

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

MCA I Year II Semester (R18) Regular End Semester Examinations – June 2019
(Regulations: R18)

PROBABILITY & STATISTICS

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either Part-A or B only

Q.1(A) State Bayes theorem. 12M

In a bolt factory machines A, B, C manufacture 25%, 35% and 40% of the total of their output 5%, 4% and 2% are defective bolts. A bolt is drawn at random from the production and is found to be defective. What is the probability that it was
(i) manufactured by machine A (ii) manufactured by machines B ?

OR

Q.1(B) (i) Define distribution function or cumulative distribution in discrete case and its properties. 12M

(ii) If $E(X) = 3$, $E(X^2) = 25$ then find (i) $E(3X - 8)$ (ii) $V(X)$ (iii) $V(3X + 8)$

Q.2(A) The joint density for (X, Y) is given by $f(x, y) = xy e^{-x} e^{-y}$, $x > 0, y > 0$ 12M

(i) Find the marginal densities for X and Y (ii) $\text{Cov}(X, Y)$ (iii) Are X and Y independent? (iv) Find $P(X < 1)$.

OR

Q.2(B) The following data represent carbon dioxide (CO_2) emissions from coal-fired boilers (in units of 1000 tons) over a period of years between 2010 and 2016. The independent variable (year) has been standardized to yield the following table: 12M

Year (x)	1	2	3	4	5	6	7
CO_2 emission	910	680	520	450	370	380	340

(i) Estimate the linear regression equation $\mu_{y|x} = \beta_0 + \beta_1 x$.

(ii) Estimate the average CO_2 emission from coal-fired boilers for the year 2018.

Q.3(A) (i) The probability that a pen manufactured by a company will be defective is $1/10$. If 12 such pens are manufactured, find the probability that (a) exactly two (b) at least two (c) none will be defective. (6+6)
M

(ii) Geophysicists determine the age of a zircon by counting the number of uranium fission tracks on a polished surface. A particular zircon is of such an age that the average number of tracks per square centimeter is five. What is the probability that a 2-cm square sample of this zircon will relieve at most three tracks, thus leading to an underestimation of the age of the material?

OR

Q.3(B) (i) Define p.d.f. for Uniform distribution. Find mean and variance? 12M

(ii) Let X be a Gamma random variable with $\alpha = 3, \beta = 4$
a) What is the expression for the density for X ?

- b) What is the Moment generating function for X?
- c) Find μ, σ^2, σ

Q.4(A) Explain the terms (i) Null hypothesis (ii) Alternative hypothesis (iii) Level of significance (iv) Critical region 12 M

OR

Q.4(B) (i) A machinist is making engine parts with axle diameters of 0.700 inch. A random sample of 10 parts shows a mean diameter of 0.742 inch with a standard deviation of 0.040 inch. Construct 95% confidence limits for true mean axle diameter. (6+6) M

(ii) A new computer network is being designed. The makers claim that it is compatible with more than 99% of the equipment already in use.

- a. Set up the null and alternative hypothesis needed to get evidence to support this claim.
- b. A sample of 300 programs is run, and 298 of these run with no changes necessary. That is, they are compatible with the new network. Can H_0 be rejected?

Q.5(A) The following table shows the lives in hours of four brands of electric lamps: 12M

Brand

A: 1610, 1610, 1650, 1650, 1680, 1700, 1720, 1800

B: 1580, 1640, 1640, 1700, 1750

C: 1460, 1550, 1600, 1620, 1640, 1660, 1740, 1820

D: 1510, 1520, 1530, 1570, 1600, 1680

Perform ANOVA and test the homogeneity of the mean lives of the four brands of lamps.

OR

Q.5(B) Explain ANOVA with Two –way classification. 12M

*** END***

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Question Paper Code: 18MCAP103

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

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MCAI Year II Semester (R18) Regular End Semester Examinations –June 2019

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PROGRAMMING IN C

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.

