

Code: 4GC42

II B.Tech. II Semester Regular Examinations May 2016

**Probability and Statistics**

( Common to CE, ME &amp; 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) Box A contains 5 red and 3 white marbles and box B contains 2 red and 6 white marbles. If a marble is drawn from each box, what is the probability that they are both of same color? 7M
- b) Two dice are thrown. Let X assign to each point (a,b) in S the maximum of its numbers i.e.  $X(a,b) = \max(a,b)$ . Find the probability distribution. X is a random variable with  $X(s) = \{1,2,3,4,5,6\}$ . Also find the mean and variance. 7M

OR

2. a) The probabilities that students A, B, C, D solve a problem are  $\frac{1}{3}, \frac{2}{5}, \frac{1}{5}$  and  $\frac{1}{4}$  respectively. If all of them try to solve the problem, what is the probability that the problem is solved. 7M
- b) Probability density function of a random variable X is  $f(x) = \frac{1}{2} \sin x$ , for  $0 \leq x \leq \pi$ . Find the mean, mode and median of the distribution and also find the probability between 0 and  $\frac{\pi}{2}$ . 7M

## UNIT-II

3. a) 20% of items produced from a factory are defective. Find the probability that in a sample of 5 chosen at random (i) none is defective (ii) one is defective (iii)  $P(1 < X < 4)$ . 7M
- b) Out of 800 families with 5 children each, how many would you expect to have (i) 3 boys (ii) 5 girls (iii) either 2 (or) 3 boys (iv) At least one boy. Assume that there is equal probability for boys and girls. 7M

OR

4. a) The life of electronic tubes of a certain type may be assumed to be normal distribution with mean 155 hours and S.D. 19 hours. Determine the probability that the life of tube (i) Between 136 hours to 174 hours (ii) Less than 117 hours (iii) More than 195 hours 7M
- b) Using Recurrence relation, find the probabilities when  $x = 0,1,2,3,4,5$ . If the mean of Poisson distribution is 3. 7M

## UNIT-III

5. 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 favor of the proposal are same, at 5%. 7M
- b) An ambulance service claims that it takes on the average less than 10 minutes to reach its destination in emergency calls. A sample of 36 calls has a mean of 11 minutes and a variance of 16 minutes. Test of significance at 0.05 level. 7M

OR

6. a) In a city A, 20% of a random sample of 900 school boys had a certain slight physical defect. In another city B, 18.5% of a random sample of 1600 school boys had the same defect. Is the difference between the proportions significant at 0.05 level of significance? 7M
- b) The mean life of a sample of 10 electric bulbs was found to be 1456 hours with S.D. of 423 hours. A second sample of 17 bulbs chosen from a different batch showed a mean life of 1280 hours with S.D. of 398 hours. Is there a significant difference between the means of two batches? 7M

<b>UNIT-IV</b>
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7. a) A random sample of 10 boys had the following I.Q's : 70, 120, 110, 101, 88, 83, 95, 98, 107 and 100.

(i) Do this data supports the assumption of a population mean I.Q of 100.

(ii) Find a reasonable range in which most of the mean I.Q. values of sample of 10 boys lie. 7M

- b) Two horses A and B were tested according to the time to run a particular track with the following results.

Horse A	28	30	32	33	33	29	34
Horse B	29	30	30	24	27	29	

Test whether the two horses have the same running capacity. 7M

**OR**

8. a) The nicotine contents in milligrams in two samples of tobacco were found to be as follows:

Sample A	24	27	26	21	25	-
Sample B	27	30	28	31	22	36

Can it be said that the two samples have come from the same normal population. 7M

- b) Fit a Poisson distribution to the following data and for its goodness of fit at level of significance 0.05.

x	0	1	2	3	4
Frequencies	419	352	154	56	19

7M

<b>UNIT-V</b>
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9. a) Explain the np- charts. 7M

- b) Show that the variance of queue is

$$V(n) = E(n^2) - [E(n)]^2$$
7M

**OR**

10. a) Construct a control chart for mean and range for the range for the following data on the basis of fuses, samples of 5 being taken every hour (each set of 5 has been arranged in ascending order of magnitude)

