
TIMES: 3 HOURS

ANSWER ANY FIVE (5) QUESTIONS

1. a) Draw an environment of subscriber station of WiMAX network and explain 6
b) "The Destination-Sequenced Distance Vector (DSDV) protocol is a table-driven routing protocol" 6
Explain
2. a) Four prominent wireless technologies: Bluetooth, Wi-Fi (more formally known as 802.11), WiMAX (802.16), and third-generation or 3G cellular wireless. Now mention typical link length, bandwidth, use, wired technology analogy of any three technologies. 6
b) Considering a baseband OFDM transmission model where x_q is the received subcarrier and x_k represents the local oscillator. When integrating received power over one symbol period, T_U , the output of the correlators is zero for any combination, except when $k = q$. Now proof the following
$$\sum_{q=0}^{N_C-1} \frac{a_q}{T_U} \int_0^{T_U} e^{j2\pi(q-k)\frac{1}{T_U}t} dt = \begin{cases} a_k, & k = q \\ 0, & k \neq q \end{cases}$$
3. a) Mention four Major Problems with Wireless network. Explain solution for one of them 6
b) A city has total population of 5,00,000. A network planar found the behavior of users of the city like: they generate 3 calls/hour with average holding time of 2 minutes. The service provider got the license of BW that can support 36 carriers of GSM. Determine number of sectors of 3/9 cell pattern maintaining GoS of 5%. 6
4. a) Explain Infrared LANs with advantages. 4
b) Bluetooth defines two types of networks called: piconet and scatternet. Explain them. 4
c) Explain Adaptive modulation and channel coding (MCS) scheme 4
5. a) Explain Interferences In Mobile Cellular Network 4
b) Explain OFDM Versus FDM. 4
c) Explain the mechanism of Soft Handover. 4

6. a) Explain the frame format of IEEE 802.11
b) Draw and describe GSM Architecture
c) A wide-range of applications offered by WSN. Explain four of them.
7. a) Explain LEACH Clustering Protocol 3
b) An urban area has a population of two million residents. Two computing trunked mobile networks (A and B) provide cellular service in this area. System A has 394 cells with 19 channels each, system B has 98 cells with 60 channels each. Find the number of users that can be supported at 2% blocking. If each user averages two calls per hour at an average call duration of three minutes. Also compute the market penetration of each cellular provider. 6
c) Explain three important features of WiMAX 3

Institute of Information Technology
Jahangirnagar University
Professional Masters in IT

Final Examination	Semester: Semester II, 2019
Duration: 3 hours	Full Marks: 60
Course Code: PMIT-6307	Course Title: Data Mining & Knowledge Discovery

Answer any 5 (five) of them. Figures in the right margin indicate marks.

1. a) Define Data Mining? What are the challenges in data mining? 4
 b) What are the difference between descriptive data mining and predictive data mining? 4
 c) Describe a situation where we can use a data mining technique. 4
2. a) What do you mean by aggregation? Why do we apply sampling on data? 4
 b) When do we follow "feature subset selection" to reduce data before data mining? Explain it in details. 4
 c) What is OLAP? Why do we need OLAP? Define the term "Slicing" and "Dicing". 4
3. a) What are the different methods of calculating similarity and dissimilarity? 4
 b) Suppose you want to calculate similarity between two customers who bought some goods from a supermarket. What are the formula you can use in this regards? 4
 c) To calculate dissimilarity between two data objects you can use Euclidian Distance and Mahalanobis Distance. Which one will you prefer and why? 4
4. a) What is classification in data mining? Draw the process of classification. 4
 b) Suppose, Asad, Kabir and Raihan bought groceries from shop. Calculate their similarities and evaluate who are very closest
 Asad 5 kg rice, 1 kg fish, 200 gm chilly and 1 kg milk
 Raihan 1 kg rice, 1 kg Meat, 200 gm chilly and 1 kg milk
 Kabir 2 kg rice, 1 kg fish, 200 gm salt and 1 kg milk
 c) What is the main principle of Gini index? – explain. When we have to use Gini index in splitting? 4
5. a) Write the procedures of tree based classification? How does one can check the validity of a tree? 4
 b) What do you mean by KNN classification? 4
 c) Suppose you have two variables (Gender and Marital status) to select one in constructing a tree. Among males there are Cheat=6 and No Cheat=9 and among females Cheat=10 and No Cheat=5 whereas under variable marital status it is 5, 7 among married and 10, 8 among unmarried respectively (assuming that there are no divorce). Which variable you should select at this point to grow up tree? Use Gini coefficient or entropy to provide your answer. 4
6. a) What do you mean by clustering? What are the different types of clusters? 4
 b) Shortly explain process of hierarchical clustering. 4
 c) Write the limitations of K-means clustering. How can we minimize these limitations? 4
7. a) If you have a data set with class attribute and a new data without class attribute. Write the process of classifying this new data using SVM. 4
 b) If $x_1(1,2)$, $x_2(3,2)$, $x_3(2,4)$, $x_4(4,1)$, $x_5(3,5)$, $x_6(1,2)$ are six data points of only two dimensional. Draw dendrogram for hierarchical clustering. 4
 c) In density based clustering (DBSCAN), how do you estimate radius (eps) and minPoints (minPts) from a set of data? 4



INSTITUTE OF INFORMATION TECHNOLOGY
JAHANGIRNAGAR UNIVERSITY
SECOND SEMESTER M.SC. FINAL EXAMINATION 2018
[IN INFORMATION TECHNOLOGY]

Time: 3 Hours IT 5205: Software Project Management and Quality Assurance Full Marks: 60

Answer any FIVE (05) from the following questions. Figures at the right indicate the marks.

1. a) What is a project? "Software projects are different from other projects", do you agree with this statement? Justify your answer. [3]
- b) Define the word "stakeholder" in relation to an IT development project. Suppose, you work for a small research organization. It is part of a group of similar research organizations, each operating in a different part of the country. At the moment each of these organizations uses a different main computersystem. It has been decided that the computer system used by your organization should be extended and then used by all of the other organizations, to replace their existing systems. A network would be set up linked to the main server, which would be located in your organization'soffices. List at least three different types of stakeholder in this new project. Identify their main concerns and their stake in the project. [5]
- c) Briefly describe how rapid prototyping can be used with the waterfall model to address its major weakness. [4]
2. a) How strategic assessment and program management is related? Explain in brief. [2]
- b) Initial investment for project A, B and C is \$40,000; \$40,000 and \$200,000 respectively. Assume a discount rate of 5%. Which project would you now select for development based on the value of NPV and ROI? [4]

Table 1: Projected cash flow for project A, B and C

Year	Project A(\$)	Project B(\$)	Project C (\$)
1	5,000	20,000	55,000
2	10,000	25,000	55,000
3	15,000	15,000	55,000
4	25,000	10,000	55,000
5	20,000	5,000	55,000

- c) What do you mean by Risk evaluation? Suppose, You're doing a prototype for your project, but you're not sure whether to proceed with this prototype. If you do the prototype, it will cost you \$100,000; and, of course, if you don't pursue it, there will be no cost. If you do the prototype, there is 30 percent chance that the prototype might fail, and for that the cost impact will be \$50,000. However, if the prototype succeeds, the project will make \$500,000. If you do not do any prototype, you're already taking a risk, the chance of which is 80 percent with a failure impact of \$250,000. But, again, without a prototype, should you succeed, the project will make the same money as mentioned before. What should you do? Explain with decision tree risk analysis. [6]
3. a) The following two sets of C code represent three LOC each. Discuss the problem associated with counting each set the same when doing cost estimation. [2]

```
for(i=0; i<10; i++) x = x + 12;
if(x > 120) printf ("Error, overload!\n");
x = 0;

if((a < b && c > d ) || (cos(x)*tan(y) >= sqrt(sin(x)*cos(y))))w+=2;
for(j=0,k=0,l=0; j<10, k>-10, l>=-20; j++, --k, --l) x=j+2*k+4*l;
while(a > b && c < d) sum(fun1(12),fun2(13),a,c);
```

