NDA MATHEMATICS MODEL TEST PAPER

Time - 150 Minute M.M-300

INSTRUCTION : *Read questions carefully. For each wrong answer, one-third the marks assigned to that question (0.83) will be deducted. Each question contains (2.5) marks/*ç'uksa dks /;kuiwoZd if<+,A çR;sd xyr mRrj ds fy,] fn, x, vadksa esa ls ,d&frgkbZ ¼0-83½ vad dkVs tk;saxsA çR;sd ç'u ¼2-5½ vad dk gS

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1. If $log_{10}2 = 0.30103$, Then $log_{10}50$ is equal to/
;fn $log_{10}2 = 0.30103$, rks $log_{10}50$ cjkcj gS
(a) 2.30103
(b) 2.69897
(c) 1.69897
(d) 0.69897

2. If $A = [1\ 2\ 3\ 4\ ], B = [2\ 3\ 4\ 5\ ]$ and $4A - 3B + C = O$, then C is equal to/ ;fn $A = [1\ 2\ 3\ 4\ ], B = [2\ 3\ 4\ 5\ ]$ vkSj $4A - 3B + C = O$, rks C cjkcj gS
(a) $[2\ \ -1\ 0\ 1\ ]$
(b) $[2\ 1\ 0\ \ -1\ ]$
(c) $[-2\ 1\ 0\ \ -1\ ]$
(d) None of these/ buesa ls dksbZ ugha

3. If $A = [1\ 0\ \ -1\ 7\ ]$ and $I = [1\ 0\ 0\ 1\ ]$,then the value of k, so that $A^2 = 8A + kI$ is/ ;fn $A = [1\ 0\ \ -1\ 7\ ]$ vkSj $I = [1\ 0\ 0\ 1\ ]$, fQj k dk eku] rkfd $A^2 = 8A + kI$ gks
(a) 4
(b) 5
(c) 6
(d) -7

4. The value of x for which $[1\ 1\ x\ ][1\ 0\ 2\ 0\ 2\ 1\ 2\ 1\ 0\ ][1\ 1\ 1\ ] = 0$ is/ ftlds fy, x dk eku
(a) 2
(b) -2
(c) 3
(d) -3

5. Let $\Delta = |1\ \sin\alpha\ 1\ \ -\sin\alpha\ 1\ \sin\alpha\ \ -1$ then Δ lies in the interval / eku yhft, $\Delta = |1\ \sin\alpha\ 1\ \ -\sin\alpha\ 1\ \sin\alpha$ rks Δ varjky esa fLFkr gS
(a) [2, 3]
(b) [3, 4]
(c) [1, 4]
(d) [2, 4]

6. If $f(x) = x^2 - 4x - 5$, then $f(A)$, Where $A = |1\ 2\ 2\ 2\ 1\ 2\ 2\ 2\ 1\ |$, is equal to/ ;fn $f(x) = x^2 - 4x - 5$, rks $f(A)$,tgk¡ $A = |1\ 2\ 2\ 2\ 1\ 2\ 2\ 2\ 1\ |$, ds cjkcj gS
(a) 0
(b) I
(c) $-I$
(d) $2I$

7. If $\left|x^2 + 2x\ 2x + 1\ 1\ 2x + 1\ x + 2\ 1\ 3\ 3\ 1\right| = (x-1)^k$ then k equals to / ;fn $\left|x^2 + 2x\ 2x + 1\ 1\ 2x + 1\ x + 2\ 1\ 3\ 3\ 1\right| =$ rks k ds cjkcj gS
(a) 1 (b) 2
(c) 3 (d) 4

8. If $\Delta = \left|1\ \alpha\ \alpha^2\ \cos cos\ (n-1)x\ \ \cos cos\ nx\ \ \cos cos\ (n\right.$ then Δ is/ ;fn $\Delta = \left|1\ \alpha\ \alpha^2\ \cos cos\ (n-1)x\ \ \cos cos\ nx\ \ \cos\right.$ rks Δ gS
(a) Independent of x/ x ls Lora=
(b) Independent of a/ a ls Lora=
(c) Independent of n/ n ls Lora=
(d) None of these/ buesa ls dksbZ ugha

