

# NDA MATHEMATICS - SET C

COMPLETE SOLUTIONS | 120 Questions | Answer Key

## PROBABILITY & STATISTICS (Q1 - Q20)

### Q1. 4-digit from {0,1,2,3,4}, no repetition: P(divisible by 2)

Total =  $4 \times 4 \times 3 \times 2 = 96$ . Last digit in {0,2,4}:  $24 + 18 + 18 = 60$ .  $P = 60/96 = 5/8$ .

**Answer : (a) 5/8**

### Q2. P(divisible by 3)

Sum of 4 digits must be divisible by 3. Leave out 1 or 4:  $18 + 18 = 36$ .  $P = 36/96 = 3/8$ .

**Answer : (b) 3/8**

### Q3. P(divisible by 4)

Valid endings {04,12,20,24,32,40}:  $6 + 4 + 6 + 4 + 4 + 6 = 30$ .  $P = 30/96 = 5/16$ .

**Answer : (d) 5/16**

### Q4. P(divisible by 6)

Div by 2 AND 3. From {0,2,3,4}: 14, from {0,1,2,3}: 10. Total=24.  $P = 24/96 = 1/4$ .

**Answer : (c) 1/4**

### Q5. P(no zero at any position)

Digits {1,2,3,4}:  $4! = 24$  numbers.  $P = 24/96 = 0.25$ .

**Answer : (b) 0.25**

### Q6. $P(A) + P(B) + P(C)$ where $P(A)/2 = P(B)/3 = P(C)/5 = P(D)/8 = k$

$18k = 1$ ,  $k = 1/18$ . Sum =  $10k = 5/9$ .

**Answer : (a) 5/9**

### Q7. $[2P(A) + 3P(B)] / [4P(C) + 5P(D)]$

$= (4k + 9k) / (20k + 40k) = 13k / 60k = 13/60$ .

**Answer : (b) 13/60**

### Q8. $9G$ where $G =$ geometric mean of $P(A), P(B), P(C), P(D)$

$G^4 = 240k^4$ .  $9G = (240)^{(1/4)} / 2 = 15^{(1/4)}$ .

**Answer : (b)  $15^{(1/4)}$**

### Q9. P(sum=6) with four dice

$e_1 + e_2 + e_3 + e_4 = 6$  ( $e_j = d_{j-1} \geq 0$ ).  $C(5,2) = 10$ .  $P = 10/1296 = 5/648$ .

**Answer : (c) 5/648**

### Q10. P(sum $\geq 23$ ) with four dice

By symmetry =  $P(\text{sum} \leq 5)$ .  $P(4) = 1$ ,  $P(5) = 4$ . Total =  $5/1296$ .

**Answer : (d) 5/1296**

**Q11. Correlation coefficient:  $x+y+11=0$ ,  $2x+3y+4=0$**

$b_{yx}=-2/3$ ,  $b_{xy}=-1$ .  $r^2=2/3$ .  $r=-\sqrt{2/3}$ .

**Answer : (a)  $-\sqrt{2/3}$**

**Q12. Sum  $100(2x_i+4)$ , mean=1.414**

Sum  $x_i=28.28$ . Total= $100[56.56+80]=13656$ .

**Answer : (d) 13656**

**Q13. Bayes:  $P(\text{guessing}|\text{correct})$**

$P=(0.1*0.25)/(0.9+0.025) = 0.025/0.925 = 1/37$ .

**Answer : (c) 1/37**

**Q14. (AUBUC) inter (A' inter B' inter C') impossible?**

I.  $S \text{ inter } S'=\text{empty}$  (impossible). TRUE. II.  $T \text{ inter } T'=\text{empty}$  (impossible, NOT possible). FALSE.

**Answer : (a) I only**

**Q15. SD=10, multiply by 5: new SD?**

New SD =  $5*10 = 50$ .

**Answer : (d) 50**

**Q16. Binomial: mean=6, SD= $\sqrt{2}$ .  $P(X=0)$ ?**

$np=6$ ,  $npq=2$ .  $q=1/3$ ,  $p=2/3$ ,  $n=9$ .  $P=(1/3)^9$ .

**Answer : (a)  $(1/3)^9$**

**Q17.  $\text{Var}(Y)$  where  $Y=2X-5$ ,  $\text{SD}(X)=5$**

$\text{Var}(Y) = 4*\text{Var}(X) = 4*25 = 100$ .

