

## FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2013

(UG—CCSS)

Mathematics—Open Course

MM 5D 02—MATHEMATICS FOR NATURAL SCIENCES

Time : Three Hours \_\_\_\_\_

Maximum : 30 Weightage

*Objective type Questions.*  
*Answer all twelve questions.*

- For any set A,  $A \cup A$  is :
  - A.
  - U.
  - $A$ .
  - $A$ .
- When 10 is subtracted from all values of a data, its S.D. is :
  - Decreased by 10.
  - Increased by 10.
  - Not affected.
  - Multiplied by 10.
- If 25 % items of a data are less than 10 and 25 % are more than 40, then Quartile deviation is :
  - 15.
  - 30.
  - 25.
  - 50.
- In a discrete series having  $2K + 1$  observations, median is :
  - $K^{\text{th}}$  value.
  - $(K + 1)^{\text{th}}$  value.
  - $\left(\frac{2K + 1}{2}\right)^{\text{th}}$  value.
  - $\left(\frac{K + 2}{2}\right)^{\text{th}}$  value.
- For a binomial distribution :
  - Mean < variance.
  - Mean = Variance.
  - Mean > variance.
  - Mean = S.D.
- If  $f(x) = \frac{x+3}{x-3}$ , then  $f(3) =$ 
  - 6.
  - 0.
  - 3.
  - Not defined.

Turn over

7. Mean deviation is minimum when deviations are taken about \_\_\_\_\_
8. For a **mesokurtic** distribution, Co-efficient of kurtosis [ $\beta_2 =$  \_\_\_\_\_]
9. If A and B are independent events then  $P(A \cap B)$
10. A normal distribution with mean = 0 and SD = 1 is called \_\_\_\_\_
11. A fair coin is tossed twice. The probability of getting two heads is \_\_\_\_\_
12. If first two raw moments of a distribution are 2 and 12 respectively then the second central moment is \_\_\_\_\_

(12 x  $\frac{1}{4}$  = 3 weightage)

*Short Answer Questions.*  
 Answer **all** nine questions.

13. State any **two** limitations of AM.
14. Find two numbers whose AM = 10 and GM =
15. For a moderately skewed data, mean = 28 and Median = 30. Find Mode.
16. State the addition theorem on probability for two events.
17. For a binomial distribution mean = 12 and variance = 9, find **p**.
18. State any **four** properties of Normal distribution.
19. What is the relation between binomial and Poisson distribution.
20. A discrete random variable X has the following probability distribution :

X	0	1	2	3	4
Prob.	0.1	0.2	0.3	0.3	0.1

find E (X).

21. Sketch the graph of  $Y = 2x - 3$ .

4.

(9 x 1 = 9 weightage)

*Short Essay Questions.*  
 Answer any **five** questions.

22. Draw a histogram to the following data :

Class	0-10	10 - 20	20 - 30	30 - 40	40 - 50	60 - 60
Frequency	: 12	15	20	18	14	10

23. Calculate the quartile deviation of the following data :

<i>Class</i>	20 - 39	40 - 59	60 - 79	80 - 99	100 - 119
<i>Frequency</i>	8	19	28	18	7

24. First three moments of a data about 5 are  $-2$ ,  $10$  and  $-25$  respectively. Calculate first three central moments.

25. The mean grade points obtained by 25, 30 and 35 students in three classes are 32, 27 and 26 respectively. What is mean grade point of all classes taken together.

26. Find mean deviation about median :

$x_i$	3	6	9	12	13	15
$f_i$	3	4	5	2	4	5

27. A fair die is thrown twice. Find the probability of getting

(a) A sum 7.

(b) A sum greater than 10.

28. A problem is given to two students whose chances of solving it are  $\frac{2}{5}$  and  $\frac{1}{4}$  respectively. What is the probability that the problem will be solved?

(x 2 = 10 weightage)

*Essay Questions.*

*Answer any two questions.*

29. Calculate Karl Pearson's coefficient of skewness.

<i>Marks</i>	:	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
<i>No. of Students</i>	:	3	5	12	15	26	20	12	7

30. -Draw **Ogives** to the following data and locate median :

<i>Class</i>	16 - 20	21 - 25	26 - 30	31 - 35	36 - 40	41 - 45	46 - 50	51 - 55
<i>Frequency</i>	5	6	12	14	26	12	16	9

31. A fair die is tossed 5 times. Let X denote the number of times '3' appears. Find the probabilities for X= 0, 1, 2, 3, 4 and 5.

(2 x 4 = 8 weightage)