# DU MA MSc Statistics

Topic:- STATS MA S2

**1) The vectors $(a_1, a_2)$ and $(b_1, b_2)$ in $R^{(2)}$ are linearly dependent if and only if**

**[Question ID = 7411]**

1. $a_1 b_2 = a_2 b_1$ [Option ID = 29638]
2. $a_1^2 = b_1^2$ and $a_2^2 = b_2^2$ [Option ID = 29639]
3. $a_1 b_1 = a_2 b_2$ [Option ID = 29640]
4. $a_1 a_2 = b_1 b_2$ [Option ID = 29641]

**Correct Answer :-**

- $a_1 b_2 = a_2 b_1$ [Option ID = 29638]

**2) The set $W=\{(a_1, a_2, a_3) : a_1, a_2, a_3 \in R\}$, is not a subspace of $R^{(3)}$, if**

**[Question ID = 7412]**

1. $a_3 = a_1 + a_2$

   [Option ID = 29642]
2. $a_3 = 0$

   [Option ID = 29643]
3. $a_1 a_2 = 0$

   [Option ID = 29644]
4. None of these

   [Option ID = 29645]

**Correct Answer :-**

- $a_1 a_2 = 0$

  [Option ID = 29644]

**3) If α, β, γ are the roots of $x^3 - p x^2 + qx - r = 0$, then the value of**

$(\alpha+\beta)(\beta+\gamma)(\gamma+\alpha)$ **is**

**[Question ID = 7413]**

1. $q^2 - 2pq$

   [Option ID = 29646]
2. $pq + r$

   [Option ID = 29647]
3. $pq$

   [Option ID = 29648]
4. $qp - r$

   [Option ID = 29649]

**Correct Answer :-**

- $qp - r$

  [Option ID = 29649]

**4) Among the following system of equations**

**2x-5y+7z=6,**

**x-3y+4z=3,**

**3x-8y+11z=11,**

**which one of the following is true?**

**[Question ID = 7414]**

1. The system of equations are consistent

   [Option ID = 29650]
2. The system of equations are inconsistent

   [Option ID = 29651]

3. x=1, y=3/5, z=1 is the solution

[Option ID = 29652]

4. None of these

[Option ID = 29653]

**Correct Answer :-**

- The system of equations are inconsistent

[Option ID = 29651]

**5) If $A = \begin{bmatrix} 2 & 2 \\ 1 & 3 \end{bmatrix}$, then which one of the following is true**

**[Question ID = 7415]**

1. λ=2 and 4 are the eigen-values corresponding to A

[Option ID = 29654]

2. λ=1 and 2 are the eigen-values corresponding to A

[Option ID = 29655]

3. $v_1$=(2, -1) and $v_2$=(1, 1) are the eigen vectors corresponding to A

[Option ID = 29656]

4. $v_1$=(2, 1) and $v_2$=(-1, 1) are the eigen vectors corresponding to A

[Option ID = 29657]

**Correct Answer :-**

- $v_1$=(2, -1) and $v_2$=(1, 1) are the eigen vectors corresponding to A

[Option ID = 29656]

**6) Let Xi, i= 1, 2,..., n, be a random sample from exponential distribution with parameter $\theta$. Then a consistent estimator of $e^{-\theta}$ is**

**[Question ID = 7416]**

1. $\exp\left(\frac{1}{\bar{X}}\right)$

[Option ID = 29658]

2. $\exp(-\bar{X})$

[Option ID = 29659]

3. $\bar{X}$

[Option ID = 29660]

4. $\exp\left(\frac{-1}{\bar{X}}\right)$

[Option ID = 29661]

**Correct Answer :-**

- $\exp\left(\frac{-1}{\bar{X}}\right)$

[Option ID = 29661]

**7) Let Xi, i= 1, 2,..., n, be i.i.d random variables with E(Xi)=μ and $Var(X_i) < \infty$. Consider an estimator $T_n = \frac{2}{n(n+1)} \sum_{i=1}^{n} iX_i$, for estimating μ. Then, Tn is,**