Given project has 5 user inputs, 10 user outputs, 7 inquiries, 5 files, and 3 external interfaces. All of these are average complexity except 2 of the inputs are complex, two of the outputs are complex, and one of the outputs is simple. Complexity factors are all moderate except that the system will require a significant amount of online data entry, and it is essential that the code is designed with reuse in mind. Calculate the number of Function Points for this system. Complexity factors adjustment weight is given below:

Degree of Influence	Weight
Not present	0
Incidental	1
Moderate	2
Average	3
Significant	4
Essential	5

- c) Given the following COCOMO constants table:

[3x2=6]

Application	a	b	c	d
Organic	2.4	1.05	2.5	0.38
Semi-Detached	3.0	1.12	2.5	0.35
Embedded	3.6	1.20	2.5	0.32

Assume that you are using Cocomo cost estimation model in your project. A person on your team who has done this before estimates the total lines of code to be 400,000 LOC. Required software reliability is very high, product complexity is high, memory constraint high, all the members on your team are very inexperienced and new and analyst capability is high. The program must be written in C and nobody on your team has written a C program in the last year. The team is very fluent in Linux. All other factors can be considered to be nominal.

- i. Calculate total effort needed for this project.
- ii. Calculate the total duration of this project in months.

4. a) Your company is expanding rapidly and has decided to buy in and install an off-the shelf (O-T-S) ledger package to replace the existing manual system. This will need new equipment and network cabling throughout the offices. You are to manage this project. You have drawn up an outline project plan to include the following main tasks. Draw a work breakdown structure (WBS) diagram for the project, to show all the planned tasks. This WBS should contain at least two levels. [3]

Activity	Task	Weeks	Labour
A	Interview accounts staff, draw up and agree a list of main requirements	6	3
B	Assess alternative O-T-S packages and select the most appropriate.	6	2
C	Specify and order all the required new hardware and communications equipment.	3	4
D	Test and install all the new hardware and equipment.	9	3
E	Modify and test the package software.	15	4
F	Install the package software	1	2
G	Specify and obtain the accounts data required to implement the system	6	4
H	Draw up a training plan.	3	2
I	Train the users	9	2
J	Draw up an acceptance test plan	3	3
K	Acceptance testing	4	4
L	Load data and implement the new system.	3	2

- b) Draw the network diagram for the project, showing all dependencies and floats and highlighting the critical path according the dependencies between the 12 tasks listed above:

[6]

- B depends on A
 - C, E, H and J all depend on B
 - D depends on C
 - F depends on D and E
 - G depends on E
 - I depends on H
 - K depends on F, I and J
 - L depends on G and K
- c) In the above network manually level your resource so that you may not use more than 10 laborers per day at any time. [3]
5. a) Why rational is important for software development? [3]
- b) You have buy a toy for a 5 years old boy. You have three options like soft toys, picture puzzles and video games. Your criteria for choosing are cost, age suitability and boy's likeness. Find the best choice. [4]
- c) How issue model works? [3]
- d) Write the correct term for the given statements: [1/2×4=2]
- The required attributes of a product or process playing an important role in quality management.
 - It is concerned with deriving a numeric value for an attribute of a software product or process.
 - The correctness, completeness, and consistency of the requirements model will have a strong influence on the quality of all work products that follow.
 - It sets out the desired product qualities and how these are assessed and defines the most significant quality attributes.
6. a) How agile makes project planning and scheduling simple? What is the most complicated part in agile process? [4]
- b) Define the following terms: [2×3=6]
- Black box testing
 - White box testing
 - Coverage based testing
- c) Mention the risk identification factors. [2]
7. a) Table 2 showing Tasks, durations, and dependencies of a project. Draw an activity bar chart using today's date as starting date. Find the finish date. [5]
- Table 2: Task Dependencies
- | Task | Effort (person-days) | Duration (days) | Dependencies |
|----------------|----------------------|-----------------|---|
| T ₁ | 15 | 10 | |
| T ₂ | 8 | 15 | |
| T ₃ | 20 | 15 | T ₁ (M ₁) |
| T ₄ | 5 | 10 | |
| T ₅ | 5 | 10 | T ₂ , T ₄ (M ₃) |
| T ₆ | 10 | 5 | T ₁ , T ₂ (M ₄) |
| T ₇ | 25 | 20 | T ₁ (M ₁) |
| T ₈ | 75 | 25 | T ₄ (M ₂) |
- b) Write the expression for algorithmic cost model and empirical cost model. If for any project size (LOC) of the product is 33,200, B=0.34, P= 620 and the duration of the project is 3 month; then find the estimated efforts. If Burdened labor rate is 20000tk per month, then find the estimated cost. [5]
- c) Write the planning activities. [2]



Institute of Information Technology
Jahangirnagar University
Professional Masters in IT

1st Trimester Final Examination, Spring 2022

Duration: 3 Hours

Course Code: PMIT 6111

Intake: Fall 2021 & Spring 2022

Full Marks: 60

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) Mention the agile manifesto. Draw the XP release cycle. 2+2
- b) How test driven development works? Write the difficulties of it. 2+2
- c) Why continuous integration is important for agile development? 4

2. a) Apply an appropriate testing strategy for the system given in fig.1. Justify your opinion. 5

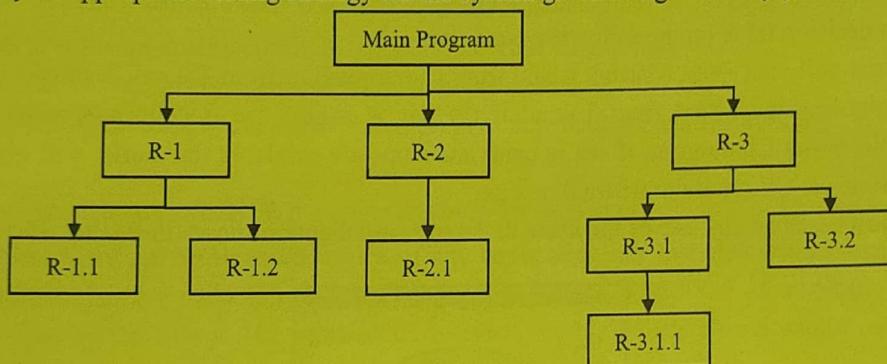


Fig. 1

- b) What are the stages of Testing? Identify the following types of testing: 1.5+2.5
 - a. Testing the limits of system e.g. maximum number of users, peak demands, extended operation.
 - b. Test the various software and hardware configurations
 - c. Evaluate response times and time to perform a function
 - d. Exercise all input and output parameters of each component, all components and all calls (each component is called at least once and every component is called by all possible callers.)
 - e. Conducted at sponsor's site (developer is not present) and software gets a realistic workout in target environment.

- c) What is driver and stub? When it is critical to write driver and stub? 3

3. a) Write different types of interfaces. What kind of errors are commonly occurs in the interfaces. 4
- b) Draw a model of software testing process. Do you think testing done by the developers are enough? Justify your answer. 2+2
- c) Show the unit testing environment. Which parts of any system can be identified as units? 4

4. a) Mention different kinds of coverage. Calculate the coverage for the flowchart in fig.2 when "a = 121".

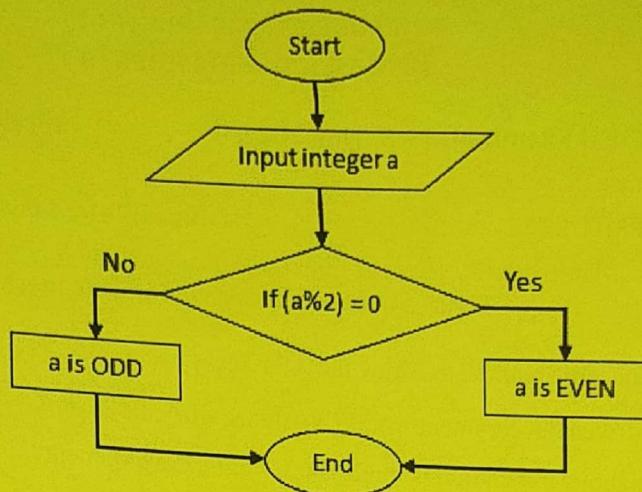


Fig. 2

- b) 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 got to Saint Martine. Otherwise tourist will not go."
- c) Write test cases on any one of the users in the use case diagram shown in fig. 3.

