

D5BMT2306

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Reg.No.....

Name:

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION NOVEMBER 2025

(Regular / Improvement / Supplementary)

MATHEMATICS

GMAT5D04T: MATHEMATICS FOR DECISION MAKING

(Open Course)

Time: 2 Hours

Maximum Marks: 60

**SECTION A: Answer the following questions. Each carries 2 marks
(Ceiling 20 Marks)**

1. Write a note on classification of data.
2. A movie's length represents the first quartile for movies showing at a theatre. Make an observation about the movie's length.
3. Name each level of measurement for which data can be quantitative.
4. Let A and B events such that $P(A \cup B) = 0.9$, $P(A) = 0.6$, $P(B) = 0.5$. Find $P(A/B)$.
5. The objective of a 9×9 Sudoku number puzzle is to fill the grid so that each row, each column, and each 3×3 grid contain the digits 1 to 9. How many different ways can the first row of a blank 9×9 Sudoku grid be filled?
6. You ask for a student's age at his or her last birthday. Determine the number of outcomes in the event. Then decide whether the event is simple or not. Explain your reasoning.
Event D: The student's age is 20.

(PTO)

7. Determine whether the events are mutually exclusive. Explain your reasoning.
Event A: Randomly select a blood donor with type O blood.
Event B: Randomly select a female blood donor.
8. The board of directors of a company has 12 members. One member is the president, another is the vice president, another is the secretary, and another is the treasurer. How many ways can these positions be assigned?
9. Define a random variable. When do you say that a random variable is continuous?
10. Write the Binomial probability formula.
11. Find the mean, variance, and standard deviation of the binomial distribution with the given values of n and p .
 $n = 316$, $p = 0.82$
12. Find $P(1)$ using the geometric distribution when $p = 0.45$.

**SECTION B: Answer the following questions. Each carries 5 marks
(Ceiling 30 Marks)**

13. Find the mean, the median, and the mode of the sample ages of students in a class given. Which measure of central tendency best describes a typical entry of this data set? Are there any outliers?
20, 20, 20, 20, 20, 20, 21, 21, 21, 21, 22, 22, 22, 23, 23, 23, 23, 24, 24, 65
14. Determine the level of measurement of the given data set. The top five fiction books on The New York Times Best Sellers List on December 23, 2012 are listed.
1. Threat Vector 2. Gone Girl 3. The Forgotten 4. The Racketeer 5. Private London
15. You are purchasing a new car. The possible manufacturers, car sizes, and colors are listed.
Manufacturer: Ford, GM, Honda
Car size: compact, midsize
Color: white (W), red (R), black (B), green (G)
How many different ways can you select one manufacturer, one car size, and one color? Use a tree diagram to check your result.

16. Two cards are selected, without replacing the first card, from a standard deck of 52 playing cards. Find the probability of selecting a king and then selecting a queen.
17. Find the probability of being dealt 5 diamonds from a standard deck of 52 playing cards..
18. Determine whether the random variable x is discrete or continuous. Explain your reasoning.
 - (a) Let x represent the number of Fortune 500 companies that lost money in the previous year.
 - (b) Let x represent the volume of gasoline in a 21-gallon tank.
19. In San Francisco, California, about 44% of the days in a year are clear. Find the mean, variance, and standard deviation for the number of clear days during the month of May. Interpret the results and determine any unusual events.

SECTION C: Answer any 1 question. The question carries 10 marks.

20. Construct a frequency distribution for the data set using the indicated number of classes. In the table, include the midpoints, relative frequencies, and cumulative frequencies. Which class has the greatest frequency and which has the least frequency?
Number of classes: 5
Data set: Times (in minutes) spent reading a political blog in a day
7, 39, 13, 9, 25, 8, 22, 0, 2, 18, 2, 30, 7, 35, 12, 15, 8, 6, 5, 29, 0, 11, 39, 16, 15.
21. In a survey, U.S. adults were asked to identify what devices they use to access social media. The result say that 46% of adults use a cell phone to access social media. Seven adults who participated in the survey are randomly selected and asked whether they use a cell phone to access social media. Construct a binomial probability distribution for the number of adults who respond yes.

(1 × 10 = 10 Marks)