9. What is the measure of the angle $114°\ 35'30''$ in radian?/ dks.k $114°\ 35'30''$ dk eki jsfM;u esa D;k gS\
(a) 1 rad/1 jsM (b) 2 rad/ 2 jsM
(c) 3 rad/ 3 jsM (d) 4 rad/ 4 jsM

10. The angle between the minute hand and the hour hand of a clock when the time is 8:25 am is / tc lqcg 8%25 cts dk le; gksrk gS rks ?kM+h dh feuV dh lqbZ vkSj ?kaVs dh lqbZ ds chp dk dks.k gksrk gS
(a) 92°45' (b) 102°30'
(c) 105° (d) 107°15'

11. What is the value of $\sin sin\ 292\frac{1}{2}°$? / $\sin sin\ 292\frac{1}{2}°$ dk eku D;k gS\

(a) $\frac{1}{3}\sqrt{2+\sqrt{3}}$

(b) $-\frac{1}{3}\sqrt{2-\sqrt{3}}$

(c) $\frac{1}{2}\sqrt{2+\sqrt{2}}$

(d) $-\frac{1}{2}\sqrt{2+\sqrt{2}}$

12. Which one of the following is correct?
$\left(1+cos67\frac{1^\circ}{2}\right)\left(1+\cos cos\ 112\frac{1^\circ}{2}\right)$ is/
fuEufyf[kr esa ls dkSu lk lgh gS\
$\left(1+cos67\frac{1^\circ}{2}\right)\left(1+\cos cos\ 112\frac{1^\circ}{2}\right)$ gS

(a) An irrational number and is greater than 1/,d vifjes; la[;k vkSj 1 ls cM+h gS

(b) A rational number but not an integer/,d ifjes; la[;k ysfdu iw.kkaZd ugha

(c) An integer/ ,d iw.kkaZd

(d) An inrrational number and is less than 1/,d vifjes; la[;k vkSj 1 ls de gS

13. What is the value of
$cos\left(\frac{\pi}{9}\right)+cos\left(\frac{\pi}{3}\right)+cos\left(\frac{5\pi}{9}\right)+cos\left(\frac{7\pi}{9}\right)$?/
$cos\left(\frac{\pi}{9}\right)+cos\left(\frac{\pi}{3}\right)+cos\left(\frac{5\pi}{9}\right)+cos\left(\frac{7\pi}{9}\right)$dk eku D;k gS\

(a) 1

(b) -1

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

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

14. tan $tan\ \frac{7\pi}{6}$, $tan\frac{9\pi}{4}$, $tan\frac{10\pi}{3}$ are in / esa gSa

(a) AP

(b) GP

(c) HP

(d) None of these/ buesa ls dksbZ ugha

15. $\frac{sinsin\ x+sinsin\ 3x+sinsin\ 5x+sinsin\ 7x}{coscos\ x+coscos\ 3x+coscos\ 5x+coscos\ 7x}$ is equal to /
$\frac{sinsin\ x+sinsin\ 3x+sinsin\ 5x+sinsin\ 7x}{coscos\ x+coscos\ 3x+coscos\ 5x+coscos\ 7x}$ ds cjkcj gS

(a) tan $tan\ 16x$

(b) tan $tan\ 8x$

(c) tan $tan\ 4x$

(d) tan $tan\ 2x$

16. If tan $tan\ \theta+\sin sin\ \theta=m$ and tan $tan\ \theta-\sin sin\ \theta=n$, then /;fn tan $tan\ \theta+\sin sin\ \theta=m$ vkSj tan $tan\ \theta-\sin sin\ \theta=n$,

(a) $m^2-n^2=4mn$

(b) $m^2+n^2=4mn$

(c) $m^2-n^2=m^2+n^2$

(d) $m^2-n^2=4\sqrt{mn}$

17. If cos $cos\ \theta=\frac{\alpha coscos\ \phi+b}{\alpha+bcoscos\ \phi}$, then $tan\frac{\theta}{2}$ is equal to/ ;fn cos $cos\ \theta=\frac{\alpha coscos\ \phi+b}{\alpha+bcoscos\ \phi}$, rks $tan\frac{\theta}{2}$ cjkcj gS