**Answer : (d) 100**

**Q18.  $P(C)$ : A,B disjoint; A,C indep; B,C indep;  $4P(A)=2P(B)=P(C)$**

$P(A)=x$ .  $7x-12x^2=5x$ .  $x=1/6$ .  $P(C)=4/6=2/3$ .

**Answer : (d) 2/3**

**Q19. Mean deviation about AM (freq distribution,  $f=30$ )**

Mean=25. MD= $(200+200+0+400)/100=8$ .

**Answer : (d) 8**

**Q20. Standard deviation**

Var= $(4000+2000+0+4000)/100=100$ . SD=10.

**Answer : (d) 10**

## INTEGRATION & PIECEWISE FUNCTIONS (Q21 - Q30)

### Q21. Value of A in partial fraction integral

Partial fractions:  $1/[(2+u)(3+4u)]$ . After integration:  $A = 1/5$ .

**Answer : (c) 1/5**

### Q22. Value of B

From same decomposition:  $B = -1/5$ .

**Answer : (b) -1/5**

### Q23. Integral $f(x)/g(x)$ from 0 to 4, $f=\sin x$ , $g=\sin x+\sin(4-x)$

King's property:  $I + I = \text{integral } 1 \, dx = 4$ . So  $I = 2$ .

**Answer : (c) 2**

### Q24. Integral $f(4-x)/g(4-x)$ from 0 to 4

Same denominator by substitution. Also  $= 2$ .

**Answer : (c) 2**

### Q25. Value of p (piecewise, continuous, not diff at $x=1$ , $f'$ cont at $x=3$ )

$3p+q=0$  and  $6p+q=1$ . Solving:  $p=1/3$ .

**Answer : (c) 1/3**

### Q26. Value of q

$q = -3p = -1$ .

**Answer : (a) -1**

### Q27. $(d^2y/dx^2)(dx/dy)^2$ for $e^{(x+y)} \, dy/dx = e^{(x-y)}$

$dy/dx=e^{(-2y)}$ .  $d^2y/dx^2=-2e^{(-4y)}$ .  $(dx/dy)^2=e^{(4y)}$ . Product $=-2$ .

**Answer : (a) -2**

### Q28. Solution of DE with $y(0)=0$

$e^{(2y)}dy=dx$ .  $(1/2)e^{(2y)}=x+1/2$ .  $2y=\ln(2x+1)$ .

**Answer : (c)  $2y = \ln(2x+1)$**

### Q29. $p(x)=\tan(x^2)*x|x|$ : continuous and differentiable at $x=0$ ?

$p(0)=0$ , limits $=0$  (cont).  $p'(0+)=p'(0-)=0$  (diff). Both true.

**Answer : (c) Both I and II**

### Q30. $q(x)=f(g(x))=\tan(x^4)$ : continuous and differentiable at $x=0$ ?

$q(0)=0$  (cont).  $q'(0)=0$  (diff). Both true.

**Answer : (c) Both I and II**

## DIFFERENTIAL EQUATIONS & APPLICATIONS (Q31 - Q40)

**Q31.  $dy/dx$  for  $(e^y)^x - y = 0$** 

$e^{(xy)}=y$ ,  $xy=\ln y$ . Differentiating:  $dy/dx = y^2/(1-xy)$ .

**Answer : (c)  $y^2/(1-xy)$**

**Q32.  $dy/dx$  at  $x=1$ ,  $y=y_0$** 

At  $x=1$ :  $e^{(y_0)}=y_0$ .  $dy/dx = y_0 \cdot e^{(y_0)}/(1-e^{(y_0)})$ .

**Answer : (d)  $y_0 \cdot e^{(y_0)}/(1-e^{(y_0)})$**

**Q33. Value of k: integral  $[a \sin x + b \cos x]/[(a+b)(\sin x + \cos x)] dx$** 

King's property:  $I = \pi/4$ .

**Answer : (a)  $\pi/4$**

**Q34. Integral  $(a \cos x + b \sin x)/(\sin x + \cos x)$  from 0 to  $\pi/2$** 

By King's property  $= (a+b) \cdot \pi/4 = k(a+b)$ .

**Answer : (c)  $k(a+b)$**

**Q35. T: where  $f(x)=x^3/3-5x^2/2+6x+7$  increases**

$f'(x)=(x-2)(x-3) \geq 0$  when  $x \leq 2$  or  $x \geq 3$ .

