D 70945 (Pages : 4) Name.....

Reg. No.....

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2014

(UG—CCSS)

Open Course—Mathematics

MM 5D 02—MATHEMATICS FOR NATURAL SCIENCES

Time : Three Hours Maximum : 30 Weightage

Part A

Answer **all** *questions.*
Each question carries $\frac{1}{4}$ *weightage.*

1. For a set A, $A \cup A$ =
   (a) A. (b) U.
   (c) 4). (d) $\mathcal{A}$.
2. If A c B, then A n B=
   (a) A. (b) B.
   (c) $\mathcal{A} \cup B$. (d) A
3. The class interval of the continuous grouped data 30-33 34-37 38-41 is :
   (a) 3.5. (b) 3.
   (c) 4. (d) 4.5.
4. Sum of algebraic deviations of a data from its A.M. is :
   (a) Mean deviation. (b) $\bar{x}$.
   (c) 1. (d) Zero.
5. The empirical relation between mean, median and mode is :
   (a) Mean – Mode = Mean – Median.
   (b) 3 Mean – 2 Median = Mode.
   (c) Mean – Mode = 3 (Mean—Median).
   (d) Median – Mode = 2 (Mean—Median).
6. The most repeated value in a data is called :
   (a) Mode. (b) Median.
   (c) H.M. (d) G.M.

Turn over

7. Sum of squares of the deviations is minimum when deviations are taken from :

(a) Mode. (b) Mean.

(c) Median. (d) H.M.

8. If the minimum value in a set of values is 12 and its range is 46, then the maximum value of the set is :

(a) 34. (b) 58.

(c) 52. (d) 40.

9. The probability of getting a white ball from a box containing 6 white and 4 black balls is :

(a) $\frac{6}{4}$. (b) $\frac{2}{\ }$.

(c) $\frac{6}{10}$ (d) $\frac{2}{\ }$.

10. For a Poisson distribution :

(a) Mean = Variance. (b) Mean = 2 Variance.

(c) Mean < Variance. (d) Mean > Variance.

11. For two events A and B, P (A /B) =

(a) $\frac{P(A \cap B)}{P(A)}$ (b) $\frac{P(A \cap B)}{P(B)}$

(c) $\frac{P(A \cup B)}{P(A)}$ (d) $\frac{P(A \cup B)}{P(B)}$

12. The first central moment of a distribution is :

(a) One. (b) AM.

(c) Zero. (d) Median.

(12 x ¼ = 3 weightage)

Part B

Answer **all** *questions.*

Each question carries 1 weightage.

13. Define null set. Give an example.

14. Define a discrete variable.

15. Define Median.

16. What are Percentiles ?

17. If S = {1, 2, 3, 4, 5, 6, 7, 8}, A = {1, 3, 4, 5, 6 B = {4, 6, 7, 8} find A u B and A n B .

18. State the classification of probability.

19. Define mutually exclusive events.

20. Define Kurtosis.

21. Define probability distribution of a discrete random variable.

(9 x 1 = 9 weightage)

Part C

Answer any five *questions.*

Each question carries 2 *weightage.*

22. Sketch the graph of $Y = 3X - 4$.

23. A variable takes values 8,10,15,18,20 with frequencies 2,5,8,4,1 respectively. Find its AM.

24. Find the SD of 5,8,10,12,15.

25. Distinguish between raw moments and central moments.

26. Define independent events.

If P (A) = $\frac{1}{2}$ and P (B) = find P (A v B) if A and B are independent.

27. From a box containing 5 white and 3 black balls, 2 balls are drawn at random. What is the probability that :

(i) Both are white. (ii) One is White.

28. State the properties of Normal distribution.

(5 x 2 = 10 weightage)

Part D

Answer any two *questions.*

Each question carries 4 *weightage.*

29. Find the 10-90 percentile range of the following data :

Class	5-9	10-14	15-19	20-24	25-29	30-34	35-39
Frequency	10	30	80	50	40	20	20

30. A random sample of 100 items has the following distribution :

Class	30-35	35-40	40-45	45-50	50-55	55-60	60-65
Frequency	3	12	21	28	19	12	5

Compute the mean and standard deviation.

31. (a) A discrete random variable X has the following probability distribution :

X	:	1	2	3	4	5
P *(x)*	:	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{12}$

Find E *(x)*.

(b) If 20 % of the bolts produced by a machine are defective, determine the probability that in a sample .of 4 chosen at random at least one is defective.

(2 x 4 = 8 weightage)