

NATIONAL ACADEMY - DHARMAPURI

P.G TRB MATHS

UNITWISE STUDY MATERIALS

AND

QUESTION PAPERS AVAILABLE

CLASSES ARE CONDUCTED: MONDAY-SUNDAY (10 A.M TO 5 P.M)

TEST BATCH :SATURDAY & SUNDAY

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TRB MATHS COACHING CENTRE-DHARMAPURI

Total :100**STATISTICS- 2****duration :2 hrs**

- The mean and variance of the Binomial distributions are 4 and $\frac{4}{3}$ respectively. Find $P(X \geq 1)$
 (a) $\frac{1}{729}$ (b) $\frac{728}{729}$ (c) $\frac{730}{729}$ (d) $\frac{729}{728}$
- The mean and variance of the Binomial distributions are 4 and 3, Find its mode
 (a) 4 (b) 5 (c) 3 (d) 4 and 3
- Let X be the number of heads (success) in $n = 7$ Independent tosses of an Unbiased coin then the p.d.f of X is
 (a) $\binom{7}{x} \left(\frac{1}{2}\right)^{7-x}$ (b) $\binom{7}{x} \left(\frac{1}{2}\right)^x$ (c) $\binom{7}{x} \left(\frac{1}{2}\right)^7$ (d) $\binom{7}{x} \left(\frac{1}{2}\right)$
- Which one of the following will be the Binomial distribution
 (a) Distribution with mean = 3, S.D = 4 (b) Distribution with mean = 5, S.D = 4
 (c) Distribution with mean = 6, S.D = 2 (d) Distribution with mean = 5, S.D = 5
- Six coins are tossed 6400 times, Using poisson distribution the approximate probability of getting six heads r times.
 (a) $P(X=r) = e^{-100} \frac{(100)^r}{r!}$ (b) $P(X=r) = e^{100} \frac{(100)^r}{r!}$ (c) $P(X=r) = e^{64} \frac{(64)^r}{r!}$ (d) None
- If X and Y are Independent poisson Variate such that $p(X = 1) = p(x=2)$ and $p(Y=2) = p(Y=3)$. Find the mean and Variance of $X-2Y$,
 (a) -4 and 14 (b) 4 and 14 (c) -4 and -14 (d) -4 and 10
- In a poisson distribution $p(X=0) = p(x = 1) = k$, then find the value of λ
 (a) $\lambda = \log k$ (b) $\lambda = e^k$ (c) $\lambda = \log\left(\frac{1}{k}\right)$ (d) $\lambda = \frac{1}{\log\left(\frac{1}{k}\right)}$
- A Random variable X follows poisson distribution $E(X^2) = 30$, Find the variance
 (a) 10 (b) 5 (c) 15 (d) 20
- A poisson distribution has a double mode at $x = 1$ and $x = 2$, what is the probability that x will be have one or other of these two values
 (a) $2e^{-2}$ (b) $2e^2$ (c) $e^{-2} \frac{2^x}{x}$ (d) $4e^{-2}$
- The average number of customer who appear at a certain bank per minute is two, then the probability that during a given minute, no customer appears $p(0)$ is,
 (a) e (b) e^{-1} (c) e^{-2} (d) e^2

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11. In a Negative Binomial Distribution which one of the following is false?
 (a) mean = rp (b) variance = rPQ (c) $rP > rPQ$ (d) $rP < rPQ$
12. For a Normal distribution, Q.D, M.D and S.D are in the ratio
 (a) $\frac{4}{5} : \frac{2}{3} : 1$ (b) $\frac{2}{3} : \frac{4}{5} : 1$ (c) $1 : \frac{4}{5} : \frac{2}{3}$ (d) $\frac{1}{2} : 1 : \frac{4}{5}$
13. For moment generating function of a normal distribution is $\exp(\mu t + \frac{1}{2}\sigma^2 t^2)$ Then $E(X^2) = ?$
 (a) μ^2 (b) $\sigma^2 + \mu^2$ (c) $\sigma^2 - \mu^2$ (d) σ^2
14. If $X \sim N(8, 64)$, then the standard normal variate Z will be,
 (a) $\frac{X-64}{8}$ (b) $\frac{X-8}{64}$ (c) $\frac{X-8}{8}$ (d) $\frac{X-8}{\sqrt{8}}$
15. X is a normal variate with mean 30 and S.D is 5, Find the probability that $P(X \geq 45) [P(0 \leq z \leq 3) = 0.4986]$ (a) 0.5 (b) 0.4986 (c) 0.7653 (d) 0.0013
16. In a sample of 1000 candidates the mean of certain test is 45 and S.D is 15. Assuming the normality of the distribution find the following, How many candidate score between 40 and 60?
- | | | |
|------|--------|--------|
| z | 0.33 | 1 |
| Area | 0.1293 | 0.3413 |
- (a) 471 (b) 371 (c) 0.4706 (d) 47.16
17. If X is a independent normal Variate with mean 1 and variance 4, Y is a another normal variate independent of X with mean 2 and variance 3, then the distribution of $X+2Y$ is
 (a) 5,16 (b) 10,13 (c) 5,10 (d) None
18. If X and Y are Independent std normal Variate with $N(0,1)$ then $U = X+Y$, $V = X-Y$ are also Independent std normal Variate with
 (a) $U \sim N(0,2)$ and $V \sim N(0,2)$ (b) $U \sim N(0,1)$ and $V \sim N(0,1)$
 (c) $U \sim N(0,1)$ and $V \sim N(0,2)$ (d) $U \sim N(0,2)$ and $V \sim N(2,0)$
19. Let X have the p.d.f $f(x) = \begin{cases} 1 & \text{if } 0 < x < 1 \\ 0 & \text{otherwise} \end{cases}$, then the M.G.F of $Y = ax+b$ is
 (a) $\frac{e^{at}-1}{at}$ (b) $e^{bt}(\frac{e^{at}-1}{at})$ (c) $e^{bt}(\frac{e^t-1}{t})$ (d) $e^{bt}(\frac{e^{at}-1}{t})$
20. Let die is thrown until 6 happens then the distribution of mean and variance is
 (a) 30 and 5 (b) 5 and 30 (c) 5 and 36 (d) None