**Answer : (a)  $\{x \leq 2\} \cup \{x \geq 3\}$**

**Q36. S: where f decreases**

$f'(x) \leq 0$  when  $2 \leq x \leq 3$ .

**Answer : (d) [2, 3]**

**Q37. Area  $\sin x$  from  $\pi/4$  to  $\pi/2$  (in terms of k)**

$k=1-\sqrt{2}/2$ . Integral  $=\sqrt{2}/2=1-k$ .

**Answer : (b)  $1-k$**

**Q38. Area  $\cos x$  from  $\pi/4$  to  $\pi/2$** 

Integral  $=1-\sqrt{2}/2=k$ .

**Answer : (a) k**

**Q39. Intersection points of  $y=x^2$  and  $y=2|x|$** 

$(0,0), (2,4), (-2,4)$ . Total=3.

**Answer : (b) 3**

**Q40. Area bounded by curves,  $x=0$  to  $x=1$** 

Integral  $(2x-x^2)dx = 1-1/3 = 2/3$  sq unit.

**Answer : (b)  $2/3$  square unit**

**LIMITS, DERIVATIVES & APPLICATIONS (Q41 - Q50)****Q41. Differentiability implies continuity and limit**

I. Continuous (TRUE). II.  $\lim f(x)=f(a)$  (TRUE).

**Answer : (c) Both I and II**

**Q42.  $\lim_{x \rightarrow 1} [x^{(n^2-1)} - 1] / [x^{(n+1)} - 1]$**

$$= (n^2-1)/(n+1) = n-1.$$

**Answer : (c)  $n-1$**

**Q43.  $\lim_{x \rightarrow 0} (10^{\sin x} - 1) / \tan x$**

$$= \ln 10 * 1 = \ln 10.$$

**Answer : (c)  $\ln 10$**

**Q44. Derivative of  $x/|x|$  for  $x < 0$**

$$x/|x| = -1 \text{ (constant). Derivative} = 0.$$

**Answer : (b) 0**

**Q45.  $f(x) = x$  on  $(-1, 1)$ : max/min?**

Open interval: neither max nor min attained.

**Answer : (d) Neither I nor II**

**Q46. 4th-root( $y$ ) =  $x + \sqrt{x^2 + 4}$ :  $\sqrt{x^2 + 4} * dy/dx = ?$**

$$y = [x + \sqrt{x^2 + 4}]^4. dy/dx = 4y/\sqrt{x^2 + 4}. \text{ Answer} = 4y.$$

**Answer : (d)  $4y$**

**Q47. Longest interval where  $2\cos^2 x - 1$  is decreasing**

$$\cos 2x \text{ decreasing when } \sin 2x > 0: x \text{ in } (0, \pi/2). \text{ Length} = \pi/2.$$

**Answer : (c)  $\pi/2$**

**Q48.  $2A + 2B = \pi$ , max of  $\sin A * \sin B$**

$$\sin A * \cos A = (1/2) \sin 2A. \text{ Max} = 1/2.$$

**Answer : (a)  $1/2$**

**Q49.  $\cos(dy/dx) = p$ ,  $y(0) = q$ : solution**

$$dy/dx = \cos^{-1}(p). y = x * \cos^{-1}(p) + q. \cos((y-q)/x) = p.$$

**Answer : (a)  $\cos((y-q)/x) = p$**

**Q50.  $2f(x) + f(1-x) = x$ : find  $f(x)$**

$$3f(x) = 3x - 1. f(x) = x - 1/3.$$

**Answer : (b)  $x - 1/3$**

## CONICS, SPHERES & VECTORS (Q51 - Q70)

### Q51. Ellipse/hyperbola coinciding foci: value of p

$\sqrt{16-p}=3$ .  $p=7$ .

**Answer : (c) 7**

### Q52. Difference of eccentricities

$e_h=5/4$ ,  $e_e=3/4$ . Diff= $1/2=0.5$ .

**Answer : (a) 0.5**

### Q53. Radius of concentric sphere through origin

Centre(2,3,6).  $r=\sqrt{4+9+36}=7$ .

**Answer : (c) 7**

### Q54. Radius=8, find k

$49-k=64$ .  $k=-15$ .

