Total No. of Printed Pages:1

SUBJECT CODE NO:- K-21
FACULTY OF ENGINEERING AND TECHNOLOGY
Second Year MCA Examination Oct/Nov 2016
Design & Analysis of Algorithm
(Old)

[Time:Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B i) Q.No.4 and Q.No.8 are compulsory.
ii) Solve any two questions from each section from remaining.

SECTION A

Q.1	a)	Apply d & c method to find max & min element from the following. 22,13,-8,9,60,17,47,31,21,78	08
	b)	Write an algorithm to perform non recursive binary search algorithm.	08
Q.2	a)	Define Queue. Write an algorithm to perform insert, delete and display operations.	08
	b)	Explain various asymptotic notations with suitable example.	08
Q.3	a)	Write an algorithm to perform quick sort. Discuss its complexity.	08
	b)	What is d & c? Explain various algorithm specifications.	08
Q.4	Explain the following terms with example		08
	a)	Linear Probing	
	b)	Step table	

SECTION B

Q.5	a)	Write an algorithm to perform Min cost spanning tree using kruskal's method.	08
	b)	Explain job sequencing with deadlines problem with suitable example.	08
Q.6	a)	Write an algorithm to perform BFS of a graph.	08
	b)	Explain 4-queen's problem using backtracking method with suitable example.	08
Q.7	a)	Write an algorithm to perform string editing problem.	08
	b)	Explain longest common subsequence problem with suitable example.	08
Q.8	Explain the following terms with example		08
	a)	Hamiltonian cycle	
	b)	DFS	

SUBJECT CODE NO:- K-50

FACULTY OF ENGINEERING AND TECHNOLOGY

Second Year MCA Examination Oct/Nov 2016

Cryptography

(Old)

[Time:Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
I. Q.No.1 and Q.No.5 are compulsory.
II. Solve any two from the remaining question form each section.
III. Use of non-programmable calculator is allowed.
IV. Assume suitable data, if necessary.

Section A

Q.1 Solve the following. 08
a) Check whether -532 Ξ1783 (mod 32) is congruent or not?
b) Use Euclidean algorithm to find gcd(198,396)
c) Use Euler criterion to check whether "a" is quadratic residue to 'modul op' where a=5 and p=13.
d) Find the modulo multiplicative inverse of "15 mod 26".

Q.2 a) Illustrate 'Miller Rabin' test for primality for numbers 'n=23' and witness 'a=2' 08
b) Explain 'shift cipher' algorithm with the help of example. 08

Q.3 a) What is cryptosystem? Explain in detail 'Affine cipher' algorithm with the help of example. 12
b) Find the modular Inverse of the matrix $\begin{bmatrix} 7 & 14 \\ 22 & 13 \end{bmatrix}$ in Z_{26} 04

Q.4 Write a short note on (any four) 16
1) Basic principles of modern cryptography.
2) Repeated square & multiply algorithm.
3) Euler's phi function.
4) Chinese Remainder Theorem.
5) Quadratic Residue Numbers.
6) Solovay strassen.

Section B

Q.5 Differentiate between symmetric key and asymmetric key cryptography. Explain "Diffie Hellman" key exchange algorithm with the help of example. 08

Q.6 a) Explain Pollard-rho' integer factorization algorithm with the help of example. 08
b) Give the step for encryption & decryption using RSA with P=17 q=19 and M=15(plain text) 08

Q.7 a) With the help of example explain 'Baby step giant step' algorithm. 08
b) Describe SHA-I in detail. 08

Q.8 Write a short note on (any four) 16
1) Message authentication code.
2) The pohlig –Hellman algorithm.
3) Primitive root modulo n.
4) Elliptical curve over prime field.
5) Discrete logarithm problem.
6) security of hash function.