(a) $\sqrt{\left(\frac{a-b}{a+b}\right)}tan\frac{\phi}{2}$

(b) $\sqrt{\left(\frac{a+b}{a-b}\right)}cos\frac{\phi}{2}$

(c) $\sqrt{\left(\frac{a-b}{a+b}\right)}sin\frac{\phi}{2}$

(d) None of these/ buesa ls dksbZ ugha

18. What is the principle value of $cosec^{-1}\left(-\sqrt{2}\right)$?/ $cosec^{-1}\left(-\sqrt{2}\right)$ dk fl)kar eku D;k gS\

(a) $\frac{\pi}{4}$

(b) $\frac{\pi}{2}$

(c) $-\frac{\pi}{4}$

(d) 0

19. sin $sin\left[\frac{\pi}{3}-sin^{-1}\left(-\frac{1}{2}\right)\right]$ is equal to/ rks sin $sin\left[\frac{\pi}{3}-sin^{-1}\left(-\frac{1}{2}\right)\right]$ cjkcj gS

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

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

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

(d) 1

20. *A* $30m$ Long ladder is placed against a wall $15m$ high such that it just reaches the top of the wall. The angle made by the ladder with the horizontal is/ ,d 30 ehVj yach lh<+h dks 15 ehVj Åaph nhokj ds lkeus bl çdkj j[kk x;k gS fd og nhokj ds 'kh"kZ rd igqap tk,A lh<+h }kjk {kSfrt ds lkFk cuk;k x;k dks.k gS

(a) 30°

(b) 45°

(c) 60°

(d) 90°

21. The coordinates of the middle points of the sides of a triangle are (4, 2), (3, 3) and (2, 2), then find the coordinates of its centroid are/ ,d f=Hkqt dh Hkqtkvksa ds e/; fcanqvksa ds funsZ'kkad ¼4]2½]¼3]3½ vkSj ¼2]2½ gSa] rks bUds dsUæd ds funsZ'kkad Kkr dhft,

(a) $\left(3,\frac{7}{3}\right)$

(b) (3, 3)

(c) (4, 3)

(d) None of these/ buesa ls dksbZ ugha

22. The co-ordinates of incentre of ΔABC with vertices $A(0,6)$, $B(8,12)$ and $C(8,0)$ is/ 'kh"kZ

$A(0,6), B(8,12)$vkSj $C(8,0)$ ds lkFk ΔABCds var%dsaæ ds funsZ'kkad gSa

(a) $\left(\frac{16}{3},0\right)$ (b) $(8,11)$

(c) $(-4,3)$ (d) $(5,6)$

23. The middle point of the segment of the straight line joining the points (p,q) and $(q,-p)$ is $(r/2,s/2)$. what is the length of the segment?/ fcanqvksa (p,q) vkSj $(q,-p)$ dks tksM+us okyh lh/kh js[kk ds [kaM dk e/; fcanq $(r/2,s/2)$. gSA [kaM dh yackbZ D;k gS\

(a) $\left[\left(s^2+r^2\right)^{1/2}\right]/2$

(b) $\left[\left(s^2+r^2\right)^{1/2}\right]/4$

(c) $\left(s^2+r^2\right)^{1/2}$

(d) $s+r$

24. If $t_1 \neq t_2$ and the points $A(\alpha,0), B\left(at_1^2, 2at_1\right)$ and $C\left(at_2^2, 2at_2\right)$are collinear, then t_1t_2 is equal to/ ;fn $t_1 \neq t_2$ vkSj fcanq $A(\alpha,0), B\left(at_1^2, 2at_1\right)$ vkSj $C\left(at_2^2, 2at_2\right)$ lajs[k gSa] rks t_1t_2 ds cjkcj gS

