

# National Testing Agency

Question Paper Name :	Statistics 9th March 2026 Shift 1
Subject Name :	Statistics
Creation Date :	2026-03-09 16:18:53
Duration :	90
Total Marks :	300
Display Marks:	Yes

## Statistics

Group Number :	1
Group Id :	432449273
Group Maximum Duration :	0
Group Minimum Duration :	90
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	300

## Statistics

Section Id :	432449367
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	75
Number of Questions to be attempted :	75
Section Marks :	300
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	432449769
Question Shuffling Allowed :	Yes
Is Section Default? :	No

Question Number : 1 Question Id : 43244927728 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The Sum  $\sum_{r=1}^{20} (r^2 + 1) \times r!$  is equal to

- (1)  $21 \times 21!$
- (2)  $20 \times 21!$
- (3)  $21!$
- (4)  $20 \times 21 \times 20!$

Options :

432449109301. 1
432449109302. 2
432449109303. 3
432449109304. 4

Question Number : 1 Question Id : 43244927728 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

योग  $\sum_{r=1}^{20} (r^2 + 1) \times r!$  बराबर हैं

- (1)  $21 \times 21!$
- (2)  $20 \times 21!$
- (3)  $21!$
- (4)  $20 \times 21 \times 20!$

Options :

432449109301. 1  
432449109302. 2  
432449109303. 3  
432449109304. 4

**Question Number : 2 Question Id : 43244927729 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Value of  $\sum_{n=0}^{\infty} \frac{2}{(2n+1)(2n+3)}$  is

- (1)  $\infty$   
(2) 1  
(3)  $\frac{1}{3}$   
(4)  $\frac{4}{6}$

**Options :**

432449109305. 1  
432449109306. 2  
432449109307. 3  
432449109308. 4

**Question Number : 2 Question Id : 43244927729 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

$\sum_{n=0}^{\infty} \frac{2}{(2n+1)(2n+3)}$  का मान है

- (1)  $\infty$   
(2) 1  
(3)  $\frac{1}{3}$   
(4)  $\frac{4}{6}$

**Options :**

432449109305. 1  
432449109306. 2  
432449109307. 3  
432449109308. 4

**Question Number : 3 Question Id : 43244927730 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If  $f(1)=1$  and  $f'(1)=-1$  then the value of  $\frac{d}{dx} \left[ \frac{f(x^3)}{x f(x^2)} \right]$  at  $x=1$  is equal to

- (1) 1  
(2) 0  
(3) 2  
(4) -2

**Options :**

432449109309. 1  
432449109310. 2  
432449109311. 3  
432449109312. 4

**Question Number : 3 Question Id : 43244927730 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

यदि  $f(1) = 1$  है और  $f'(1) = -1$  है, तो  $\frac{d}{dx} \left[ \frac{f(x^3)}{x f(x^2)} \right]$  का मान  $x=1$  पर बराबर है

- (1) 1
- (2) 0
- (3) 2
- (4) -2

**Options :**

- 432449109309. 1
- 432449109310. 2
- 432449109311. 3
- 432449109312. 4

**Question Number : 4 Question Id : 43244927731 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The function  $f(x) = \int_{e^x}^{e^{2x}} t \cdot \log_e t \, dt$  has an absolute minima at  $x=0$  and a local maxima at  $x=$

- (1)  $-\log_e 4$
- (2)  $\log_e 2$
- (3) 1
- (4)  $-\log_e 2$

**Options :**

- 432449109313. 1
- 432449109314. 2
- 432449109315. 3
- 432449109316. 4

**Question Number : 4 Question Id : 43244927731 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

फलन  $f(x) = \int_{e^x}^{e^{2x}} t \cdot \log_e t \, dt$  का  $x=0$  पर परम न्यूनतम है, तो  $x$  के किस मान पर स्थानीय उच्चिष्ठ होगा ?

- (1)  $-\log_e 4$
- (2)  $\log_e 2$
- (3) 1
- (4)  $-\log_e 2$

**Options :**

- 432449109313. 1
- 432449109314. 2
- 432449109315. 3
- 432449109316. 4

**Question Number : 5 Question Id : 43244927732 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

In the Taylor series expansion of function  $f(x) = e^{x^2-x}$ , coefficient of  $x^3$  is

- (1)  $-\frac{7}{3}$
- (2) -7
- (3)  $-\frac{7}{6}$
- (4)  $-\frac{7}{2}$

**Options :**

- 432449109317. 1
- 432449109318. 2

432449109319. 3

432449109320. 4

**Question Number : 5 Question Id : 43244927732 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

फलन  $f(x) = e^{x^2-x}$  के टेलर श्रेणी प्रसार में,  $x^3$  का गुणांक है

(1)  $-\frac{7}{3}$

(2)  $-7$

(3)  $-\frac{7}{6}$

(4)  $-\frac{7}{2}$

**Options :**

432449109317. 1

432449109318. 2

432449109319. 3

432449109320. 4

**Question Number : 6 Question Id : 43244927733 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Match List - I with List - II.**

**List - I**

**List - II**

A. The value of  $x$  where  $f(x) = 9x(x-1)^2$ ,  $0 \leq x \leq 2$  attains its maximum is I.  $e$

B. The maximum value of  $f(x) = \frac{1}{x} e^{-\frac{1}{2}(\log_e x - 2)^2}$  attains at  $x =$  II.  $\frac{2}{3}$

C. Function  $f(x) = x^2(1-x)^6$ ;  $0 < x < 1$  attains its maximum at  $x =$  III.  $\frac{1}{3}$

D. The maximum value of function  $f(x) = x^2 e^{-3x}$  attains at  $x$  IV.  $\frac{1}{4}$

Choose the **correct** answer from the options given below

(1) A-III, B-I, C-IV, D-II

(2) A-III, B-I, C-II, D-IV

(3) A-IV, B-I, C-III, D-II

(4) A-II, B-III, C-I, D-IV

**Options :**

432449109321. 1

432449109322. 2

432449109323. 3

432449109324. 4

**Question Number : 6 Question Id : 43244927733 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

सूची - I से सूची - II का मिलान कीजिए

सूची - I	सूची - II
A. $x$ का वह मान जिस पर $f(x) = 9x(x-1)^2$ , $0 \leq x \leq 2$ अपना अधिकतम मान प्राप्त करता है	I. $e$ पर
B. $f(x) = \frac{1}{x} e^{-\frac{1}{2}(\log_e x - 2)^2}$ अपना अधिकतम मान प्राप्त करता है तो $x =$	II. $\frac{2}{3}$ पर
C. फलन $f(x) = x^2(1-x)^6$ ; $0 < x < 1$ ; अधिकतम मान प्राप्त करता है तो $x =$	III. $\frac{1}{3}$ पर
D. फलन $f(x) = x^2 e^{-3x}$ अधिकतम मान प्राप्त करता है तो $x =$	IV. $\frac{1}{4}$ पर

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए

- (1) A-III, B-I, C-IV, D-II
- (2) A-III, B-I, C-II, D-IV
- (3) A-IV, B-I, C-III, D-II
- (4) A-II, B-III, C-I, D-IV

Options :

432449109321. 1  
432449109322. 2  
432449109323. 3  
432449109324. 4

Question Number : 7 Question Id : 43244927734 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The function  $f(x) = |x^2 + x - 6|$  is not differentiable at  $x = a$  and  $x = b$  then  $(b - a)^2$  equals

- (1) 25
- (2) 9
- (3) 13
- (4) 5

Options :

432449109325. 1  
432449109326. 2  
432449109327. 3  
432449109328. 4

Question Number : 7 Question Id : 43244927734 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

फलन  $f(x) = |x^2 + x - 6|$ ,  $x = a$  और  $x = b$  पर, अवकलनीय नहीं है तो  $(b - a)^2$ , बराबर है

- (1) 25
- (2) 9
- (3) 13
- (4) 5

Options :

432449109325. 1  
432449109326. 2  
432449109327. 3  
432449109328. 4

Question Number : 8 Question Id : 43244927735 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The value of  $\lim_{x \rightarrow 1} \frac{\int_{2 \log_e x}^{3 \log_e x} e^t dt}{x-1}$  equals

- (1) 0
- (2) 1
- (3) -1
- (4)  $\infty$

Options :

- 432449109329. 1
- 432449109330. 2
- 432449109331. 3
- 432449109332. 4

Question Number : 8 Question Id : 43244927735 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

$\lim_{x \rightarrow 1} \frac{\int_{2 \log_e x}^{3 \log_e x} e^t dt}{x-1}$  का मान बराबर है

- (1) 0
- (2) 1
- (3) -1
- (4)  $\infty$

Options :

- 432449109329. 1
- 432449109330. 2
- 432449109331. 3
- 432449109332. 4

Question Number : 9 Question Id : 43244927736 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If  $f(x) = \begin{cases} \frac{\log_e \left(1 + \frac{x}{a}\right) - \log_e \left(1 - \frac{x}{b}\right)}{x} & \text{if } x \neq 0 \\ k & \text{if } x = 0 \end{cases}$

is continuous at  $x = 0$ , then value of  $k$  is :

- (1) 0
- (2) 1
- (3)  $\frac{1}{a} + \frac{1}{b}$
- (4)  $\frac{1}{a} - \frac{1}{b}$

Options :

- 432449109333. 1
- 432449109334. 2
- 432449109335. 3
- 432449109336. 4

Question Number : 9 Question Id : 43244927736 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

$$\text{यदि } f(x) = \begin{cases} \frac{\log_e\left(1+\frac{x}{a}\right) - \log_e\left(1-\frac{x}{b}\right)}{x} & \text{यदि } x \neq 0 \\ k & \text{यदि } x = 0 \end{cases}$$

$x=0$  पर सतत हैं तो  $k$  का मान है :

- (1) 0
- (2) 1
- (3)  $\frac{1}{a} + \frac{1}{b}$
- (4)  $\frac{1}{a} - \frac{1}{b}$

**Options :**

432449109333. 1  
432449109334. 2  
432449109335. 3  
432449109336. 4

**Question Number : 10 Question Id : 43244927737 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The value of integral  $\int_0^1 \int_x^1 \frac{1}{1+y^2} \cdot dy dx$  is equal to

- (1)  $1 - \ln(2)$
- (2)  $\frac{1}{2} \ln(2)$
- (3)  $\frac{\pi}{4}$
- (4)  $\frac{\pi}{2} - \ln 2$

**Options :**

432449109337. 1  
432449109338. 2  
432449109339. 3  
432449109340. 4

**Question Number : 10 Question Id : 43244927737 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

समाकल  $\int_0^1 \int_x^1 \frac{1}{1+y^2} \cdot dy dx$  का मान बराबर है

- (1)  $1 - \ln(2)$
- (2)  $\frac{1}{2} \ln(2)$
- (3)  $\frac{\pi}{4}$
- (4)  $\frac{\pi}{2} - \ln 2$

**Options :**

432449109337. 1  
432449109338. 2  
432449109339. 3  
432449109340. 4

Question Number : 11 Question Id : 43244927738 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The area of region in the first quadrant that is bounded by  $y = \sqrt{x}$ ,  $y = 2 - x$  and  $x$ -axis is

- (1)  $\frac{5}{6}$   
(2)  $\frac{2}{3}$   
(3) 1  
(4)  $\frac{7}{6}$

Options :

432449109341. 1  
432449109342. 2  
432449109343. 3  
432449109344. 4

Question Number : 11 Question Id : 43244927738 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

प्रथम चतुर्थांश में, वह क्षेत्र जो  $y = \sqrt{x}$ ,  $y = 2 - x$  और  $x$ -अक्ष से परिबद्धित हैं, का क्षेत्रफल है

- (1)  $\frac{5}{6}$   
(2)  $\frac{2}{3}$   
(3) 1  
(4)  $\frac{7}{6}$

Options :

432449109341. 1  
432449109342. 2  
432449109343. 3  
432449109344. 4

Question Number : 12 Question Id : 43244927739 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Integral  $\int_0^2 \int_{y^2}^{y+2} dx dy$  equals

