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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SECOND SEMESTER MCA (Second Year Direct) &

FOURTH SEMESTER MCA (Regular) DEGREE EXAMINATION, APRIL 2018

Course Code: RLMCA 202

Course Name: APPLICATION DEVELOPMENT AND MAINTENANACE

Max. Marks: 60 Duration: 3 Hours

PART A

Answer All Questions. Each question carries 3 marks.

1. Specify the commands for configuration of GIT. How we can clone a repository?
2. Define types of testing based on Brian Marick.
3. Define git blame.
4. Explain any two build tools.
5. Define performance, throughput and capacity.
6. How we can create a release strategy?
7. Who is a pragmatic programmer and define his characteristics?
8. Discuss coupling and law of Demeter.

PART B

Answer any one question from each module. Each question carries 6 marks.

MODULE I

9. Define continuous Integration. Explain the essential practices required for continuous Integration.

OR

10. Explain version control and steps for effective use of version control.

MODULE II

11. Explain how we can work with GIT.

OR

12. Explain how can we organize our repository with branches and tags.

MODULE III

13. Explain Deployment pipeline with figure.

OR

14. Explain Commit Stage.

MODULE IV

15. How we can create and maintain effective automated acceptance test?

OR

16. Write short notes on

- Canary Releasing.
- Zero Downtime Release.
- Blue Green Deployment.

MODULE V

17. Explain any four basic tools of pragmatic programmer.

OR

18. Discuss on evils of duplication.

MODULE VI

19. Explain Software testing methods.

OR

20. Write short notes on

a. Meta programming.

b. Refactoring.

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SECOND SEMESTER (Second Year Direct) &

FOURTH SEMESTER (Regular) MCA DEGREE EXAMINATION, APRIL 2018

Course Code: RLMCA 204

Course Name: BIG DATA TECHNOLOGIES

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions. Each question carries 3 marks

1. What do the four V's denote? Discuss.
2. How distributed file systems helps Big Data storage?
3. On what concept the Hadoop framework works?
4. What are the main components of a Hadoop Application?
5. Summarize the uses of Map Reduce.
6. How in memory data grid helps in Big Data?
7. Discuss about RDBMS.
8. Compare and contrast correlation and regression.

PART B

Answer any one from each question. Each question carries 6 marks

9. a. How analytical approaches work in Big Data?

   OR

   b. Classify the types of data.

10. a. Differentiate between Sharding and replication.

    OR

    b. Contrast CAP, BASE and ACID theorem.

11. a. Write a short note on HBase.

    OR

    b. Exemplify Hadoop Ecosystem.

12. a. Explore the techniques that optimize the working of MapReduce.

    OR

    b. Execute the working of MapReduce Algorithm.

13. a. Interpret the NoSQL databases.

    OR

    b. Specify the cases where in memory storage devices are appropriate.

14. a. Recognize the types of semantic analysis.

    OR

    b. Classify the statistical analysis methods.

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SECOND SEMESTER (Second Year Direct) &

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Course Code: RLMCA206

Course Name: MOBILE COMPUTING

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1	List the three main components of a typical WLAN.	(3)
2	Why it is said that mobile computing subsumes wireless networking?	(3)
3	Compare any three important features of 3G and 4G.	(3)
4	List any three user interactive features supported by iOS.	(3)
5	What are the important features of Windows mobile OS?	(3)
6	What are the issues that arise when considering mobile devices as web clients?	(3)
7	Explain the importance of ADT and AVD while developing an application in Android	(3)
8	What are Services in Android? Explain its importance in Android.	(3)

PART B

Answer six questions, one full question from each module and carries 6 marks.

