V.S.B. ENGINEERING COLLEGE, KARUR.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR 2017 -2018(EVEN SEMESTER)

ASSIGNMENT QUESTIONS

CS6551- COMPUTER NETWORKS

1 Modify the simplex-talk socket program so that each time the client sends a line to the server, the server sends the line back to the client. The client (and server) will now have to make alternating calls to recv() and send().

2. The UNIX utility who is can be used to find the domain name corresponding to an organization, or vice versa. Read the man page documentation for who is an experiment with it. Try who is princeton.edu and who is prince on, for starters.

3. Use a Web search tool to locate useful, general, and noncommercial information about the following topics: M Bone, ATM, MPEG, IPv6, and Ethernet.

4. Use anonymous FTP to connect to ftp.isi.edu (directory in-notes), and retrieve the RFC index. Also retrieve the protocol specifications for TCP, IP, and UDP.

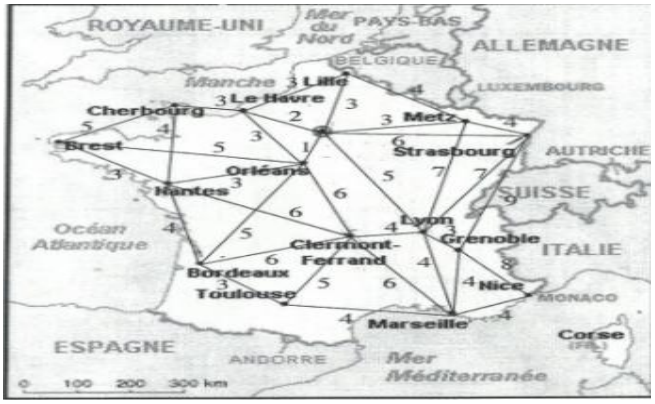
5. Most Telnet clients can be used to connect to port 25, the SMTP port, instead of to the Telnet port. Using such a tool, connect to an SMTP server and send yourself (or someone else, with permission) some forged email. Then examine the headers for evidence the message isn't genuine.

CS6402 - DESIGN AND ANALYSIS OF ALGORITHMS

1. Glove selection: There are 22 gloves in a drawer: 5 pairs of red gloves,4 pairs of yellow, and 2 pairs of green. You select the gloves in the dark and can check them only after a selection has been made. What is the smallest number of gloves you need to select to have at least one matching pair in the best case? What is in the worst case?

2. Explain how merge sort works? Sort the following sequence: { 17, 28, 31, 35, 65, 25, 42, 86, 45, 52 }. Write the Merge Sort Algorithm. Analyze the time complexity.

3. How to connect the main cities of France in order to minimize the cost of project using Prim's algorithm.



4. Find a stable-marriage matching for the instance defined by the following ranking matrix:

	A	B	C	D
α	1, 3	2, 3	3, 2	4, 3
β	1, 4	4, 1	3, 4	2, 2
γ	2, 2	1, 4	3, 3	4, 1
δ	4, 1	2, 2	3, 1	1, 4

5. What is Travelling Salesperson Problem? Write about the branch and bound solution for TSP. Solve the following TSP

$$\begin{bmatrix} \infty & 20 & 30 & 10 & 11 \\ 15 & \infty & 16 & 4 & 2 \\ 3 & 5 & \infty & 2 & 4 \\ 19 & 6 & 18 & \infty & 3 \\ 16 & 4 & 7 & 16 & \infty \end{bmatrix}$$

EC6504 - MICROPROCESSOR AND MICRO CONTROLLER

1. Interface an 8-digit 7 segment LED display using 8255 to the 8086 microprocessor system and write an 8086 assembly language routine to display message on the display.
2. Design a microprocessor system to control traffic light. The traffic should be controlled by the following manner.
   a. Allow traffic from west to east and east to west transition for 20 seconds.
   b. Give transition period of 5 seconds (yellow bulb on)
   c. Allow traffic from north to south and south to north for 20 seconds
   d. Give transition period of 5 seconds (yellow bulb on)
   e. Repeat the process
3. Write an assembly language program to control conveyer belt using stepper motor and 8051 controller. Belt moves continuously at rate of 1 step/sec but stops for 5sec. When external interrupt occurs and then continues to move.
4. Interface 8-bit, 8 channel ADC to 8051.Write assembly language program to convert CH0, CH3 and CH7 and store the result in external memory location starting from C000H.Repeate procedure for every 1sec.
5. An 8051 based system requires external memory of four 4 kbytes of SRAM each ant two chips of EPROM of size 2kybytes. The EPROM starts at address 2000H. SRAM address map follows EPROM map. Give the complete interface.