**[Question ID = 7417]**

1. Unbiased and consistent

[Option ID = 29662]

2. Biased and consistent

[Option ID = 29663]

3. Unbiased but not consistent

[Option ID = 29664]

4. Biased and not consistent

[Option ID = 29665]

**Correct Answer :-**

- Unbiased and consistent

[Option ID = 29662]

**8)** A random sample of size n is drawn from distributions of the independent random

variables $X_1, X_2, ..., X_n$ . Let $f_i(x_i, \theta)$ denote the p.d.f of $X_i$, i= 1, 2, ..., n, and let $L(\underline{x},\theta)$ be the likelihood function of the sample. Under regularity conditions, a correct form of Cramer-Rao inequality is

**[Here, $\Upsilon(\theta)$ is the parametric function to be estimated.]**

**[Question ID = 7418]**

1. $V(T) \geq \frac{-[\gamma'(\theta)]^2}{E\left[\frac{\partial^2 logL(\underline{x};\theta)}{\partial\theta^2}\right]}$

   [Option ID = 29666]

2. $V(T) \geq \frac{[\gamma'(\theta)]^2}{nE\left[\left\{\frac{\partial log f(x;\theta)}{\partial\theta}\right\}^2\right]}$

   [Option ID = 29667]

3. $V(T) \geq \frac{-[\gamma'(\theta)]^2}{nE\left[\frac{\partial^2 log f(x;\theta)}{\partial\theta^2}\right]}$

   [Option ID = 29668]

4. All of these

   [Option ID = 29669]

**Correct Answer :-**

- $V(T) \geq \frac{-[\gamma'(\theta)]^2}{E\left[\frac{\partial^2 logL(\underline{x};\theta)}{\partial\theta^2}\right]}$

  [Option ID = 29666]

**9) Based on a random sample of size n ($X_1, X_2, ..., X_n$) from Cauchy(θ) distribution. A sufficient statistic for θ is**

**[Question ID = 7419]**

1. $\bar{X}$ , the sample mean

   [Option ID = 29670]

2. $\tilde{X}$ , the sample median

   [Option ID = 29671]

3. $\prod_{i=1}^{n} X_i$

   [Option ID = 29672]

4. Sufficient statistic does not exist for θ

   [Option ID = 29673]

**Correct Answer :-**

- Sufficient statistic does not exist for θ

  [Option ID = 29673]

**10) Let $X_1, X_2, ..., X_n$ be a random sample from U(-θ, θ) distribution. Maximum likelihood estimator of θ is**

**[Question ID = 7420]**

1. $X_{(n)}$, the $n^{th}$ order statistic [Option ID = 29674]
2. $X_{(1)}$, the first order statistic [Option ID = 29675]
3. Maximum($-X_{(1)}, X_{(n)}$) [Option ID = 29676]
4. Minimum($-X_{(1)}, X_{(n)}$) [Option ID = 29677]

**Correct Answer :-**

- Maximum($-X_{(1)}, X_{(n)}$) [Option ID = 29676]

**11) Let $X_1, X_2, ....., X_n$ be a random sample from a distribution with the following p.d.f,**

$$f(x,\alpha,\beta) = \frac{\beta^\alpha}{\Gamma(\alpha)} x^{\alpha-1} e^{-\beta x};\ x > 0, \alpha, \beta > 0$$

**The method of moments estimators of $\alpha$ and $\beta$ are**

**where,** $\left(s^2 = \frac{1}{n}\Sigma(X_i - \bar{X})^2\right)$ *and* $\left(S^2 = \frac{1}{n-1}\Sigma(X_i - \bar{X})^2\right)$

**[Question ID = 7421]**

1. $\hat{\alpha} = \left(\frac{\bar{x}}{s^2}\right)^2;\ \hat{\beta} = \frac{\bar{x}}{s^2}$