2016

Total No. of Printed Pages:2

SUBJECT CODE NO:- K-81
FACULTY OF ENGINEERING AND TECHNOLOGY
Second Year MCA Examination Oct/Nov 2016
Operation Research
(Old)

[Time:Three Hours] **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B i) All question carries 10 marks.
ii) Q.No.1 & 6 are compulsory.
iii) Solve any three questions from (2 to 5) in Section 'A' & from (7 to 10) in Section 'B',

Section A

Q.1 Solve following transportation problem by using least cost method and find optimum solution by modified distribution method. 10

From/To	A	B	C	Supply
1	6	8	10	150
2	7	11	11	175
3	4	5	12	275
Demand	200	100	300	

Q.2 Write the steps, 10
1) Processing 'n' jobs through two machines.
2) Vogel's approximation method.

Q.3 Solve the following problem by using graphical method 10
Minimize Z = 60x+40y
S:t.c $30x+10y \geq 240$
$10x+10y \geq 160$
$10x+60y \geq 480$
$x, y \geq 0$

Q.4 Solve the following assignment problem. 10

	I	II	III	IV	V
1	11	17	8	16	20
2	9	7	12	6	15
3	13	16	15	12	16
4	21	24	17	28	26
5	14	10	12	11	13

Q.5 What is project planning? Explain project scheduling and controlling. 10

Section B

Q.6 Write a short note on 10

1) Formulation of linear programming problem.
2) Unbound solution
3) Graphical method to solve LPP.

Q.7 The time estimates for the activities of a PERT N/x are given below. 10

Activity	t_o	t_m	t_p
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Draw the project N/x and indentify all the

a) Path through it
b) Determine the expected project length

Q.8 There are five jobs each of which is to be processed through three machines A, B & C in the order ABC. 10
Processing times in hours are

Job	A	B	C
1.	3	4	7
2.	8	5	9
3.	7	1	5
4.	5	2	6
5.	4	3	10

Determine the optimum sequence for the five jobs and the minimum elapsed time also find the idle time for three machines and waiting time for the jobs.

Q.9 Solve the following problem by using Simplex method. 10

Maximize $Z= 4x_1+5x_2$

Subject to constraint

$X_1+2x_2 \leq 40$

$4x_1+3x_2 \leq 120$

$X_1 \geq 0, x_2 \geq 0$

Q.10 What is critical path analysis? what are the areas where these technique can be applied. 10

2016

SUBJECT CODE NO:- K-148
FACULTY OF ENGINEERING AND TECHNOLOGY
Second Year MCA Examination Oct/Nov 2016
Data Warehousing & Data Mining
(Old)

[Time:Three Hours] **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B
1) Question No.1 and Q. No.5 are compulsory.
2)Solve any two questions from Q. No.2 to Q. No.4
3) Solve any two questions from Q.6 to Q.No.8
4) Assume suitable data, whenever necessary.

Section A

Q.1 What is data warehouse? Explain different characteristics of data warehouse. 08

Q.2 a) What is metadata in data warehouse? Explain various types of metadata. 08

b) Discuss issues regarding data integration. 08

Q.3 a) Explain min-max normalization and z score normalization method with suitable example. 08

b) Suppose data for analysis includes attribute age. The age values for data tuples are. 08
19, 21, 22, 23, 24, 25, 91.
Find mean, median, standard deviation and variance of above data.

Q.4 a) Discuss OLAP operation in multidimensional data model. 08

b) What is concept hierarchy? Explain data reduction techniques with suitable example. 08

Section B

Q.5 Elaborate the concept of association rule mining and explain apriori algorithm. 08

Q.6 a) The following table consists of training data from an employee database. 08

Department	Status	Age	Salary	Count
Sales	Senior	31..35	46k..50k	30
Sales	Junior	26..30	26k..30k	40
Sales	Junior	31..35	31k..35k	40
Systems	Junior	21..25	46k..50k	20
Systems	Senior	31..35	66k..70k	5
Systems	Junior	26..30	46k..50k	3
Systems	Senior	41..45	66k..70k	3
Marketing	Senior	36..40	46k..50k	10
Marketing	Junior	31..35	41k..45k	4
Secretary	Senior	46..50	36k..40k	4
Secretary	Junior	26..30	26k..30k	6

Let status be the class label attribute given a data tuple having the values “systems” “26..30” and “46k..50k” for the attribute department, age & salary respectively. What would a naïve Bayesian classification of the status for the tuple be?