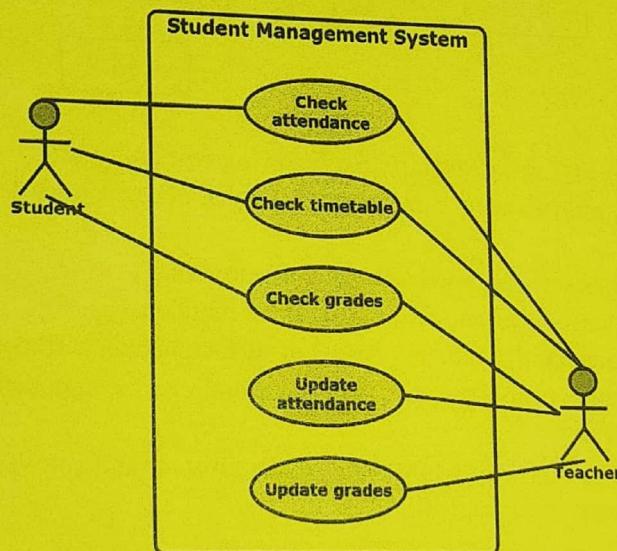


Fig. 3

- d) what is fault attack or error guessing testing?
5. a) Identify the severity and priority of the following defect:
- You cannot add items in shopping cart of an online shopping site.
 - An application or web page crashes when a remote link is clicked.
 - In a student information system, new student cannot be added.
 - Spelling mistake in a paragraph describing anything in a website.

- b) Write the parameters of defect tracking system. What is the role of a business analyst? 2+2
 c) Identify the defect life cycle states: 2
 a. A defect assigned to developer team and they are investigating it.
 b. After fixing the defect ready for testing.
 c. The defect is identified as duplicate.
 d. After testing, QA team still finds defects.
- d) Show the risk management process. When we need contingency plans? 2+2
6. a) How agile makes inspection easier? Identify the types of faults: 3+3
 a. If character strings are used, is a delimiter explicitly assigned?
 b. If a break is required after each case in case statements, has it been included?
 c. Do formal and actual parameter types match?
 d. Is space explicitly de-allocated after it is no longer required?
 e. In case statements, are all possible cases accounted for?
 f. Are all output variables assigned a value before they are output?
- b) How ISO 9001 standard can be achieved by any organization. 3
 c) What is software quality conflicts? Identify the following terms: 2+1
 a. What kind of standard "Requirements document structure" is?
 b. What kind of standard "Submission of new code for system building" is?
7. a) Mention the quality goals. Write some attributes of each goal. 4
 b) Suppose there are 50 licensed copies of any application has installed within 3 months. Customers has reported 200 problem during this period. The FP = 45 and true defect identified by the user is 162; total closed defects = 156, defects closed within responses time = 144.
 i. Find PUM.
 ii. Find defect density
 iii. Find BMI
 iv. Find Percent delinquent fixes
- c) If any application has mean-time-to-failaure is 300 hours and mean-time-to-repair is 20 seconds. Then find its availability. Is it a reliable system? 2



Institute of Information Technology

Jahangirnagar University

Professional Masters in IT

1st Semester Final Examination- Spring 2022

Intake: Spring 2022, Fall 2021

Duration: 3 Hours

Full Marks: 60

Course Code: PMIT – 6113

Course Title: Mobile Application Development

Do not write anything on the question paper.

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

- 1 (a)** Android is an OS, an open source and a platform - explain why? 4
- (b)** Draw the Android architecture and write the main component used in an Android application. 4
- (c)**
 - i. What is for screen orientation in Android?
 - ii. Differentiate between: TextView and ScrollView4

- 2 (a)** Make a list of Android features with their functions. 4
- (b)**
 - i. Explain Android Margin and Padding Attributes.
 - ii. What is for:
 - i. android:textColor="#0832ca"
 - ii. android:textSize="30sp"4
- (c)**
 - i. How to call the method "MenuInflater.inflate()" for "menu"?
 - ii. What is the method to handle a menu item click events?4

- 3 (a)** What is Open Handset Alliance (OHA) and what is its purpose? 4
- (b)** Sketch the Android App/Project Folder Structure. 4
- (c)** What are the main folders and files required to implement an application in android studio? 4

- 4 (a)** How many layers are in Android Architecture? Explain the roles and features of each layers. 4
- (b)** What is for activity_main.xml file? Write necessary code for activity_main.xml file. 4
- (c)**
 - i. What are the two modes of UI and why they are for?
 - ii. Write the meaning of setProgress(0, 0, false).4

- 5 (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

- 6 (a)** Draw and explain Activity Lifecycle of Android (use necessary code and diagram). 4
- (b)** How to create "menu" in Android, what are the different items of "menu"? 4
- (c)** Which class, object and properties are used for notification? Write a sample code using these. 4

- 7 (a)** What is Android Layout? Briefly describe different types of Layout with respective diagram. 5
- (b)** With example explain the following properties used in Layout: orientation, gravity, layout_weight, weightSum, alignParentRight. 2
- (c)** What are the available animations used in Android?



Institute of Information Technology

Jahangirnagar University

Professional Masters in IT

1st Semester Final Examination- Spring 2022

Intake: Spring 2022, Fall 2021

Duration: 3 Hours

Full Marks: 60

Course Code: PMIT – 6217

Course Title: Wireless Networks

Do not write anything on the question paper.

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

1. 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) "Wireless LANs can operate in one of two configurations, with a base station and without a base station". Explain this statement. 4
c) Describe the layers of Bluetooth Network. 4

2. a) In the GSM800 digital channelized cellular system, the one-way bandwidth of the system is 12.5 MHz. The RF channel spacing is 200 kHz. Eight users share each RF channel and three channels per cell are used for control channels. Calculate the spectral efficiency of modulation (for a dense metropolitan area with small cells) using the following parameters: 6
 - Area of a cell=8 km²
 - Total coverage area =4000km²
 - Average number of calls per user during the busy hour= 1.2
 - Average holding time of a call=100 seconds
 - Call blocking probability=3%
 - Frequency reuse factor=7

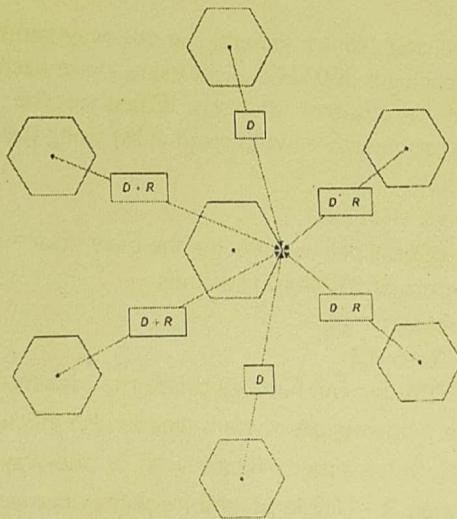
- b) Define Cell Capacity of a TDMA System. Now calculate the capacity and spectral efficiency of a TDMA system using the following parameters: bandwidth efficiency factor $\eta_b = 0.9$, bit efficiency (with QPSK) $\mu=2$, voice activity factor $v_f=1.0$, one-way system bandwidth $B_w = 12.5$ MHz, information bit rate $R = 16.2$ kbps, and frequency reuse factor $N = 19$. 6