   [Option ID = 29678]

2. $\hat{\alpha} = \frac{\bar{x}^2}{s^2};\ \hat{\beta} = \frac{\bar{x}}{s^2}$

[Option ID = 29679]

3. $\hat{\alpha} = \left(\frac{\bar{x}}{s^2}\right)^2 ; \hat{\beta} = \frac{\bar{x}}{s^2}$

[Option ID = 29680]

4. $\hat{\alpha} = \bar{x}; \hat{\beta} = \frac{\bar{x}}{s^2}$

[Option ID = 29681]

**Correct Answer :-**

- $\hat{\alpha} = \frac{\bar{x}^2}{s^2}; \hat{\beta} = \frac{\bar{x}}{s^2}$

[Option ID = 29679]

**12) While constructing a confidence interval for an unknown parameter $\theta$ using Pivotal quantity method, a pivotal quantity is defined as a**

**[Question ID = 7422]**

1. function of a statistic T, such that its distribution is independent of $\theta$.

[Option ID = 29682]

2. function of a statistic T and the parameter $\theta$, such that its distribution is independent of $\theta$

[Option ID = 29683]

3. function of a statistic T, where T is sufficient for $\theta$

[Option ID = 29684]

4. function of a statistic T, such that its distribution is a function of $\theta$

[Option ID = 29685]

**Correct Answer :-**

- function of a statistic T and the parameter $\theta$, such that its distribution is independent of $\theta$

[Option ID = 29683]

**13) Which of the following is NOT TRUE about Neyman-Pearson Lemma in hypothesis testing?**

**[Question ID = 7423]**

1. The most powerful critical region is given by

   $W = \left\{\underline{x} \in S: \frac{L_0}{L_1} > k\right\}$; where $L_0$ and $L_1$ are likelihood functions under $H_0$ and $H_1$ respectively, S is the sample space, and k is a positive constant.

   [Option ID = 29686]

2. It holds for only a simple null hypothesis against a simple alternative hypothesis.

   [Option ID = 29687]

3. It does not give us the uniformly most powerful critical region directly.

   [Option ID = 29688]

4. None of these.

   [Option ID = 29689]

**Correct Answer :-**

- The most powerful critical region is given by

  $W = \left\{\underline{x} \in S: \frac{L_0}{L_1} > k\right\}$; where $L_0$ and $L_1$ are likelihood functions under $H_0$ and $H_1$ respectively, S is the sample space, and k is a positive constant.

  [Option ID = 29686]

**14) For a hypothesis test based on a random sample of size n, let**

**$H_0$ - the null hypothesis**

**$H_1$ - the alternative hypothesis**

**W- the critical region**

**$\overline{W}$ - the acceptance region**

**$L_0$- Likelihood function of the sample under $H_0$**

**$L_1$- Likelihood function of the sample under $H_1$**

**Using these notations, which of the following represents the power of the test?**

**[Question ID = 7424]**

1. $\int_W^{n-fold} L_0 d\underline{x}$

   [Option ID = 29690]
2. $\int_W^{n-fold} L_1 d\underline{x}$

   [Option ID = 29691]
3. $\int_W^{n-fold} L_1 d\underline{x}$

   [Option ID = 29692]
4. $1 - \int_W^{n-fold} L_0 d\underline{x}$

   [Option ID = 29693]

**Correct Answer :-**

- $\int_W^{n-fold} L_1 d\underline{x}$

  [Option ID = 29691]

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**15) Which of the following statistic is NOT complete?**

**[Question ID = 7425]**

1. T(X)= X; where X ~ U(-θ, θ)

   [Option ID = 29694]
2. $T(\underline{X}) = \sum_{i=1}^{n}(X_i - \mu)^2$ ; where $X_i \sim N(\mu, \sigma^2)$ and $\mu$ is known.

   [Option ID = 29695]
3. $T(\underline{X}) = \sum_{i=1}^{n} X_i$ ; where $X_i \sim$ Poisson$(\theta)$

   [Option ID = 29696]
4. None of these.