b) Discuss issues regarding classification and prediction. 08

Q.7 a) Explain multilevel association rules with example. 08

b) What is cluster analysis? Explain k-means partitioning method. 08

Q.8 a) How data mining techniques used in fraud detection? Explain. 08

b) What is concept description? Explain data generalization and summarization in detail. 08

Total No. of Printed Pages:1

SUBJECT CODE NO:- K-208

FACULTY OF ENGINEERING AND TECHNOLOGY

Second Year MCA Examination Oct/Nov 2016

System Prog. & Adv. Operating System

(Old)

[Time:Three Hours] **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B
I. Q.No.1 and Q.No.5 are compulsory.
II. Attempt any two questions from Q.2 to Q.4 and Q.6 to Q.8

Section A

Q.1 Explain various types of operating systems. 08

Q.2
a) Explain Request-Reply protocol. 08
b) Define & explain system calls. Discuss the importance of API in system call implementation. 08

Q.3
a) Explain inter process communication in distributed OS. 08
b) Discuss how the performance of distributed OS can be evaluated against. 08
i) Impact of faults.
ii) Resiliency.
iii) Latency.

Q.4
a) What is transparency? Explain types of transparency in distributed OS. 08
b) Explain process control block. 08

Section B

Q.5 Differentiate between distributed OS, network OS & parallel OS. 08

Q.6
a) Explain the terms i) Critical section. ii) race condition . iii) Mutual exclusion. 08
b) Write note on i) priority inversion, ii) MPI. 08

Q.7
a) Differentiate between real time OS with general purpose OS. 08
b) Explain process scheduling in multimedia OS. 08

Q.8
a) Compare preemptive scheduling with non -preemptive scheduling with suitable example. 08
b) Explain need and implementation of semaphores in OS. 08

Total No. of Printed Pages:1

SUBJECT CODE NO:- K-209
FACULTY OF ENGINEERING AND TECHNOLOGY
Second Year MCA(CGPA) Examination Oct/Nov 2016
Relational Database Management System
(Revised)

[Time:Three Hours] **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B i) Q.No.1 and Q.No.5 are compulsory.
ii) Solve any two from Q.No.2 to Q.NO.4.
iii) Solve any two from Q.No.6 to Q.No.8.

Section A

Q.1 What is Normalization? Explain 2 NF and 3 NF with example. 08

Q.2 a) Explain Left, Right and full outer joins with the help of example. 08
b) Explain union operation and set difference operations of relational algebra. 08

Q.3 a) Differentiate between ordered indexing and hashing. 08
b) Explain various levels of RAID. 08

Q.4 a) Write short note on performance measures of disk. 08
b) Explain structure of B-tree with example. 08

Section B

Q.5 Explain different features and advantages of PL/SQL. 08

Q.6 a) What is transaction? Explain various states of transaction. 08
b) Explain ARIES recovery algorithm. 08

Q.7 a) Explain Lock- based protocol with example. 08
b) What are types of cursor? Explain explicit cursor with example. 08

Q.8 a) Write a procedure in PL/SQL to find largest of three numbers. 08
b) Explain case statement in PL/SQL with example. 08

Total No. of Printed Pages:1

SUBJECT CODE NO:- K-357
FACULTY OF ENGINEERING AND TECHNOLOGY
Second Year MCA Examination Oct/Nov 2016
Software Engineering-I
(Old)

[Time: Three Hours] **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B i) Q.No.4 and Q.No.8 is compulsory.
ii) Solve any two questions from remaining questions in each section.

Section A

Q.1	a)	Explain spiral model in detail.	08
	b)	Explain software configuration management process in detail.	08
Q.2	a)	Define project scheduling. Explain any one of the project scheduling technique.	08
	b)	Explain RISK management process in detail.	08
Q.3	a)	Explain waterfall model in detail.	08
	b)	Explain unified process in detail.	08
Q.4	Write a short note on		08
	a)	Software applications.	
	b)	Prototyping.	

