D5BMT2106 **(Pages: 2)** **Name:.....**

Reg. No:.....

FIFTH SEMESTER U.G DEGREE EXAMINATION, NOVEMBER 2023

(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. What is the difference between a parameter and a statistic?
2. Explain the terms Nominal Level and Ordinal Level of measurements with one example for each.
3. What is the difference between a census and a sampling ?
4. A data of marks of 30 students is given : 507, 389, 305, 291, 336, 310, 514, 442, 373, 428, 387, 454, 323, 441, 388, 426, 411, 382, 320, 450, 309, 416, 359, 388, 307, 337, 469, 351, 422, 413. Prepare a suitable frequency distribution table so that there will be 8 classes of equal length.
5. Write the sample space of tossing a fair coin on a particular day of a week.
6. In how many ways can four people be seated on a bench along a row ?
7.

Ages	20-30	30-40	40-50	50-60	More than 60	Total
Frequency	158	319	259	202	62	1000

   From this data of subscribers of a local library, find the probabilty that

   (a) a subscriber belongs to the age group 30-50.

   (b) a subscriber belongs to the age group below 40.
8. Write the formula for calculating ${}_nP_r$, the number of permutations of n items taken r at a time.
9. What is a random variable ? Give example of a continuous random variable.
10.

Value	1	2	3	4	5	6
Probability	3k	5k	6k	3k	2k	k

    From this discrete probability distribution, find the value of k.
11. If a random variable takes values 0, 1, 2, 3 and 4 with respective probabilities 0.4, 0.2, 0.2, 0.1 and 0.1, then find its mean.
12. Write the formula for probability in binomial probability distribution. Explain the terms used.

(PTO)

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

13. Write a note on any three different techniques of sampling.

14.

Age of Residents	0-14	15-29	30-44	45-59	60-74	75-89	Total
Frequency	54	62	66	48	37	33	300

Find the mean age of residents of the society from the data.

15. Find the mean and variance of the first six even numbers 2, 4, 6, 8, 10 and 12.

16. From a well suffled pack of playing cards, one card is drawn at random. Find the probability that the card drawn is

    (a) a red card or a face card.

    (b) not a number card.

    (c) a king.

17. Of the cartons produced by a company, 5% have a puncture, 8% have a smashed corner, and 0.4% have both a puncture and a smashed corner. Find the probability that a randomly selected carton has a puncture or has a smashed corner.

18. Find the number of different four digit odd numbers formed using the digits 0, 1, 2, 3, 7, 8 and 9 where the digits are not repeated.

19.

Defects	0	1	2	3	4	5
Probability	0.250	0.298	0.229	0.168	0.034	0.021

The table describes number of defects per batch of executive chairs inspected. Find the mean and variance.

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

20. The table describes the travel time to work in minutes for a class of workers.

Class	0-9	10-19	20-29	30-39	40-49	50-59	60-69
Frequency	188	372	264	205	83	76	32

Find the class width, class mid points and class boundaries.
Represent the data by a histogram and draw the frequency polygon.

21. It is believed that a girl child is twice probable than a boy child for couples undergoing a particular treatment.
Which type of probability distribution is associated with this ?
When 6 such couples are considered, find the proability that

    (a) girl child is born to at least five coules.

    (b) girl child is born to at most one couple.

(*There is no need to write the answer in the decimal form.*)

(1 x 10 = 10 Marks)