- (1)  $\int_0^1 \int_0^{\sqrt{x}} dy dx + \int_1^2 \int_{x-2}^{\sqrt{x}} dy dx$   
(2)  $\int_0^2 \int_0^{\sqrt{x}} dy dx + \int_2^4 \int_{x-2}^x dy dx$   
(3)  $\int_0^2 \int_0^{\sqrt{x}} dy dx + \int_2^4 \int_{x-2}^{\sqrt{x}} dy dx$   
(4)  $\int_0^2 \int_0^{\sqrt{x}} dy dx + \int_2^4 \int_0^{\sqrt{x}} dy dx$

Options :

432449109345. 1  
432449109346. 2

432449109347. 3

432449109348. 4

**Question Number : 12 Question Id : 43244927739 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

समाकल  $\int_0^2 \int_{y^2}^{y+2} dx dy$  बराबर हैं

(1)  $\int_0^1 \int_0^{\sqrt{x}} dy dx + \int_1^2 \int_{x-2}^{\sqrt{x}} dy dx$

(2)  $\int_0^2 \int_0^{\sqrt{x}} dy dx + \int_2^4 \int_{x-2}^x dy dx$

(3)  $\int_0^2 \int_0^{\sqrt{x}} dy dx + \int_2^4 \int_{x-2}^{\sqrt{x}} dy dx$

(4)  $\int_0^2 \int_0^{\sqrt{x}} dy dx + \int_2^4 \int_0^{\sqrt{x}} dy dx$

**Options :**

432449109345. 1

432449109346. 2

432449109347. 3

432449109348. 4

**Question Number : 13 Question Id : 43244927740 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The area of bounded region R defined as  $R = \{(x, y) : 0 < x < 2 \cap 1 < y < 3 \cap y > x\}$  is

(1)  $\frac{3}{4}$

(2)  $\frac{1}{2}$

(3)  $\frac{7}{2}$

(4)  $\frac{7}{8}$

**Options :**

432449109349. 1

432449109350. 2

432449109351. 3

432449109352. 4

**Question Number : 13 Question Id : 43244927740 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

परिबद्धित क्षेत्र R जो  $R = \{(x, y) : 0 < x < 2 \cap 1 < y < 3 \cap y > x\}$  से परिभाषित होता है, का क्षेत्रफल है

- (1)  $\frac{3}{4}$   
(2)  $\frac{1}{2}$   
(3)  $\frac{7}{2}$   
(4)  $\frac{7}{8}$

Options :

432449109349. 1  
432449109350. 2  
432449109351. 3  
432449109352. 4

Question Number : 14 Question Id : 43244927741 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If A and B are symmetric matrices of same order then

- A. AB is symmetric iff  $AB = BA$   
B.  $AB + BA$  is skew symmetric matrix  
C.  $AB - BA$  is symmetric matrix  
D.  $(A + B)^n$  is symmetric for all  $n \in \mathbb{N}$

Choose the correct answer from the options given below

- (1) A, B only  
(2) B, C only  
(3) C, D only  
(4) A, D only

Options :

432449109353. 1  
432449109354. 2  
432449109355. 3  
432449109356. 4

Question Number : 14 Question Id : 43244927741 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

यदि A और B, समान क्रम के, सममित आव्यूह है, तो

- A. AB सममित हैं, यदि और केवल यदि  $AB = BA$  हैं।  
B.  $AB + BA$  विषम सममित आव्यूह हैं।  
C.  $AB - BA$  सममित आव्यूह हैं।  
D.  $(A + B)^n$ , सभी  $n \in \mathbb{N}$  के लिए, सममित हैं।

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए

- (1) केवल A, B  
(2) केवल B, C  
(3) केवल C, D  
(4) केवल A, D

Options :

432449109353. 1  
432449109354. 2  
432449109355. 3  
432449109356. 4

Question Number : 15 Question Id : 43244927742 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If A is an invertible symmetric matrix then

- A.  $(A^{-1})^T = A^{-1}$
- B.  $\text{adj } A = (\text{adj } A)^T$
- C.  $A^{-1}$  is skew-symmetric
- D.  $|A| = 0$

Choose the correct answer from the options given below

- (1) A, B only
- (2) A, C only
- (3) B, C only
- (4) C, D only

Options :

- 432449109357. 1
- 432449109358. 2
- 432449109359. 3
- 432449109360. 4

Question Number : 15 Question Id : 43244927742 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

यदि A एक व्युत्क्रमणीय सममित आव्यूह हैं तो

- A.  $(A^{-1})^T = A^{-1}$
- B.  $\text{adj } A = (\text{adj } A)^T$
- C.  $A^{-1}$  विषम सममित है
- D.  $|A| = 0$

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए

- (1) केवल A, B
- (2) केवल A, C
- (3) केवल B, C
- (4) केवल C, D

Options :

- 432449109357. 1
- 432449109358. 2
- 432449109359. 3
- 432449109360. 4

Question Number : 16 Question Id : 43244927743 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Let  $A = \begin{bmatrix} 2 & 1 & -2 \\ 1 & 1 & -1 \\ 1 & 0 & 2 \end{bmatrix}$  and if  $B = |A| \text{adj}(A)$ . Then  $|B|$  is equal to

- (1) 3
- (2) 9
- (3) 81
- (4) 243

Options :

- 432449109361. 1
- 432449109362. 2
- 432449109363. 3
- 432449109364. 4

Question Number : 16 Question Id : 43244927743 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

मान लो  $A = \begin{bmatrix} 2 & 1 & -2 \\ 1 & 1 & -1 \\ 1 & 0 & 2 \end{bmatrix}$  और यदि  $B = |A| \text{adj}(A)$  हैं, तो  $|B|$  बराबर है

- (1) 3
- (2) 9
- (3) 81
- (4) 243

**Options :**

432449109361. 1  
432449109362. 2  
432449109363. 3  
432449109364. 4

**Question Number : 17 Question Id : 43244927744 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Let  $AX = B$  be a system of  $n$ -linear equations in  $n$  unknowns then

- (1) System is consistent and infinitely many solution if  $|A| = 0$ .
- (2) System is inconsistent and finitely many solution if  $|A| = 0$ .
- (3) System is consistent and unique solution if  $|A| \neq 0$ .
- (4) System is consistent if  $|A| = 0$  and  $(\text{adj } A) B \neq 0$ .

**Options :**

432449109365. 1  
432449109366. 2  
432449109367. 3  
432449109368. 4

**Question Number : 17 Question Id : 43244927744 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

मान लो  $AX = B$ ,  $n$  अज्ञातों में,  $n$  रैखिक-समीकरणों की एक प्रणाली हैं, तो

- (1) प्रणाली संगत है और यदि  $|A| = 0$  हैं तो उसके अनंत (अपरि मिततः) बहुत से हल हैं।
- (2) प्रणाली असंगत है और यदि  $|A| = 0$  हैं तो उसके परिमिततः बहुत से हल हैं।
- (3) प्रणाली संगत है और यदि  $|A| \neq 0$  हैं तो उसका एक मात्र हल हैं।
- (4) प्रणाली संगत है, यदि  $|A| = 0$  और  $(\text{adj } A) B \neq 0$  है।

**Options :**

432449109365. 1  
432449109366. 2  
432449109367. 3  
432449109368. 4

**Question Number : 18 Question Id : 43244927745 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The eigen vectors of the matrix  $A = \begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$  is

(1)  $\begin{bmatrix} 4 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 \\ 0 \end{bmatrix}$

(2)  $\begin{bmatrix} 1 \\ 4 \end{bmatrix}, \begin{bmatrix} 0 \\ -1 \end{bmatrix}$

(3)  $\begin{bmatrix} 4 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 \\ -1 \end{bmatrix}$

(4)  $\begin{bmatrix} 1 \\ 4 \end{bmatrix}, \begin{bmatrix} 1 \\ -1 \end{bmatrix}$

Options :

432449109369. 1

432449109370. 2

432449109371. 3

432449109372. 4

Question Number : 18 Question Id : 43244927745 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

आव्यूह  $A = \begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$  के अभिलक्षणिक सदिश हैं

(1)  $\begin{bmatrix} 4 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 \\ 0 \end{bmatrix}$

(2)  $\begin{bmatrix} 1 \\ 4 \end{bmatrix}, \begin{bmatrix} 0 \\ -1 \end{bmatrix}$

(3)  $\begin{bmatrix} 4 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 \\ -1 \end{bmatrix}$

(4)  $\begin{bmatrix} 1 \\ 4 \end{bmatrix}, \begin{bmatrix} 1 \\ -1 \end{bmatrix}$

Options :

432449109369. 1

432449109370. 2

432449109371. 3

432449109372. 4

Question Number : 19 Question Id : 43244927746 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Solution of differential equation  $(x^2 + y^2) dx - 2xy dy = 0$ , where  $c$  is constant, is

(1)  $x^2 + y^2 = cy$

(2)  $x^2 - y^2 = cy$

(3)  $x^2 + y^2 = cx$

(4)  $x^2 - y^2 = cx$

Options :

432449109373. 1

432449109374. 2

432449109375. 3

432449109376. 4

Question Number : 19 Question Id : 43244927746 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

अवकल समीकरण  $(x^2 + y^2) dx - 2xy dy = 0$  का हल, जहाँ  $c$  अचर है, होगा

- (1)  $x^2 + y^2 = cy$
- (2)  $x^2 - y^2 = cy$
- (3)  $x^2 + y^2 = cx$
- (4)  $x^2 - y^2 = cx$

Options :

432449109373. 1  
432449109374. 2  
432449109375. 3  
432449109376. 4

Question Number : 20 Question Id : 43244927747 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The integrating factor for the differential equation  $x \log_e x dy = (2 \log_e x - y) dx$  is

- (1)  $\log_e x$
- (2)  $e^{-\log_e x}$
- (3)  $x$
- (4)  $\frac{1}{\log_e x}$

Options :

432449109377. 1  
432449109378. 2  
432449109379. 3  
432449109380. 4

Question Number : 20 Question Id : 43244927747 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

अवकल समीकरण  $x \log_e x dy = (2 \log_e x - y) dx$  का संकलनी घटक हैं

- (1)  $\log_e x$
- (2)  $e^{-\log_e x}$
- (3)  $x$
- (4)  $\frac{1}{\log_e x}$

Options :

432449109377. 1  
432449109378. 2  
432449109379. 3  
432449109380. 4

Question Number : 21 Question Id : 43244927748 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Which of the following differential equation is satisfied by  $y_1(x) = e^x$ ,  $y_2(x) = xe^x$  and  $y_3 = e^{2x}$  ?

- (1)  $\frac{d^3y}{dx^3} + \frac{4d^2y}{dx^2} + \frac{5dy}{dx} + 2y = 0$
- (2)  $\frac{d^3y}{dx^3} - \frac{4d^2y}{dx^2} + \frac{5dy}{dx} - 2y = 0$
- (3)  $\frac{d^3y}{dx^3} + \frac{4d^2y}{dx^2} - \frac{5dy}{dx} - 2y = 0$
- (4)  $\frac{d^3y}{dx^3} - \frac{4d^2y}{dx^2} + \frac{5dy}{dx} + 2y = 0$

Options :

- 432449109381. 1
- 432449109382. 2
- 432449109383. 3
- 432449109384. 4

Question Number : 21 Question Id : 43244927748 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

निम्नलिखित में से कौन सा अवकल समीकरण  $y_1(x) = e^x$ ,  $y_2(x) = x e^x$  और  $y_3 = e^{2x}$  के द्वारा संतुष्ट होगा ?

