



**Institute of Information Technology**  
Jahangirnagar University  
Professional Masters in IT

1<sup>st</sup> Trimester Final Examination, Summer 2022

Intake: Spring & Summer, 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) How Scrum works? What is the main drawback of Scrum? 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: 3  
i. Security testing  
ii. Recovery testing  
iii. Human factor testing
- 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:
- Functional Requirements
  - Product requirement
  - Organizational requirement
  - External requirement
- b) Consider the following pseudocode, find the coverage for three testcases. 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: 2
- High priority and low severity
  - 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 terms: (You can assume other parameters with respect to the total defect 500) 2×4=8
- Defect Density per FPs
  - Defect removal effectiveness (DRE)
  - Backlog management index (BMI)
  - 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

Course Title: Mobile Application Development

Marks: 60

Time: 3 Hours

Answer any FIVE questions

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

- 1 (a) 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: 4  
    i. TextView and ScrollView, ii. Margin and Padding Attributes.  
(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: 4  
    i. android:textColor="#bd82ac"  
    ii. android:textSize="40sp"  
    iii. android:layout\_width="match\_parent"  
    iv. android:layout\_width="wrap\_content"
- 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

1<sup>st</sup> 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: 4
  - Area of a cell =  $9 \text{ km}^2$
  - Total coverage area =  $4500 \text{ km}^2$
  - 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  $B_w = 12.5 \text{ MHz}$ , information bit rate  $R = 16.2 \text{ kbps}$ , 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



- b) The access method of MAC protocol of IEEE 802.11 based on exponential binary backoff algorithm. Explain the algorithm. 4
- 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 slop 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  $BW=2R_b/3$ , 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? 4
- 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. 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
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  $60^\circ$  beam then what is the impact on Co-channel interference?
- b) A city has total population of 45,00,000. A network planar 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 and 2nd 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