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SUBJECT- MATHS, LOGICAL REASONING & STATS

Test Code – CFN 9271

BRANCH - () (Date :)

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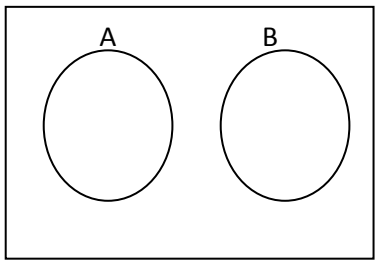
1. P(A) = 0.3, P(B) = 0.4, P(C) = 0.45

$\therefore$ P(A′) = 0.7, P(B′) = 0.6, P(C′) = 0.55

$\therefore$ No. of correct statements = 0.7(20) + 0.6(10) + 0.55 (40)

= 14 + 6 + 22 = 42 **[Ans.: C]**

2.



$\therefore$ A & B are mutually exclusive. **[Ans.: A]**

3. Poisson distribution is always positively skewed. **[Ans.: B]**

4. P(A) = 0.3, P(B) = 0.4, P(A $\cup$ B) = 0.5

P(A $\cap$ B) = P(A) + P(B) – P(A $\cup$ B) = 0.3 + 0.4 – 0.5 = 0.2

Now, P(A′| B) = $\frac{P(A' \cap B)}{P(B)} = \frac{P(B)-P(A \cap B)}{P(B)} = \frac{0.4-0.2}{0.4}$ = 0.5 = $\frac{1}{2}$ **[Ans.: A]**

5. Normal distribution is unimodal distribution. **[Ans.: A]**

6. Sum of points neither 6 nor 9 = 36 – [5 + 4] = 27

$\therefore$ Probability = $\frac{27}{36}$ = ¾ = 0.75 **[Ans.: C]**

7. S : F = 3 : 1 $\quad\therefore$ P(s) = ¾ = p, P(F) = ¼ = q

n = 5, x = 0 $\quad\therefore$ P(0) = ${}^5C_0 \left(\frac{3}{4}\right)^0 \left(\frac{1}{4}\right)^5$

= $1 \times 1 \times \frac{1}{1024} = \frac{1}{1024}$ **[Ans.: B]**

8. n = 4, N = 1600, p = $\frac{1}{2}$, q = ½

Probability of all four coins do not turn head

= 1 – p(4)

= $1 - {}^4C_4 \left(\frac{1}{2}\right)^4 \left(\frac{1}{2}\right)^0$

= $1 - 1 \times \frac{1}{6} \times 1 = 1 - \frac{1}{16} = \frac{15}{16}$ **[Ans.: D]**

9. Leap year has 366 days. i.e. 52 weeks & 2 days.

$\therefore$ Probability of 53 Sundays = $\frac{2}{7}$ **[Ans.: B]**

10. Here m = 4 & P(0) = $e^{-m} = e^{-4} = 0.0183$ **[Ans.: A]**

11. Here n = 36, A = {(4, 5), (5, 4), (3,6), (6, 3)}

$\therefore$ m = 4

$\therefore$ P(A) = $\frac{m}{n} = \frac{4}{36} = \frac{1}{9}$ **[Ans.: B]**

12. **For A :** 5 : 7 (favour)

$\therefore$ P(A) = $\frac{5}{12}$ $\therefore$ P(A′) = $\frac{7}{12}$

For B : 9 : 6 (against)

$\therefore$ P(B′) = $\frac{9}{15} = \frac{3}{5}$ & P(B) = 2/5

Now, P(A $\cup$ B) = 1 – P(A ′ $\cap$ B′) = $1 - \frac{7}{12} \times \frac{3}{5} = 1 - \frac{21}{60} = \frac{39}{60} = \frac{117}{180}$ **[Ans.: A]**

13. p = ½, q = ½, N = 128, n = 10, $x \leq 2$

P(0) + P(1) + P(2) = $^{10}C_0 \left(1/2\right)^0 \left(1/2\right)^{10} + {}^{10}C_1 \left(1/2\right)^1 \left(1/2\right)^9 + {}^{10}C_2 \left(1/2\right)^2 \left(1/2\right)^8$

= $\frac{1}{1024} + \frac{10}{1024} + \frac{45}{1024} = \frac{56}{1024}$

$\therefore$ No. of investigators = $\frac{56}{1024} \times 128 = 7$ **[Ans.: C]**

14. $g(x) \geq 0$ and $\Sigma\, g(x) = 1$ **[Ans.: D]**

15. $3x + 4y + 25 = 0$

$\therefore$ $4y = -3x - 25$

$\therefore$ $y = -\frac{3x}{4} - \frac{25}{4}$

$\therefore$ $v(y) = \frac{9}{16} v(x) = \frac{9}{16} \times 6 = \frac{27}{8} = 3.375$ **[Ans.: A]**

16. Here m = 3, N = 1000, $x \geq 1$

$\therefore$ Probability = P(1) + P(2) + P(3) + …….