Section B

Q.5	a)	Explain behavioural modelling in detail.	08
	b)	Explain design principles and design concept of web application in detail.	08
Q.6	a)	Explain software requirement specification (SRS) with example.	08
	b)	Explain planning principles in detail.	08
Q.7	a)	Explain the term requirement engineering in detail.	08
	b)	Develop a use case diagram showing a scenario of one customer service for ATM system.	08
Q.8	Write short not on		08
	a)	Design model	
	b)	Navigation design.	

2016

Total No. of Printed Pages:1

SUBJECT CODE NO:- K-358
FACULTY OF ENGINEERING AND TECHNOLOGY
Second Year MCA (CGPA) Examination Oct/Nov 2016
Web Engineering
(Revised)

[Time: Two Hours] **[Max. Marks:50]**

Please check whether you have got the right question paper.

N.B i) Q.No.1 and Q.No.4 are compulsory.
ii) Attempt any one questions from each section from remaining.
iii) Use suitable diagram with labels wherever required.

Section A

Q.1 Explain hyper text structure modelling concepts with suitable diagram. 10

Q.2 a) What are the activities of requirement engineering for web application? 08
b) Explain middleware technology with suitable diagram. 07

Q.3 Short notes (any 3) 15
1) Architectures for web document management
2) Cookies
3) Documents specific technologies
4) DTD(Document Type Definition)
5) XML DOM

Section B

Q.4 Describe various modelling with its characteristics & objectives 10

Q.5 a) Explain in brief factors influencing the development of an architecture 08
b) State & explain briefly client side technologies 07

Q.6 Short notes (any 3) 15
1) Requirements of s/w application modelling
2) Servelet
3) X-Path
4) Extensible Markup language
5) Namespaces

Subject Code : 159

FACULTY OF ENGINEERING & TECHNOLOGY
S.Y. M.C.A. Examination
NOVEMBER/DECEMBER, 2016
Software Engineering – II

Time: Three Hours

Max. Marks : 80

"Please check whether you have got the right the question paper"

Note: i) *Q. No. 1 from Section A and Q.No. 6 from Section B are compulsory.*
ii) *Attempt any two questions from remaining questions from in each section.*

SECTION – A

Q.1 Attempt any Five from following

(a) Why SQA is important? **10**
(b) Define software quality.
(c) Explain in brief Garvin's quality dimensions.
(d) What is cost of quality?
(e) Explain in brief strategic issues in testing.
(f) What is security and safety?
(g) Explain in brief reliability terminologies.
(h) What is software dependability?

Q.2 (a) Explain in detail white box testing.

(b) Explain in detail defect life cycle. **08**

Q.3 (a) Explain in detail general format of defect reporting. **07**

(b) Explain different strategies of software testing. **08**

Q.4 (a) Explain in detail safety and dependability cases. **07**

(b) Explain in detail safety specification of critical system. **07**

Q.5 Write a short note on (Any three) : **08**

(a) Processes for safety assurance **15**
(b) Reliability testing
(c) Statistical SQA
(d) Security testing
(e) Application frameworks.

SECTION – B

Q.6 Attempt any Five from following

(a) Explain in brief human factors in agile development. **10**
(b) Explain in brief agile process.
(c) Define the terms : (i) Concerns (ii) Viewpoints.
(d) Explain in brief various terminologies used in aspect oriented software engineering
(e) Explain in brief problems during maintenance process.
(f) Explain the term software reengineering.
(g) What is mean by software reusability?
(h) Write down the applications of reverse engineering.

Q.7	(a)	Explain in detail separation of concerns in aspect oriented software engineering.	07
	(b)	Explain in detail defect feature driven development	08
Q.8	(a)	Explain in detail reuse oriented maintenance model.	08
	(b)	Explain in detail adaptive software development.	07
Q.9	(a)	Explain in detail Taute's maintenance model.	07
	(b)	Annual change Traffic (Act) for a software system is 15% per year. The development effort is 600 PMs. Compute estimate for Annual Maintenance Effort (AME). If life time of the project is 10 years. What is the total effort of the project?	08

Q.10 Write a short note on (Any Three) : **15**

(a) Lean software development

(b) Belady and Lahman model

(c) Maintenance process

(d) Crystal

(e) Categories of maintenance model.