42	42	19	36	42	51	60	18	15	69	64	61
65	45	24	54	51	74	60	20	30	109	90	78
75	68	80	89	57	75	72	27	39	113	93	94
78	72	81	77	59	78	95	42	62	118	109	109
87	90	81	84	78	132	138	60	84	153	112	136

7M

- b) Patients arrive at a clinic according to a poisson distribution at the rate of 30 patients per hour. The waiting room does not accommodate more the 14 patients. Examination time per patient is exponential with mean rate 20 per hour.

i) Find the effective arrival rate at the clinic.

ii) What is the probability that an arriving patient will not wait. Will he find a vacant seat in the room?

iii) What is the expected waiting time until a patient is discharged from the clinic. 7M

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Hall Ticket Number :									
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**R-14**

**Code: 4GA41**

*II B.Tech. II Semester Regular Examinations May 2016*  
**Managerial Economics and Financial Analysis**  
( Information Technology )

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. Define Managerial Economics. "Managerial Economics helps in solving Managerial Problems". Do you agree with this statement? Support your answer.

**OR**

2. Define elasticity of demand. How do you measure the price elasticity of demand?

**UNIT-II**

3. Explain the Law of Returns to scale with appropriate examples.

**OR**

4. XYZ Company Ltd. Providing you the following data relating to 31<sup>st</sup> December 2015  
Sales : 1,00,000 units of Rs.10 each unit  
Variable cost : Rs. 6 per unit  
Fixed Cost : Rs.3,00,000 P.A

You are required to

- a) Calculate P/V ratio, Break –even point in rupees and Margin of Safety.
- b) What should be Sales if profit Rs.1, 50,000?
- c) What should be the profit if sales are Rs.12, 50,000?

**UNIT-III**

5. Define Perfect Competition. Describe the price output determination under perfect competition.

**OR**

6. Discuss the features, merits and demerits of sole trader form of organization

**UNIT-IV**

7. What is the need of capital for the business enterprises? And also explain various types of capital required.

**OR**

8. A company has two proposals for consideration (X and Y). The cost of the proposals in both the cases is Rs.5, 00,000 each. The company applies 12% discounting rate to evaluate the proposals. Cash flows( annual earnings) after tax but before depreciation are as under

Year	Proposal –X Rs.	Proposal –Y Rs.
1	1,50,000	50,000
2	2,00,000	1,50,000
3	2,50,000	2,00,000
4	1,50,000	3,00,000
5	1,00,000	2,00,000

Which proposal would you recommend under Net present value method?

<b>UNIT-V</b>
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9. Prepare Trading and Profit and Loss a/c and a Balance Sheet as on 31.3.20015 from the following Trial Balance of Ajith Trading & Co.

Debit	Rs.	Credit	Rs.
Salaries	6,000	Capital	25,000
Purchases	26,000	Sales	47,000
Trade expenses	1,000	Discount	200
Wages	7,800	Creditors	23,000
Carriage on purchases	400	Bills payable	6,800
Office expenses	500	Bank overdraft	7,000
Commission	600	Returns	1000
Bad debts	1,200		
Debtors	30,000		
Furniture	3,000		
Machinery	10,000		
Bills receivable	2,000		
Insurance	5400		
Opening stock	7,000		
Cash in hand	500		
Cash at bank	3,600		
Drawings	3,500		
Returns	1,500		
	<b>1,00,000</b>		<b>1,00,000</b>

**Adjustments :**

- (a) Closing stock Rs.11,000
- (b) Outstanding wages Rs.2,000
- (c) Prepaid insurance Rs.50
- (d) Depreciate machinery and furniture @ 5%.

**OR**

10. What are the uses of Ratio analysis? How the Liquidity and profitability Ratio's help the banker to evaluating financial position of the borrowing organization?