3. a) If GSM uses a frame structure where each frame consists of 8 time slots, and each time slot contains 156.25 bits, and data is transmitted at 270.833 kbps in the channel, find (a) the time duration of a bit, (b) the time duration of a slot, (c) the time duration of a frame, and (d) how long must a user occupying a single time slot must wait between two simultaneous transmissions. 4
b) Mention some features of Narrow-band signals and Spread Spectrum Signals 4
c) Draw and describe general Model of Spread Spectrum System. Whether CDMA is a Direct Sequence Spread Spectrum system? Or not Explain. 4

4. a) What is linear-feedback shift register? Draw a 16-bit Fibonacci LFSR. If the seed is 1010110011100110. Find the pseudo-noise sequences for four rounds. 6
b) The access method of MAC protocol of IEEE 802.11 based on exponential binary backoff algorithm. Explain the algorithm. 6

5. a) What do you mean by Multipath propagation? How does it cause harmful interference to the signal? Explain with generating environment for urban area. 6
- b) Why cells are hexagonal? For a hexagonal geometry, evaluate the co-channel reuse ratio is: $q = \sqrt{3N}$. 6
6. a) If the bandwidth for 8-QAM and 8-PSK is $BW=2Rb/3$, then what is the bandwidth of 16-QAM and 16-PSK? If a bit stream of 64 kb/s is to be transmitted, how much bandwidth is required in each case?
 How many symbols are represented (M) for 8-QAM and 16-QAM modulation?
 How many bits per symbol are used (K) for 8-PSK and 16-PSK?
 If the Baud is 10000 symbols/s, what is bit rate (Rb) for 8-QAM and 16-QAM?
 Would 16-QAM be more or less susceptible to noise than 16-PSK modulation?
 Draw the signal constellation diagram for both 16-QAM and 16-PSK.
- 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) 6



Calculate the signal to interference ratio (S/I) from the above worst-case scenario for co-channel interference.

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

If the cell is divided into six sectors by using a 60° beam then what is the impact on Co-channel interference?

- b) A city has total population of 5,00,000. A network planar found the behavior of users of the city like: they generate 3 calls/hour with average holding time of 2 minutes. The service provider got the license of BW that can support 36 carriers of GSM. Determine number of sectors of 3/9 cell pattern maintaining GoS of 5%. 3
- c) Explain the Destination-Sequenced Distance Vector (DSDV) Packet Process Algorithm with example. 3



Institute of Information Technology

Jahangirnagar University

Professional Masters in IT

1st Semester Final Examination- Spring 2022

Intake: Spring 2022, Fall 2021

Duration: 3 Hours

Full Marks: 60

Course Code: PMIT – 6307

Course Title: Data Mining & Knowledge Discovery

Do not write anything on the question paper.

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

-
1. a) Define Data Mining? What are the difference between descriptive data mining and predictive data mining? 4
 - b) A marketing officer of a Laptop Sales House is trying inspire customers to buy the special brand of laptop. He will have to use different data mining techniques in different phases. Explain it from your imagination. 4
 - c) What is “Association Rule Discovery”? give an appropriate example. 4
 2. a) There are a lot of challenges in doing data mining. One of them is “Scalability” – explain it clearly. 4
 - b) Explain different reasons for which data may be affected. 4
 - c) In nature, data is heterogeneous. In data mining, **nominal data** and **ordinal data** comes along with **ratio data**. Explain the bold terms with example. 4
 3. a) Why do we use data aggregation and dimension reduction? 4
 - b) Give an example of stratified sampling and write its purpose of use in data mining. 4
 - c) When do we need discretization and binarization of data? 4
 4. a) Define the term EDA. Why EDA is necessary for data mining? 4
 - b) Suppose, Asad, Kabir and Raihan bought groceries from shop. Calculate their similarities and evaluate who are very closest
Asad 5 kg rice, 1 kg fish, 200 gm chilly and 1 kg milk
Raihan 1 kg rice, 1 kg Meat, 200 gm chilly and 1 kg milk
Kabir 2 kg rice, 1 kg fish, 200 gm salt and 1 kg milk 4
 - c) What is the main principal of Gini index? – explain. When we have to use Gini index in splitting? 4
 5. a) Write the procedures of tree based classification? How does one can check the validity of a tree? 4
 - b) When do one can stop constructing classification tree? 4
 - c) Suppose you have two variables (A and B) to select one in constructing a tree. Under variable A distribution of class variable are 5 Cheat and 10 No Cheat in one hand and in other hand it is 3, 12 whereas under variable B it is 3, 7 in one hand and 12, 8 in other hand respectively. Which variable you should select? Use Gini coefficient or entropy to give your answer. 4

6. a) What do you mean by clustering? What are the different types of clusters? 4
b) Shortly explain process of hierarchical clustering. 4
c) Write the steps of K-means clustering in your own words sequentially. 4
7. a) How a KNN classification is performed? What are the steps of k-means clustering? 4
b) In density based clustering, how do you decide **minPoints** and **Eps**? 4
c) Write two limitations of k-means clustering. How can we minimize these limitations? 4



Institute of Information Technology

Jahangirnagar University
Professional Masters in IT

1st Trimester Final Examination, Summer 2022

Duration: 3 Hours

Course Code: PMIT 6111

Intake: Spring & Summer, 2022

Full Marks: 60

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) How scrum works? What is the main drawback of sprint? 2+2
b) Write test case before coding in test driven development on the following story. 4

As a teacher, anyone can publish research interest and supervise not more than 5 students per session.

As a student, anyone can request for supervision then get accepted if research interest matches with the teacher and teacher has less than 5 students assigned under his/her supervision.

- c) Mention some agile practices. 4
2. a) Show the process of testing any software. 3
b) How smoke testing works? 3
c) Write one test condition for the following types of tests:
i. Security testing 3
ii. Recovery testing 3
iii. Human factor testing 3
- d) Consider the following story. Mention the features you can test from the story. 3

Kate is a nurse who specializes in mental health care. One of her responsibilities is to visit patients at home to check that their treatment is effective and that they are not suffering from medication side -effects.

On a day for home visits, Kate logs into the MHC-PMS and uses it to print her schedule of home visits for that day, along with summary information about the patients to be visited. She requests that the records for these patients be downloaded to her laptop. She is prompted for her key phrase to encrypt the records on the laptop.

3. a) Explain how testing becomes larger as development proceeds. Why big bang approach cannot be applied for integration? 4
b) Mention the types of interfaces. If any component A can send and receive parameters to module B then how this interface can be tested? 4
c) Consider any five components of a system such as A, B, C, D and E. Where the pairs (A, B); (B, E); (C, D); (C, F) and (A, C) has interfaces between them. Apply an integration strategy and mention if there are any drawbacks. 4

4. a) Suppose you are developing a system for student management. Give examples of the following types of requirements:

- i. Functional Requirements
- ii. Product requirement
- iii. Organizational requirement
- iv. External requirement

- b) Consider the following pseduocode, find the coverage for three tescases. Can we get full coverage? 4

```
If (child age <=9)
    Print: You get 50% Discount.
If (child age <= 3)
    Print: You get free entry.
Else
    Print: Please pay the full entry fee.
```

- c) Mention the techniques of experience-based testing. Give example. 4

5. a) Draw the defect life cycle. How many ways any defect reached at closed status? 2+2

- b) Suppose you have an agile team with productivity and cost per month of 4 FPs and 50k. If total count is 500. Find function point, total time and cost. 2

- c) Give example of the following types of defects:
- i. High priority and low severity
 - ii. Low priority and high severity

- d) Mention the types of risks. Give examples. 4

6. a) Draw the Quality review process. How review can be made easier with agile? 2+2

- b) How process and product quality depend on each other? Give example of product standard and process standard. 2+2

- c) Mention different types of faults with example in inspection checklist. 4

7. a) Show the stages of CMMI. What is continuous CMMI? 2+2

- b) Suppose you have total 120 FPs and total 500 defects were identify in a month. Find the following therms: (You can assume other parametters with respect to the total defect 500) 2x4=8