= 1 – P(0)

= $1 - e^{-m} = 1 - e^{-3} = 1 - 0.05 = 0.95$

$\therefore$ No. of drivers = $0.95 \times 1000 = 950$ **[Ans.: D]**

17. Subjective probability and Objective probability **[Ans. A]**

18. For standard normal distribution, Mean = 0, S.D. = 1 **[Ans. C]**

19. A and B are independent events $\therefore P(A \cap B) = P(A) \cdot P(B)$

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$\therefore \frac{2}{5} = P(A) + \frac{1}{3} - P(A).P(B)$

$\therefore \frac{2}{5} - \frac{1}{3} = P(A) - \frac{1}{3}P(A)$

$\therefore \frac{1}{15} = \frac{2}{3}P(A)$

$\therefore P(A) = \frac{1}{10}$ **[Ans. D]**

20. Here m = 1.5, x = 1

$P(1) = e^{-m}.m = e^{-1.5}(1.5) = 0.2231 \times 1.5 = 0.3347$

i.e. 33.47 % **[Ans.: B]**

21. **Probability =** $\frac{{}_4C_1 \times {}_3C_1}{{}_8C_2}$

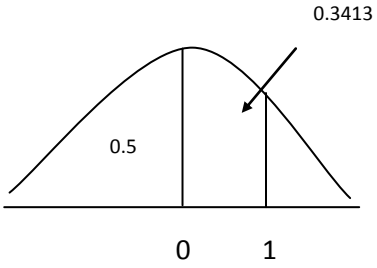
$= \frac{12}{28} = \frac{3}{7}$ **[Ans.: B]**

22. **(d)** (b) and (c). **[Ans.:D]**

23. $\phi(1) = P(z \leq 1)$

$= 0.5 + 0.3413$

$= 0.8413$ **[Ans.: B]**



24. Mean + variance = 6.4

N = 10

$\therefore np + npq = 6.4$

$\therefore nP(1 + q) = 6.4$ ……. (i)

$\therefore 10P(1 + 1 - P) = 6.4$

$\therefore P(2 - p) = 0.64$

$\therefore P = 0.4$

(by trial & error method) **[Ans.: B]**

25. Probability = $\frac{card\ is\ diamond}{Card\ is\ red} = \frac{13}{26} = 0.5$ **[Ans.: D]**

26. Here n = 5, p = Probability of getting club = $\frac{13}{52}$ = ¼

$\therefore$ q = ¾, x = 0

$\therefore$ P(0) = $^5C_0 \left(\frac{1}{4}\right)^0 \left(\frac{3}{4}\right)^5 = 1 \times 1 \times \frac{243}{1024} = \frac{243}{1024}$ **[Ans.: A]**

27. Mean of x + y = $\mu_1 + \mu_2 = 10 + 12 = 22$

S.D. of x + y = $\sqrt{\sigma_1^2 + \sigma_2^2} = \sqrt{3^2 + 4^2} = \sqrt{9 + 16} = \sqrt{25} = 5$ **[Ans.: C]**

28. Here P (A $\cap$ B) $\neq 0$

and P(A $\cap$ B) = P(A) . P(B)