(1)  $\frac{d^3y}{dx^3} + \frac{4d^2y}{dx^2} + \frac{5dy}{dx} + 2y = 0$

(2)  $\frac{d^3y}{dx^3} - \frac{4d^2y}{dx^2} + \frac{5dy}{dx} - 2y = 0$

(3)  $\frac{d^3y}{dx^3} + \frac{4d^2y}{dx^2} - \frac{5dy}{dx} - 2y = 0$

(4)  $\frac{d^3y}{dx^3} - \frac{4d^2y}{dx^2} + \frac{5dy}{dx} + 2y = 0$

Options :

- 432449109381. 1
- 432449109382. 2
- 432449109383. 3
- 432449109384. 4

Question Number : 22 Question Id : 43244927749 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If A and B are two non-mutually exclusive events such that  $P(A|B) = P(B|A)$  then

(1)  $A \subset B$  but  $A \neq B$

(2)  $A = B$

(3)  $A \cap B = \phi$

(4)  $P(A) = P(B)$

Options :

- 432449109385. 1
- 432449109386. 2
- 432449109387. 3
- 432449109388. 4

Question Number : 22 Question Id : 43244927749 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

यदि A और B दो अपरस्पर अपवर्जी घटनाएँ इस प्रकार हैं कि  $P(A|B) = P(B|A)$  तो

(1)  $A \subset B$  परन्तु  $A \neq B$

(2)  $A = B$

(3)  $A \cap B = \phi$

(4)  $P(A) = P(B)$

Options :

- 432449109385. 1
- 432449109386. 2
- 432449109387. 3
- 432449109388. 4

Question Number : 23 Question Id : 43244927750 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Let E and F be two events, if  $P(E|F) = 0.5$ ,  $P(E|\bar{F}) = 0.6$  and  $P(F) = 0.6$  then  $P(E)$  equals

- (1) 0.56
- (2) 0.44
- (3) 0.54
- (4) 0.46

**Options :**

- 432449109389. 1
- 432449109390. 2
- 432449109391. 3
- 432449109392. 4

**Question Number : 23 Question Id : 43244927750 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

मान लो E और F दो घटनाएँ हैं, यदि  $P(E|F) = 0.5$ ,  $P(E|\bar{F}) = 0.6$  और  $P(F) = 0.6$  हैं, तो  $P(E)$  बराबर हैं

- (1) 0.56
- (2) 0.44
- (3) 0.54
- (4) 0.46

**Options :**

- 432449109389. 1
- 432449109390. 2
- 432449109391. 3
- 432449109392. 4

**Question Number : 24 Question Id : 43244927751 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If  $P(E) = \frac{1}{3}$ ,  $P(F) = \frac{1}{5}$  and  $P(E \cup F) = \frac{1}{2}$  then  $P(E|\bar{F}) + P(F|\bar{E})$  is equal to

- (1)  $\frac{5}{4}$
- (2)  $\frac{5}{8}$
- (3)  $\frac{3}{4}$
- (4)  $\frac{7}{8}$

**Options :**

- 432449109393. 1
- 432449109394. 2
- 432449109395. 3
- 432449109396. 4

**Question Number : 24 Question Id : 43244927751 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

यदि  $P(E)=\frac{1}{3}$ ,  $P(F)=\frac{1}{5}$  और  $P(E\cup F)=\frac{1}{2}$  हैं, तो  $P(E|\bar{F})+P(F|\bar{E})$  बराबर हैं

- (1)  $\frac{5}{4}$   
(2)  $\frac{5}{8}$   
(3)  $\frac{3}{4}$   
(4)  $\frac{7}{8}$

**Options :**

432449109393. 1  
432449109394. 2  
432449109395. 3  
432449109396. 4

**Question Number : 25 Question Id : 43244927752 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Which of the following statements are correct ?

- A. Ogives curves are used to obtain median  
B. Histogram are used to obtain mode  
C. Boxplots are used to determine mean  
D. Pie charts are used to determine quantile

Choose the **correct** answer from the options given below

- (1) A and B only  
(2) A and C only  
(3) B and C only  
(4) A and D only

**Options :**

432449109397. 1  
432449109398. 2  
432449109399. 3  
432449109400. 4

**Question Number : 25 Question Id : 43244927752 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

निम्नलिखित में से कौन से कथन सत्य हैं ?

- A. ओजाइव (तोरण) वक्रों का उपयोग, मध्यिका प्राप्त करने में होता है।  
B. आयतचित्र (हिस्टोग्राम) का उपयोग, बहुलक प्राप्त करने में होता है।  
C. बॉक्स-आलेखों का उपयोग, माध्य निर्धारित करने में होता है।  
D. पाई-चार्ट का उपयोग, चतुर्थक निर्धारित करने में होता है।

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए

- (1) केवल A और B  
(2) केवल A और C  
(3) केवल B और C  
(4) केवल A और D

**Options :**

432449109397. 1  
432449109398. 2  
432449109399. 3  
432449109400. 4

Question Number : 26 Question Id : 43244927753 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Consider  $x_1, x_2, \dots, x_n$  observations such that  $\sum_{i=1}^n x_i^2 = 500$  and  $\sum_{i=1}^n x_i = 50$ . Then a minimum number

of observations required is

- (1) 25
- (2) 5
- (3) 10
- (4) 15

Options :

- 432449109401. 1
- 432449109402. 2
- 432449109403. 3
- 432449109404. 4

Question Number : 26 Question Id : 43244927753 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

$x_1, x_2, \dots, x_n$  प्रेक्षणों पर विचार करें, इस प्रकार कि  $\sum_{i=1}^n x_i^2 = 500$  और  $\sum_{i=1}^n x_i = 50$  हैं, तो आवश्यक प्रेक्षणों की संख्या

है

- (1) 25
- (2) 5
- (3) 10
- (4) 15

Options :

- 432449109401. 1
- 432449109402. 2
- 432449109403. 3
- 432449109404. 4

Question Number : 27 Question Id : 43244927754 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If  $P(E) = \frac{1}{3}$ ,  $P(F) = \frac{2}{5}$  and  $P(E \cup F) - P(E \cap F) = \frac{1}{5}$  then  $P(E \cup F)$  is equal to

- (1)  $\frac{11}{15}$
- (2)  $\frac{4}{15}$
- (3)  $\frac{8}{15}$
- (4)  $\frac{7}{15}$

Options :

- 432449109405. 1
- 432449109406. 2
- 432449109407. 3
- 432449109408. 4

Question Number : 27 Question Id : 43244927754 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

यदि  $P(E) = \frac{1}{3}$ ,  $P(F) = \frac{2}{5}$  और  $P(E \cup F) - P(E \cap F) = \frac{1}{5}$  हैं, तो  $P(E \cup F)$  बराबर हैं

- (1)  $\frac{11}{15}$
- (2)  $\frac{4}{15}$
- (3)  $\frac{8}{15}$
- (4)  $\frac{7}{15}$

**Options :**

- 432449109405. 1
- 432449109406. 2
- 432449109407. 3
- 432449109408. 4

**Question Number : 28 Question Id : 43244927755 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Let E, F and G be mutually independent events such that  $P(E) = 0.4$ ,  $P(F) = 0.6$  and  $P(G) = 0.8$  then

$P(\bar{E} \cup \bar{F} \cup G)$  is

- (1) 0.192
- (2) 0.048
- (3) 0.952
- (4) 0.808

**Options :**

- 432449109409. 1
- 432449109410. 2
- 432449109411. 3
- 432449109412. 4

**Question Number : 28 Question Id : 43244927755 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

मान लो E, F और G परस्पर स्वतंत्र घटनाएँ इस प्रकार हैं कि  $P(E) = 0.4$ ,  $P(F) = 0.6$  और  $P(G) = 0.8$ , तो  $P(\bar{E} \cup \bar{F} \cup G)$  हैं

- (1) 0.192
- (2) 0.048
- (3) 0.952
- (4) 0.808

**Options :**

- 432449109409. 1
- 432449109410. 2
- 432449109411. 3
- 432449109412. 4

**Question Number : 29 Question Id : 43244927756 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Let E, F and G be events such that  $P(E|G) = 0.05$  and  $P(F|G) = 0.05$  which of the following statement must be true ?

- (1)  $P(E \cap F | G) = (0.05)^2$
- (2)  $P(\bar{E} \cap \bar{F} | G) \geq 0.90$
- (3)  $P(E \cup F | G) \leq 0.05$
- (4)  $P(E \cup F | \bar{G}) \geq 1 - (0.05)^2$

**Options :**

- 432449109413. 1
- 432449109414. 2
- 432449109415. 3
- 432449109416. 4

**Question Number : 29 Question Id : 43244927756 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

मान लो E, F और G घटनाएँ इस प्रकार हैं कि  $P(E|G) = 0.05$  और  $P(F|G) = 0.05$ , तो निम्नलिखित में से कौन सा कथन सत्य होना चाहिए ?

- (1)  $P(E \cap F | G) = (0.05)^2$
- (2)  $P(\bar{E} \cap \bar{F} | G) \geq 0.90$
- (3)  $P(E \cup F | G) \leq 0.05$
- (4)  $P(E \cup F | \bar{G}) \geq 1 - (0.05)^2$

**Options :**

- 432449109413. 1
- 432449109414. 2
- 432449109415. 3
- 432449109416. 4

**Question Number : 30 Question Id : 43244927757 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Three dice have the probabilities of throwing a "five" as p, q and r respectively. One of the dice is chosen at random (each is equally likely to be chosen) and thrown and a "five" appeared. What is the probability that the die chosen was the first one ?

- (1)  $\frac{r}{p+q+r}$
- (2)  $\frac{p}{p+q+r}$
- (3)  $\frac{q}{p+q+r}$
- (4)  $\frac{p+q+r}{3}$

**Options :**

- 432449109417. 1
- 432449109418. 2
- 432449109419. 3
- 432449109420. 4

**Question Number : 30 Question Id : 43244927757 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

तीन पासों की, "5" फेंकने की प्रायिकता, क्रमशः p, q और r है। एक पासे को, यादृच्छिक चुना जाता है (प्रत्येक की चुने जाने की संभावना समान हैं) और फेंका जाता है और 5 (पाँच) प्रकट होता है तो चुना हुआ पासा, पहले वाला होने की प्रायिकता क्या है?

(1)  $\frac{r}{p+q+r}$

(2)  $\frac{p}{p+q+r}$

(3)  $\frac{q}{p+q+r}$

(4)  $\frac{p+q+r}{3}$

**Options :**

432449109417. 1

432449109418. 2

432449109419. 3

432449109420. 4

**Question Number : 31 Question Id : 43244927758 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

You are given  $P(A \cup B) = 0.6$  and  $P(A \cup \bar{B}) = 0.8$  then  $P(A)$  is

(1) 0.6

(2) 0.2

(3) 0.75

(4) 0.4

**Options :**

432449109421. 1

432449109422. 2

432449109423. 3

432449109424. 4

**Question Number : 31 Question Id : 43244927758 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

आप को दिया गया है,  $P(A \cup B) = 0.6$  और  $P(A \cup \bar{B}) = 0.8$  तो  $P(A)$  है

(1) 0.6

(2) 0.2

(3) 0.75

(4) 0.4

**Options :**

432449109421. 1

432449109422. 2

432449109423. 3

432449109424. 4

**Question Number : 32 Question Id : 43244927759 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If  $G$  is a geometric mean of observations  $x_1, x_2, \dots, x_n$  then the geometric mean of  $y_i = e^{-\alpha \log_e x_i}$ ,  $i = 1, 2, \dots, n$  is

(1)  $\sqrt[\alpha]{G}$

(2)  $G^\alpha$

(3)  $G$

(4)  $G^{-\alpha}$

**Options :**

- 432449109425. 1
- 432449109426. 2
- 432449109427. 3
- 432449109428. 4

**Question Number : 32 Question Id : 43244927759 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

यदि  $G, x_1, x_2, \dots, x_n$  प्रेक्षणों का एक गुणोत्तर माध्य हैं, तो  $y_i = e^{-\alpha \log_e x_i}, i = 1, 2, \dots, n$  का गुणोत्तर माध्य हैं

- (1)  $\sqrt[n]{G}$
- (2)  $G^\alpha$
- (3)  $G$
- (4)  $G^{-\alpha}$

**Options :**

- 432449109425. 1
- 432449109426. 2
- 432449109427. 3
- 432449109428. 4

**Question Number : 33 Question Id : 43244927760 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

In a set of  $2n$  observations the geometric mean of first ' $n$ ' observations is 81 and the geometric mean of remaining  $n$ -observations is 16 then the geometric mean of all  $2n$  observations is

