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FIFTH SEMESTER B.A./B.Sc./B.Com./B.B.A. DEGREE (SUPPLEMENTARY/ IMPROVEMENT) EXAMINATION, NOVEMBER 2016

(UG–CCSS)

Open Course

MM 5D 02—MATHEMATICS FOR NATURAL SCIENCES

Time : Three Hours

Maximum : 30 Weightage

Part A

Answer **all** *questions.*

Each question carries ¼ weightage.

1. If number of elements in set A is 4, then number of subsets of A is :

    (a) 4.

    (b) 8.

    (c) 16.

    (d) 15.

2. $(A \cup \overline{\quad} =$

    (a) $A' \cup B'$.

    (b) $A' \cap B'$.

    (c) $(A \cap B)'$.

    (d) $A' \cap B$.

3. The difference between upper and lower limits of a class is :

    (a) Class mark.

    (b) Class limit.

    (c) Class interval.

    (d) Class boundary.

4. The average which we cannot use when there are zero values in a data is :

    (a) G.M.

    (b) A.M.

    (c) Median.

    (d) Mode.

5. The GM of 8 and 18 is :

    (a) 26.

    (b) 144.

    (c) 13.

    (d) 12.

6. For a positively skewed distribution :

    (a) Mean > Mode.

    (b) Mode > Mean.

    (c) Median < Mode.

    (d) Median > Mean.

7. The moment measure of kurtosis is :

    (a) $\dfrac{P4}{\mu_2}$

    (b) $\dfrac{\mu_4}{P2^2}$

    (c) $\dfrac{\mu_3}{\mu_2^2}$.

    (d) $P2$

Turn over

8. The relation between variance and standard deviation is :

    (a) $SD = (Var)\hat{}$.   (b) $SD = \overline{Var}$.

    (c) $SD = \pm\ Var$.   (d) $Var = \sqrt{SD}$.

9. If two events A and B have no element in common, they are called :

    (a) Mutually exclusive.   (b) Independent.

    (c) Exhaustive.   (d) Complementary to each other.

10. The probability of getting a sum 8 when two dice are thrown is :

    (a) $\dfrac{3}{36}$ (b) $\dfrac{8}{36}$.

    (c) $\dfrac{1}{6}$.   (d) $\dfrac{5}{36}$

11. For a binomial distribution :

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

    (c) Mean = $\sqrt{Variance}$.   (d) Mean > Variance.

12. A normal distribution is :

    (a) Leptokurtic.   (b) Positively skewed.

    (c) Symmetric.   (d) Negatively skewed.

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

Part B

*Answer **all** questions.*

Each question carries 1 weightage.

13. **Define** complement of a set.

14. Write all subsets of A = {x, y, z}.

15. What is the empirical relation between mean, median and mode?

16. Define Range.

17. Define Quartile deviation.

18. The first two raw moments of a data are 6 and 45.2 respectively. Find the second central moment.

19. State the frequency definition of Probability.

20. State the addition Rule of probability.

21. What is the probability of selecting two red balls from a box containing 5 red and 4 white balls.

(9 x 1 = 9 weightage)

Part C
Answer any **five** *questions.*
Each question carries **2** *weightage.*

22. **Sketch the graph of y = 2x – 3.**

23. **Find the mean deviation about median of :**

    3, 9, 5, 3, 12, 10, 18, 4, 7, 19, 21.

24. **The mean monthly salary of all employees of a company is Rs. 20,000. The mean salary of male employees is Rs. 20,800 and that of females is 16,800. If there are 20 females in the factory, find the number of males.**

25. **Write the relation between first four central moments and raw moments.**

26. **Distinguish between absolute and _relative measures of dispersion.**

27. **The probability distribution of a random variable** *x is* :

0	1	2	3	4
P (x) : $\frac{1}{12}$	$\frac{1}{8}$	$\frac{3}{4}$	$\frac{1}{6}$	

    Find E *(x)* **and E (x)^2.**

28. **5% of the items produced by a factory are defective. Using Poisson approximation, find the probability of getting one or two defectives of 40 items are inspected.**

(5 x 2 = 10 weightage)

Part D
Answer any **two** *questions.*
Each question carries **4** *weightage.*

29. **Obtain the mean and standard deviation of the following data :**

Class :	0 – 5	5 -10	10 -15	15 – 20	20 – 25	25 – 30	30 – 35	35 – 40
Freq. :	2	5	7	13	21	16	8	3

30. **(a) Define conditional probability and independence of events.**

    (b) A problem is given to two students A and B whose chances of solving it are $\frac{2}{5}$ and $\frac{3}{7}$ respectively. What is the probability that the problem will be solved?

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

Class :	10 -19	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69	70 – 79
Freq. :	4	12	32	20	16	8	8

(2 x 4 = 8 weightage)