- i. Defect Density per FPs
- ii. Defect removal effectiveness (DRE)
- iii. Backlog management index (BMI)
- iv. Percent delinquent fixes



Professional Masters in Information Technology (PMIT)
Institute of Information Technology
Jahangirnagar University
PMIT Final Examination (Summer: 2022)

Course Code: IT-6113

Intake : Spring 2022, Summer 2022

Marks: 60

Course Title: Mobile Application Development

Time: 3 Hours

Answer any **FIVE** questions

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

- 1 (a) Draw and explain Activity Lifecycle of Android (use necessary code and diagram). 4
(b) Which class, object and properties are used for notification? Write a sample code using these. 4
(c) Write a sample code of TextView and ListView. 4
- 2 (a) What is Android Layout? Briefly describe different types of Layout with respective diagram. 4
(b) With example explain the following properties used in Layout: i. gravity, ii. layout_weight, iii. weightSum, iv. alignParentRight. 4
(c) Write the purpose of screen orientation in Android. 4
- 3 (a) Draw the Android architecture and write the main component used an Android application. 4
(b) What is Open Handset Alliance (OHA) and what is its purpose? 4
(c) What are the main folders and files required to implement an application in android studio? 4
- 4 (a) Android is an OS, an open source and a platform - explain why? 4
(b) Differentiate between:
 - i. TextView and ScrollView, ii. Margin and Padding Attributes. 4
(c) What is for AndroidManifest.xml file? Write necessary code for AndroidManifest.xml. 4
- 5 (a) Mansion some animations used in Android. 4
(b) What are the two modes of UI and why they are for? 4
(c) What is for:
 - i. android:textColor="#bd82ac"
 - ii. android:textSize="40sp"
 - iii. android:layout_width="match_parent"
 - iv. android:layout_width="wrap_content" 4
- 6 (a) How many callback methods are in android? Explain their behavior at different stages in Android. 4
(b) What is Android Intent for, and how many types of Intent are? 4
(c) Mansion different types of adaptor in Android. 4
- 7 (a) Draw and explain Activity Lifecycle of Android (use necessary code and diagram). 4
(b) How to create “menu” in Android, what are the different items of “menu”? 4
(c) Sketch the entire, visible and foreground lifetimes of android activity or fragment transition during execution. 4



Institute of Information Technology
Jahangirnagar University
Professional Masters in IT

1st Semester Final Examination Summer 2022
Duration: 3 Hours
Course Code: PMIT 6217

Intake : Summer 2022, Spring 2022
Full Marks: 60
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.

1. a) Define Wireless Network. Mention devices commonly used for wireless networking. Why do we need this new technology when we have such a developed public telephone network? 4
- b) Explain infrastructure mode in detail by drawing Mobile Networks. 4
- c) Describe the layers of Bluetooth Network. 4
2. a) Explain about IrDA and ZigBee 4
- b) Described briefly 4 features of TDMA 4
- c) In the GSM800 digital channelized cellular system, the one-way bandwidth of the system is 12.5 MHz. The RF channel spacing is 200 kHz. Eight users share each RF channel and three channels per cell are used for control channels. Calculate the spectral efficiency of modulation (for a dense metropolitan area with small cells) using the following parameters:
 - Area of a cell=9 km²
 - Total coverage area =4500km²
 - Average number of calls per user during the busy hour= 1.2
 - Average holding time of a call=120 seconds
 - Call blocking probability=2%Frequency reuse factor=7
3. a) 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 $\eta_b = 0.9$, bit efficiency (with QPSK) $\mu=2$, 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
- b) If GSM uses a frame structure where each frame consists of 8 time slots, and each time slot contains 156.25 bits, and data is transmitted at 270.833 kbps in the channel, find (a) the time duration of a bit, (b) the time duration of a slot, (c) the time duration of a frame, and (d) how long must a user occupying a single time slot must wait between two simultaneous transmissions. 4
- c) Draw and describe general Model of Spread Spectrum System. Whether CDMA is a Direct Sequence Spread Spectrum system? Or not Explain 4
4. a) Explain “near-far” problem. 4



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- b) The access method of MAC protocol of IEEE 802.11 based on exponential binary backoff algorithm. Explain the algorithm.
- c) Types of frequency hopping are: (i) Slow frequency hopping (ii) Fast frequency hopping. Explain both. 4
5. a) What do you mean by Multipath propagation? How does it cause harmful interference to the signal? Explain with generating environment for urban area. 4
- b) "For a given SNR, a modulation technique with a higher bit transmission rate will have a higher BER" Explain. 4
- c) Consider a GSM system with a one-way spectrum of 12.5 MHz and channel spacing of 200 kHz. There are 3 control channels per cell and reuse factor is 7. Assuming an Omnidirectional antenna with 6 interferers in the first tier and a slope path loss of 40 dB/decade, calculate the number of calls per hour per cell site with 2% blocking during the system busy hour and an average call holding time is 120 seconds, The GSM uses 8 voice channels per RF channel. 4
6. a) Why cells are hexagonal? For a hexagonal geometry, evaluate the co-channel reuse ratio is: $q = \sqrt{3N}$. 4
- b) If the bandwidth for 8-QAM and 8-PSK is $BW = 2Rb/3$, then what is the bandwidth of 16-QAM and 16-PSK? If a bit stream of 64 kb/s is to be transmitted, how much bandwidth is required in each case?
- How many symbols are represented (M) for 8-QAM and 16-QAM modulation?
- How many bits per symbol are used (K) for 8-PSK and 16-PSK?
- If the Baud is 10000 symbols/s, what is bit rate (R_b) for 8-QAM and 16-QAM?
- Would 16-QAM be more or less susceptible to noise than 16-PSK modulation?
- Draw the signal constellation diagram for both 16-QAM and 16-PSK.
- c) Draw a baseband OFDM transmission model. Prove the statement "When integrating received power over one symbol period, T_u , the output of the correlators is zero for any combination, except when $k = q$ ". 4
7. a) Calculate the signal to interference ratio (S/I) from the worst-case scenario for co-channel interference. 6
- If we assume the reuse distance D is same for six interfering cells then $S/I = ?$
- If the cell is divided into six sectors by using a 60° beam then what is the impact on Co-channel interference?
- b) A city has total population of 45,00,000. A network planner found the behavior of users of the city like: they generate 2 calls/hour with average holding time of 1.5 minutes. The service provider got the license of BW that can support 27 carriers of GSM. Determine number of sectors of 3/9 cell pattern maintaining GoS of 2%. 3
- c) Explain the LEACH Clustering Protocol 3



Institute of Information Technology
Jahangirnagar University
Professional Masters in IT

1st Trimester Final Examination, Summer 2022

Duration: 3 Hours

Intake: Summer 2022, Spring 2022

Full Marks: 60

Course Code: PMIT - 6307

Course Title: Data Mining & 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.

1. a) Define the term "Data Mining" and give an example where human always use data mining techniques. 4
- b) What are the difference between classification and clustering? 4
- c) What are the sequential steps in doing classification of a set of data? 4
2. a) List different types of attributes with their general properties 4
- b) For different types of data how do you calculate dissimilarity for a single attribute? 4
- c) What is decision tree classification? 4
3. a) How a tree-based classification works? What are the advantages of tree-based classification? 4
- b) Suppose you have two variables (A and B) to select one in constructing a tree. Under variable A distribution of class variable are 5 Cheat and 15 No Cheat in one hand and in other hand it is 3, 10 whereas under variable B it is 3, 7 in one hand and 6, 8 in other hand respectively. Which variable you should select? Use Gini coefficient or entropy to give your answer. 4
- c) Define the terms: True positive and False Negative and F-measure 4
4. a) Data may affected by various kind of reasons. These reasons we may define as data quality problems. 4
- b) Why EDA is necessary for data mining? Why do we use cross validation in classification? 4
- c) What is OLAP? Why do researcher use Slicing and Dicing in data analysis? 4
5. a) What are the steps of KNN classification? 4
- b) Why most researchers do 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) What are the different types of clustering? 4
- c) Write some limitations of k-means clustering. How can you overcome these limitations? 4
7. a) What is the basic principal 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) The distance of k-th neighbor of data points are almost equal" – explain this comment. 4



Institute of Information Technology

Jahangirnagar University
Professional Masters in IT

1st Trimester Final Examination, Fall 2019 [Intake: Fall 2019 & Summer 2019]

Duration: 3 Hours

Full Marks: 60

Course Code: PMIT - 6111

Course Title: Software Testing & Quality Assurance

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.