Module 1

9	Explain the architecture of Mobile Telecommunication System with figure.	(6)

OR

10	Explain the various functions of components of a Wireless Communication System.	(6)

Module 1I

11	Explain the characteristics of mobile computing applications.	(6)

OR

12	Explain GPRS architecture with figure and also its services.	(6)

Module 1II

13	Explain the structure of traditional OS and its two types of design with figures.	(6)

OR

14	Explain the responsibilities and services to be carried out by a mobile OS.	(6)

Module 1V

15 Explain Android Software Components and Stack Structure in Android Software development Kit. (6)

OR

16 Explain Wireless Access protocol and Protocol Stack with diagrams. (6)

Module V

17 Explain Dalvik Virtual Machine with diagrams. Differentiate it with Java Virtual Machine (6)

OR

18 Explain Eclipse and DDMS in Android Development Environment (6)

Module VI

19 Explain Android User Interfaces with Views using Examples (6)

OR

20 Explain ViewGroups and Layouts In Android with examples (6)

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SECON SEMESTER (Second Year Direct) &

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Course Code: RLMCA208

Course Name: INTRODUCTION TO MACHINE LEARNING

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

		Marks
1	What is the purpose of Ordinary Least Square Estimation?	(3)
2	Give a sample scenario where decision tree can be used for classifying data?	(3)
3	Explain the structure of a single artificial neuron with a diagram.	(3)
4	What is deep learning?	(3)
5	Give one method to choose a maximum margin hyperplane for SVM classifiers?	(3)
6	What is a Support Vector?	(3)
7	What are the advantages of K-fold cross validation?	(3)
8	How Boosting process improves model performance?	(3)

PART B

Each question carries 6 marks.

9 a) Explain PCA and its steps in detail. (6)

OR

b) Describe any 6 different measurements of central tendency & spread with relevant examples? (6)

10 a) We have data from survey and objective testing with two attributes (acid durability and strength) to classify whether a special tissue is good or not. Here is four training samples. (6)

X1(Acid Durability)	X2(Strength)	Y(Class)
7	7	BAD
7	4	BAD
3	4	GOOD
1	4	GOOD

Now the factory produces a new tissue paper that pass the test with x value

3 and Y value 5. Find the classification of this new paper from the data of trained samples using KNN algorithm.

OR (6)

b) Write a note on Bayes theorem and illustrate the method for predicting probabilities with an example. (6)

11 a) Differentiate Simple Linear Regression & Multiple linear regression with an example. (6)

OR

b) Explain the divide and conquer approach for the construction of decision trees with an example. (6)

12 a) Explain any 3 characteristics of neural networks? (6)

OR

b) How does a Perceptron learn the appropriate weights using delta rule? (6)

13 a) How SVM handles non- linearly separable data. (6)

OR

b) How Classification using hyper planes is possible? What is Maximum Margin Hyperplane? (6)

14 a) How will you evaluate the performance of a model using confusion matrices? Justify answer using the statistics - Accuracy, Precision and Recall. (6)

OR

b) How ensembles learning improve model performance? Explain any two ensemble based methods. (6)

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SECOND SEMESTER (Second Year Direct) &

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Course Code: RLMCA262

Course Name: FUNCTIONAL PROGRAMMING

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1		Explain Tail Recursion and Recursion Trees.	(3)
2		How can we use Functions as a value? Explain with suitable example.	(3)
3		What are Inverse Functions? Explain with suitable examples.	(3)
4		What do you mean by Lazy Evaluation?	(3)
5		What is an Enumerated Data Type? What are its uses?	(3)
6		What are Type Classes? Explain the usage of any three type classes.	(3)
7		Does Haskell provide any structure in which you can accommodate different values belonging to different types? If so, name and explain how to use it.	(3)
8		Write the lists generated by the following Haskell list comprehensions. i) [x*3 | x < - [1..10]] ii) [y | x< - [1..5],y<-[1..x]] iii) [x | x< - ['a','c'..'t']]	(3)

PART B

Each question carries 6 marks.