In Q.no 1 to 5 answer either Part-A or B only

- Q.1(A) i. What is Identifier? List out the rules for declaring an identifier. 6M
ii. Explain structure of the C program with a suitable example. 6M
- OR**
- Q.1(B) i. Discuss different types of operators of C programming. 6M
ii. What is operator precedence? Give precedence hierarchy of each operator. 6M
-
- Q.2(A) i. Write about control structure in C? 2M
ii. Explain the nested control structure with the help of suitable examples. 10M
- OR**
- Q.2(B) Explain simple if-else and nested if-else statements with their syntaxes and examples. 12M
-
- Q.3(A) i. State in your own words about call by value and call by reference with suitable examples. 6M
ii. Write a C program for adding two matrices. 6M
- OR**
- Q.3(B) List out and explain all the storage classes available in C language. 12M
-
- Q.4(A) i. Explain dynamic memory allocation with an example. 6M
ii. Define union. Explain the declaration and initialization of union. 6M
- OR**
- Q.4(B) i. Explain pointer to an array with an example. 6M
ii. Explain the process of passing pointer and array as an argument to a function. 6M
-
- Q.5(A) i. Define file handling? 2M
ii. What are the modes to open a file in C? Explain them with examples. 10M
- OR**
- Q.5(B) Write a C program that reads contents of a file and displays the number of characters, tabs, and blank spaces. 12M

*** END***

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Question Paper Code: 18MCAP104

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

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MCA I Year II Semester (R18) Regular End Semester Examinations – June 2019

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DATABASE MANAGEMENT SYSTEMS

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either Part-A or B only

Q.1(A) Explain in detail with neat diagrams about different types of database models. 12M

OR

Q.1(B) Explain the notational conventions used in ER model. Construct ER model for student administration system. 12M

Q.2(A) Explain DDL and DML types of SQL commands. Give the syntax for the following SQL commands: SELECT, INSERT INTO. 12M

OR

Q.2(B) (i) What is a View? Explain the syntax. Explain the different types of views. (6+6)
(ii) Explain any two fundamental operations of relational algebra with examples. M

Q.3(A) Explain about inference rules for functional dependencies and also explain about second normal form. 12M

OR

Q.3(B) Explain the following with an example. (6+6)
(i) Lossy decomposition (ii) Non loss decomposition M

Q.4(A) What is a Transaction? Explain the properties of the transaction. Explain the States of the transaction with a neat sketch. 12M

OR

Q.4(B) (i) Discuss the validation concurrency control technique. (6+6)
(ii) What is Locking? Explain the 2 Phase locking technique and its types. M

Q.5(A) Explain the syntax for creating and compiling a procedure with example 12M

OR

Q.5(B) Explain the two types of exception defined in PL/SQL 12M

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Question Paper Code: 18MCAP105

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OPERATING SYSTEMS

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either Part-A or B only

Q.1(A) What is Operating System? Explain the functions and objectives of Operating System. 12M

OR

Q.1(B) What is Virtual Machine? Explain with neat diagram. 12M

Q.2(A) Explain the UNIX structure and environment. 12M

OR

Q.2(B) Write short note on the following 12M

- i) Grep Command
- ii) Vi Editor

Q.3(A) Explain the shell responsibilities in BASH. 12M

OR

Q.3(B) Discuss debugging shell scripts in detail. 12M

Q.4(A) Describe various scheduling algorithms with examples. 12M

OR

Q.4(B) What is Deadlock? Discuss Deadlock Recovery Process in detail. 12M

Q.5(A) Differentiate between Logical Address Space and Physical Address Space. 12M

OR

Q.5(B) Define file and Describe the file accessing methods in detail. 12M

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Question Paper Code: 18MCAP106

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SOFTWARE ENGINEERING

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either Part-A or B only

Q.1(A) Explain the waterfall and spiral model for software life cycle. Discuss various activities in each phase. 12M

OR

Q.1(B) What is project scheduling? Discuss how software project scheduling helps in timely release of a product. 12M

Q.2(A) What is Software Requirement Specification (SRS)? Explain in detail about the various components of SRS. 12M

OR

Q.2(B) Explain the requirement modeling for Web Apps. 12M

Q.3(A) What are the characteristics of a good design? Describe different types of coupling and cohesion. How design evaluation is performed? 12M

OR

Q.3(B) Explain the metrics for requirement model. 12M

Q.4(A) What are the various testing strategies to software testing? Discuss in detail. 12M

OR

Q.4(B) Discuss about elements of SQA. Write the different types of software review techniques in detail. 12M

Q.5(A) Explain the various project estimation in detail. 12M

OR

Q.5(B) What is risk? Explain the different types of risks that occurs from initialization of phase of a software development to product delivery. 12M

*** END***