Hall Ticket Number :										

Code: 4G141 **R-14**

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016

Computer Organization

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) State and prove DeMorgan's theorem. 4M

   b) Design a combinational circuit such that the 4 bit output is an excess-3 of its applied 4-bit input to the circuit. 10M

OR

2. a) Specify the characteristics of ASCII code. Identify the string represented by the following ASCII sequence: 1000011 1010011 1000101. 7M

   b) A 24 bit binary number is represented in floating point representation. 8 bits are used for exponent and the rest used to represent the mantissa part. The mantissa and exponent are both represented in 2's complement representation. Determine the range of numbers possible in this representation. 7M

UNIT–II

3. a) What is a bus? Depict with a neat sketch, a 4-bit bus is shared among 4 registers using multiplexers and explain its functionality. 7M

   b) Enumerate the sixteen logic micro-operations of a digital computer. Which one of these is used to implement equivalence function? 7M

OR

4. a) List and explain any four memory reference instructions. 7M

   b) Define stack. Explain the uses of stack memory and its organization in digital computer design. 7M

UNIT–III

5. a) What is a control memory? Explain the process of generating control address from an instruction code. 7M

   b) Assume that the first 9 bits of a 20 bit microinstruction format are divided into

F1	Microoperation	Symbol
000	None	NOP
001	AC ← AC + DR	ADD
010	AC ← 0	CLRAC
011	AC ← AC + 1	INCAC
100	AC ← DR	DRTAC
101	AR ← DR(0-10)	DRTAR
110	AR ← PC	PCTAR
111	M[AR] ← DR	WRITE

F2	Microoperation	Symbol
000	None	NOP
001	AC ← AC- DR	SUB
010	AC ← AC ∨ DR	OR
011	AC ← AC ∧ DR	AND
100	DR ← M[AR]	READ
101	DR ← AC	ACTDR
110	DR ← DR + 1	INCDR
111	DR(0-10) ← PC	PCTDR

three fields as follows:

F3	Microoperation	Symbol
000	None	NOP
001	AC ← AC ⊕ DR	XOR
010	AC ← AC'	COM
011	AC ← shl AC	SHL
100	AC ← shr AC	SHR
101	PC ← PC + 1	INCPC
110	PC ← AR	ARTPC
111	Reserved	

Specify the 9-bit microoperation field for the following microoperations:

(i) AC ← AC + 1; AC ^ DR;

(ii) DR ← DR + 1; PC ← AR; AC ← 0; 7M

OR

6. a) State the pros and cons of microprogrammed control unit over hardwired control unit. 4M

   b) Describe the organization and functions of a microprogram sequencer for control memory. 10M

UNIT–IV

7. a) Explain the functional units and their data flow in a hardware implementation that performs addition and subtraction of signed-magnitude numbers. 7M

   b) Depict the sequence of operations performed in the Booth's algorithm to perform multiplication of signed-magnitude numbers. 7M

OR

8. a) Relate the virtual memory with that of main memory. Discuss various page replacement policies used in virtual memory system 7M

   b) Differentiate between 'write-through' and 'write back' cache techniques. Explain these techniques with suitable example. 7M

UNIT–V

9. a) Explain the interrupt-initiated data transfer between I/O devices with CPU with emphasize on interrupt priority resolution. 7M

   b) Illustrate the CPU-IOP communication to perform direct memory access. 7M

OR

10. a) Explain the structure of a four-stage pipeline. 7M

    b) Enumerate the applications of array-processors. 7M

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Hall Ticket Number :										

Code: 4G441

R-14

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016

Database Management Systems

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Discuss about different types of data models? 7M
   b) Define data abstraction and discuss levels of abstraction? 7M

OR

2. a) Describe the structure of DBMS? 8M
   b) Explain about transaction management? 6M

UNIT–II

3. a) Discuss additional features of the ER-Models. 7M
   b) Define the terms **i)** Entity **ii**) Entity set **iii**) weak entity set **iv**) strong entity set? 7M

OR

4. a) Write about views and updates on views? 8M
   b) Differentiate DBMS and RDBMS? 6M

UNIT–III

5. a) Describe logical connectives of SQL with examples? 7M
   b) Demonstrate how to add a NOT NULL column to a table? 7M

OR

6. a) Discuss the basic form of SQL query? 4M
   b) Define a nested query?
      i. Write a nested query to find the names of sailors who have reserved both a red and green boat.
      ii. Write a nested query to find the names of sailors who have reserved all boats. 10M

UNIT–IV

7. a) Define decomposition and how does it address redundancy? Discuss the problem s that may be caused by the use of decompositions? 5M
   b) Explain 1NF, 2NF, 3NF normal forms? 9M

OR

8. a) Define functional dependencies. How are primary keys related to FD's? 6M
   b) Illustrate multi valued dependencies and fourth normal form with example? 8M

UNIT–V

9. a) Discuss how do you implement atomicity and durability? 7M
   b) Discuss serializability in detail? 7M

OR

10. a) Discuss about data on external storage? 6M
    b) Explain in detail about ISAM? 8M

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Hall Ticket Number :										

Code: 4G144

R-14

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016

Object Oriented Programming Through JAVA

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Explain relational operators in java. 5M
   b) Java does not support goto statement. Why? 4M
   c) Explain garbage collection in Java. 5M

OR

2. a) Explain the OOPs concepts: Encapsulation, Polymorphism and Abstraction 7M
   b) Explain the java buzz words. 4M
   c) What is the difference between String and StringBuffer objects? 3M