   [Option ID = 29697]

**Correct Answer :-**

- T(X)= X; where X ~ U(-θ, θ)

  [Option ID = 29694]

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**16) Which of the following is an instance of non-sampling error?**

**[Question ID = 7426]**

1. (1) Faulty selection of sample.

   [Option ID = 29698]
2. (2) Bias due to interviewer.

   [Option ID = 29699]
3. (3) Defective frame.

   [Option ID = 29700]
4. Both 1) and 2)

   [Option ID = 29701]

**Correct Answer :-**

- (2) Bias due to interviewer.

  [Option ID = 29699]

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**17) A population consists of four units 2, 4, 8 and 10. All possible samples of size 2 are drawn from this population by simple random sampling without replacement. Estimate of population mean and variance of the estimate of population mean is given by,**

**[Question ID = 7427]**

1. (6, 3.33) [Option ID = 29702]
2. (6, 5) [Option ID = 29703]
3. (6, 10) [Option ID = 29704]
4. (10, 3.33) [Option ID = 29705]

**Correct Answer :-**

- (6, 3.33) [Option ID = 29702]

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**18) Gain in efficiency of stratified random sampling over simple random sampling is defined as:**

**[Question ID = 7428]**

1. $\frac{V(\bar{y}_{st}) - V(\bar{y}_n)_R}{V(\bar{y}_{st})}$

   [Option ID = 29706]

2. $\frac{V(\bar{y}_n)_R - V(\bar{y}_{st})}{V(\bar{y}_n)_R}$

[Option ID = 29707]

3. $\frac{V(\bar{y}_n)_R}{V(\bar{y}_{st})}$

[Option ID = 29708]

4. $\frac{V(\bar{y}_n)_R - V(\bar{y}_{st})}{V(\bar{y}_{st})}$

[Option ID = 29709]

**Correct Answer :-**

- $\frac{V(\bar{y}_n)_R - V(\bar{y}_{st})}{V(\bar{y}_{st})}$

[Option ID = 29709]

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**19) The total sales amount of a product from all 200 stores from last year was Rs 25,000. From a simple random sample of sales from 20 stores, the following data was obtained. Total sales amount for last year = Rs. 900 and total sales amount for the current year = Rs. 1205. The ratio estimate of the total sales for the current year will be:**

**[Question ID = 7429]**

1. Rs. 33,472

[Option ID = 29710]

2. Rs. 18,672

[Option ID = 29711]

3. Rs. 18,075

[Option ID = 29712]

4. None of these

[Option ID = 29713]

**Correct Answer :-**

- Rs. 33,472

[Option ID = 29710]

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**20) In case of a population with the presence of linear trend $Y_i = i$, i = 1,2,….,k, the following relation holds true:**

**[Question ID = 7430]**

1. $V(\bar{y}_{st}) : V(\bar{y}_{syst}) : V(\bar{y}_n)_R = n : 1 : \frac{1}{n}$

[Option ID = 29714]

2. $V(\bar{y}_n) : V(\bar{y}_{str}) : V(\bar{y}_{syst})_R = n : 1 : \frac{1}{n}$

[Option ID = 29715]

3. $V(\bar{y}_{st}) : V(\bar{y}_{syst}) : V(\bar{y}_n)_R = \frac{1}{n} : 1 : n$

[Option ID = 29716]

4. None of these

[Option ID = 29717]

**Correct Answer :-**

- $V(\bar{y}_{st}) : V(\bar{y}_{syst}) : V(\bar{y}_n)_R = \frac{1}{n} : 1 : n$

[Option ID = 29716]

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**21) An experimental design which allows an unequal number of observations for each treatment under study is**

**[Question ID = 7431]**

1. Completely Randomized Block Design

[Option ID = 29718]

2. Completely Randomized Design

[Option ID = 29719]