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Hall Ticket Number :

**R-14**

**Code: 4G141**

*II B.Tech. II Semester Regular Examinations May 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) Simplify the Boolean function  $f(w,x,y,z) = (0,5,11,14)$  and give the circuit realization of this function using logic gates. 7M
- b) Explain the function of a 3 to 8 line decoder using its associated signals and truth table. 7M

**OR**

2. a) List the techniques used to represent negative numbers in binary. Compare and contrast among them in terms of the range of numbers, considering N bits are used to represent a number. 7M
- b) State the limitations of using parity bit to detect errors. Explain the features of Hamming codes to locate the presence of errors. 7M

**UNIT-II**

3. a) What is a three-state buffer? Design a decoder and three-state buffer logic to implement multiplexing the least significant bit of 6 registers of a CPU onto a common bus line. 7M
- b) The 8-bit registers AR and BR, respectively are initialized with 10011001 and 00011110. Determine the values of each registers after executing the following sequence of micro-operations:  
AR  $\leftarrow$  AR  $\oplus$  BR  
BR  $\leftarrow$  AR  $\oplus$  BR  
AR  $\leftarrow$  AR  $\oplus$  BR 7M

**OR**

4. a) State and explain the phases of an instruction cycle of basic computer architecture. 10M
- b) Differentiate between an interrupt cycle and instruction cycle. 4M

**UNIT-III**

5. a) Explain the functional units of a microprogrammed control unit. 7M
- b) Discuss in detail the various fields of a microinstruction format and specify the control memory size. 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) Bring out the features of Booth's algorithm for multiplication. Explain the data flow among the functional units of a hardware implementation of Booth's algorithm. 10M
- b) Explain the terms 'mantissa' and 'exponent' with suitable examples. State the advantage of using biased exponent. 4M

**OR**

8. a) Explain the hierarchy of memory subsystem of a computer organization. 4M
- b) What is the use of 'tag' and 'index' fields in a cache memory organization? Assume a cache memory of size 1K words is to be mapped with 1 MB of physical address space. Determine the number of bits required for address the main memory and hence the number of bits for tag and index fields. 10M

**UNIT-V**

9. a) State the advantages and disadvantages of isolated I/O mapping when compared to memory mapped I/O. 4M
- b) List and describe the features of data transfer schemes between I/O and CPU. 10M

**OR**

10. a) State the advantages of instruction pipelining. Describe the difficulties that may arise due pipelining and cite the techniques to handle the same. 7M
- b) Explain the organization of SIMD array processor. 7M

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Hall Ticket Number :

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Code: 4G142

R-14

II B.Tech. II Semester Regular Examinations May 2016

## Software Engineering

( 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-II

- 1 a) For the scenario described below, which life cycle model would you choose? Give the reason why you would choose this model. You are interacting with the MIS department of a very large pharmaceutical company with multiple departments. They have a complex legacy system. Migrating the data from this legacy system is not an easy task and would take a considerable time. The pharmaceutical company is very particular about processes, acceptance criteria and legal contracts. 10M
- b) List out any five benefits of software engineering 5M

OR

2. a) A Coffee Vending Machine dispenses coffee to customers. Customers order coffee by selecting a recipe from a set of recipes. Customers pay for the coffee using coins. Change is given back, if any, to the customers. The 'Service Assistant' loads ingredients (coffee powder, milk, sugar, water, chocolate) into the coffee machine. The 'Service Assistant' adds a recipe by indicating the name of the coffee, the units of coffee powder, milk, sugar, water and chocolate to be added as well as the cost of the coffee. The Service Assistant can also edit and delete a recipe. Develop the use case diagram for the specification above. 6M
- a) For any two scenarios draw an activity diagram and sequence diagram. 8M

### UNIT-II

3. a) What are the components of the standard structure for the software requirements document? Explain in detail. 9M
- b) Write the software requirement specification of a distributed airline reservation system. 5M

OR

4. a) Differentiate verification and validation. Give an example. 8M
- b) Name the metrics for specifying Non-functional requirements. 6M

### UNIT-III

5. a) Explain clearly the concepts of pattern based software design. 9M
- b) Distinguish between class based and conventional components design 5M

OR

6. a) Explain Structured Analysis Design Tool (SADT) 7M
- b) Design a SADT 7M

**UNIT-IV**

7. Write short notes on
- a) Architecture design. 7M
  - b) Data acquisition system. 7M

**OR**

8. a) With a neat sketch draw the architecture model for an integration framework for CASE tool and explain them. 9M
- b) Design a black box testing for an Under Water submarine 5M