1. a) Explain how test driven development works. 4
b) Show the sprint based life cycle of Agile. What are the limitations of sprint? 5
c) Why extreme programming is called extreme? 3

2. a) A web application has several functional components. To test the functionalities which tests are conducted from developers' and users' end? 4
b) Suppose you are building an application for your client. After few iterations you have faced a problem in a program code. But you can't find the source of it. What should you do to identify the error? 4
c) What are the stages of Testing? Identify the following types of testing: 4
 - i. Testing the limits of system e.g. maximum number of users, peak demands, extended operation.
 - ii. Test the various software and hardware configurations
 - iii. Exercise all input and output parameters of each component, all components and all calls (each component is called at least once and every component is called by all possible callers.)
 - iv. Conducted at sponsor's site (developer is not present) and software gets a realistic workout in target environment.

3. a) Which testing strategy will be appropriate for a four layer call hierarchy of any system? Explain with example. 4
b) Mention the types of interface and interface errors. 4
c) How many types of requirements can be identify for any developing system? Suppose your developing a result processing system for PMIT. Give example of different types of requirements. 4

4. a) Write a program code consisting at least 10 statements including loop or control statements. For any three test cases calculate different types of coverages. 4
b) Draw a state transition table for a scenario where a user tries to log in to another session while being logged into another session already. 3
c) When we use equivalence partitioning? 2
d) Draw a decision table for user login, where user can login if they provide correct username and password. 3

5. a) Identify the priority and severity of the following error: 4
 - i. The system crashes after you made the payment or when you are not able to add the items to the Cart,
 - ii. The logo of the company in the front-page is wrong.
 - iii. A new feature published in Facebook but it is not working properly or not very much liked by the users.
 - iv. In the email service provider like Yahoo or Gmail, after typing the correct Username and the password, instead of logging in, the system crashes or throws the error message.
 - v. In the email service provider like Yahoo or Gmail, when you are not allowed to add more than one recipient in the CC section.
 - vi. In web form you have three options like: "BACK", "NEXT" & "CANCEL". Among them when you press "BACK", you go back to previous page but your information are not found.
 - vii. Your product name and description have several spelling mistakes.
 - viii. For each online transaction 1% of payment amount is not added to the payment gateway vendor's account.

- b) Identify the terms or states of defects:
- A potential defect that has been identified but not validated.
 - Assigned to development team but not solved yet.
 - If the defect is repeated twice or the defect corresponds to the same concept of the bug
 - If the bug persists even after the developer has fixed the bug
 - The defect is assigned to development team and further investigation is going on.
 - The tester re-tests the bug after it got fixed by the developer.
 - If the developer feels the defect is not a genuine defect.
 - If the present bug is not of a prime priority and if it is expected to get fixed in the next release.
- c) From the following table calculate the function point, FP. If any team has productivity/month 5FPs and cost/month 50,000BDT, the estimate the time and cost of the project. 4

Information Domain Value	Count	Weighting factor
External Inputs (EIs)	50	3
External Outputs (EOs)	20	2
External Inquiries (EQs)	30	3
Internal Logical Files (ILFs)	35	7
External Interface Files (EIFs)	10	5

6. a) Draw the risk management process. How risk planning works? 4
- b) Identify the types of risk, probability and effect of the risks: 3
- i. Organizational financial problems force reductions in the project budget.
 - ii. Key staff are ill at critical times in the project.
 - iii. Changes to requirements that require major design rework are proposed.
 - iv. The time required to develop the software is underestimated.
 - v. The code generated by software code generation tools is inefficient.
- c) Show the quality review process. 2
- d) Identify the types of faults: 3
- i. Are all program variables initialized before their values are used?
 - ii. For each conditional statement, is the condition correct?
 - iii. Are compound statements correctly bracketed?
 - iv. Are all output variables assigned a value before they are output?
 - v. Do formal and actual parameter types match?
 - vi. Is space explicitly deallocated after it is no longer required?
7. a) Suppose you are developing a module which can find you the best deal for properties like plots, apartments etc. for buying and selling. Write a test scenario for this module. 4
- b) Draw the McCall's quality triangle. 3
- c) Write the expressions for the following terms: 5
- i. Defect removal effectiveness
 - ii. Availability
 - iii. Problems per User-Month
 - iv. Percent delinquent fixes
 - v. Defect Density



Institute of Information Technology

Jahangirnagar University
Professional Masters in IT

1st Trimester Final Examination, Fall 2019 [Intake: Fall 2019 & Summer 2019]

Duration: 3 Hours

Full Marks: 60

Course Code: PMIT - 6113

Course Title: Mobile Application Development

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.

- 1 (a) Define Mobile Platform and write some examples of good platform and some features of WAP. 4
(b) Make list of Android platform version, code name with their API level. 4
(c) What is for Android Manifest.xml? What information contain Manifest.xml and R.java files? 4
- 2 (a) What is a "bundle" and "gradle" in Android application? Differentiate between them. 3
(b) What are the different types of "Menu" used in Android? Write the meaning of the following: 3

Element	Description
<menu>	
<item>	
<group>	

- (c) Interpret the following android code line by line. 6

1. @Override

```
public boolean onCreateOptionsMenu(Menu menu) {  
    getMenuInflater().inflate(R.menu.options_menu, menu);  
    return true;
```

2. @Override

```
public void OnInit(int status) {  
    if (status == TextToSpeech.SUCCESS) {  
        int result = textToSpeech.setLanguage(Locale.US);  
        String text = speakText.getText().toString();  
        textToSpeech.speak(text,  
        TextToSpeech.QUEUE_FLUSH, null, null);  
    }  
}
```

3. android:interpolator="@android:anim/linear_interpolator">
 <alpha
 android:duration="2000"
 android:fromAlpha="1.0"
 android:toAlpha="0.1" >
 </alpha>

- 3 (a) How many types of Intent – explain with necessary codes and graph? 4
(b) What are the different components and actions that are useful to perform by Intent? 4
(c) Differentiate between Implicit Intent and Explicit Intent. 4
- 4 (a) What is Android Layout? Briefly describe different types of Layout with respective diagram. 4
(b) Make a comparison table among different types of layout. 4
(c) With example explain the following properties used in Layout: orientation, gravity, layout_weight, weightSum, alignParentRight 4
- 5 (a) Write the necessary XML and Java codes for designing a simple calculator. 4
(b) What is listener? Write down some common listener events in Android. 4
(c) What's the difference between class, method and activity in android? 4
- 6 (a) What is for Content Provider in Android and what are different steps to creating a Content Provider? Explain their functionality with diagram. 4
(b) What is for Fragment? Draw the Fragment life cycle method of Android. 4
(c) Define listener and handler with example. What is the difference between listener and handler? 4
- 7 (a) Draw and explain Activity Lifecycle of Android (use necessary code and diagram). 4
(b) Sketch the entire, visible and foreground lifetimes of android activity or fragment transition during execution. 4
(c) How many callback methods are in android? Explain their behavior at different stages in Android. 4



Institute of Information Technology

Jahangirnagar University
Professional Masters in IT

1st Trimester Final Examination, Fall 2019

Intake: Fall 2019 & Summer 2019

Duration: 3 Hours

Full Marks: 60

Course Code: PMIT-6217

Course Title: Wireless Network

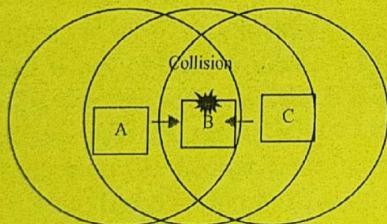
Do not write anything on the question paper.