**Answer : (a) -15**

### Q55. Angle between a and b ( $a \times b=c$ , $b \times c=a$ )

$a \perp b$ . Angle= $\pi/2$ .

**Answer : (c)  $\pi/2$**

### Q56. Angle between a and c

$a \times b=c$  implies  $c \perp a$ . Angle= $\pi/2$ .

**Answer : (c)  $\pi/2$**

### Q57. a,b,c orthogonal? unit vectors?

I. Mutually orthogonal (TRUE). II.  $|a|=|b|=|c|=1$  (TRUE).

**Answer : (c) Both I and II**

### Q58. Vector identity verification

$(a \times b) \cdot c=1$ ,  $(b \times c) \cdot a=1$ . Both hold.

**Answer : (c) Both I and II**

### Q59. $c=pa+qb+r(a \times b)$ : $p+q=?$

$p=\cos(\pi/3)=1/2$ ,  $q=\cos(\pi/3)=1/2$ .  $p+q=1$ .

**Answer : (b) 1**

### Q60. Value of $r^2$

$1/4+1/4+r^2=1$ .  $r^2=1/2$ .

**Answer : (d)  $1/2$**

### Q61. Angle alpha (line through origin with line L)

$\tan(\alpha)=\sqrt{3}$ .  $\alpha=60$  deg.

**Answer : (c) 60 deg**

**Q62. Angle L makes with positive y-axis**

Angle with x-axis=150. With y-axis= $|150-90|=60$  deg.

**Answer : (c) 60 deg**

**Q63. PQ parallel RS? PR perp QS?**

PQ=(6,2,0), RS=(-4,-2,2): not parallel. PR.QS=4: not perp.

**Answer : (d) Neither I nor II**

**Q64.  $PQ^2+2QS^2-2PR^2$** 

$40+108-148=0$ .

**Answer : (b) 0**

**Q65. Equation of line L (through (-1,2,-3) perp to plane)**

Direction=(2,3,1).  $3(x+1)=2(y-2)=6(z+3)$ .

**Answer : (c)  $3x+3=2y-4=6z+18$**

**Q66. Direction ratios parallel to plane**

(2,2,-10): dot with (2,3,1)= $4+6-10=0$ .

**Answer : (d)  $\langle 2, 2, -10 \rangle$**

**Q67. X,Y,Z with a,b,c and p,q,r in AP**

Y=midpoint of XZ. Collinear.

**Answer : (a) on a straight line**

**Q68. p,q,r not in AP, b=c: XY,Z line parallel to?**

Y,Z same x-coord. Parallel to y-axis.

**Answer : (a) y-axis**

**Q69. Circle through A(0,2),B(2,3),C(4,5),D(0,k): values of k**

$k^2-19k+34=0$ .  $k=2$  or  $17$ .

**Answer : (c) 2, 17**

**Q70. Diameter of circle through A,B,D**

$r^2=250/4$ . Diameter= $5\sqrt{10}$ .

**Answer : (b)  $5\sqrt{10}$**

## ALGEBRA, TRIGONOMETRY & MISCELLANEOUS (Q71 - Q90)

**Q71.  $R=\{(x,y):x=y^3\}$ : symmetric? transitive?**

Not symmetric, not transitive.

**Answer : (d) Neither I nor II**

**Q72. Min of  $x^2+kx+k^2$**

$f(-k/2)=3k^2/4$ .

**Answer : (c)  $3k^2/4$**

**Q73.  $\sqrt{x}+x+1=0$  and  $5\sqrt{x}-x-4=0$**

I: no real roots (FALSE). II:  $x=1,16$  (TRUE).

**Answer : (b) II only**

**Q74. Numbers  $>1000$  from  $\{0,1,2,3\}$ , no repetition**

$3*3!=18$ .

**Answer : (b) 18**

**Q75. AP:  $T_p=k$ , sum of  $T_{(p+q)}, T_{(p-q)}$**

$a_{(p+q)}+a_{(p-q)}=2T_p=2k$ . But wait,  $T_p + T_{(p+q)} + T_{(p-q)} = T_p + 2T_p...$  Actually the sum of  $p$ -th,  $(p+q)$ -th and  $(p-q)$ -th terms =  $a_p + a_{(p+q)} + a_{(p-q)} = k + 2k = 3k$ .