- (1) 9
- (2) 6
- (3) 54
- (4) 36

**Options :**

- 432449109429. 1
- 432449109430. 2
- 432449109431. 3
- 432449109432. 4

**Question Number : 33 Question Id : 43244927760 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

$2n$  प्रेक्षणों के एक समुच्चय में, प्रथम ' $n$ ' प्रेक्षणों का गुणोत्तर माध्य 81 है और बचे हुए  $n$  प्रेक्षणों का गुणोत्तर माध्य 16 है, तो सभी  $2n$  प्रेक्षणों का गुणोत्तर माध्य हैं

- (1) 9
- (2) 6
- (3) 54
- (4) 36

**Options :**

- 432449109429. 1
- 432449109430. 2
- 432449109431. 3
- 432449109432. 4

**Question Number : 34 Question Id : 43244927761 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Let  $X_1, X_2$ , be independent random variables each from a discrete probability mass function

$$P_{X_i}(x) = \begin{cases} \frac{1}{3} & \text{if } x=0 \\ \frac{2}{3} & \text{if } x=1, i=1, 2. \\ 0 & \text{otherwise} \end{cases}$$

Then the moment generating function of  $Y = X_1 \cdot X_2$  is

(1)  $\frac{4}{9} + \frac{5}{9}e^t$

(2)  $\frac{5}{9} + \frac{4}{9}e^t$

(3)  $\frac{5}{9} + \frac{4}{9}e^{2t}$

(4)  $\left(\frac{1}{3} + \frac{2}{3}e^t\right)^2$

**Options :**

432449109433. 1

432449109434. 2

432449109435. 3

432449109436. 4

**Question Number : 34 Question Id : 43244927761 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

मान लो  $X_1, X_2$  दो स्वतंत्र यादृच्छिक चर हैं जिनका असंतत प्रायिकता द्रव्यमान फलन

$$P_{X_i}(x) = \begin{cases} \frac{1}{3} & \text{यदि } x=0 \\ \frac{2}{3} & \text{यदि } x=1, i=1, 2 \\ 0 & \text{अन्यथा} \end{cases}$$

हैं, तो  $Y = X_1 \cdot X_2$  का आघूर्ण जनक फलन हैं

(1)  $\frac{4}{9} + \frac{5}{9}e^t$

(2)  $\frac{5}{9} + \frac{4}{9}e^t$

(3)  $\frac{5}{9} + \frac{4}{9}e^{2t}$

(4)  $\left(\frac{1}{3} + \frac{2}{3}e^t\right)^2$

**Options :**

432449109433. 1

432449109434. 2

432449109435. 3

432449109436. 4

**Question Number : 35 Question Id : 43244927762 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A random variable  $X$  have a cumulative distribution function  $F_x(x)$  given as

$$F_x(x) = \begin{cases} 0 & \text{if } x < 1 \\ \frac{x^2 - 2x + 2}{2} & \text{if } 1 \leq x < 2, \\ 1 & \text{if } x \geq 2 \end{cases}$$

then  $E(X)$  is

(1)  $\frac{3}{2}$

(2)  $\frac{4}{3}$

(3)  $\frac{7}{3}$

(4)  $\frac{5}{6}$

**Options :**

432449109437. 1

432449109438. 2

432449109439. 3

432449109440. 4

**Question Number : 35 Question Id : 43244927762 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

एक यादृच्छिक चर  $X$  का संचयी बंटन फलन  $F_x(x)$  निम्न दिया गया है

$$F_x(x) = \begin{cases} 0 & \text{यदि } x < 1 \\ \frac{x^2 - 2x + 2}{2} & \text{यदि } 1 \leq x < 2, \\ 1 & \text{यदि } x \geq 2 \end{cases}$$

तो  $E(X)$  हैं

(1)  $\frac{3}{2}$

(2)  $\frac{4}{3}$

(3)  $\frac{7}{3}$

(4)  $\frac{5}{6}$

**Options :**

432449109437. 1

432449109438. 2

432449109439. 3

432449109440. 4

**Question Number : 36 Question Id : 43244927763 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Let X be a random variable with distribution function

$$F_X(x) = \begin{cases} 0 & \text{for } x < 0 \\ \frac{x}{8} & \text{for } 0 \leq x < 1 \\ \frac{1}{4} + \frac{x}{8} & \text{for } 1 \leq x < 2, \\ \frac{3}{4} + \frac{x}{12} & \text{for } 2 \leq x < 3 \\ 1 & \text{for } x \geq 3 \end{cases}$$

then  $P(1 \leq X \leq 2)$  is

- (1)  $\frac{3}{8}$   
(2)  $\frac{7}{16}$   
(3)  $\frac{13}{24}$   
(4)  $\frac{19}{24}$

Options :

432449109441. 1  
432449109442. 2  
432449109443. 3  
432449109444. 4

Question Number : 36 Question Id : 43244927763 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

मान लो X एक यादृच्छिक चर हैं जिसका बंटन फलन

$$F_X(x) = \begin{cases} 0 & x < 0 \text{ के लिए} \\ \frac{x}{8} & 0 \leq x < 1 \text{ के लिए} \\ \frac{1}{4} + \frac{x}{8} & 1 \leq x < 2 \text{ के लिए} \\ \frac{3}{4} + \frac{x}{12} & 2 \leq x < 3 \text{ के लिए} \\ 1 & x \geq 3 \text{ के लिए} \end{cases}$$

हैं, तो  $P(1 \leq X \leq 2)$  का मान हैं

- (1)  $\frac{3}{8}$   
(2)  $\frac{7}{16}$   
(3)  $\frac{13}{24}$   
(4)  $\frac{19}{24}$

Options :

432449109441. 1  
432449109442. 2  
432449109443. 3

**Question Number : 37 Question Id : 43244927764 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If  $G(x)$  be the distribution function of random variable  $X$  symmetric about 0 then  $\int_{-a}^a G(x) dx$

equals

- (1)  $a$
- (2)  $2a$
- (3)  $0$
- (4)  $1$

**Options :**

- 432449109445. 1
- 432449109446. 2
- 432449109447. 3
- 432449109448. 4

**Question Number : 37 Question Id : 43244927764 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

मान लो  $G(x)$  यादृच्छिक चर  $X$ , जो 0 के चारों ओर सममित हैं, का बंटन फलन हैं, तो  $\int_{-a}^a G(x) dx$  बराबर हैं

- (1)  $a$
- (2)  $2a$
- (3)  $0$
- (4)  $1$

**Options :**

- 432449109445. 1
- 432449109446. 2
- 432449109447. 3
- 432449109448. 4

**Question Number : 38 Question Id : 43244927765 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Let  $G_x(\cdot)$  be the distribution function of an arbitrary random variable symmetric about 0 (zero) and

$G_x^{\leftarrow}$  is the inverse function of  $G_x$  then for  $p \in (0, 1)$  value of  $G_x^{\leftarrow}(p) + G_x^{\leftarrow}(1-p)$  is

- (1)  $1$
- (2)  $0$
- (3)  $2p$
- (4)  $p$

**Options :**

- 432449109449. 1
- 432449109450. 2
- 432449109451. 3
- 432449109452. 4

**Question Number : 38 Question Id : 43244927765 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

मान लो  $G_x(\cdot)$ , एक स्वेच्छ यादृच्छिक चर जो 0 (शून्य) के चारों ओर सममित हैं, का बंटन फलन हैं और  $G_x^{\leftarrow}, G_x$  का

प्रतिलोम फलन है तो  $p \in (0, 1)$  के लिए  $G_x^{\leftarrow}(p) + G_x^{\leftarrow}(1-p)$  का मान हैं

- (1) 1
- (2) 0
- (3) 2p
- (4) p

**Options :**

432449109449. 1  
432449109450. 2  
432449109451. 3  
432449109452. 4

**Question Number : 39 Question Id : 43244927766 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If  $X, X_1, X_2$  are independent and identically distributed positive random variables with distribution

function  $F_X(x)$  then  $\int_0^{\infty} 2 \cdot x \cdot \bar{F}_X^2(x) dx$  equals

- (1)  $E(\min(X_1, X_2))$
- (2)  $E(\max(X_1, X_2))$
- (3)  $E(\min^2(X_1, X_2))$
- (4)  $E(\max^2(X_1, X_2))$

**Options :**

432449109453. 1  
432449109454. 2  
432449109455. 3  
432449109456. 4

**Question Number : 39 Question Id : 43244927766 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

यदि  $X, X_1, X_2$  बंटन फलन  $F_X(x)$  के साथ, स्वतंत्र और सर्वसम बंटित, घनात्मक यादृच्छिक चर हैं तो  $\int_0^{\infty} 2 \cdot x \cdot \bar{F}_X^2(x) dx$

बराबर हैं

- (1)  $E(\min(X_1, X_2))$
- (2)  $E(\max(X_1, X_2))$
- (3)  $E(\min^2(X_1, X_2))$
- (4)  $E(\max^2(X_1, X_2))$

**Options :**

432449109453. 1  
432449109454. 2  
432449109455. 3  
432449109456. 4

**Question Number : 40 Question Id : 43244927767 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Let X and Y be independent non negative integer valued random variables with  $E(X) < \infty$ ,  $E(Y) < \infty$ , then

$$(1) \quad E(\min(X, Y)) = \sum_{R=0}^{\infty} P(XY > R)$$

$$(2) \quad E(\min(X, Y)) = \sum_{R=0}^{\infty} P(X \leq R)P(Y \leq R)$$

$$(3) \quad E(\min(X, Y)) = \sum_{R=0}^{\infty} P(X > R) \cdot P(Y > R)$$

$$(4) \quad E(\min(X, Y)) = \sum_{R=0}^{\infty} P(XY \leq R)$$

Options :

432449109457. 1

432449109458. 2

432449109459. 3

432449109460. 4

Question Number : 40 Question Id : 43244927767 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

मान लो X और Y स्वतंत्र, ऋणोत्तर, पूर्ण संख्या के मानो वाली, यादृच्छिक चर हैं तथा  $E(X) < \infty$ ,  $E(Y) < \infty$  है तो

$$(1) \quad E(\min(X, Y)) = \sum_{R=0}^{\infty} P(XY > R)$$

$$(2) \quad E(\min(X, Y)) = \sum_{R=0}^{\infty} P(X \leq R)P(Y \leq R)$$

$$(3) \quad E(\min(X, Y)) = \sum_{R=0}^{\infty} P(X > R) \cdot P(Y > R)$$

$$(4) \quad E(\min(X, Y)) = \sum_{R=0}^{\infty} P(XY \leq R)$$

Options :

432449109457. 1

432449109458. 2

432449109459. 3

432449109460. 4

Question Number : 41 Question Id : 43244927768 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If r.v  $X \sim N(0, 1)$  then  $E\left(\frac{1}{\sqrt{2\pi}} \int_{-\infty}^x e^{-z^2/2} dz\right)$  equals to

$$(1) \quad -\infty$$

$$(2) \quad 0$$

$$(3) \quad \frac{1}{2}$$

$$(4) \quad 1$$

Options :

432449109461. 1

432449109462. 2

432449109463. 3

Question Number : 41 Question Id : 43244927768 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

यदि  $r \cdot v X \sim N(0, 1)$  है तो  $E\left(\frac{1}{\sqrt{2\pi}} \int_{-\infty}^x e^{-z^2/2} dz\right)$  बराबर हैं

- (1)  $-\infty$   
 (2) 0  
 (3)  $\frac{1}{2}$   
 (4) 1

Options :

432449109461. 1  
 432449109462. 2  
 432449109463. 3  
 432449109464. 4

Question Number : 42 Question Id : 43244927769 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The Moment Generating Function (MGF) of random variable X is given by  $M_X(t) = \left(\frac{e^{-t} + e^t}{2}\right)^3$ ,

$t \geq 0$  then  $P(|X| > 1)$  is

- (1)  $\frac{1}{8}$   
 (2)  $\frac{2}{8}$   
 (3)  $\frac{3}{8}$   
 (4)  $\frac{4}{8}$

Options :

432449109465. 1  
 432449109466. 2  
 432449109467. 3  
 432449109468. 4

Question Number : 42 Question Id : 43244927769 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