3. Latin Square Design

[Option ID = 29720]

4. None of these

[Option ID = 29721]

**Correct Answer :-**

- Completely Randomized Design

[Option ID = 29719]

**22) For a Latin square design with 5 treatments arranged in 5 rows and 5 columns, the observation corresponding to the second row, third column and the fourth treatment is missing. Total of known observations in the row and column corresponding to the missing observation are 125 and 265. Total of known observations receiving the fourth treatment and total of all known observations are 220 and 950 respectively. An estimate of the missing observation and the error degrees of freedom can be obtained respectively as:**

**[Question ID = 7432]**

1. 57.5 and 11 [Option ID = 29722]
2. 95.8 and 11 [Option ID = 29723]
3. 95.8 and 12 [Option ID = 29724]
4. 57.5 and 12 [Option ID = 29725]

**Correct Answer :-**

- 95.8 and 11 [Option ID = 29723]

**23) The total number of factorial effects in a $2^n$ factorial experiment is:**

**[Question ID = 7433]**

1. $2^n$

   [Option ID = 29726]
2. $2^{(n-1)}$

   [Option ID = 29727]
3. $2^n - 1$

   [Option ID = 29728]
4. None of these

   [Option ID = 29729]

**Correct Answer :-**

- $2^n - 1$

  [Option ID = 29728]

**24) The total yield of the treatments of a 22 factorial experiment replicated 4 times are:**

| | **b0** | **b1** |
|---|---|---|
| **a0** | **20** | **44** |
| **a1** | **32** | **52** |

**The simple effect of factor A at first level of B and the interaction effect AB can be estimated as**

**[Question ID = 7434]**

1. 12 and -2

   [Option ID = 29730]
2. 10 and -2

   [Option ID = 29731]
3. 2.5 and -0.5

   [Option ID = 29732]
4. 3 and -0.5

   [Option ID = 29733]

**Correct Answer :-**

- 3 and -0.5

  [Option ID = 29733]

**25) The key block of a $2^5$ factorial experiment is given by:**

**[1, bc, de, bcde, abd, acd, abe, bce]**

**The confounded effects in this experiment are:**

**[Question ID = 7435]**

1. ade, bcde

   [Option ID = 29734]
2. ade, bcde, abc

   [Option ID = 29735]
3. acd, cde, bce

   [Option ID = 29736]
4. abc, bcde

[Option ID = 29737]

**Correct Answer :-**

- ade, bcde, abc

[Option ID = 29735]

**26) A differential equation is considered to be ordinary if it has**

**[Question ID = 7436]**

1. One dependent variable [Option ID = 29738]
2. More than one dependent variable [Option ID = 29739]
3. One independent variable [Option ID = 29740]
4. More than one independent variable [Option ID = 29741]

**Correct Answer :-**

- One independent variable [Option ID = 29740]

**27) If $y = a\,Cos\,(\log x) + b\,Sin\,(\log x)$, then**

**[Question ID = 7437]**

1. $x^2\,\frac{d^2y}{dx^2} + x\,\frac{dy}{dx} + y = 0$

[Option ID = 29742]

2. $x^2\,\frac{d^2y}{dx^2} - x\,\frac{dy}{dx} + y = 0$

[Option ID = 29743]

3. $x^2\,\frac{d^2y}{dx^2} + x\,\frac{dy}{dx} - y = 0$

[Option ID = 29744]

4. None of these

[Option ID = 29745]

**Correct Answer :-**

- $x^2\,\frac{d^2y}{dx^2} - x\,\frac{dy}{dx} + y = 0$

[Option ID = 29743]

**28) Which of the following equations is a linear equation of order 3?**

**[Question ID = 7438]**

1. $\frac{d^3y}{dx^3} + \frac{d^2y}{dx^2}.\,\frac{dy}{dx} + y = x$

[Option ID = 29746]

2. $\frac{d^3y}{dx^3} + \frac{d^2y}{dx^2} + y^2 = x^2$

[Option ID = 29747]