$\therefore$ A and B are independent but not mutually exclusive. **[Ans.: B]**

29. (d) (a) or (b) **[Ans.: D]**

30. N = 800, μ = 50, σ = 20

$P(46 \leq x \leq 62) = P(-0.2 \leq z \leq 0.6)$

$= P(-0.2 \leq z \leq 0) + P(0 \leq z \leq 0.6)$

= 0.0793 + 0.2257

= 0.3050

$\therefore$ No of students = 800 $\times$ 0.305 = 244 **[Ans.: B]**

31. P(4) = P(5) $\therefore$ m = 5 **[Ans.: D]**

32. n = $^5P_5$ = 5! = 120 digits are 1, 2, 5, 6, 8

div. by 4 : .....12 $\rightarrow$ 3! = 6

.....16 $\rightarrow$ 3! = 6

.....52$\rightarrow$ 3! = 6

.....28$\rightarrow$ 3! = 6

.....56 $\rightarrow$ 3! = 6

.....68 $\rightarrow$ 3! = 6

36

$\therefore$ Probability = $\frac{36}{120} = \frac{3}{10}$ **[Ans.: A]**

33. N = 75, μ = 50, σ = 5

$P(x \geq 60) = P(z \geq 2) = 0.5 - 0.4772 = 0.0228$

$\therefore$ No. of students = 0.0228 $\times$ 75 $\cong$ 2 **[Ans.: B]**

34. MD = 0.86

$\therefore$ 8 = 0.86

$\therefore$ σ = 10

Q_d = 0.6756

$\therefore \frac{Q_3 - Q_1}{2} = 0.675 \times 10$

$\therefore Q_3 - Q_1 = 135$

$\therefore$ Q_3 – 13.25 = 13.5

$\therefore$ Q_3 = 26.75

M = $\frac{Q_1 + Q_3}{2}$

= $\frac{13.25 + 26.75}{2}$

= $\frac{40}{2}$

$\therefore$ M = 20 **[Ans.: B]**

35. P(A) = 2 . P(B), P(B) = 2P(C) $\therefore$ P(A) = 4P (C)

Now, P(A) + P(B) + P(C) = 1

$\therefore$ 4P(C) + 2P(C) + P(C) = 1

$\therefore$ 7P(C) = 1

$\therefore$ P(C) = 1/7 **[Ans.: D]**

36. P = 1/2 , q = ½, n = 5, x = 3

$\therefore$ P(3) = ${}^5C_3 \left(1/2\right)^3 \left(1/2\right)^2$

= $10 \times \frac{1}{8} \times \frac{1}{4} = \frac{10}{32}$ = 0.3125 **[Ans.: A]**

37. Probability = $\frac{{}_2C_2}{{}_4C_2}$ **= $\frac{1}{6}$** **[Ans.: B]**

38. Multiple of 5 or 6 = 5, 6, 10, 12

$\therefore$ m = 4

$\therefore$ P(A) = $\frac{m}{n} = \frac{4}{12}$ = 1/3 **[Ans.: A]**

39. Mean of x + y = 5 + 7 = 12

S.D. of x + y = $\sqrt{\sigma_1^2 + \sigma_2^2} = \sqrt{3^2 + 4^2} = \sqrt{25}$ = 5 **[Ans.: C]**

40. Product is positive if all are positive or all are negative or two positive and two negative.

$\therefore$ Probability = $\frac{6C4 + 8C4 + 6C2 \times 8C2}{14C4} = \frac{15 + 70 + 420}{1001} = \frac{505}{1001}$ **[Ans.: D]**

41. any real number **[Ans.: C]**

42. M = $\frac{Q_3+Q_1}{2} = \frac{14+8}{2} = 11$ **[Ans.: C]**

43. A {(2, 3), (4, 3), (6, 3), (2, 6), (4, 6), (6, 6)}

$\therefore$ m = 6 $\therefore$ P(A) = $\frac{m}{n} = \frac{6}{36} = \frac{1}{6}$ **[Ans.: B]**

44. S.D. = $\sqrt{npq} = \sqrt{48 \times 0.75 \times 0.25} = 3$ **[Ans.: D]**

45.

No. of white balls	Amount x_i	$P(x_i)$	$x_i P(x_i)$
0	400	$\frac{5C_2}{8C_2} = \frac{10}{28}$	4000/ 28
1	700	$\frac{3C_1 \times 5C_1}{8C_2} = \frac{15}{28}$	10500/28
2	1000	$\frac{3C_2 \times 5C_0}{8C_2} = \frac{3}{28}$	3000/28
		1	17500/28
			= 625

$\therefore$ Exp. = 625 – 400 = 225 **[Ans.: C]**

46. No. of correct balance sheet = $0.8 \times 60 + 0.7 \times 70 + 0.9 \times 90$

= 48 + 49 + 81 = 178 **[Ans.: A]**

47. Mean = Variance = 30 **[Ans.: C]**

48. $P(E' \cup F') = 1 - P(E \cap F) = 1 - \frac{1}{5} \times \frac{1}{10} = \frac{49}{50}$ **[Ans.: D]**

49. True **[Ans.: A]**

50. n = 6, p = 1/3, q = 2/3

x = 1, 2, 3, 4, 5

$\therefore$ Probability = 1 – [P(0) + P(6)] = $1 - [{}^6C_0 (1/3)^0 (2/3)^6 + {}^6C_6 \left(\frac{1}{3}\right)^6 \left(\frac{2}{3}\right)^0]$

$= 1 - \left[\frac{64}{729} + \frac{1}{729}\right] = 1 - \frac{65}{729} = \frac{664}{729}$ **[Ans. : B]**