UNIT–II

3. a) Explain method overriding with an example. 7M
   b) Explain the different levels of access protection in java. 7M

OR

4. a) Explain the difference between class and interface with an example each. 7M
   b) Explain in detail the process of creating, defining, importing and accessing a package with suitable examples 7M

UNIT–III

5. a) Explain the creation and usage of your own exception with an example. 7M
   b) Explain thread synchronization with an example. 7M

OR

6. a) Write the differences between multithreading and multi tasking. 3M
   b) Write short notes on ThreadGroup class. 4M
   c) Explain the creation of thread using Runnable interface with an example. 7M

UNIT–IV

7. Explain in detail any four classes of the java.net package. 14M

OR

8. a) Write the differences between applet and an application program. 7M
   b) Write an applet to display the current date and time. 7M

UNIT–V

9. a) Describe delegation event model 5M
   b) Write the limitations of AWT components 4M
   c) Write a java program to illustrate TextEvent. 5M

OR

10. a) Write a java program to display the month names by JList and display the days by JComboBox. 7M
    b) In what way JButton is better than Button class? Explain it with an example. 7M

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Hall Ticket Number :										

Code: 4GC42

R-14

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016

Probability and Statistics

(Common to CE, ME & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1 a) In a group there are 3 men and 2 women. Three persons are selected at random from this group. Find the probability that one man and two women or two men and one women are selected. 7M

b) A random variable X has the following probability function:

X	1	2	3	4	5	6
P(X)	K	3K	5K	7K	9K	11K

Determine **i**) K. **ii**) Expectation. **iii**)Variance. 7M

OR

2. a) Two cards are selected at random from 10each numbered 1 to 10.
Find the probability that the sum is even if
i) The two cards are drawn together
ii) The two cards are drawn one after other with replacement. 7M

b) For the continuous random variable X whose probability density function is given by $f(x) = \begin{cases} cx(2-x), if\ 0 \leq x \leq 2 \\ 0, otherwise \end{cases}$ where c is a constant. Find *c*, mean and variance of X. 7M

UNIT–II

3. a) If the masses of 300 students are normally distributed with mean 68 kgs and deviation 3 kgs, how many students have masses
(i) Greater than 72 kg.
(ii) Less than or equal to 64 kg.
(iii) Between 65 and 71 kg inclusive. 7M

b) 10 % of screws produced by a company are defective. Find the probability that out of 10 screws chosen at random
(i) 1 will be defective
(ii) at most 2 will be defective
(iii) none will be defective. 7M

OR

4. a) In a normal distribution 31% of the items are under 45 and 8% of the items are over 64. Find the mean and variance of the distribution. 7M

b) A hostel switch board receives an average of 4 emergency calls in a 10 minute interval. What is the probability that
(i) There are at most two emergency calls.
(ii) Exactly 3 emergency calls, in a 10 minutes interval. 7M

UNIT–III

5. a) Write the short note on Test of hypothesis. 7M

b) A manufacturer claimed that at least 95% of the equipment which he supplied to a factory conformed to specifications. An examination of a sample 200npieces of equipment revealed that 18 were faulty. Test his claim at 5% level of significance. 7M

OR

6. a) Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favor of the proposal. Test the hypothesis that proportions of men and women in favour of the proposal are same, at 5%. 7M

b) The mean yield of wheat from a district A was 210 pounds with S.D 10 pounds per acre from a sample of 100 plots. In another district the mean yield was 220 pounds with S.D 12 pounds from a sample of 150 plots. Assuming that the S.D of yield in the entire state was 11 pounds, test whether there is any significant difference between the mean yields of crops in the two districts. 7M

UNIT–IV

7. a) The mean life time of a sample of 25 fluorescent light bulbs produced by a company is computed to be 157 hours with S.D of 120 hours. The company claims that the average life of the bulbs is 1600 hours using the level of significance of 0.05. Is the claim acceptable? 7M

b) From the following data, find whether there is any significant liking in the habit of taking soft drinks among the categories of employees.

	Employees				
Soft drinks		Clerks	Teachers	Officers	Total
	Pepsi	10	25	65	100
	Thumps up	15	30	65	110
	Fanta	50	60	30	140
	Total	75	115	160	350

7M

OR

8. a) A mechanist is making engine parts with axle diameters of 0.7000 inches. A random sample of 10 parts shows a mean diameter of 0.742 inch, with S.D of 0.04 inch. Compute the statistic you would use to test whether the work is meeting the specifications at 0.05 level of significance. 7M

b) Two random samples have the following results.

Sample	Size	Sample mean	Sum of square of deviations from the mean
1	10	15	90
2	12	14	108

Test whether the samples came from the same normal population. 7M

UNIT–V

9. a) Give the comparison of $\bar{x}$ and R charts with P-chart. 7M

b) A self-service store employs one cashier at its counter. Nine customers arrive on an average every 5 minutes while the cashier can serve 10 customers in 5 minutes. Assuming Poisson distribution for arrival rate and exponential distribution for service time, find

i) Average number of customers in the system.

ii) Average number of customers in the queue or average queue length.

iii) Average time a customer spends in the system.

iv) Average time a customer waits before being served. 7M

OR

10 a) In a manufacturing process the number of defectives found in the inspection of 15 lots of 400 items each are given below:

2,5,0,14,3,0,1,0,18,8,6,0,3,0 and 6.

i) Determine the trial control limits and state whether the process is in control.

ii) What will be the corresponding control limits of some obvious points outside the control limits are eliminated? Examine whether the process is still in control or not. 7M

b) Derive average number of customers and average length of queuing system. 7M

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