**Answer : (b)  $3k$**

**Q76.  $(\sqrt{2}+1)^{10}=u+f$ ,  $(\sqrt{2}-1)^{10}=v$ : statements**

$u+f+v$ =integer.  $f+v=1$ . Both I and II true.

**Answer : (c) Both I and II**

**Q77. Multiplicative inverse of  $(\sqrt{2}+1)^{20}$**

$= (\sqrt{2}-1)^{20} = v^2$ .

**Answer : (c)  $v^2$**

**Q78. Value of  $v+f$**

$f+v=1$ .

**Answer : (b) 1**

**Q79. Value of  $u$**

$u=6726-1=6725$ .

**Answer : (d) 6725**

**Q80. Value of  $uv$**

$uv=u/(u+f)<1$ . So  $0<uv<1$ .

**Answer : (c)  $0 < uv < 1$**

**Q81.  $\theta$  in Q4,  $3\cot(\theta)+4=0$ :  $\sin 2\theta+\cos 2\theta$**

$\tan=-3/4$ .  $\sin 2\theta=-24/25$ ,  $\cos 2\theta=7/25$ . Sum= $-17/25$ .

**Answer : (b)  $-17/25$**

**Q82.  $\cos(\alpha)+\cos(\beta)=\sin(\alpha)+\sin(\beta)=0$ : expression**

$\alpha-\beta=\pi$ . Expression=0.

**Answer : (a) 0**

**Q83.  $\sin A=\cos B+\cos C$  in triangle:  $\tan(B/2)+\cot(B/2)$**

$B=\pi/2$ .  $\tan(\pi/4)+\cot(\pi/4)=2$ .

**Answer : (d) 2**

**Q84. Inverse trig identities: how many correct?**

I and IV correct. Two.

**Answer : (b) Two**

**Q85.  $\tan[2\tan^{-1}(1/2)-\pi/4]$**

$\tan(2\alpha)=4/3$ . Result= $(1/3)/(7/3)=1/7$ .

**Answer : (d) 1/7**

**Q86. Triangle 1:1:4, longest side=3: perimeter**

$a=\sqrt{3}$ . Perimeter= $3+2\sqrt{3}$ .

**Answer : (b)  $3+2\sqrt{3}$**

**Q87.  $\sin(A-B)/\sin(A+B)$  in triangle**

$=\frac{a^2-b^2}{c^2}$ .

**Answer : (c)  $\frac{a^2-b^2}{c^2}$**

**Q88. Smallest x:  $\log_{\sin x}(\cos x)+\log_{\cos x}(\sin x)=2$**

$t=1$ .  $\sin x=\cos x$ .  $x=\pi/4$ .

**Answer : (c)  $\pi/4$**

**Q89. Height of plane: 10km, elevation 67.5 deg**

$h=10\sin(67.5)=5\sqrt{2+\sqrt{2}}$  km.

**Answer : (c)  $5\sqrt{2+\sqrt{2}}$  km**

**Q90. Chord of unit circle, 45 deg at centre**

Chord= $2\sin(22.5)=\sqrt{2-\sqrt{2}}$ .

**Answer : (d)  $\sqrt{2-\sqrt{2}}$  units**

## MATRICES, SETS & TRIGONOMETRY (Q91 - Q100)

**Q91.  $|M+M^T|$  properties for 2x2**

I: FALSE. II: anti-sym  $M+M^T=0$ ,  $\det=0$  TRUE.

**Answer : (b) II only**

**Q92.  $M^3=M$ : values of  $|M|$**

$|M|$  in  $\{0,1,-1\}$ . Three values.

**Answer : (c) Three**

**Q93. Det|x 1 1;1 y 1;1 1 z|>0**

= $q-p+2 > 0$ .  $q+2 > p$ .

**Answer : (c)  $q+2 > p$**

**Q94. Set operation simplification**

$(A \cap B) \cup (A - B) = A$ ,  $(A \cap B) \cup (B - A) = B$ . Result = A.

**Answer : (b) A**

**Q95.  $A \cap C = B \cap C = \text{empty}$ ,  $A \cup C = B \cup C$ : which true?**

$A = B$  always. C need not be empty. II only.

**Answer : (b) II only**

**Q96.  $2 \sec 4\beta = \tan 2\alpha + \cot 2\alpha$**

RHS =  $2 \csc 4\alpha$ .  $\alpha + \beta = \pi/8$ .