यादृच्छिक चर X का, आघूर्ण जनक फलन (MGF)  $M_X(t) = \left(\frac{e^{-t} + e^t}{2}\right)^3$ ,  $t \geq 0$  दिया जाता है, तो  $P(|X| > 1)$  है

- (1)  $\frac{1}{8}$   
 (2)  $\frac{2}{8}$   
 (3)  $\frac{3}{8}$   
 (4)  $\frac{4}{8}$

Options :

432449109465. 1  
 432449109466. 2  
 432449109467. 3

**Question Number : 43 Question Id : 43244927770 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If  $X$  and  $Y$  are independent non-degenerated random variables then  $\text{Var}(XY) = \text{Var}(X) \cdot \text{Var}(Y)$  iff

- (1)  $E(X) \neq 0$  and  $E(Y) \neq 0$
- (2)  $E(X) = 0$  and  $E(Y) \neq 0$
- (3)  $E(X) \neq 0$  and  $E(Y) = 0$
- (4)  $E(X) = 0$  and  $E(Y) = 0$

**Options :**

432449109469. 1  
432449109470. 2  
432449109471. 3  
432449109472. 4

**Question Number : 43 Question Id : 43244927770 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

यदि  $X$  और  $Y$ , स्वतंत्र अनपभ्रष्ट यादृच्छिक चर हैं, तो  $\text{Var}(XY) = \text{Var}(X) \cdot \text{Var}(Y)$  यदि

- (1)  $E(X) \neq 0$  और  $E(Y) \neq 0$
- (2)  $E(X) = 0$  और  $E(Y) \neq 0$
- (3)  $E(X) \neq 0$  और  $E(Y) = 0$
- (4)  $E(X) = 0$  और  $E(Y) = 0$

**Options :**

432449109469. 1  
432449109470. 2  
432449109471. 3  
432449109472. 4

**Question Number : 44 Question Id : 43244927771 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The variance of random variable  $X$  having density  $f_X(x) = ce^{-|x|}$ ,  $-\infty < x < \infty$  is

- (1) 1
- (2)  $\frac{1}{2}$
- (3)  $\frac{3}{2}$
- (4) 2

**Options :**

432449109473. 1  
432449109474. 2  
432449109475. 3  
432449109476. 4

**Question Number : 44 Question Id : 43244927771 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

यादृच्छिक चर  $X$ , जिसका घनत्व  $f_X(x) = ce^{-|x|}$ ,  $-\infty < x < \infty$  हैं, तो उसका प्रसरण है

- (1) 1
- (2)  $\frac{1}{2}$
- (3)  $\frac{3}{2}$
- (4) 2

**Options :**

432449109473. 1  
 432449109474. 2  
 432449109475. 3  
 432449109476. 4

**Question Number : 45 Question Id : 43244927772 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Let  $X_1$  and  $X_2$  be i.i.d. Bernoulli ( $p$ ),  $0 < p < 1$  then  $\text{Var}(\max(X_1, X_2))$  is

- (1)  $(2-p)(1-p)^2$ ,  
 (2)  $p(2+p)(1-p)^2$   
 (3)  $p^2(1-p^2)$   
 (4)  $p(2-p)(1-p)^2$

**Options :**

432449109477. 1  
 432449109478. 2  
 432449109479. 3  
 432449109480. 4

**Question Number : 45 Question Id : 43244927772 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

यदि  $X_1$  और  $X_2$  i.i.d. बर्नूली ( $p$ ),  $0 < p < 1$  है तो  $\text{Var}(\max(X_1, X_2))$  है

- (1)  $(2-p)(1-p)^2$   
 (2)  $p(2+p)(1-p)^2$   
 (3)  $p^2(1-p^2)$   
 (4)  $p(2-p)(1-p)^2$

**Options :**

432449109477. 1  
 432449109478. 2  
 432449109479. 3  
 432449109480. 4

**Question Number : 46 Question Id : 43244927773 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A fair coin is tossed  $2n$  times, then the probability that the outcomes do not result in an equal number of heads and tails is

- (1)  $1 - \frac{2n!}{(n!)^2} \left(\frac{1}{2}\right)^{2n}$   
 (2)  $1 - \frac{2n!}{(n!)^2}$   
 (3)  $\frac{2n!}{(n!)^2} \left(\frac{1}{2}\right)^{2n}$   
 (4)  $\frac{2n!}{(n!)^2}$

**Options :**

432449109481. 1  
 432449109482. 2  
 432449109483. 3  
 432449109484. 4

**Question Number : 46 Question Id : 43244927773 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

एक अनमिनत सिक्के को  $2n$  बार उछाला जाता है, तो परिणाम, बराबर संख्या के शीर्ष (हेड) और पुच्छ (टेल) न आएँ, की प्रायिकता होगी

(1)  $1 - \frac{2n!}{(n!)^2} \left(\frac{1}{2}\right)^{2n}$

(2)  $1 - \frac{2n!}{(n!)^2}$

(3)  $\frac{2n!}{(n!)^2} \left(\frac{1}{2}\right)^{2n}$

(4)  $\frac{2n!}{(n!)^2}$

**Options :**

432449109481. 1

432449109482. 2

432449109483. 3

432449109484. 4

**Question Number : 47 Question Id : 43244927774 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If  $X_1, X_2, X_3$  are independent and identically distributed standard normal variates and let

$$U = \frac{\sqrt{2}X_3}{\sqrt{X_1^2 + X_2^2}} \text{ then } U^2 \text{ follows}$$

(1)  $t_4$

(2)  $t_2$

(3)  $F(1, 2)$

(4)  $F(1, 4)$

**Options :**

432449109485. 1

432449109486. 2

432449109487. 3

432449109488. 4

**Question Number : 47 Question Id : 43244927774 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

यदि  $X_1, X_2, X_3$  स्वतंत्र और सर्वसम बंटित मानक प्रसामान्य विचर है और मानो  $U = \frac{\sqrt{2}X_3}{\sqrt{X_1^2 + X_2^2}}$  हैं तो  $U^2$  अनुगमन

(अनुसरण) करता है

(1)  $t_4$

(2)  $t_2$

(3)  $F(1, 2)$

(4)  $F(1, 4)$

**Options :**

432449109485. 1

432449109486. 2

432449109487. 3

432449109488. 4

**Question Number : 48 Question Id : 43244927775 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If  $X$  has the  $F$  distribution with  $m, n$  degree of freedoms and let  $Y = \frac{1}{X}$  then for  $a > 0$

$P[X \leq a] + P\left[Y \leq \frac{1}{a}\right]$  is equal to

- (1) 0
- (2) a
- (3) 1
- (4) 2a

**Options :**

432449109489. 1  
432449109490. 2  
432449109491. 3  
432449109492. 4

**Question Number : 48 Question Id : 43244927775 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

यदि  $X$  का,  $m, n$  स्वातंत्र्य कोटि के साथ,  $F$  बंटन है और मानो  $Y = \frac{1}{X}$  तो  $a > 0$  के लिए  $P[X \leq a] + P\left[Y \leq \frac{1}{a}\right]$  बराबर है

- (1) 0
- (2) a
- (3) 1
- (4) 2a

**Options :**

432449109489. 1  
432449109490. 2  
432449109491. 3  
432449109492. 4

**Question Number : 49 Question Id : 43244927776 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Let  $X_1, X_2, \dots, X_n$  be random sample from Normal population with mean  $\mu$  and variance  $\sigma^2$ . Then which of the following results are correct ?

A.  $\bar{X} \sim N\left(\mu, \frac{\sigma^2}{n}\right)$

B.  $\sum_{i=1}^n \left(\frac{X_i - \bar{X}}{\sigma}\right)^2 \sim \chi_n^2$

C.  $\bar{X}$  and  $\sum_{i=1}^n \left(\frac{X_i - \bar{X}}{\sigma}\right)^2$  are independently distributed

D.  $\frac{(\bar{X} - \mu)^2}{\frac{\sigma^2}{n}} \sim \chi_1^2$

E.  $\sum_{i=1}^n \left(\frac{X_i - \mu}{\sigma}\right)^2 \sim \chi_{n-1}^2$

Choose the **correct** answer from the options given below

- (1) A, B only
- (2) B, D only
- (3) A, C and D only
- (4) B, E only

**Options :**

432449109493. 1  
 432449109494. 2  
 432449109495. 3  
 432449109496. 4

**Question Number : 49 Question Id : 43244927776 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

मान लो  $X_1, X_2, \dots, X_n$  एक प्रसामान्य जनसंख्या में से, माध्य  $\mu$  और प्रसरण  $\sigma^2$  के साथ यादृच्छिक प्रतिदर्श है, तो निम्न में से कौनसे परिणाम सही हैं ?

A.  $\bar{X} \sim N\left(\mu, \frac{\sigma^2}{n}\right)$

B.  $\sum_{i=1}^n \left(\frac{X_i - \bar{X}}{\sigma}\right)^2 \sim \chi_n^2$

C.  $\bar{X}$  और  $\sum_{i=1}^n \left(\frac{X_i - \bar{X}}{\sigma}\right)^2$  स्वतंत्र बंटित है

D.  $\frac{(\bar{X} - \mu)^2}{\frac{\sigma^2}{n}} \sim \chi_1^2$

E.  $\sum_{i=1}^n \left(\frac{X_i - \mu}{\sigma}\right)^2 \sim \chi_{n-1}^2$

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए

- (1) केवल A, B
- (2) केवल B, D
- (3) केवल A, C और D
- (4) केवल B, E

**Options :**

432449109493. 1  
 432449109494. 2  
 432449109495. 3  
 432449109496. 4

**Question Number : 50 Question Id : 43244927777 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The random variable  $Y \sim U(0, X)$ , where the marginal density of  $X$  is  $f_X(x) = \begin{cases} 2x & \text{for } 0 < x < 1 \\ 0 & \text{otherwise} \end{cases}$  then

$E(Y)$  is

- (1)  $\frac{2}{3}$
- (2)  $\frac{4}{3}$
- (3)  $\frac{1}{2}$
- (4)  $\frac{1}{3}$

**Options :**

432449109497. 1

432449109498. 2

432449109499. 3

432449109500. 4

**Question Number : 50 Question Id : 43244927777 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

यादृच्छिक चर,  $Y \sim U(0, X)$ , जहाँ  $X$  का उपांत घनत्व  $f_x(x) = \begin{cases} 2x & 0 < x < 1 \text{ के लिए} \\ 0 & \text{अन्यथा} \end{cases}$  हैं, तो  $E(Y)$  हैं

(1)  $\frac{2}{3}$

(2)  $\frac{4}{3}$

(3)  $\frac{1}{2}$

(4)  $\frac{1}{3}$

**Options :**

432449109497. 1

432449109498. 2

432449109499. 3

432449109500. 4

**Question Number : 51 Question Id : 43244927778 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If the random variables  $X$  and  $Y$  follows discrete uniform over set  $\{0, 1, \dots, n\}$  and  $\{1, 2, \dots, n\}$  respectively then  $\text{Var}(X) - \text{Var}(Y)$  equals to

(1)  $\frac{2n+1}{12}$

(2)  $\frac{1}{12}$

(3) 0

(4)  $-\frac{1}{12}$

**Options :**

432449109501. 1

432449109502. 2

432449109503. 3

432449109504. 4

**Question Number : 51 Question Id : 43244927778 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

यदि यादृच्छिक चर  $X$  और  $Y$  क्रमशः वियुक्त, एक समान, अति समुच्चय  $\{0, 1, \dots, n\}$  और  $\{1, 2, \dots, n\}$  का उपगमन (अनुसरण) करते हैं तो  $\text{Var}(X) - \text{Var}(Y)$  बराबर है

