Institute of Information Technology

Jahangirnagar University

Professional Masters in IT

1st Trimester Final Examination, Spring 2022 **Intake: Fall 2021 & Spring 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)** 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

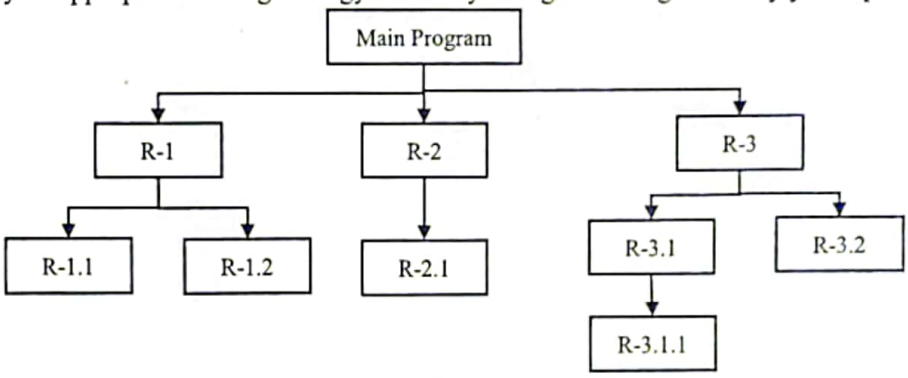


Fig. 1

   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". 4

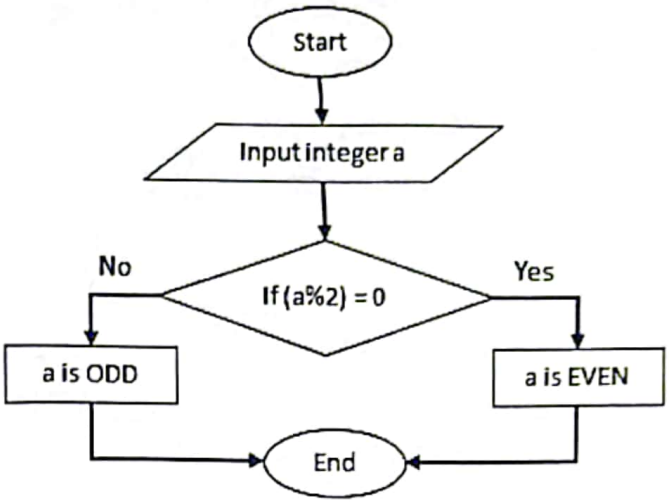


Fig. 2

b) Draw a decision table on the following condition. 3
"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. 3

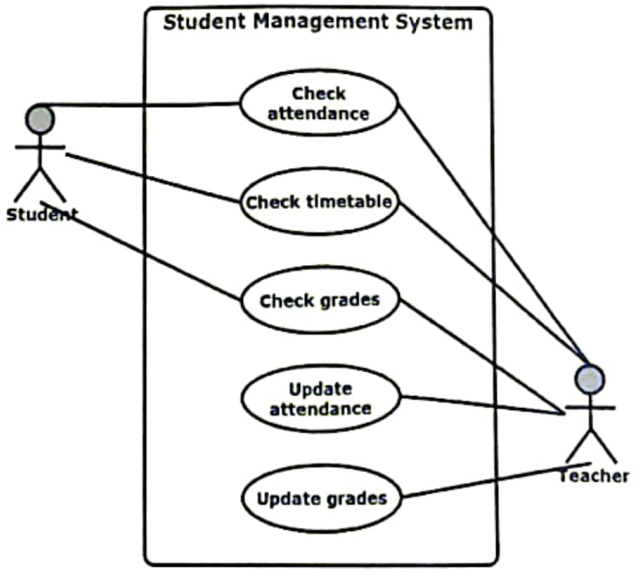


Fig. 3

d) what is fault attack or error guessing testing? 2

5. a) Identify the severity and priority of the following defect: 2

a. You cannot add items in shopping cart of an online shopping site.
b. An application or web page crashes when a remote link is clicked
c. In a student information system, new student cannot be added.
d. 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 respones time = 144. 6

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 an Android application.	**4**
	(c)	i. What is for screen orientation in Android? ii. Differentiate between: TextView and ScrollView	**4**
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.	**5**
	(c)	What are the available animations used in Android?	**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 – 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 km^2
   - Total coverage area =4000km^2
   - 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 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. 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? 6

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?

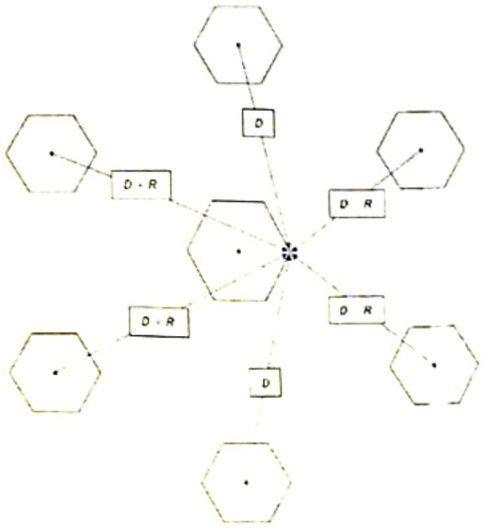
If the Baud is 10000 symbols/s, what is bit rate (Rb) for 8-QAM and 16-QAM?

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 60^0 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 4

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 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