

Ques Setter	
Moderator	
VP	

Subject Code: 

1	3	0
---	---	---

Set: 

C
---

[N.B. – Answer all the questions. Each question carries ONE mark. Block fully, with a black ball- point pen, the circle of the letter that stands for the correct/best answer in the “Answer sheet” for the Multiple Choice Questions Examination.]

**Candidates are asked not to leave any mark or spot on the question paper.**

- If  $n$  in  $P_n = P_o(1 + r)^n$  is split into infinite parts and  $r$  adjusted accordingly, what type of growth do we have?  
 (a) Simple growth      (b) Arithmetic growth      (c) Exponential growth      (d) Geometric growth
- The dependency ratio of a town is 0.60. If there are 40,000 people aged 15–64, how many individuals are considered dependents?  
 (a) 22,000      (b) 26,500      (c) 24,000      (d) 25,000
- $E(4x+2Y) = ?$   
 (a)  $E(X) - E(Y)$       (b)  $4E(X) + 2E(Y)$       (c)  $2E(X) + 4E(Y)$       (d)  $E(X) \times E(Y)$

**Answer the next THREE questions based on the following information**

X	1	2	3
P(x)	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{3}$

- What is the value of  $E(X)$ ?  
 (a) 2.00      (b) 2.17      (c) 2.33      (d) 2.50
- What is the value of  $E(X^2)$ ?  
 (a) 5.17      (b) 4.83      (c) 5.00      (d) 5.33
- What is  $V(3X)$ ?  
 (a) 9.67      (b) 11.33      (c) 12.67      (d) 4.25
- If  $E(X^2) = 45$  and  $V(X) = 21$ , what is  $E(X)$ ?  
 (a)  $4\sqrt{3}$       (b)  $2\sqrt{6}$       (c)  $6\sqrt{2}$       (d)  $7\sqrt{2}$
- What is the Standard Deviation of Binomial Distribution?  
 (a)  $np$       (b)  $npq$       (c)  $nq$       (d)  $\sqrt{npq}$
- In a binomial distribution with  $p = 0.5$  and  $P(2) = 0.1093$ , what is  $n$ ?  
 (a) 15      (b) 1      (c) 8      (d) 12
- Consider a binomial experiment. Which of the following statements is/are true?
  - Each trial results in exactly one of two possible outcomes.
  - The expected value is always greater than the variance.
  - The probability mass function of a binomial distribution can be computed using the binomial formula.**Which one is correct?**  
 (a) i and ii      (b) i and iii      (c) ii and iii      (d) i, ii and iii

**Answer the next two questions based on the following information**

The mean of a Binomial distribution is 40 and standard deviation 6.

11. **What is the value of  $n$ ?**  
 (a) 200 (b) 300 (c) 400 (d) 500
12. **What is the value of  $1 - q$ ?**  
 (a) 0.5 (b) 0.2 (c) 0.3 (d) 0.1
13. **What is the value of  $P(X \leq 40)$ ?**  
 (a) 0.52 (b) 0.54 (c) 0.45 (d) 0.91
14. **Which one is true of the parameter ( $m$ ) of Poisson Distribution?**  
 (a)  $m = 0$  (b)  $m < 0$  (c)  $m > 0$  (d)  $m = 1$
15. **For a Poisson variate  $X$ , if  $P(2) = P(3)$ , what is the variance?**  
 (a) 3 (b) 4 (c) 5 (d) 6
16. **A number is randomly chosen from a list of 10 consecutive positive integers. What is the probability that the number selected is greater than the average (arithmetic mean) of all 10 integers?**  
 (a)  $\frac{1}{3}$  (b)  $\frac{3}{4}$  (c)  $\frac{4}{10}$  (d)  $\frac{1}{2}$
17. **Let  $S = \{1, 2, 3, \dots, 10\}$ . Which of the following pairs of events are disjoint?**  
 (a)  $A$ : Multiples of 3,  $B$ : Multiples of 5  
 (b)  $A$ : Prime numbers,  $B$ : Even numbers greater than 2  
 (c)  $A$ : Numbers less than 4,  $B$ : Numbers greater than 6  
 (d) None of the above
18. **The probability of rain is  $\frac{1}{6}$  for any given day next week. What is the probability that it will rain on both Monday and Tuesday?**  
 (a)  $\frac{1}{6}$  (b)  $\frac{1}{36}$  (c)  $\frac{5}{6}$  (d)  $\frac{1}{17}$
19. **If  $P(A) = 0.2$ ,  $P(B) = 0.3$ , and  $P(A \cup B) = 0.4$ , what is  $P(A \cap B)$ ?**  
 (a) 0.9 (b) 0.2 (c) 0.3 (d) 0.1
20. **If two fair coins are tossed together, what is the probability of getting at least one head?**  
 (a)  $\frac{1}{2}$  (b)  $\frac{1}{3}$  (c)  $\frac{3}{4}$  (d)  $\frac{1}{4}$
21. **A die is thrown thrice and the number of times a 6 appears is denoted by  $X$ . How many possible values can  $X$  take?**  
 (a) 1 (b) 2 (c) 3 (d) 4
22. **For a continuous random variable  $X$  with PDF  $f(x) = k(2 - x)$  defined on  $0 \leq x \leq 2$ :**  
 i. The value of  $k$  is 1.  
 ii. The cumulative distribution function  $F(x) = x - \frac{x^2}{4}$  for  $0 \leq x \leq 2$ .  
 iii.  $P(1 < X < 2) = \frac{3}{8}$   
**Which one is correct?**  
 (a) i (b) i and ii (c) ii (d) i, ii and iii

**Answer the next three questions based on the following information**

$X$	0	1	2	3
$P(X)$	$\frac{1}{4}$	$m$	$\frac{1}{3}$	$\frac{1}{6}$

23. **What is the value of  $m$ ?**  
 (a)  $\frac{1}{3}$  (b)  $\frac{5}{12}$  (c)  $\frac{1}{4}$  (d)  $\frac{1}{6}$
24. **Find  $F(2)$ .**  
 (a)  $\frac{1}{2}$  (b)  $\frac{3}{4}$  (c)  $\frac{5}{6}$  (d)  $\frac{2}{3}$
25. **What is  $P(X > 1)$ ?**  
 (a)  $\frac{1}{2}$  (b)  $\frac{5}{12}$  (c)  $\frac{1}{3}$  (d)  $\frac{7}{12}$