(1)  $\frac{2n+1}{12}$

(2)  $\frac{1}{12}$

(3) 0

(4)  $-\frac{1}{12}$

**Options :**

432449109501. 1

432449109502. 2

432449109503. 3

432449109504. 4

**Question Number : 52 Question Id : 43244927779 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The joint density of random variable X and Y is  $f_{XY}(x, y) = \begin{cases} 2x & \text{for } 0 < x < 1, x < y < x+1 \\ 0 & \text{otherwise} \end{cases}$ , then

marginal of Y is

$$(1) f_Y(y) = \begin{cases} y^2 & \text{for } 0 < y < 1 \\ y(2-y) & \text{for } 1 < y < 2 \\ 0 & \text{otherwise} \end{cases}$$

$$(2) f_Y(y) = \begin{cases} 1 & \text{for } 0 < y < 1 \\ 0 & \text{otherwise} \end{cases}$$

$$(3) f_Y(y) = \begin{cases} 2y & \text{for } 0 < y < 1 \\ 0 & \text{otherwise} \end{cases}$$

$$(4) f_Y(y) = \begin{cases} 3y^2 & \text{for } 0 < y < 1 \\ 0 & \text{otherwise} \end{cases}$$

**Options :**

432449109505. 1

432449109506. 2

432449109507. 3

432449109508. 4

**Question Number : 52 Question Id : 43244927779 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

यादृच्छिक चर X और Y का संयुक्त घनत्व है  $f_{XY}(x, y) = \begin{cases} 2x & \text{for } 0 < x < 1, x < y < x+1 \\ 0 & \text{अन्यथा} \end{cases}$  तो Y का उपांत है

$$(1) f_Y(y) = \begin{cases} y^2 & , 0 < y < 1 \text{ के लिए} \\ y(2-y) & , 1 < y < 2 \text{ के लिए} \\ 0 & \text{अन्यथा} \end{cases}$$

$$(2) f_Y(y) = \begin{cases} 1 & , 0 < y < 1 \text{ के लिए} \\ 0 & \text{अन्यथा} \end{cases}$$

$$(3) f_Y(y) = \begin{cases} 2y & , 0 < y < 1 \text{ के लिए} \\ 0 & \text{अन्यथा} \end{cases}$$

$$(4) f_Y(y) = \begin{cases} 3y^2 & , 0 < y < 1 \text{ के लिए} \\ 0 & \text{अन्यथा} \end{cases}$$

**Options :**

432449109505. 1

432449109506. 2

432449109507. 3

432449109508. 4

**Question Number : 53 Question Id : 43244927780 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The joint density function of X and Y is  $f_{X,Y}(x,y) = \begin{cases} x+y & \text{for } 0 < x < 1 \text{ and } 0 < y < 1 \\ 0 & \text{elsewhere} \end{cases}$ , then

$P(X < 2Y)$  is

(1)  $\frac{4}{3}$

(2)  $\frac{19}{24}$

(3)  $\frac{1}{4}$

(4)  $\frac{3}{4}$

**Options :**

432449109509. 1

432449109510. 2

432449109511. 3

432449109512. 4

**Question Number : 53 Question Id : 43244927780 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

X और Y का संयुक्त घनत्व फलन  $f_{X,Y}(x,y) = \begin{cases} x+y & 0 < x < 1 \text{ और } 0 < y < 1 \text{ के लिए} \\ 0 & \text{अन्यथा} \end{cases}$  है, तो  $P(X < 2Y)$  है

(1)  $\frac{4}{3}$

(2)  $\frac{19}{24}$

(3)  $\frac{1}{4}$

(4)  $\frac{3}{4}$

**Options :**

432449109509. 1

432449109510. 2

432449109511. 3

432449109512. 4

**Question Number : 54 Question Id : 43244927781 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Let X be a random variable having probability density function  $f_X(x) = \begin{cases} 2x & 0 < x < 1 \\ 0 & \text{otherwise} \end{cases}$  then the

density of  $Y = \frac{1}{X^\alpha}$  is

(1)  $f_Y(y) = \frac{\alpha}{y^{\alpha+1}}; y > 1$

(2)  $f_Y(y) = \frac{\alpha}{2y^{\frac{\alpha}{2}+1}}; y > 1$

(3)  $f_Y(y) = \frac{2\alpha}{y^{2\alpha+1}}; y > 1$

(4)  $f_Y(y) = \frac{1}{2\alpha y^{\frac{1}{2\alpha}+1}}; y > 1$

**Options :**

- 432449109513. 1
- 432449109514. 2
- 432449109515. 3
- 432449109516. 4

**Question Number : 54 Question Id : 43244927781 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

मान लो X एक यादृच्छिक चर है, जिसका प्रायिकता घनत्व फलन  $f_X(x) = \begin{cases} 2x & 0 < x < 1 \\ 0 & \text{अन्यथा} \end{cases}$  है, तो  $Y = \frac{1}{X^\alpha}$  का घनत्व है

(1)  $f_Y(y) = \frac{\alpha}{y^{\alpha+1}}; y > 1$

(2)  $f_Y(y) = \frac{\alpha}{2y^{\frac{\alpha}{2}+1}}; y > 1$

(3)  $f_Y(y) = \frac{2\alpha}{y^{2\alpha+1}}; y > 1$

(4)  $f_Y(y) = \frac{1}{2\alpha y^{\frac{1}{2\alpha}+1}}; y > 1$

**Options :**

- 432449109513. 1
- 432449109514. 2
- 432449109515. 3
- 432449109516. 4

**Question Number : 55 Question Id : 43244927782 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Consider the regression model  $y_i = \beta_0 + i\beta_1 + \epsilon_i$  ( $i = 1, 2, \dots, n > 2$ ) where  $\beta_0$  and  $\beta_1$  are unknown parameters and  $\epsilon_i$ 's are random errors. Let  $y_i$  be the observed value of  $Y_i$  ( $i = 1, 2, \dots, n$ ). Using the method of ordinary least squares, the estimate of  $\beta_1$  is

$$(1) \frac{1}{n^2-1} \left[ \frac{12}{n} \sum_{i=1}^n iy_i - 6(n+1)\bar{y} \right]$$

$$(2) \frac{1}{(n^2-1)n} \left[ 12 \sum_{i=1}^n iy_i - 6(n+1)\bar{y} \right]$$

$$(3) \frac{1}{n(n^2-1)} \left[ 12 \sum_{i=1}^n iy_i - 6n\bar{y} \right]$$

$$(4) \frac{1}{n(n^2-1)} \left[ 12 \sum_{i=1}^n iy_i - 6\bar{y} \right]$$

**Options :**

432449109517. 1  
 432449109518. 2  
 432449109519. 3  
 432449109520. 4

**Question Number : 55 Question Id : 43244927782 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

समाश्रयण मॉडल पर विचार करें  $y_i = \beta_0 + i\beta_1 + \epsilon_i$  ( $i = 1, 2, \dots, n > 2$ ) यहाँ  $\beta_0$  और  $\beta_1$  अज्ञात प्राचल हैं और  $\epsilon_i$ 's यादृच्छिक त्रुटियाँ हैं। मानो  $y_i, Y_i$  ( $i = 1, 2, \dots, n$ ) का प्रेक्षित मान है तो साधारण न्यूनतम वर्ग विधि का प्रयोग करके  $\beta_1$  का आकलन करें

$$(1) \frac{1}{n^2-1} \left[ \frac{12}{n} \sum_{i=1}^n iy_i - 6(n+1)\bar{y} \right]$$

$$(2) \frac{1}{(n^2-1)n} \left[ 12 \sum_{i=1}^n iy_i - 6(n+1)\bar{y} \right]$$

$$(3) \frac{1}{n(n^2-1)} \left[ 12 \sum_{i=1}^n iy_i - 6n\bar{y} \right]$$

$$(4) \frac{1}{n(n^2-1)} \left[ 12 \sum_{i=1}^n iy_i - 6\bar{y} \right]$$

**Options :**

432449109517. 1  
 432449109518. 2  
 432449109519. 3  
 432449109520. 4

**Question Number : 56 Question Id : 43244927783 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A joint density function of random variable X and Y is given by

$$f(x,y)=\begin{cases} kx & \text{for } 0 < x < 1, 0 < y < 1 \\ 0 & \text{otherwise} \end{cases},$$

then  $\text{Cov}(X, Y)$  is

(1)  $-\frac{1}{6}$

(2)  $\frac{1}{6}$

(3) 0

(4)  $\frac{2}{3}$

**Options :**

432449109521. 1

432449109522. 2

432449109523. 3

432449109524. 4

**Question Number : 56 Question Id : 43244927783 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

यादृच्छिक चर X और Y का एक संयुक्त घनत्व फलन  $f(x,y)=\begin{cases} kx & 0 < x < 1, 0 < y < 1 \\ 0 & \text{अन्यथा} \end{cases}$  है,

तो  $\text{Cov}(X, Y)$  है

(1)  $-\frac{1}{6}$

(2)  $\frac{1}{6}$

(3) 0

(4)  $\frac{2}{3}$

**Options :**

432449109521. 1

432449109522. 2

432449109523. 3

432449109524. 4

**Question Number : 57 Question Id : 43244927784 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Let  $X_1, X_2, \dots$  be independent variables each taking values +1 or -1 with equal probability

respectively. If  $S_n = \sum_{i=1}^n X_i$  then  $\lim_{n \rightarrow \infty} P\left(S_n < \sqrt{\frac{n(n+1)(2n+1)}{3}}\right)$ , where  $\Phi$  is distribution function

of standard normal variate, is

(1)  $\Phi(-\sqrt{3})$

(2)  $\Phi(-\sqrt{2})$

(3)  $1 - \Phi(-\sqrt{3})$

(4)  $1 - \Phi(-\sqrt{2})$

**Options :**

432449109525. 1

432449109526. 2

432449109527. 3

**Question Number : 57 Question Id : 43244927784 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

मान लो  $X_1, X_2, \dots$  स्वतंत्र चर हैं, यहाँ प्रत्येक समान प्रायिकता के साथ, क्रमशः +1 या -1 मान लेता हैं। यदि

$S_n = \sum_{i=1}^n X_i$  है तो  $\lim_{n \rightarrow \infty} P\left(S_n < \sqrt{\frac{n(n+1)(2n+1)}{3}}\right)$ , यहाँ  $\Phi$  मानक प्रसामान्य विचर का बंटन फलन है, है

- (1)  $\Phi(-\sqrt{3})$
- (2)  $\Phi(-\sqrt{2})$
- (3)  $1 - \Phi(-\sqrt{3})$
- (4)  $1 - \Phi(-\sqrt{2})$

**Options :**

432449109525. 1  
432449109526. 2  
432449109527. 3  
432449109528. 4

**Question Number : 58 Question Id : 43244927785 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If  $A_{x:n} = \left\{k : \left|k - \frac{n}{2}\right| \leq \frac{x\sqrt{n}}{2}\right\}$ , then value of  $\lim_{n \rightarrow \infty} \sum_{k \in A_{1:n}} \binom{n}{k} 2^{-n}$  (where  $\Phi(\cdot)$  is distribution

function of standard normal variate) is

- (1)  $\Phi(-1)$
- (2)  $\Phi(1)$
- (3)  $1 - 2\Phi(-1)$
- (4)  $\frac{\Phi(1)}{2}$

**Options :**

432449109529. 1  
432449109530. 2  
432449109531. 3  
432449109532. 4

**Question Number : 58 Question Id : 43244927785 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

यदि  $A_{x:n} = \left\{k : \left|k - \frac{n}{2}\right| \leq \frac{x\sqrt{n}}{2}\right\}$ , तो  $\lim_{n \rightarrow \infty} \sum_{k \in A_{1:n}} \binom{n}{k} 2^{-n}$  का मान (यहाँ  $\Phi(\cdot)$  मानक प्रसामान्य विचर का बंटन

फलन है) है

- (1)  $\Phi(-1)$
- (2)  $\Phi(1)$
- (3)  $1 - 2\Phi(-1)$
- (4)  $\frac{\Phi(1)}{2}$

**Options :**

432449109529. 1  
432449109530. 2  
432449109531. 3  
432449109532. 4

**Question Number : 59 Question Id : 43244927786 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Let  $X_i \sim N(0, 1)$ ,  $i=1, 2, \dots$ , be independent random variables. If  $T_n = \sum_{i=1}^n X_i^2$ , then