CS6401- OPERATING SYSTEM

1. Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

Process	Burst Time	Priority
1. P1	10	0	3
2 .P2	29	1	1
3. P3	3	2	4
4. P4	7	3	5
5. P5	12	4	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.

a. Draw four Gantt charts illustrating the execution of these processes using FCFS,SJF,A non preemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 1) scheduling.

b. What is the turnaround time of each process for each of the scheduling algorithms in part a?

c. What is the waiting time of each process for each of the scheduling algorithms in Part a?

d. Which of the schedules in part a results in the minimal average waiting time (over all processes)?

2. Consider the following page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.

How many page faults would occur for the following replacement algorithms, assuming one, two, three, four, five, six, or seven frames?

Remember all frames are initially empty, so your first unique pages will all cost one fault each.

LRU replacement

FIFO replacement

Optimal replacement

3. Consider the following page reference string:

1,2,3,4,2,1,5,6,1,2,3,7,6,3,2,1,2,3,6

How many page faults would occur for the LRU, FIFO, LFU and optimal page replacement algorithms assuming two and five frames?

4. Consider the following page reference string:

1,2,3,4,2,1,5,6,1,2,3,7,6,3,2,1,2,3,6

How many page faults would occur for the LRU, FIFO, LFU and optimal page replacement algorithms assuming three and four frames?

5. Consider the following page reference string:

1,2,3,4,2,1,5,6,1,2,3,7,6,3,2,1,2,3,6

How many page faults would occur for the LRU, FIFO, LFU and optimal page replacement algorithms assuming two and six frames?

6. Consider the following page reference string:
1,2,3,4,2,1,5,6,1,2,3,7,6,3,2,1,2,3,6
How many page faults would occur for the LRU, FIFO, LFU and optimal page replacement algorithms assuming seven frames?

7. Consider the following page reference string: 7,5,7,8,6,0,1,8,9,7,5,4,3,2,1.
How many page faults would occur for the following replacement algorithms, assuming one, two, three,
four, five, six, or seven frames?
Remember all frames are initially empty, so your first unique pages will all cost one fault each.
LRU replacement
FIFO replacement
Optimal replacement

8. Consider the following page reference string: 8,5,6,4,7,2,1,9,7,2,0,1,6,8,9,0,1.
How many page faults would occur for the following replacement algorithms, assuming one, two, three,
four, five, six, or seven frames?
Remember all frames are initially empty, so your first unique pages will all cost one fault each.
LRU replacement
FIFO replacement
Optimal replacement

9. Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

Process	Burst Time		Priority
1. P1	5	4	3
2 .P2	2	6	7
3. P3	8	2	4
4. P4	7	3	1
5. P5	6	4	3

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.
a. Draw four Gantt charts illustrating the execution of these processes using FCFS,SJF,A non preemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 3) scheduling.
b. What is the turnaround time of each process for each of the scheduling algorithms in part a?
c. What is the waiting time of each process for each of the scheduling algorithms in Part a?

d. Which of the schedules in part a results in the minimal average waiting time (over all processes)?

10. Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

Process	Burst Time	Priority	
1. P1	4	6	7
2 .P2	3	2	0
3. P3	1	8	5
4. P4	7	9	8
5. P5	4	3	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.

a. Draw four Gantt charts illustrating the execution of these processes using FCFS,SJF,A non preemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 2) scheduling.

b. What is the turnaround time of each process for each of the scheduling algorithms in part a?

c. What is the waiting time of each process for each of the scheduling algorithms in Part a?

d. Which of the schedules in part a results in the minimal average waiting time (over all processes)?

11. Linux System

12. System Administration, Requirements for Linux System Administrator

13. Setting up a LINUX Multifunction Server

14. Domain Name System and Setting up Local Network Services

15. Virtualization

16. Setting Up Xen

17. VMware on Linux Host

18. Adding Guest OS

19. Windows 7

20. Windows 8

21. Windows 10

22. Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

Process	Burst Time		Priority
1. P1	4	5	6
2 .P2	3	4	2
3. P3	7	8	9
4. P4	5	2	3
5. P5	4	3	1

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.

a. Draw four Gantt charts illustrating the execution of these processes using FCFS,SJF,A non preemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 4) scheduling.

b. What is the turnaround time of each process for each of the scheduling algorithms in part a?

c. What is the waiting time of each process for each of the scheduling algorithms in Part a?

d. Which of the schedules in part a results in the minimal average waiting time (over all processes)?

23. Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

Process	Burst Time		Priority
1. P1	4	3	5
2 .P2	8	9	7
3. P3	7	2	3
4. P4	1	2	4
5. P5	5	2	1

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.

a. Draw four Gantt charts illustrating the execution of these processes using FCFS,SJF,A non preemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 1) scheduling.

b. What is the turnaround time of each process for each of the scheduling algorithms in part a?

c. What is the waiting time of each process for each of the scheduling algorithms in Part a?

d. Which of the schedules in part a results in the minimal average waiting time (over all processes)?

24. Consider the following page reference string:

3,2,1,4,6,7,8,4,9,2,1,5,4,3,2,1

How many page faults would occur for the LRU, FIFO, LFU and optimal page replacement algorithms assuming two, three, four and five frames?

25. Consider the following page reference string:

7,2,4,3,8,9,4,1,6,7,9,1,4,5,3,8,7,6,4,2,1,2.

How many page faults would occur for the LRU, FIFO, LFU and optimal page replacement algorithms assuming three and five frames?

MA6453 - PROBABILITY AND QUEUEING THEORY

PART-A

1. If X and Y are two independent random variables with variances 2 and 3, find the Variance of 3X+4Y.

2. If a random variable has the moment generating function given by $M_X(t)=\frac{2}{2-t}$ determine the variance of X.

3. Comment on the treatment:"The mean of a binomial distribution is 3 and variance is 4".

4. State the equations of the two regression lines.

5. Find the acute angle between the two lines of regression.

PART-B

6. Let X be a normally distributed random variable with mean = 10 and the probability P(x>12) = 0.1587.What is the probability that X will be in the interval (9,11)?

7. Suppost that a trainee soldier shoots a target in an independent fashion. If the probability that the target is shot on any one shot is 0.7,(i) what is the probability that the target would be hit on 10^{th} attempt? (ii) what is the probability that it takes him less than 4 shots? (iii) what is the probability that it takes him an even number of shots?

8. If the density function of a continuous R.V X is given by $f(x) = \begin{cases} ax, 0 \le x \le 1 \\ a, 1 \le x \le 2 \\ 3a - ax, 2 \le x \le 3 \\ 0, elsewhere \end{cases}$.

   (i) Find the value of 'a'
   (ii) Find the c.d.f of X and
   (iii) P(X>1.5)

9. The joint density function of the random variables X and Y is given by

   f(x,y) = 8xy, 0<x<1,0<y<x
   = 0, elsewhere.

   (i) Find the marginal and conditional density functions**.**
   (ii) Are x and y independent?

10 . The marks obtained by 10 students in Mathematics and Statistics are given below. Find the correlation coefficient between the two subjects.

Marks in mathematics :	*75*	*30*	*60*	*80*	*53*	*35*	*15*	*40*	*38*	*48*
Marks in statistics :	*85*	*45*	*54*	*91*	*58*	*63*	*35*	*43*	*45*	*44*

CS6403 - SOFTWARE ENGINEERING

1.A flood warning system is to be procured which will give early warning of possible flood dangers to sites that are threatened by floods. The system will include a set of sensors to monitor the rate of change of river levels, links to a meteorological system giving weather forecasts, links to the communication systems of emergency services (police, coastguard,etc.), video monitors installed at selected locations, and a control room equipped with operator consoles and video monitors. Controllers can access database information and switch video displays. The system database includes information about the sensors, the location of sites at risk and the threat conditions for these sites (e.g., high tide, southwesterly winds), tide tables for coastal sites, the inventory and location of flood control equipment, contact details for emergency services, local radio stations, and so on. Draw a block diagram of a possible architecture for such a system. You should identify the principal sub-systems and the links between them.

2.Bank teller machines rely on using information on the user's card giving the bank identifier, the account number and the user's personal identifier. They also derive account information from a central database and update that database on completion of a transaction. Using your knowledge of ATM operation, write Z schemas defining the state of the system, card validation (where the user's identifier is checked) and cash withdrawal.