9	a)		What are the different data structures commonly used in computer programming? (Explain any 3 data structures)	(6)
			OR	
	b)		What are the various data types used commonly in programming languages? (Explain any 4 types with examples)	(6)
10	a)		Explain Functional Composition and the usage of Auxiliary Functions.	(6)
			OR	
	b)	i)	Explain Pattern Matching in Function definitions with suitable examples.	(3)
		ii)	Explain the use of Strict Functions and Non-strict Functions	(3)
11	a)		Explain any 4 operations defined over a List with examples.	(6)

OR

	b)		Explain recursion over Lists.	(6)
12	a)		Explain the use of MAP function and FILTER function on Lists.	(6)
			OR	
	b)		Explain recursion over Natural Numbers	(6)
13	a)		What are Abstract Data types? Explain using one example.	(6)
			OR	
	b)		What operations are defined on a Binary Search Tree? Explain the operations using the definition of the functions.	(6)
14	a)		How would you implement a Queue Data Structure using Haskell? (You need to insert and delete values in the data structure).	(6)
			OR	
	b)	i.	Write the Haskell code using Pattern Matching to find the factorial of a number.	(3)
		ii.	Write the Haskell code to find the sum of even numbers from a list.	(3)

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SECOND SEMESTER (Second Year Direct) &

FOURTH SEMESTER MCA (Regular) DEGREE EXAMINATION, APRIL 2018

Course Code: RLMCA266

Course Name: ADVANCED DATABASE SYSTEMS

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1		Diagrammatically represent the basic steps in query processing.	(3)
2		Give an example for query execution plan with an annotation plan.	(3)
3		What are Accessors? Give an example.	(3)
4		Explain the different types of classes.	(3)
5		Illustrate the different types of Distributed Databases.	(3)
6		List out the disadvantages of distributed databases.	(3)
7		State the role of gossip protocol.	(3)
8		Comment on RegionServer.	(3)

PART B

Each question carries 6 marks.

9	a)	Explain how the physical storage media are classified.	(6)
		OR	
	b)	List out the duties of Buffer Manager. Compare LRU strategy with MRU strategy.	(6)
10	a)	Differentiate between dense and sparse indices.	(6)
		OR	
	b)	Write down the algorithm for finding a search key value in a B^+ tree.	(6)
11	a)	Describe Selection operation A1,A2,A3	(6)
		OR	
	b)	Design external sort merge algorithm. Use sufficient example.	(6)
12	a)	Compare “is a” and “whole part” relationships.	(6)
		OR	
	b)	Explain OMT Notations.	(6)
13	a)	Design the steps of Two Phase Commit Protocol (2PC)	(6)
		OR	
	b)	Differentiate between local transaction and global transaction.	(6)
14	a)	Differentiate between range based partitioning and hash based sharding.	(6)
		OR	
	b)	Give an illustration of data locality in Hbase.	(6)

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SECOND SEMESTER (Second Year Direct) &

FOURTH SEMESTER (Regular) MCA DEGREE EXAMINATION, APRIL 2018

Course Code: RLMCA 268

Course Name: COMPUTATIONAL SCIENCES

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1 Find a root of the equation $3x - cosx - 1 = 0$ that lies between 0 and 1 using bisection method correct to two decimal places. (3)

2 Find a positive root of the equation $2x - log_{10}x - 7 = 0$in two iterations using fixed point iteration method. (3)

3 Solve the following system of equations using Gauss elimination method (3)

$$x_1 + x_2 + 5x_3 = -1$$

$$2x_1 + 4x_2 = 12$$

$$5x_1 - x_2 + x_3 = 10$$

4 Write Newton's forward interpolation formula and backward interpolation formula. (3)

5 Use Newton's divided difference formula to find$f(4)$ from the given data: (3)

x:	0	1	3	5
$f(x)$:	8	11	35	123

6 Solve the following LPP graphically (3)

$$Minimize\ Z = 20x + 10y$$

subject to, $x + 2y \leq 40;\ 3x + y \geq 30;\ 4x + 3y \geq 60;\ x, y \geq 0$

7 Obtain the initial basic feasible solution to the following transportation problem by North West Corner Rule. (3)

Origin/ Destination	***D1***	***D2***	***D3***	***Supply***
O1	*2*	*7*	*4*	*5*
O2	*3*	*3*	*1*	*8*
O3	*5*	*4*	*7*	*7*
O4	*1*	*6*	*2*	*14*
Demand	*7*	*9*	*18*	*34*

8 Write any three rules of Network construction. (3)

PART B

Each question carries 6 marks.