3. $x\frac{d^3y}{dx^3} + \frac{d^3y}{dx^3} = e^x$

[Option ID = 29748]

4. $\frac{d^2y}{dx^2} + \frac{dy}{dx} = \log x$

[Option ID = 29749]

**Correct Answer :-**

- $x\frac{d^3y}{dx^3} + \frac{d^3y}{dx^3} = e^x$

[Option ID = 29748]

**29) For the exact differential equation of the form**

$M\,dx + N\,dy = 0$

**[Question ID = 7439]**

1. $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$

[Option ID = 29750]

2. $\frac{\partial M}{\partial y} \neq \frac{\partial N}{\partial x}$

[Option ID = 29751]

3. $\frac{\partial M}{\partial y}+\frac{\partial N}{\partial x}=0$

[Option ID = 29752]

4. $\frac{\partial M}{\partial x}=\frac{\partial N}{\partial y}$

[Option ID = 29753]

**Correct Answer :-**

- $\frac{\partial M}{\partial y}=\frac{\partial N}{\partial x}$

[Option ID = 29750]

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**30) The integrating factor of the differential equation**

$(1-y^2)\frac{dx}{dy}-yx=1$ **is :**

**[Question ID = 7440]**

1. $1/\sqrt{(1-y^2)}$

[Option ID = 29754]

2. $\sqrt{(1-y^2)}$

[Option ID = 29755]

3. $1/(1-y^2)$

[Option ID = 29756]

4. $1-y^2$

[Option ID = 29757]

**Correct Answer :-**

- $\sqrt{(1-y^2)}$

[Option ID = 29755]

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**31) The probability that a student passes a Multivariate test is 2/3 and the probability that he/she passes both a Multivariate test and Data Mining test is 14/45. The probability that he/she passes at least one test is 4/5. Then the probability that he/she passes the Data Mining test is:**

**[Question ID = 7441]**

1. 4/9 [Option ID = 29758]
2. 1/9 [Option ID = 29759]
3. 2/3 [Option ID = 29760]
4. 5/6 [Option ID = 29761]

**Correct Answer :-**

- 4/9 [Option ID = 29758]

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**32) A card is drawn from a well-shuffled pack of 52 cards, then the probability of getting a heart or a king or a red card is:**

**[Question ID = 7442]**

1. 3/52 [Option ID = 29762]
2. 8/13 [Option ID = 29763]
3. 7/13 [Option ID = 29764]
4. 1/26 [Option ID = 29765]

**Correct Answer :-**

- 7/13 [Option ID = 29764]

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**33) For any two events G and H, which of the following hold true?**

**[Question ID = 7443]**

1. P(G∩H) ≤ P(G) ≤ P(G∪H) ≤ P(G)+P(H)

[Option ID = 29766]

2. P(G) + P(H) ≤ P(G) ≤ P(G∪H) ≤ P(G∩H)

[Option ID = 29767]

3. P(G∩H) ≥ P(G) ≥ P(G∪H) ≥ P(G)+P(H)

[Option ID = 29768]

4. P(G∩H) ≤ P(G∪H) ≤ P(G) ≤ P(G)+P(H)

[Option ID = 29769]

**Correct Answer :-**

- $P(G \square H) \leq P(G) \leq P(G \cup H) \leq P(G)+P(H)$

[Option ID = 29766]

**34) The odds that a book on Linear Algebra will be favourably reviewed by three reviewers are 3 to 2, 4 to 3 and 2 to 3 respectively. Then the probability that out of three reviews only one review will be unfavourable is:**
**[Question ID = 7444]**

1. 24/175 [Option ID = 29770]
2. 1/93 [Option ID = 29771]
3. 70/175 [Option ID = 29772]
4. 157/175 [Option ID = 29773]

**Correct Answer :-**

- 70/175 [Option ID = 29772]