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21. If X_1 and X_2 have two Independent Geometric distribution, then conditional distribution $\frac{X_1}{(X_1+X_2=n)}$ is
 (a) Uniform distribution (b) exponential distribution
 (c) Normal distribution (d) Geometric distribution
22. A Box contains 10 screws out of which 3 are defective and 2 screws are taken at random from the Box Find the distribution of 1 defective screws are drawn
 (a) $\frac{15}{7}$ (b) $\frac{7}{45}$ (c) $\frac{7}{15}$ (d) $\frac{21}{15}$
23. The M.G.F of Gamma distribution with single parameter λ is
 (a) $(1-t)^\mu$ (b) $(1+t)^{-\lambda}$ (c) $(1-t)^{-\lambda}$ (d) $(1-t)^{-(\lambda+\mu)}$
24. If $X \sim \gamma(a, \lambda)$ Then the p.d.f of Gamma distribution is
 (a) $f(x) = \frac{e^{-x}x^{\lambda-1}}{\sqrt{\lambda}}, \lambda > 0, 0 < x < \infty$ (b) $f(x) = \frac{e^{-x}}{\lambda x^{\lambda-1}}, \lambda > 0, 0 < x < \infty$
 (c) $f(x) = \frac{a^\lambda}{\lambda} e^{-ax} x^{\lambda-1}, a > 0, \lambda > 0$ (d) $f(x) = \frac{a^\lambda}{\sqrt{\lambda}} e^{-ax} x^{\lambda-1}, a > 0, \lambda > 0, 0 < x < \infty$
25. In a Gamma distribution which one of the following is Incorrect?
 (a) $K_1 = \lambda$ (b) $K_2 = \lambda$ (c) $K_3 = 2\lambda$ (d) $K_4 = 6\lambda + 3\lambda^2$
26. If X have a standard Cauchy distribution, then p.d.f of X^2 is a
 (a) Cauchy (b) $\beta_2(\frac{1}{2}, \frac{1}{2})$ variate (c) β_1 variate (d) normal
27. If $X \sim \gamma(\mu), Y \sim \gamma(\nu)$ and X, Y are Independent which one of the following is true,
 (a) $X+Y \sim \nu(\mu + \nu)$ (b) $X/Y \sim \beta_2(\mu, \nu)$ (c) $X/X+Y \sim \beta_1(\mu, \nu)$ (d) All the above true
28. the probability density function of a standard Cauchy distribution is
 (a) $f(x) = \frac{1}{\pi} \frac{1}{(1+x^2)}, -\infty < x < \infty$ (b) $f(x) = \frac{1}{\lambda\pi} \frac{1}{(1+x^2)}, -\infty < x < \infty$
 (c) $f(x) = \frac{1}{(1+x^2)}, -\infty < x < \infty$ (d) $f(x) = \frac{1}{\pi} \frac{1}{(1+x^2)}, 0 < x < \infty$
29. If $\mu = 1$ and $\nu = 1$, then p.d.f of a Beta distribution is
 (a) $f(x) = \begin{cases} 1, 0 < x < \infty \\ 0, \text{otherwise} \end{cases}$ (b) $f(x) = \begin{cases} \frac{1}{2}, 0 < x < 1 \\ 0, \text{threwise} \end{cases}$ (c) $f(x) = \begin{cases} 1, 0 < x < 1 \\ 0, \text{threwise} \end{cases}$ (d) None
30. The range of Beta variate of the second kind is
 (a) $(0, \infty)$ (b) $(-\infty, \infty)$ (c) $(0, 1)$ (d) $(-1, 1)$