9 a) Using Newton-Raphson method obtains an iterative formula to find the square root of a positive integer N and hence compute $\sqrt{24}$ approximately. (6)

OR

b) Find a real root of the equation $x^3 - 5x - 7 = 0$ using Regula-Falsi method in four iterations. (6)

10 a) Using Jacobi's iteration method solve the given system of equations taking initial solution as $x = 0, y = 0, z = 0$ (6)

$$30x - 2y + 3z = 75$$

$$x + 17y - 2z = 48$$

$$x + y + 9z = 15$$

OR

b) Solve the following system of equations by Gauss-Jordan method (6)

$$x_1 + 10x_2 + x_3 = 20.08$$

$$10x_1 + x_2 - x_3 = 11.19$$

$$-x_1 + x_2 + 10x_3 = 35.61$$

11 a) Using Newton's forward difference interpolation formula to find the polynomial of degree 3 which fits the following data: (6)

x:	0	2	4	6
y:	1	15	85	259

Hence find the value of y when $x = 1$.

OR

b) Apply Gauss's backward interpolation formula to obtain $sin45^o$, given in the following table (6)

x^o :	20	30	40	50	60	70
$y = sinx^o$:	0.3420	0.5020	0.6428	0.7660	0.8660	0.9397

12 a) Solve the given LPP using simplex method (6)

Maximize $Z = 3x_1 + 2x_2 + 5x_3$

Subject to, $x_1 + 2x_2 + x_3 \leq 430$

$$3x_1 + 2x_3 \leq 260$$

$$x_1 + 4x_2 \leq 420$$

$$x_1, x_2, x_3 \geq 0.$$

OR

b) Use two phase simplex method to solve (6)

$$\text{Maximize } Z = 5x_1 - 4x_2 + 3x_3$$

$$\text{Subject to, } 2x_1 + x_2 - 6x_3 = 20$$

$$6x_1 + 5x_2 + 10x_3 \leq 76$$

$$8x_1 - 3x_2 + 6x_3 \leq 50$$

$$x_1, x_2, x_3 \geq 0.$$

13 a) Solve the following transportation problem starting with the initial solution obtained by Vogel's approximation method (6)

Origin/ Destination	***D1***	***D2***	***D3***	***D4***	***Supply***
O1	*2*	*2*	*2*	*1*	*3*
O2	*10*	*8*	*5*	*4*	*7*
O3	*7*	*6*	*6*	*8*	*5*
Demand	*4*	*3*	*4*	*4*	*15*

OR

b) A company has four mechanics to do five jobs for the day. The expected profit for each mechanic on each job is as follows. (6)

Job

	A	*B*	*C*	*D*	*E*
Mechanic 1	62	78	50111	82
2	71	84	6173	59
3	87	92	11171	81
4	48	64	8777	80

Find the optimum assignment of mechanics to the jobs that will result in maximum profit.

14 a) A small maintenance project consists of the following jobs, whose precedence relationships are given below (6)

Job	1-2	1-3	2-3	2-5	3-4	3-6	4-5	4-6	5-6	6-7
Duration (days)	15	15	3	5	8	12	1	14	3	14

1. Draw an arrow diagram representing the project.
2. Find the total float for each activity.
3. Find the critical path and the total project duration.