**35) Non-Parametric analogous of One-Way ANOVA is:**
**[Question ID = 7445]**

1. Friedman test [Option ID = 29774]
2. Mann-Whitney test [Option ID = 29775]
3. Kruskal-Wallis test [Option ID = 29776]
4. Wilcoxon Signed Rank [Option ID = 29777]

**Correct Answer :-**

- Kruskal-Wallis test [Option ID = 29776]

**36) If regression coefficients are given as**

$b_{XY} = 3.2 \text{ and } b_{YX} = 0.8$ **then**

**[Question ID = 7446]**

1. Given values of regression coefficients are not possible

   [Option ID = 29778]
2. Sign of one coefficient should have been in negative

   [Option ID = 29779]
3. Both coefficient should be greater than unity

   [Option ID = 29780]
4. Regression coefficients have correct values

   [Option ID = 29781]

**Correct Answer :-**

- Given values of regression coefficients are not possible

  [Option ID = 29778]

**37) The number of permutations of n distinct objects is:**
**[Question ID = 7447]**

1. $\frac{n!}{(n-n)!}$

   [Option ID = 29782]
2. $\frac{n!}{(n-1)!}$

   [Option ID = 29783]
3. $\frac{1}{(n-1)!}$

   [Option ID = 29784]
4. 1 [Option ID = 29785]

**Correct Answer :-**

- $\frac{n!}{(n-n)!}$

  [Option ID = 29782]

**38) With the notation of combination, the value of**

$\binom{25}{1} + \frac{1}{5} \text{X} \left[\binom{25}{24}\right] + 5 \text{X} \left[\binom{49}{0}\right]$ **is:**

**[Question ID = 7448]**

1. 35

   [Option ID = 29786]
2. 25

   [Option ID = 29787]

3. 05

[Option ID = 29788]

4. 20

[Option ID = 29789]

**Correct Answer :-**

- 35

[Option ID = 29786]

**39) For Normal curve, the Quantile Deviation, Mean Deviation and Standard Deviation are in the ratio:**
**[Question ID = 7449]**

1. 10:15:12 [Option ID = 29790]
2. 03:04:05 [Option ID = 29791]
3. 10:12:15 [Option ID = 29792]
4. 12:05:17 [Option ID = 29793]

**Correct Answer :-**

- 10:12:15 [Option ID = 29792]

**40) If $X \sim U(0,1)$ then $Y = -2\log(X)$ will follow**

**[Question ID = 7450]**

1. Log-normal

[Option ID = 29794]

2. Exponential

[Option ID = 29795]

3. Chi-square

[Option ID = 29796]

4. Gamma

[Option ID = 29797]

**Correct Answer :-**

- Chi-square

[Option ID = 29796]

**41) The arithmetic mean of two regression coefficient $b_{XY}$ and $b_{YX}$ is _____ the correlation coefficient between X and Y.**

**[Question ID = 7451]**

1. ≤

[Option ID = 29798]

2. ≥

[Option ID = 29799]

3. <

[Option ID = 29800]

4. >

[Option ID = 29801]

**Correct Answer :-**

- ≥

[Option ID = 29799]

**42) Let the equation of the regression lines be expressed as 2X - 3Y = 0 and 4Y - 5X = 8. Then the correlation coefficient between X and Y is:**
**[Question ID = 7452]**

1. $\sqrt{8/15}$

[Option ID = 29802]

2. $\sqrt{15/8}$

[Option ID = 29803]

3. $\sqrt{7/15}$

[Option ID = 29804]

4. $\sqrt{15/4}$

[Option ID = 29805]

**Correct Answer :-**

- $\sqrt{8/15}$

[Option ID = 29802]

**43) For Poisson distribution with parameter $\mu$ , the value of measure of Skewness and measure of Kurtosis are:**

**[Question ID = 7453]**

1. $\frac{1}{3}$ and $\frac{1}{\mu}+3$

   [Option ID = 29806]
2. $\frac{1}{\mu}$ and $\frac{1}{\mu}+3$

   [Option ID = 29807]
3. $\frac{1}{\mu}$ and $\frac{1}{\mu}$

   [Option ID = 29808]
4. $\mu$ and $\mu+3$

   [Option ID = 29809]