**Answer : (d)  $\pi/8$**

**Q97. Complementary:  $\alpha - \beta = \pi/6$ ,  $m \tan(\beta) = n \tan(\alpha)$**

$n/m = 1/3$ .  $(m+n)/(m-n) = 2$ .

**Answer : (a) 2**

**Q98.  $x = \sec(\theta) - \tan(\theta)$ ,  $y = \csc(\theta) + \cot(\theta)$**

Verified:  $x - y + xy + 1 = 0$ .

**Answer : (b)  $x - y + xy + 1 = 0$**

**Q99.  $\cos(\theta) = 1/3$ :  $\sin(\theta/2) \sin(3\theta/2)$**

=  $(1/2)[\cos \theta - \cos 2\theta] = (1/2)(10/9) = 5/9$ .

**Answer : (a) 5/9**

**Q100. Maximum of  $\cos x + \sqrt{3} \sin x$**

=  $2 \cos(x - \pi/3)$ . Max at  $x = \pi/3$ .

**Answer : (b)  $\pi/3$**

## QUADRATICS, DETERMINANTS & COMBINATORICS (Q101 - Q120)

### Q101. Quadratics unchanged by squaring roots

4 equations:  $x^2$ ,  $x^2-x$ ,  $(x-1)^2$ ,  $x^2+x+1$ .

**Answer : (b) 4**

### Q102. Roots of $x^2-(b+c)x+bc=0$ (AM=b, GM=c)

Roots are b and c, i.e. A and G.

**Answer : (a) A, G**

### Q103. $1-\log_{10}(2)=\log_{10}(5^x+4^x+3^x+2^x+1)$

LHS= $\log_{10}(5)$ . At  $x=0$ : RHS= $\log_{10}(5)$ .  $x=0$ .

**Answer : (d) 0**

### Q104. $f(x)=\det[3x^2, \cos x, \sin x; 6, -1, 0; q, q^2, q^3]$ : $f''(0)$

$f''(0)=-6q^3+6q^3=0$ .

**Answer : (b) 0**

### Q105. Det with row differences: value of k

$R_1+R_2+R_3=(0,0,0)$ . LHS=0 always.  $k=0$ .

**Answer : (b) 0**

### Q106. Det with cube roots of unity p,q,r

$p^2+q^2+r^2=0$ .  $\det=4(pqr)^2=4$ .

**Answer : (d) 4**

### Q107. $|AA^T|$ where $|A|=-2$

$|A|^2=4$ .

**Answer : (d) 4**

### Q108. Symmetric inverse and singular adjoint

I: TRUE. II: TRUE.

**Answer : (c) Both I and II**

### Q109. $M=2I_3$ : $|M|*|\text{adj}M|$

$8*64=512$ .

**Answer : (d) 512**

### Q110. $M_k=[[k,k-1],[k-1,k]]$ : Sum $|M_k|$

Sum $(2k-1)=50^2=2500$ .

**Answer : (c) 2500**

### Q111. AP/GP ratio: $(p+q):(q+r):(r+p)$

$d=p$ . Ratio=3:5:4.

**Answer : (c) 3:5:4**

**Q112. GP means:  $g_1^2/g_2 + g_2^2/g_1$**

$=p+q=2m$ .

**Answer : (b) 2m**

**Q113. Complex inequalities validity**

Cannot order complex numbers. None valid.

**Answer : (a) None**

**Q114.  $|Z_1+Z_2|/|Z_1-Z_2|$  where  $3Z_1/(4Z_2)$  purely imaginary**

$Z_1/Z_2=ki$ .  $|1+ki|/|1-ki|=1$ .

**Answer : (d) 1**

**Q115. Cube roots of -8: ratio of expressions**

Ratio= $\omega$ = $\gamma$ / $\beta$ .

**Answer : (b)  $\gamma/\beta$**

**Q116.  $S_n=3n^2+5n$ , m-th term=68**

$a_m=6m+2=68$ .  $m=11$ .

**Answer : (c) 11**

**Q117. Set S with  $2n+1$  elements, subsets  $\leq n$ : 1024**

$2^{(2n)}=1024$ .  $n=5$ .

**Answer : (d) 5**

**Q118. Max intersection points of 5 circles**

$C(5,2)*2=20$ .

**Answer : (c) 20**

**Q119. Greatest r:  $15C(r+1) > 2*15C_r$**

$r < 13/3$ . Greatest  $r=4$ .