OR

b) The following table shows the jobs of a network along with their time estimates. (6)

Job	1-2	1-6	2-3	2-4	3-5	4-5	6-7	5-8	7-8
a (days)	1	2	2	2	7	5	5	3	8
m (days)	7	5	14	5	10	5	8	3	17
b (days)	13	14	26	8	19	17	29	9	32

Draw the project network and find the expected project duration and the critical path.

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SECOND SEMESTER (Second Year Direct) &

FOURTH SEMESTER MCA (Regular) DEGREE EXAMINATION, APRIL 2018

Course Code: RLMCA272

Course Name: ADVANCED JAVA PROGRAMMING

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

1		Explain any three Collection API improvements in java 8?	(3)
2		What is JVM JavaScript Engine? Give an example.	(3)
3		Explain a solution to session tracking in Servlets?	(3)
4		How do you remove dependencies from a java program? Explain with an example.	(3)
5		What is Spring Boot? List out and define the features of Spring Boot?	(3)
6		Explain Strengths of java's Servlet technology.	(3)
7		What is Spring security? List out its advantages.	(3)
8		Explain point-to-point messaging model and publish subscribe messaging model?	(3)

PART B

Each question carries 6 marks.

9	a)	With a neat diagram, explain Core collection interfaces and its hierarchy.	(6)
		OR	
	b)	Explain JVM architecture with a neat diagram.	(6)
10	a)	Define bound and constrained properties of beans.	(6)
		OR	
	b)	Explain the process of analyzing a Bean to determine its capabilities.	(6)
11	a)	What is Lambda Expression? With an example, explain the advantages of using Lambda Expressions.	(6)
		OR	
	b)	Write a program to read local date and time and manipulate local date values in absolute way.	(6)
12	a)	Explain Servlets life cycle with a diagram.	(6)
		OR	
	b)	Define GenericServlet and HttpServlet	(6)

13	a)	Explain life of a bean in spring container	(6)
		OR	
	b)	Explain unit testing in Spring Framework	(6)
14	a)	How a request makes its way from the client through the components in Spring MVC? Explain with diagram.	(6)
		OR	
	b)	Explain how data can be accessed with Spring Boot? Give an example.	(6)

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SECOND SEMESTER (Second Year Direct) &

FOURTH SEMESTER (Regular) MCA DEGREE EXAMINATION, APRIL 2018

Course Code: RLMCA 274

Course Name: BUSINESS INTELLIGENCE AND ITS APPLICATIONS

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1		Compare Holsapple and Whinston's classification with AIS SIGDSS classification.	(3)
2		What are the components of Decision Support Systems?	(3)
3		Define how the decision making is performed under assumed certainty, risk and uncertainty.	(3)
4		Compare and contrast decision table and decision tree.	(3)
5		What are the roles of summation and transformation function in network information processing?	(3)
6		Mention the significance of natural language processing in text mining.	(3)
7		What is meant by real time data warehousing? How it is different from traditional data warehousing?	(3)
8		Identify the similarities and differences between Inman and Kimball data warehouse development approaches.	(3)

PART B

Each question carries 6 marks.

9	a)	List the nine major categories of Decision support tools	(6)
		OR	
	b)	Define BI. Describe the architecture of BI with diagram	(6)
10	a)	What are the different types of models? Mention the benefits of model.	(6)
		OR	
	b)	Compare the normative and descriptive models in decision making.	(6)
11	a)	Briefly explain the characteristics and capabilities of DSS.	(6)
		OR	
	b)	Explain the major functions of Model Base Management System.	(6)
12	a)	Describe the major issues in modelling.	(6)

OR

	b)	Briefly explain at least three of the major data mining methods?	(6)
13	a)	Briefly explain the network structure of Artificial Neural Networks.	(6)

OR

	b)	Describe the three step process of text mining.	(6)
14	a)	Briefly explain about three tier Data Warehouse Architecture with diagram. Why it has been chosen as the most commonly used architecture?	(6)

OR

	b)	Define OLAP and its operations. Compare and contrast OLAP and OLTP	(6)

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