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Total No. of Printed Pages:1

SUBJECT CODE NO:- K-258
FACULTY OF ENGINEERING AND TECHNOLOGY
Second Year MCA Examination Oct/Nov 2016
Computer Networks
(Old)

[Time: Three Hours] **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B i) Question no 4 & 8 compulsory.
ii) Solve any two questions from each section from remaining.
iii) Figure to the right indicates full marks.

Section-A

Q.1 A) Explain Co-axial cable in detail with advantage and disadvantage. 08
B) Explain static Routing in detail with advantage and disadvantage. 08

Q.2 A) Explain different types of error correction tech's. 08
B) Explain simplex, half duplex & full duplex with suitable example. 08

Q.3 A) Discuss the following adaptive routing tech's with an example. 08
I) Distance vector routing
II) Link state Routing
B) Explain OSI model in detail 08

Q.4 Write short notes. 08
A) IPv4
B) Hamming code.

Section-B

Q.5 A) Discuss the importance of DHCP server 08
B) Difference between SMTP and MIME 08

Q.6 A) Explain the working of DNS in detail. 08
B) Explain working concept of IPSec. 08

Q.7 A) What is VPN and explain relation with security. 08
B) Explain working of Data Encryption Standard (DES) 08

Q.8 Write short notes. 08
A) POP3
B) IMAP4

Total No. of Printed Pages:1

SUBJECT CODE NO:- K-259
FACULTY OF ENGINEERING AND TECHNOLOGY
Second Year MCA(CGPA) Examination Oct/Nov 2016
Advanced Computer Networks
(Revised)

[Time: Three Hours] **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B i) Q.No.1 and Q.No.5 are compulsory.
ii) Attempt any two questions from the remaining questions of each section.
iii) Assume suitable data wherever necessary.

Section A

Q.1	a)	What is Unicast and Multicast Routing Explain?	04
	b)	What is Inter domain and Intra Domain Routing explain?	04
Q.2	a)	Differentiate IPv4 vs IPV6 Protocols.	08
	b)	Explain Link State Routing Algorithm in detail.	08
Q.3	a)	What is Flow Control? How TCP implements flow control?	08
	b)	Explain TCP services in detail.	08
Q.4	a)	Draw and explain the TCP Segment Format.	08
	b)	What is Intra domain Routing? Explain distance vector routing Algorithm.	08

Section-B

Q.5	**Answer any two (2x4=8)**		
	a)	Explain Transposition Cipher method with an example.	04
	b)	Differentiate DNS and DDNS.	04
	c)	What is FQDN and PQDN, explain.	04
Q.6	a)	Describe Message Transfer Agent (SMTP) and explain the commands and Responses.	08
	b)	What is FTP protocol? Explain how it is used for File sharing?	08
Q.7	a)	What is Asymmetric Key Cryptography explain?	08
	b)	What port number HTTP service Runs? Write about HTTP transaction in detail.	08
Q.8	a)	Explain Two modes of IPSEC protocol	08
	b)	Describe the types of Firewalls.	08

Total No. of Printed Pages:1

SUBJECT CODE NO:- K-292
FACULTY OF ENGINEERING AND TECHNOLOGY
Second Year MCA Examination Oct/Nov 2016
Relational Database Management System
(Old)

[Time: Three Hours] **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B i) Q.No.1 and Q.No.5 are compulsory.
ii) Solve any two questions from Q.2 to Q.4.
iii) Solve any two questions from Q.6 to Q.8.
iv) Assume suitable data wherever necessary.