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

Figures in the right margin indicate marks.

1. a) Mention Wireless Link Characteristics which indicate the important differences from wired link 3
b) "Three alternative transmission techniques are used for infrared data transmission". Mention those transmission techniques and Explain one of them
c) "To reduce the packet dropping probability or to enhance throughput of wireless LAN exponential binary backoff algorithm is widely used". Explain the algorithm 6

2. a) Explain Linear-Feedback Shift Register. Now draw a 4-bit Fibonacci LFSR with its state diagram. 5
b) Mention and explain the problem that causes collision at node B. 5



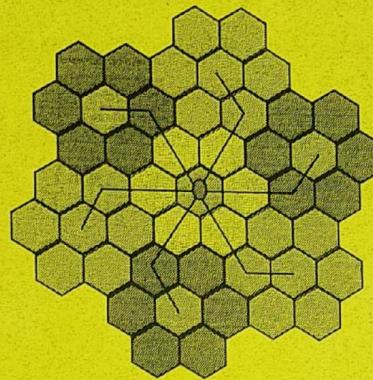
- c) "Sometimes software is not aware of mobility" Explain with example 2

3. a) Explain Gaussian frequency-shift keying 3
b) Explain DS Spectrum Spreading Technique with example. 4
c) A city has total population of 5,00,000. A network planar found the behavior of users of the city like: they generate 3 calls/hour with average holding time of 2 minutes. The service provider got the license of BW that can support 36 carriers of GSM. Determine number of sectors of 3/9 cell pattern maintaining GoS of 3%. 5

4. a) Considering a baseband OFDM transmission model where x_q is the received subcarrier and x_k represents the local oscillator. When integrating received power over one symbol period, T_U , the output of the correlators is zero for any combination, except when $k = q$. Now proof the following equation. 4

$$\sum_{q=0}^{N_c-1} \frac{\sigma_q}{T_U} \int_0^{T_U} e^{-j2\pi(q-k)\frac{1}{T_U}t} dt = \begin{cases} a_k, & k = q \\ 0, & k \neq q \end{cases}$$

- b) Let Shift Parameters are $i = 2, j = 1$ taking number of co-channel interference $j=6$, propagation constant $\gamma=4$. Calculate Carrier Interference C/I.
- c) An urban area has a population of two million residents. Two competing trunked mobile networks (A and B) provide cellular service in this area. System A has 394 cells with 19 channels each, system B has 98 cells with 60 channels each. Find the number of users that can be supported at 2% blocking. If each user averages two calls per hour at an average call duration of three minutes. Also compute the market penetration of each cellular provider.
5. a) What is Peak to Average Power Ratio (PAPR) 2
 b) Ad-hoc networks have several types of applications. Explain four of them. 4
 c) Explain Cluster-Head Gateway Switch Routing Protocol 6
6. a) Draw and describe three main component of Sensor Node Structure 4
 b) Show the steps of DEEP Clustering Algorithm 4
 c) Calculate Reuse Distance from the given cellular network using Pythagoras formula. 4



7. a) Draw GSM Architecture. 2
 b) Describe the steps of relevant call flows in case of authentication. 2
 c) A certain city has an area of 1400 square miles and is covered by a cellular system using a seven cell reuse pattern. Each cell has a radius of 3 miles and the city is allocated 30 MHz of spectrum with a full duplex channel bandwidth of 60 KHz. Assume a GOS of 2% for an Erlang B system is specified. If the offered traffic per user is 0.03 Erlangs, compute (i) the number of cells in the service area, (ii) the number of channels per cells, (iii) Traffic intensity of each cell, (iv) the maximum carried traffic 8



Institute of Information Technology

Jahangirnagar University
Professional Masters in IT

1st Trimester Final Examination, Fall 2019

Intake: Fall 2019 & Summer 2019

Duration: 3 Hours

Full Marks: 60

Course Code: PMIT-6307

Course Title: Data Mining & 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.

1. a) Define Data Mining? What are limitations of data mining? Write the differences between association rule discovery and sequential pattern discovery? 4
b) What are the difference between classification and clustering in data mining? 4
c) Why do we use test data in mining? 4

2. a) Define the terms: Why do we reduce dimensionality before applying mining techniques? 4
b) What are the factors which affect data purity? Write the actions that you can take to impure your data? 4
c) What do you mean by OLAP? Write the application of slicing and dicing? 4

3. a) Why and when do we use Gini coefficient or entropy? Write the Hunt's algorithm for decision tree. 4
b) Suppose you have two variables (A and B) to select one in constructing a tree. Under variable A distribution of class variable are 5 Cheat and 15 No Cheat in one hand and in other hand it is 3, 10, whereas under variable B it is 4, 6 in one hand and 12, 8 in other hand respectively. Which variable you should select? Use Gini coefficient or entropy to give your answer. 4
c) If an attribute, like marital status (married, single and divorce), has three different values and you have to construct binary tree what will you have to do? 4

4. a) What do you mean by similarity and dissimilarity? Write on Euclidean distance and jaccard coefficient. 4
b) What is ROC curve? What are the use of ROC curve? 4
c) Consider a 2-class problem (cancer yes, cancer no) where actual number of yes was 6990 and number of no was 3010. Using the diagnostic machine it was found number of yes 5710 and number of no was 4290. Is this machine efficient and reliable? Calculate different parameters of validation and comment on the results. 4

5. a) What are the steps of KNN classification? 4
b) Give an example of the application of clustering? 4
c) What are the advantages of SVM classification? 4

6. a) What do you mean by clustering? What are the different types of clusters? 4
b) Write the steps of K-means clustering in your own words sequentially. 4
c) Write two limitations of k-means clustering. How can we minimize these limitations? 4

7. a) What do you mean by centroid in k-means clustering 4
b) How do we estimate epsilon (EPS) and minimum points (MinPoints) in Density Based Clustering? 4
c) In hierarchical clustering we have to calculate distance between two clusters, how do we calculate this distance? 4



Institute of Information Technology

Jahangirnagar University
Professional Masters in IT

1st Trimester Special Final Examination, Summer 2018

Duration: 3 Hours

Course Code: PMIT - 6111

Full Marks: 60

Course Title: Software Testing & Quality Assurance

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.

1. a) Write the agile manifesto. Why agile methods was proposed? 4
- b) Write the activities of Test-driven Development. Write its benefits. 4
- c) How testing is done in agile environment? 4
2. a) Draw the unit testing environment. 3
- b) A web application has several functional components. To test the functionalities which tests are conducted from developers' and users' end? 5
- c) What are the stages of Testing? What is smoke testing? 4
3. a) Show the model of testing process. Why programmers' test is not enough for their code? 4
- b) A system decomposition diagram is given in fig.1. Apply an appropriate testing strategy for the system. Justify your opinion. 4

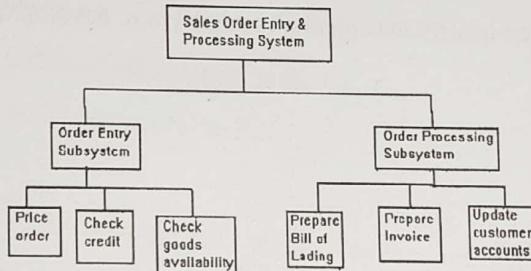


Fig. 1

- c) Show the acceptance testing process? Write its importance. 4
4. a) Give example of different types of defects and priority of defects for any web based system. 4
- b) Fill in the blanks:
 - i. When expected result of test mismatched with actual result of the application, this mismatch is called _____.
 - ii. Defect _____ signifies how important it is to fix this defect.
 - iii. A _____ is a special type of bar chart to show the defect type with the highest frequency of occurrence of defects.
 - iv. _____ involve a set of steps, conditions, and inputs that can be used while performing testing tasks.
 - v. The _____ is a measure of estimating the software testing size and effort.
- c) Show the defect life cycle. 3