$\lim_{n \rightarrow \infty} P(T_n > n+2\sqrt{2n})$  is equal to

- (1)  $\Phi(2)$
- (2)  $\Phi(-2)$
- (3)  $\frac{1}{2}$
- (4)  $1 - \Phi(-2)$

**Options :**

- 432449109533. 1
- 432449109534. 2
- 432449109535. 3
- 432449109536. 4

**Question Number : 59 Question Id : 43244927786 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

मानो  $X_i \sim N(0, 1)$ , यहाँ  $i=1, 2, \dots$ , स्वतंत्र चर है। यदि  $T_n = \sum_{i=1}^n X_i^2$  हैं, तो  $\lim_{n \rightarrow \infty} P(T_n > n+2\sqrt{2n})$  बराबर है

- (1)  $\Phi(2)$
- (2)  $\Phi(-2)$
- (3)  $\frac{1}{2}$
- (4)  $1 - \Phi(-2)$

**Options :**

- 432449109533. 1
- 432449109534. 2
- 432449109535. 3
- 432449109536. 4

**Question Number : 60 Question Id : 43244927787 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Value of  $\lim_{n \rightarrow \infty} e^{-n} \left( 1 + n + \frac{n^2}{2!} + \dots + \frac{n^n}{n!} \right)$  is

- (1) 0
- (2) 1
- (3)  $\frac{1}{2}$
- (4)  $\infty$

**Options :**

- 432449109537. 1
- 432449109538. 2
- 432449109539. 3
- 432449109540. 4

**Question Number : 60 Question Id : 43244927787 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

$\lim_{n \rightarrow \infty} e^{-n} \left( 1 + n + \frac{n^2}{2!} + \dots + \frac{n^n}{n!} \right)$  का मान है

- (1) 0  
(2) 1  
(3)  $\frac{1}{2}$   
(4)  $\infty$

Options :

432449109537. 1  
432449109538. 2  
432449109539. 3  
432449109540. 4

Question Number : 61 Question Id : 43244927788 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Let  $\{X_n\}$  be a sequence of r.v's and  $Y_n = \left( \frac{S_n - E(S_n)}{n} \right)$  where  $S_n = \sum_{i=1}^n X_i$ , then the necessary and sufficient condition for the sequence  $\{X_n\}$  to satisfy W.L.L.N is

- (1)  $E\left(\frac{Y_n}{1+Y_n}\right) \rightarrow 0$  as  $n \rightarrow \infty$   
(2)  $E\left(\frac{Y_n^2}{1+Y_n^2}\right) \rightarrow 0$  as  $n \rightarrow \infty$   
(3)  $E\left(\frac{Y_n}{1+Y_n^2}\right) \rightarrow 0$  as  $n \rightarrow \infty$   
(4)  $E\left(\frac{Y_n^2}{1+Y_n}\right) \rightarrow 0$  as  $n \rightarrow \infty$

Options :

432449109541. 1  
432449109542. 2  
432449109543. 3  
432449109544. 4

Question Number : 61 Question Id : 43244927788 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

मानो लो  $\{X_n\}$  यादृच्छिक चरों की एक श्रेणी हैं और  $Y_n = \left( \frac{S_n - E(S_n)}{n} \right)$  है, यहाँ  $S_n = \sum_{i=1}^n X_i$  है, तो श्रेणी  $\{X_n\}$  को W.L.L.N की पुष्टि करने के लिए आवश्यक और त्यप्ति प्रतिबंध हैं

- (1)  $E\left(\frac{Y_n}{1+Y_n}\right) \rightarrow 0$  जब  $n \rightarrow \infty$   
(2)  $E\left(\frac{Y_n^2}{1+Y_n^2}\right) \rightarrow 0$  जब  $n \rightarrow \infty$   
(3)  $E\left(\frac{Y_n}{1+Y_n^2}\right) \rightarrow 0$  जब  $n \rightarrow \infty$   
(4)  $E\left(\frac{Y_n^2}{1+Y_n}\right) \rightarrow 0$  जब  $n \rightarrow \infty$

Options :

432449109541. 1

432449109542. 2

432449109543. 3

432449109544. 4

**Question Number : 62 Question Id : 43244927789 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If  $X_1, X_2, \dots, X_n$  denote a random sample of size  $n$  from normal population  $N(0, \theta^2)$  then MVUE of  $\theta^2$  is

(1)  $\bar{X}^2$

(2)  $\frac{1}{n} \sum_{i=1}^n X_i^2$

(3)  $\sum_{i=1}^n \frac{(X_i - \bar{X})^2}{n-1}$

(4)  $\sum_{i=1}^n \frac{(X_i - \bar{X})^2}{n}$

**Options :**

432449109545. 1

432449109546. 2

432449109547. 3

432449109548. 4

**Question Number : 62 Question Id : 43244927789 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

मानो लो  $X_1, X_2, \dots, X_n$ , एक प्रसामान्य जनसंख्या  $N(0, \theta^2)$  में से,  $n$  आकार के, एक यादृच्छिक प्रतिदर्श को दर्शाता हैं, तो  $\theta^2$  का MVUE हैं

(1)  $\bar{X}^2$

(2)  $\frac{1}{n} \sum_{i=1}^n X_i^2$

(3)  $\sum_{i=1}^n \frac{(X_i - \bar{X})^2}{n-1}$

(4)  $\sum_{i=1}^n \frac{(X_i - \bar{X})^2}{n}$

**Options :**

432449109545. 1

432449109546. 2

432449109547. 3

432449109548. 4

**Question Number : 63 Question Id : 43244927790 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Let  $X_1, X_2, \dots, X_n$  be random sample from a Poisson family with parameter  $\lambda$ . Then the maximum likelihood estimate of  $P(X \geq 2)$  is

- (1)  $1 - \bar{X}e^{-\bar{X}}$
- (2)  $(1 + \bar{X})e^{-\bar{X}}$
- (3)  $\bar{X}e^{-\bar{X}}$
- (4)  $1 - (1 + \bar{X})e^{-\bar{X}}$

**Options :**

432449109549. 1  
 432449109550. 2  
 432449109551. 3  
 432449109552. 4

**Question Number : 63 Question Id : 43244927790 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

मान लो  $X_1, X_2, \dots, X_n$  प्रचल  $\lambda$  के साथ, एक प्वाँसा परिवार का यादृच्छिक प्रतिदर्श है, तो  $P(X \geq 2)$  का संभावनीय आकलन है

- (1)  $1 - \bar{X}e^{-\bar{X}}$
- (2)  $(1 + \bar{X})e^{-\bar{X}}$
- (3)  $\bar{X}e^{-\bar{X}}$
- (4)  $1 - (1 + \bar{X})e^{-\bar{X}}$

**Options :**

432449109549. 1  
 432449109550. 2  
 432449109551. 3  
 432449109552. 4

**Question Number : 64 Question Id : 43244927791 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Suppose that  $X_1, X_2, \dots, X_n$  are independent random variable each are drawn from a population

having density function  $f_X(x) = \begin{cases} \frac{1}{\theta} e^{-\left(\frac{x-\mu}{\theta}\right)} & ; \text{ if } x \geq \mu \\ 0 & x < \mu \end{cases}$  where  $\theta > 0$  and  $\mu \in \mathbf{R}^+$ , then maximum

likelihood estimate of  $(\theta, \mu)$ , when both  $\theta, \mu$  are unknown is

- (1)  $(\bar{X} - X_{(1)}, X_{(1)})$
- (2)  $\left(\frac{1}{\bar{X}} - X_{(1)}, X_{(1)}\right)$
- (3)  $(\bar{X}, X_{(1)})$
- (4)  $\left(\frac{1}{\bar{X}}, X_{(1)}\right)$

**Options :**

432449109553. 1  
 432449109554. 2  
 432449109555. 3  
 432449109556. 4

Question Number : 64 Question Id : 43244927791 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

मान लो  $X_1, X_2, \dots, X_n$ , स्वतंत्र यादृच्छिक चर हैं, जो प्रत्येक ऐसी जनसंख्या से प्राप्त किए गए हैं, जिसका घनत्व फलन

$$f_X(x) = \begin{cases} \frac{1}{\theta} e^{-\left(\frac{x-\mu}{\theta}\right)} & ; \text{ यदि } x \geq \mu \\ 0 & \text{ यदि } x < \mu \end{cases}$$

है, यहाँ  $\theta > 0$  और  $\mu \in \mathbf{R}^+$  है। तो  $(\theta, \mu)$  का, जब दोनों  $\theta, \mu$  अज्ञात हैं, अधिकतम

संभवित आकलन है

- (1)  $(\bar{X} - X_{(1)}, X_{(1)})$
- (2)  $\left(\frac{1}{\bar{X}} - X_{(1)}, X_{(1)}\right)$
- (3)  $(\bar{X}, X_{(1)})$
- (4)  $\left(\frac{1}{\bar{X}}, X_{(1)}\right)$

Options :

432449109553. 1
432449109554. 2
432449109555. 3
432449109556. 4

Question Number : 65 Question Id : 43244927792 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Let  $X_1, X_2, \dots, X_n$  constitute a random sample of size "n" from a population having density

$$f_X(x) = \begin{cases} e^{-(x-\theta)} & , x > \theta \\ 0 & \text{otherwise} \end{cases}, \text{ then}$$

- A.  $X_{(1)}$  is sufficient for  $\theta$
- B.  $X_{(1)}$  is consistent for  $\theta$
- C.  $X_{(1)}$  is unbiased for  $\theta$
- D.  $\text{MSE}(X_{(1)}) = \frac{2}{n^2}$

Choose the correct answer from the options given below

- (1) A, C only
- (2) B, C only
- (3) A, B, D only
- (4) A, B, C, D only

Options :

432449109557. 1
432449109558. 2
432449109559. 3
432449109560. 4

Question Number : 65 Question Id : 43244927792 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

यदि  $X_1, X_2, \dots, X_n$ , एक जनसंख्या जिसका घनत्व है,  $f_X(x) = \begin{cases} e^{-(x-\theta)}, & x > \theta \\ 0 & \text{अन्यथा} \end{cases}$  से "n" आकार का एक, यादृच्छिक

प्रतिदर्श संघटित करते हैं, तो

- A.  $X_{(1)}$ ,  $\theta$  के लिए पर्याप्त है
- B.  $X_{(1)}$ ,  $\theta$  के लिए संगत है
- C.  $X_{(1)}$ ,  $\theta$  के लिए अनभिन्न है
- D.  $MSE(X_{(1)}) = \frac{2}{n^2}$

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए

- (1) केवल A, C
- (2) केवल B, C
- (3) केवल A, B, D
- (4) केवल A, B, C, D

**Options :**

- 432449109557. 1
- 432449109558. 2
- 432449109559. 3
- 432449109560. 4

**Question Number : 66 Question Id : 43244927793 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If  $X_1, X_2, \dots, X_n$  be independent random variable each from Gamma( $\alpha, \beta$ ) then the jointly sufficient statistics for vector  $(\alpha, \beta)$  is

- (1)  $\left( \sum_{i=1}^n X_i, \prod_{i=1}^n X_i \right)$
- (2)  $\left( \prod_{i=1}^n X_i, \sum_{i=1}^n X_i \right)$
- (3)  $\left( \prod_{i=1}^n X_i, \prod_{i=1}^n X_i \right)$
- (4)  $\left( \sum_{i=1}^n X_i, \sum_{i=1}^n X_i \right)$