Section A

Q.1 What is the need of normalization? If normalization is not done, what type of problems may arise? 08

Q.2 a) What is DBMS? Explain characteristics of DBMS. 08
b) Is BCNF is stronger than 3NF? Justify you answer. 08

Q.3 a) Draw the ER diagram for departmental shop. Take the entities to define different activities (eg. sales etc.), employees (different types eg. Manager) section (eg. Section), customers & other department of the shop. Also take appropriate attribute to define the entities. 08
b) Explain different operations of relational algebra. 08

Q.4 a) Discuss different levels of abstraction present in database system. 08
b) Explain different types of joins used in DBMS. 08

Section B

Q.5 Explain ACID properties of transaction. 08

Q.6 a) What is dead lock? Explain preventive measures to avoid deadlock. 08
b) Explain clustering indexing technique with suitable example. 08

Q.7 a) Describe timestamp protocols in detail. 08
b) Explain secondary index with an example. 08

Q.8 a) What is schedule? Explain different types of schedule. 08
b) Which factors are responsible for measuring the query cost? Explain. 08

Total No. of Printed Pages:1

SUBJECT CODE NO:- K-293
FACULTY OF ENGINEERING AND TECHNOLOGY
Second Year MCA(CGPA) Examination Oct/Nov 2016
EL- I Principles of Programming Languages
(Revised)

[Time: Three Hours] **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B i) Q.No.1 and Q.No.6 are compulsory.
ii) Attempt any two questions from Q.No.2 to Q.No.5 and from Q.No.7 to Q.No.10 of each section.
iii) Figures to the right indicate full marks.

Section A

Q.1	a)	Explain roles & needs of programming language.	05
	b)	What are the array operations performed in programming language?	05
Q.2	a)	Explain PL/I design process.	07
	b)	Explain two-way selection statement used in programming language.	08
Q.3	a)	Explain language overview of Java.	07
	b)	Explain LISP functional programming with example.	08
Q.4	a)	Define context free grammar. How to convert a regular expression to convert free grammar?	08
	b)	What are the types of assignment statements used in programming language?	07
Q.5	a)	What are the types of binding used in programming language?	07
	b)	Explain parsing. Also explain LL(1) parser & LL(R) parser.	08

Section B

Q.6	a)	Explain design issues of subprogram.	05
	b)	Explain monitors in detail.	05
Q.7	a)	Explain categories of concurrency.	07
	b)	How to implement object oriented construct?	08
Q.8	a)	Explain exception handling in C++?	07
	b)	Explain in detail implementation models of parameter passing.	08
Q.9	a)	What are design issues of function? Also explain semantics of call & return.	08
	b)	Explain thread class in Java.	07

Q.10 Write short note on (any three). 15
a) Dynamic scoping
b) Blocks
c) Event handling in Java
d) Synchronous message passing

2016

Total No. of Printed Pages:2

SUBJECT CODE NO:- K-294
FACULTY OF ENGINEERING AND TECHNOLOGY
Second Year MCA(CGPA) Examination Oct/Nov 2016
EL- I Soft Computing
(Revised)

[Time: Three Hours] **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B i) Q.No.1 from Section A & Q.No.6 from section B are compulsory.
ii) Attempt any two questions from the remaining questions in each section.
iii) Assume suitable data, if necessary.

Section A

Q.1 Answer the following (any two). 10
a) Explain soft computing in detail.
b) What is unsupervised learning?
c) Write down the fundamental concept of ANN.

Q.2 a) Explain biological neural network in detail. 08
b) Explain Adeline network. 07

Q.3 a) Explain basic models of artificial neural network. 08
b) What are the different back propagation learning methods? 07

Q.4 a) What is associative memory network? 08
b) Explain machine learning in detail. 07

Q.5 Write short notes on (any three). 15
a) Artificial neuron & biological neuron.
b) Evolution of neural networks.
c) Benefits of ANN.
d) Define learning.
e) Differentiate between supervised & unsupervised learning.

Section B

Q.6 Answer the following (any two). 10
a) Define classical sets & fuzzy sets.
b) State the importance of fuzzy sets.
c) List the properties of classical sets.

Q.7 a) Explain image processing in detail 07
b) Explain pattern recognition in detail. 08

Q.8 a) What are genetic algorithms? 08
b) Write down the applications of soft computing. 07

2016

Q.9 a) Explain optimization of travelling sales person problem using genetic algorithms. 08

b) Write the methods of membership value assignment. 07

Q.10 Write short notes on (any three). 15

a) Share market analysis
b) Natural language processing
c) Biological sequence alignment & drug design
d) Robotics & sensors
e) Information retrieval systems