5. a) Suppose you need to give unique ID no consisting 7 digits for all your employees. Again age 5 range of your employees are from 23 to 55. Find test cases using an appropriate technique. 5
b) Show the definitions and uses for the program below. 3

```
1. read (a, b);
2. sum = a + b;
3. if (a >= b)
4.     then sub = a - b;
        div = a / b;
5. else
6.     sub = b - a;
        div = b / a;
7. mul = a * b;
8. print (sum, sub, mul, div);
```

- c) How many coverage can we calculate from testing? Write the factors for choosing a testing 4 technique. 4
6. a) Explain quality assurance, quality control and testing concepts. 4
b) Write the SQA goals and attributes. 5
c) How can you develop quality standards for your organization? 3
7. a) When we need to apply experienced based techniques? Draw a decision table from the following story: 5
"A customer requests a cash withdrawal. One of the business rules for the ATM is that the ATM machine pays out the amount if the customer has sufficient funds in their account or if the customer has the credit granted."
b) Write the advantages of team work? Why integration is daily practice in agile methods? 4
c) Show the relation between quality management and software development. 3



Institute of Information Technology
Jahangirnagar University
Professional Masters in IT

Semester: First Semester (Special Exam November 2018)

Final Examination
Duration: 3 Hours
Course Code: PMIT - 6217

Full Marks: 60

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.

1. a) Draw and describe the basic structure of a Mobile Cellular Network 5
b) Explain Unlicensed Narrowband RF 7
2. a) Explain the major Problems with Wireless network. 6
b) Explain Directional Antennas 6
3. a) What is Frequency hopping? Why it is so useful? 3
b) "Avoid data frame collisions completely using small reservation packets!" Explain the statement. 4
c) Explain Infrastructure of Sensor Networks 4
4. a) Draw the Flow Chart of CSMA/CD-Algorithm 5
b) Explain the mechanism of Hard Handover. 8
5. a) What is Peak to Average Power Ratio (PAPR) and Cyclic Prefix 4
b) Draw and describe a baseband OFDM transmission model 8
6. a) Handoff may be done based on two cases:
Case 1: mobile station sends the collected information to the BS
Case 2: mobile station itself selects the most suitable BS.
Explain these two cases.
b) If a signal to interference ratio of 15 dB is required for satisfactory forward channel performance of a cellular system, What is frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is $\gamma=3$? Assume that there are six co-channel cells in the first tier and all of them are at the same distance from the mobile. 4
- a) Distinguish between Fixed Channel Allocation and Channel Borrowing Scheme 6
b) An urban area has a population of two million residents. Two computing trunked mobile networks (A and B) provide cellular service in this area. System A has 394 cells with 19 channels each, system B has 98 cells with 57 channels each. Find the number of users that can be supported at 2% blocking. If each user averages two calls per hour at an average call duration of three minutes. 6



Professional Masters in Information Technology (PMIT)
Institute of Information Technology
Jahangirnagar University

PMIT Final Examination (Fall: 2018)

Course Code: IT-6113
Marks: 60

Course Title: Mobile Application Development
Time: 3 Hours

Answer any **FIVE** questions

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

- | | | |
|------|---|---|
| 1(a) | What is Android ? Write some features of Android. | 4 |
| (b) | What are the different attributes/properties in Android? | 4 |
| (c) | Draw the Android architecture and write the main component used in an Android application? | 4 |
| 2(a) | Explain step by step how to send the data from one Activity to Another Activity in Android applications. | 5 |
| (b) | Define listener and handler with example. What is the difference between listener and handler? | 5 |
| (c) | Write about an Android Emulator or AVD with its features and limitations. | 2 |
| 3(a) | Explain Eclipse IDE and Android Development Tools (ADT) Plug-in with their purpose in Android. | 5 |
| (b) | What's the difference between class, method and activity in android? | 3 |
| (c) | Make list of Android platform version, code name with their API level. | 4 |
| 4(a) | What are the seven lifecycle methods of Android activity and what is their purpose? Explain with necessary code and diagram. | 7 |
| (b) | What is an Intent in Android? How many steps are in MainActivity to reach super Activity? | 3 |
| (c) | With example, show how to use putExtra() and getExtra() for string data. | 2 |
| 5(a) | Explain ListView with example. | 5 |
| (b) | Define the Fragment. Draw the Fragment life cycle method of Android. | 5 |
| (c) | Define Dalvik Virtual Machine (DVM). | 2 |
| 6(a) | Briefly explain different types of Adapter in Android. | 4 |
| (b) | What is SQLite? How does it differ from client-server database management systems? | 4 |
| (c) | Differentiate between the following terms (any four):
i. Intent and Service
ii. Adapter and Receiver
iii. Snackbar and Toasts
iv. Widget and OpenGL
v. Fill_parent and Wrap_content
vi. LinearLayout and RelativeLayout | 4 |

7(a) What is Toast in Android? Explain the following code(s):

- i.

```
Toast toast= Toast.makeText(MainActivity.this, "Jahangirnagar University",
    Toast.LENGTH_SHORT);
    toast.setGravity(Gravity.CENTER,0,0);
    toast.show();
```
- ii.

```
videoView= (VideoView) findViewById(R.id.videoViewId);
Uri uri=
Uri.parse("android.resource://" + getPackageName() + "/" + R.raw.new_house);
videoView.setVideoURI(uri);
videoView.start();
```

(b) Describe the following folders and files of Android.

- Widgets
 - TextView
 - Button
 - ToggleButton
 - CheckBox
 - RadioButton
 - CheckedTextView
- Custom - AppCompat
 - CardView
 - GridLayout
 - RecyclerView
 - Toolbar

(c) Answer the following:

- i. Graphically explain Margin and Padding Attributes.
- ii. What are the different View and ViewGroup in Android?



Institute of Information Technology
Jahangirnagar University
Professional Masters in IT

1st Semester Final Examination

Duration: 3 hours

Course Code: IT-6307

Semester: Fall & Summer 2018

Full Marks: 60

Course Title: Data Mining & 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.

1. a) What is Data Mining? Why is data mining important in our daily life? 4
b) What do you mean by supervised and unsupervised classification? 4
c) Why do we divide data in two parts before data mining starts? 4

2. a) Why do we apply aggregation on data? 4
b) If you have missing data and noise exist in your data then what are the steps you should take? 4
c) What are the advantages of tree based classification? 4

3. a) When do we need to use discretization and binarization? Explain with an example. 4
b) How do you validate a classification model? What are the functions of ROC curve in validation? 4
c) In a validation process, among 120 test data 40 data were classified as "Cheat=Yes" where among these 22 are actually "Cheat=Yes". Actual cases of "Cheat=No" is 58. Calculate different parameters related with validation and comment on the results. 4

4. a) Why and when do we use Gini coefficient or entropy? 4
b) Suppose you have two variables (Gender and Refund) to select any one of them in constructing a tree. Under variable Gender, distribution of class variable are Cheat =5 and No Cheat =10 in one hand and in other hand it is 3, 12 whereas under variable Refund it is 3, 7 in one hand and 6 , 8 in other hand respectively. Which variable you should select? (Use Gini coefficient or entropy to give your answer.) 4
c) Explain, how do you discretize a numeric attribute? i.e. Income 4

5. a) If you have a data set with class attribute and a new data without class attribute. You want to predict the value of class attribute of new data. Write the process of classifying this new data using decision tree classification (Hunt's Algorithm). 4
b) How do you perform KNN? Write the limitations of KNN. 4
c) How ANN classifier works? 4

6. a) What is ensemble method of classification? Explain with pictorial example. 4
b) What are the different methods of calculating similarity and dissimilarity? 4
c) Why and when do researchers like to use SVM classifier? 4

7. a) What do you mean by centroid in k-means clustering 4
b) How do you calculate distance between two clusters? 4
c) Write two limitations of k-means clustering. How can we minimize these limitations? 4