**Answer : (c) 4**

**Q120.  $n=mC_2$ : find  $nC_2$**

$=3*(m+1)C_4$ .

**Answer : (c)  $3*(m+1)C_4$**

**COMPLETE ANSWER KEY -- NDA MATH SET C**

<b>Q</b>	<b>Ans</b>	<b>Q</b>	<b>Ans</b>	<b>Q</b>	<b>Ans</b>	<b>Q</b>	<b>Ans</b>	<b>Q</b>	<b>Ans</b>	<b>Q</b>	<b>Ans</b>
<b>1</b>	(a)	<b>21</b>	(c)	<b>41</b>	(c)	<b>61</b>	(c)	<b>81</b>	(b)	<b>101</b>	(b)
<b>2</b>	(b)	<b>22</b>	(b)	<b>42</b>	(c)	<b>62</b>	(c)	<b>82</b>	(a)	<b>102</b>	(a)
<b>3</b>	(d)	<b>23</b>	(c)	<b>43</b>	(c)	<b>63</b>	(d)	<b>83</b>	(d)	<b>103</b>	(d)
<b>4</b>	(c)	<b>24</b>	(c)	<b>44</b>	(b)	<b>64</b>	(b)	<b>84</b>	(b)	<b>104</b>	(b)
<b>5</b>	(b)	<b>25</b>	(c)	<b>45</b>	(d)	<b>65</b>	(c)	<b>85</b>	(d)	<b>105</b>	(b)
<b>6</b>	(a)	<b>26</b>	(a)	<b>46</b>	(d)	<b>66</b>	(d)	<b>86</b>	(b)	<b>106</b>	(d)
<b>7</b>	(b)	<b>27</b>	(a)	<b>47</b>	(c)	<b>67</b>	(a)	<b>87</b>	(c)	<b>107</b>	(d)
<b>8</b>	(b)	<b>28</b>	(c)	<b>48</b>	(a)	<b>68</b>	(a)	<b>88</b>	(c)	<b>108</b>	(c)
<b>9</b>	(c)	<b>29</b>	(c)	<b>49</b>	(a)	<b>69</b>	(c)	<b>89</b>	(c)	<b>109</b>	(d)
<b>10</b>	(d)	<b>30</b>	(c)	<b>50</b>	(b)	<b>70</b>	(b)	<b>90</b>	(d)	<b>110</b>	(c)
<b>11</b>	(a)	<b>31</b>	(c)	<b>51</b>	(c)	<b>71</b>	(d)	<b>91</b>	(b)	<b>111</b>	(c)
<b>12</b>	(d)	<b>32</b>	(d)	<b>52</b>	(a)	<b>72</b>	(c)	<b>92</b>	(c)	<b>112</b>	(b)
<b>13</b>	(c)	<b>33</b>	(a)	<b>53</b>	(c)	<b>73</b>	(b)	<b>93</b>	(c)	<b>113</b>	(a)
<b>14</b>	(a)	<b>34</b>	(c)	<b>54</b>	(a)	<b>74</b>	(b)	<b>94</b>	(b)	<b>114</b>	(d)
<b>15</b>	(d)	<b>35</b>	(a)	<b>55</b>	(c)	<b>75</b>	(b)	<b>95</b>	(b)	<b>115</b>	(b)
<b>16</b>	(a)	<b>36</b>	(d)	<b>56</b>	(c)	<b>76</b>	(c)	<b>96</b>	(d)	<b>116</b>	(c)
<b>17</b>	(d)	<b>37</b>	(b)	<b>57</b>	(c)	<b>77</b>	(c)	<b>97</b>	(a)	<b>117</b>	(d)
<b>18</b>	(d)	<b>38</b>	(a)	<b>58</b>	(c)	<b>78</b>	(b)	<b>98</b>	(b)	<b>118</b>	(c)
<b>19</b>	(d)	<b>39</b>	(b)	<b>59</b>	(b)	<b>79</b>	(d)	<b>99</b>	(a)	<b>119</b>	(c)
<b>20</b>	(d)	<b>40</b>	(b)	<b>60</b>	(d)	<b>80</b>	(c)	<b>100</b>	(b)	<b>120</b>	(c)

**Prepared for Dreamers Edu Hub (DDD) -- NDA Coaching, Dehradun**