**UNIT-V**

9. a) Elaborate on Software Configuration Management 7M
- b) Write short notes on COCOMO estimation criteria. 7M

**OR**

10. a) Write a software review for a product. 8M
- b) Write a note on the ISO 9000 quality standards. 6M

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**Code: 4G144***II B.Tech. II Semester Regular Examinations May 2016***Object Oriented Programming Through JAVA**

( Common to CSE &amp; 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) What is byte code in Java? Explain. 4M
- b) Explain the working of JVM. 5M
- c) What are the advantages of Object Oriented Programming? 5M

**OR**

2. a) Write a Java program to reverse the given long integer. 7M
- b) Write a Java program to demonstrate constructor overloading. 7M

**UNIT-II**

3. a) Explain the uses of super keyword with suitable examples 7M
- b) Write a Java program that creates an abstract class called Dimension with area() method. Create two subclasses Rectangle and Triangle. Include appropriate methods for both the subclasses that calculate and display the area of rectangle and triangle. 7M

**OR**

4. a) What is a Java package? What is a CLASSPATH? Explain how to create and access java Package with an example. 7M
- b) Explain in detail the various forms of implementing interfaces. 7M

**UNIT-III**

5. a) What is an exception? How is an exception handled in Java? Explain the different types of exceptions in Java. 7M
- b) Compare the keyword *throw* and *throws*. Write a Java program to demonstrate *throw* and *throws* 7M

**OR**

6. a) What is a thread? What are daemon threads? Explain in detail the thread synchronization in Java. 7M
- b) Write a Java program that creates two threads. First thread prints numbers from 1 to 50 and the other thread prints the numbers from 100 to 50. 7M

**UNIT-IV**

7. a) What is a socket? What are the two important TCP sockets classes? Explain. 7M
- b) Write a Java program at server side that will receive a connection from client, send a string to the client and closes the connection. Explain the program. 7M

**OR**

8. a) What is a Java applet? What are the different stages in life cycle of an applet? Explain. 7M
- b) Write a Java program to pass the parameters to an applet. 7M

**UNIT-V**

9. a) What is an event handling? Name and explain any four event classes available in *java.awt.event* package. 7M
- b) Write a Java program to draw a circle inside a rectangle. 7M

**OR**

10. a) What is a swing? What are the differences between AWT and Swing? Describe in detail about various components in Swing. 7M
- b) Explain in detail the swing controls *TabbedPanels* and *ScrollPane* with suitable Java code examples. 7M

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**Database Management Systems**

(Common to CSE &amp; 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) Compare and contrast file systems with database systems. 8M  
 b) Define instances and schemas of database? 6M

**OR**

2. a) Explain about types of database languages with syntax and example? 7M  
 b) Explain different types of database users and write the functions of DBA? 7M

**UNIT-II**

3. a) Distinguish strong entity set with weak entity set? Draw an ER diagram to illustrate weak entity set? 7M  
 b) Discuss about the concept design with the ER Model? 7M

**OR**

4. a) Discuss about the logical database design? 7M  
 b) Explain about different types of integrity constraints? 7M

**UNIT-III**

5. a) Explain about union and intersect operator  
 i. Write a query to find the names of sailors who have reserved boat 103 and color is green.  
 ii. Write a query to find the names of sailors who have reserved a red or a green boat. 7M  
 b) Explain briefly about joins and its types with examples? 7M

**OR**

6. a) Discuss different types of aggregate operators with examples in SQL? 7M  
 b) Discuss about active databases and write an example for trigger? 7M

**UNIT-IV**

7. a) Illustrate redundancy and the problems that it can cause? 7M  
 b) Explain about properties of decomposition? 7M

**OR**

8. a) Explain about schema refinement in database design? 6M  
 b) Compare and contrast BCNF with 3NF? 8M

**UNIT-V**

9. a) Explain ACID properties and illustrate them through examples? 7M  
 b) Illustrate concurrent execution of transaction with examples? 7M

**OR**

10. a) Compare I/O costs for all file organizations? 6M  
 b) Explain B+ trees? Discuss about this dynamic index structure? 8M

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