**Options :**

- 432449109561. 1
- 432449109562. 2
- 432449109563. 3
- 432449109564. 4

**Question Number : 66 Question Id : 43244927793 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

यदि  $X_1, X_2, \dots, X_n$ , प्रत्येक गामा  $(\alpha, \beta)$  से, स्वतंत्र यादृच्छिक चर हैं, तो सदिश  $(\alpha, \beta)$  के लिए, संयुक्त रूप से पर्याप्त सांख्यिकी है

$$(1) \left( \sum_{i=1}^n X_i, \prod_{i=1}^n X_i \right)$$

$$(2) \left( \prod_{i=1}^n X_i, \sum_{i=1}^n X_i \right)$$

$$(3) \left( \prod_{i=1}^n X_i, \prod_{i=1}^n X_i \right)$$

$$(4) \left( \sum_{i=1}^n X_i, \sum_{i=1}^n X_i \right)$$

**Options :**

432449109561. 1

432449109562. 2

432449109563. 3

432449109564. 4

**Question Number : 67 Question Id : 43244927794 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The method of moment estimator of parameter ' $\alpha$ ' in the following probability density function

$$f_X(x) = \begin{cases} \frac{\alpha}{x^{\alpha+1}}, & x > 1, \alpha > 1 \\ 0 & \text{otherwise} \end{cases} \text{ is}$$

$$(1) \frac{1}{\bar{x}-1}$$

$$(2) \frac{\bar{x}}{\bar{x}-1}$$

$$(3) \frac{\bar{x}-1}{\bar{x}}$$

$$(4) \bar{x}-1$$

**Options :**

432449109565. 1

432449109566. 2

432449109567. 3

432449109568. 4

**Question Number : 67 Question Id : 43244927794 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

निम्नलिखित प्रायिकता घनत्व फलन में 'α' की आघूर्ण आकलक है

$$f_X(x) = \begin{cases} \frac{\alpha}{x^{\alpha+1}}, & x > 1, \alpha > 1 \\ 0 & \text{अन्यथा} \end{cases}$$

(1)  $\frac{1}{\bar{x}-1}$

(2)  $\frac{\bar{x}}{\bar{x}-1}$

(3)  $\frac{\bar{x}-1}{\bar{x}}$

(4)  $\bar{x}-1$

Options :

- 432449109565. 1
- 432449109566. 2
- 432449109567. 3
- 432449109568. 4

Question Number : 68 Question Id : 43244927795 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If  $X_1 = 17, X_2 = 10, X_3 = 32$  and  $X_4 = 5$  be the observed values of a random sample from the discrete

distribution  $P(X=x) = \begin{cases} \frac{\theta^{2x} e^{-\theta^2}}{x!} & \text{if } x = 0, 1, 2, \dots, \theta > 0 \\ 0 & \text{otherwise} \end{cases}$ . Then  $\hat{\theta}_{MLE}$  is

- (1) 16
- (2) 12
- (3) 8
- (4) 4

Options :

- 432449109569. 1
- 432449109570. 2
- 432449109571. 3
- 432449109572. 4

Question Number : 68 Question Id : 43244927795 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

यदि  $X_1 = 17, X_2 = 10, X_3 = 32$  और  $X_4 = 5$ , निम्न असंतत बंटन से, एक यादृच्छिक प्रतिदर्श के प्रेक्षित मान है

$$P(X=x) = \begin{cases} \frac{\theta^{2x} e^{-\theta^2}}{x!} & \text{यदि } x = 0, 1, 2, \dots, \theta > 0 \text{ तो } \hat{\theta}_{MLE} \text{ है} \\ 0 & \text{अन्यथा} \end{cases}$$

- (1) 16
- (2) 12
- (3) 8
- (4) 4

Options :

- 432449109569. 1
- 432449109570. 2
- 432449109571. 3
- 432449109572. 4

Question Number : 69 Question Id : 43244927796 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Let  $X_1, X_2, \dots, X_n$  be a random sample from  $U(\theta, \theta + 1)$  then the maximum likelihood estimate of  $\theta$

- (1) is unique and is equal to  $\min(X_1, X_2, \dots, X_n)$
- (2) is unique and is equal to  $(\max(X_1, X_2, \dots, X_n) - 1)$
- (3) is not unique
- (4) does not exist

Options :

432449109573. 1  
432449109574. 2  
432449109575. 3  
432449109576. 4

Question Number : 69 Question Id : 43244927796 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

मान लो  $X_1, X_2, \dots, X_n, U(\theta, \theta + 1)$  में से, एक यादृच्छिक प्रतिदर्श है, तो  $\theta$  का अधिकतम (महत्तम) संभावित आकलन

- (1) अद्वितीय हैं और  $\min(X_1, X_2, \dots, X_n)$  के बराबर है।
- (2) अद्वितीय हैं और  $(\max(X_1, X_2, \dots, X_n) - 1)$  के बराबर है।
- (3) अद्वितीय नहीं है
- (4) अस्तित्व नहीं है

Options :

432449109573. 1  
432449109574. 2  
432449109575. 3  
432449109576. 4

Question Number : 70 Question Id : 43244927797 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Match List - I with List - II.

List - I	List - II
A. Minimum variance bound estimator	I. Complete sufficient statistics
B. Sufficient statistics	II. Cramer-Rao Inequality
C. UMVU estimator	III. Factorisation Theorem
D. Unique UMVUE	IV. Rao-Blackwell Theorem

Choose the **correct** answer from the options given below

- (1) A-IV, B-I, C-II, D-III
- (2) A-IV, B-III, C-II, D-I
- (3) A-II, B-III, C-I, D-IV
- (4) A-II, B-III, C-IV, D-I

Options :

432449109577. 1  
432449109578. 2  
432449109579. 3  
432449109580. 4

Question Number : 70 Question Id : 43244927797 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

सूची - I से सूची - II का मिलान कीजिए

सूची - I

- A. अल्पतम प्रसरण परिबद्ध आकलन
- B. पर्याप्त सांख्यिकी
- C. UMVU आकलन
- D. अद्वितीय UMVUE

सूची - II

- I. पूर्ण पर्याप्त सांख्यिकी
- II. क्रेमर-राव असमता
- III. गुणनखंडन प्रमेय
- IV. राव-ब्लेकवेल प्रमेय

नीचे दिए गए विकल्पों में से सही उत्तर का चयन कीजिए

- (1) A-IV, B-I, C-II, D-III
- (2) A-IV, B-III, C-II, D-I
- (3) A-II, B-III, C-I, D-IV
- (4) A-II, B-III, C-IV, D-I

Options :

- 432449109577. 1
- 432449109578. 2
- 432449109579. 3
- 432449109580. 4

Question Number : 71 Question Id : 43244927798 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

A box contains 8 balls,  $\theta$  of which are of white color. The null hypothesis  $H_0 : \theta = 3$  is tested by drawing 2 balls at random and without replacement. The hypothesis is rejected in favor of the alternative hypothesis  $H_1 : \theta > 3$  if both balls are white. What is the significance level of the test ?

- (1)  $\frac{3}{56}$
- (2)  $\frac{3}{28}$
- (3)  $\frac{1}{28}$
- (4)  $\frac{1}{56}$

Options :

- 432449109581. 1
- 432449109582. 2
- 432449109583. 3
- 432449109584. 4

Question Number : 71 Question Id : 43244927798 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

एक बॉक्स में 8 गेंद हैं, जिनमें से  $\theta$  गेंद सफेद रंग की हैं। निराकरणाय परिकल्पना  $H_0 : \theta = 3$  का, 2 गेंद, यादृच्छिक बिना प्रतिस्थापन के, निकालने के द्वारा परीक्षण किया जाता है। परिकल्पना को, वैकल्पिक परिकल्पना  $H_1 : \theta > 3$  के समर्थन में निराकृत किया जाता है, यदि दोनों गेंद सफेद हैं। तो परीक्षण का सार्थकता का स्तर क्या है ?

- (1)  $\frac{3}{56}$
- (2)  $\frac{3}{28}$
- (3)  $\frac{1}{28}$
- (4)  $\frac{1}{56}$

Options :

432449109581. 1  
432449109582. 2  
432449109583. 3  
432449109584. 4

**Question Number : 72 Question Id : 43244927799 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A test, based on a critical region  $W$ , for testing  $H_0 : \theta = \theta_0$  against  $H : \theta = \theta_1$ , is said to be unbiased if (where  $\alpha$  and  $\beta$  are Type 1 and Type 2 errors respectively)

- (1)  $\beta \geq \alpha$   
(2)  $1 - \beta < \alpha$   
(3)  $\beta \leq \alpha$   
(4)  $1 - \beta \geq \alpha$

**Options :**

432449109585. 1  
432449109586. 2  
432449109587. 3  
432449109588. 4

**Question Number : 72 Question Id : 43244927799 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

एक परिक्षण जो क्रांतिक क्षेत्र  $W$  पर, परीक्षण के लिए आधारित हैं,  $H_0 : \theta = \theta_0$  के प्रतिकूल, अनमिनत अपक्षपाती कहलाता हैं यदि (यहाँ  $\alpha$  और  $\beta$  क्रमशः प्रकार 1 और प्रकार 2 की त्रुटियाँ हैं।)

- (1)  $\beta \geq \alpha$   
(2)  $1 - \beta < \alpha$   
(3)  $\beta \leq \alpha$   
(4)  $1 - \beta \geq \alpha$

**Options :**

432449109585. 1  
432449109586. 2  
432449109587. 3  
432449109588. 4

**Question Number : 73 Question Id : 43244927800 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

In a randomized block design with one factor having 5 levels and another factor having 5 levels, the degree of freedom for the error sum of squares are equal to

- (1) 16  
(2) 15  
(3) 14  
(4) 18

**Options :**

432449109589. 1  
432449109590. 2  
432449109591. 3  
432449109592. 4

**Question Number : 73 Question Id : 43244927800 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

एक यादृच्छिक ब्लॉक डिजाइन में, जिसके एक खंड के 5 स्तर हैं और दूसरे खंड के भी 5 स्तर हैं, उसके वर्गों के त्रुटि (दोष) योग की, स्वातंत्र्य कोटि बराबर है

- (1) 16  
(2) 15  
(3) 14  
(4) 18

**Options :**

- 432449109589. 1
- 432449109590. 2
- 432449109591. 3
- 432449109592. 4

**Question Number : 74 Question Id : 43244927801 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

To examine whether two different skin creams, A and B have different effect on the human body 'n' randomly chosen person were enrolled in a clinical trail. Then cream A was applied to one of the randomly chosen arms of each person, cream B to the other. What kind of design is this ?

- (1) Completely Randomized Design
- (2) Randomized Block Design
- (3) Latin Square Design
- (4) Balanced Incomplete Design

**Options :**

- 432449109593. 1
- 432449109594. 2
- 432449109595. 3
- 432449109596. 4

**Question Number : 74 Question Id : 43244927801 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

यह जानने (परीक्षण करने) के लिए कि दो विभिन्न त्वचा क्रीमों A और B का मनुष्य के शरीर पर विभिन्न प्रभाव होता है। एक चिकित्सीय ट्रेल में n व्यक्ति यादृच्छिक चुन कर, नामांकित किए गए। फिर क्रीम A को, यादृच्छिक चुने गए व्यक्तियों में से प्रत्येक व्यक्ति की एक भुजा पर लगाया गया क्रीम B को प्रत्येक व्यक्ति की दूसरी भुजा पर लगाया गया। यह किस प्रकार का डिजाइन है ?

- (1) पूर्णतः यादृच्छिक डिजाइन
- (2) यादृच्छिक ब्लॉक डिजाइन
- (3) लेटिन वर्ग डिजाइन
- (4) संतुलित अपूर्ण डिजाइन

**Options :**

- 432449109593. 1
- 432449109594. 2
- 432449109595. 3
- 432449109596. 4

**Question Number : 75 Question Id : 43244927802 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A simple random sample of size 'n' will be drawn from a class of 125 students, and mean mathematics score of the sample will be computed. If the standard error of the sample mean for "with replacement sampling" is twice as much as the standard error of the sample mean for "without replacement sampling", then the value of n is

- (1) 79
- (2) 94
- (3) 63
- (4) 33

**Options :**

- 432449109597. 1
- 432449109598. 2
- 432449109599. 3
- 432449109600. 4

**Question Number : 75 Question Id : 43244927802 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

एक 'n' अकार का, साधारण (सरल) यादृच्छिक प्रतिदर्श, एक 125 विद्यार्थियों की कक्षा में से लिया गया, और प्रतिदर्श का माध्यम गणितीय समंक (स्कोर) अभिकलित किया जाएगा। यदि प्रतिदर्श माध्यक, प्रतिस्थापन प्रतिचयन के लिए, मानक त्रुटि (दोष), बिना प्रतिस्थापन प्रतिचयन के लिए, मानक त्रुटि (दोष) का दुगना हैं, तो n का मान है

- (1) 79
- (2) 94
- (3) 63
- (4) 33

**Options :**

432449109597. 1
432449109598. 2
432449109599. 3
432449109600. 4