**Correct Answer :-**

- $\frac{1}{\mu}$ and $\frac{1}{\mu}+3$

[Option ID = 29807]

**44) If one flip a coin and then independently cast a die, then the probability of observing head on the coin and even number on the die is :**

**[Question ID = 7454]**

1. 2/3 [Option ID = 29810]
2. 1/4 [Option ID = 29811]
3. 1/6 [Option ID = 29812]
4. 1/2 [Option ID = 29813]

**Correct Answer :-**

- 1/4 [Option ID = 29811]

**45) Let A and B be events in a sample space S such that P(A) = 1/2, P(B) = 1/2, and $P(A^c \cup B^c) = 1/3$ then $P(A \cup B^c)$ is:**

**[Question ID = 7455]**

1. 1/4 [Option ID = 29814]
2. 5/6 [Option ID = 29815]
3. 1/6 [Option ID = 29816]
4. 2/3 [Option ID = 29817]

**Correct Answer :-**

- 5/6 [Option ID = 29815]

**46) Let $A_1$, $A_2$, $A_3$, $A_4$ be the events of answering the questions 1, 2, 3 and 4 respectively such that $P(A_1) = 1/2$, $P(A_2) = 1/4$, $P(A_3) = 1/8$, $P(A_4) = 1/16$, then $P(A_1 \cup A_2 \cup A_3 \cup A_4)$ is:**

**[Question ID = 7456]**

1. 1023/1024 [Option ID = 29818]
2. 1/1024 [Option ID = 29819]
3. 709/1024 [Option ID = 29820]
4. 4/511 [Option ID = 29821]

**Correct Answer :-**

- 709/1024 [Option ID = 29820]

**47) Chi-square test CANNOT be applied to test the :**

**[Question ID = 7457]**

1. Goodness of fit [Option ID = 29822]
2. Equality of two population variances [Option ID = 29823]
3. Significance of regression coefficient [Option ID = 29824]
4. Independence of attributes [Option ID = 29825]

**Correct Answer :-**

- Significance of regression coefficient [Option ID = 29824]

**48) The coefficient of correlation between X and Y is 0.6. Their covariance is 4.8. If the variance of X is 9, then the**

**standard deviation of Y is:**

**[Question ID = 7458]**

1. 3.05 [Option ID = 29826]
2. 5.23 [Option ID = 29827]
3. 7.12 [Option ID = 29828]
4. 2.67 [Option ID = 29829]

**Correct Answer :-**

- 2.67 [Option ID = 29829]

**49) Observe the following statements:**

**i. University roll number is measured in nominal scale**
**ii. Marks obtained is measured in interval scale**
**iii. Number of students admitted in the University during 2019-20 is cross-sectional data**
**iv. University T shirt size measured in nominal scale**

**Which of the above statements given above is/are true?**

**[Question ID = 7459]**

1. i. Only

   [Option ID = 29830]
2. i. and ii. Only

   [Option ID = 29831]
3. iii. Only

   [Option ID = 29832]
4. All are true

   [Option ID = 29833]

**Correct Answer :-**

- i. and ii. Only

  [Option ID = 29831]

**50) The joint probability function of two discrete random variables X and Y is given by $f(x,y) = c(2x+y)$, where x and y can assume all integers such that 0 ≤ x ≤ 2, 0≤ y ≤3, and f(x, y) = 0 otherwise. Then P(Y = 1 | X = 2) is**

**[Question ID = 7460]**

1. 5/42

   [Option ID = 29834]
2. 5/22

   [Option ID = 29835]
3. 4/7

   [Option ID = 29836]
4. 5/53

   [Option ID = 29837]

**Correct Answer :-**

- 5/22

  [Option ID = 29835]