(a) 1

(b) 2

(c) -1

(d) -2

25. The area of quadrilateral $ABCD$ whose vertices in order are $A(1,1), B(7,-3), C(12,2)$ and $D,(7,21)$ is/ prqHkqZt $ABCD$ dk {ks=Qy ftlds 'kh"kZ Øe esa $A(1,1), B(7,-3), C(12,2)$ vkSj $D,(7,21)$ gSa

(a) 66 *sq units*/ 66 oxZ bdkb;k¡

(b) 132 *sq units*/ 132 oxZ bdkb;k¡

(c) 124 *sq units*/ 124 oxZ bdkb;k¡

(d) 86. 5 *sq units*/ 86-5 oxZ bdkb;k¡

26. The distance between the lines $4x+3y=11$ and $8x+6y=15$ is/ js[kkvksa $4x+3y=11$ vkSj $8x+6y=15$ ds chp dh nwjh gS

(a) 7/2

(b) 7/3

(c) 7/5

(d) 7/10

27. For the equation $ax^2+by^2+2hxy+2gx+2fy+c=0$, where $a\neq0$, to represent a circle, the condition will be/ lehdj.k $ax^2+by^2+2hxy+2gx+2fy+c=0$, ds fy,] tgka $a\neq0$, ,d o`Ùk dk çfrfuf/kRo djus ds fy,] 'krZ gksxh

(a) $a=b$ And $c=0$/ $a=b$ vkSj $c=0$

(b) $f=g$ And $h=0$/ $f=g$ vkSj $h=0$

(c) $a=b$ And $h=0$/ $a=b$ vkSj $h=0$

(d) $f=g$ And $c=0$/ $f=g$ vkSj $c=0$

28. The equation of the circle passing through (4, 5) having the center at (2, 2) is/ dsaæ ¼2]2½ ij ¼4]5½ ls xqtjus okys o`Ùk dk lehdj.k gS

(a) $x^2+y^2+4x+4y-5=0$

(b) $x^2+y^2-4x-4y-5=0$

(c) $x^2+y^2-4x=13$

(d) $x^2+y^2-4x-4y+5=0$

29. The two ends of latusrectum of a parabola are the points $(3,6)$ and $(-5,6)$, then the focus is/ ,d ijoy; ds ySVljsDVe ds nks fljs fcanq ¼3]6½ vkSj ¼&5]6½ gSa] rks Qksdl gS

(a) (1, 6)

(b) $(-1,6)$

(c) $(1,-6)$

(d) $(-1,-6)$

30. The parametric representation $(2+t^2, 2t+1)$ represents/ iSjkehfV^a d çfrfuf/kRo $(2+t^2, 2t+1)$ n'kkZrk gS

(a) A parabola with focus at (2, 1)/ ¼2]1½ ij Qksdl okyk ,d ijoy;

(b) A parabola with vertex at (2, 1)/ 'kh"kZ ij ,d ijoy; ¼2]1½

(c) An ellipse with center at (2, 1)/ ¼2]1½ ij dsaæ okyk ,d nh?kZo`Ùk

(d) None of the above/mijksä esa ls dksbZ ugha

31. The ratio in which the line joining (2,4,5), $(3,5,-4)$ is divided by the YZ −plane is/ og vuqikr ftlesa ¼2]4]5½] ¼3]5]&4½ dks tksM+us okyh js[kk YZ −ry ls foHkkftr gksrh gS

(a) 2:3

(b) 3:2

(c) $-2:3$

(d) $4:-3$

32. A straight line which makes an angle of 60°with each of Y and Z −axes, is inclined with X −axis at an angle/ ,d lh/kh js[kk tks Y vkSj Z &v{kksa esa ls çR;sd ds lkFk 60° dk

dks.k cukrh gS] X &v{k ds lkFk ,d dks.k ij >qdh gqbZ gS
(a) 45°
(b) 30°
(c) 75°
(d) 60°

33. The foot of the perpendicular from (0, 2, 3) to the line $\frac{x+3}{5} = \frac{y-1}{2} = \frac{z+4}{3}$ is/ ¼0]2]3½ ls js[kk $\frac{x+3}{5} = \frac{y-1}{2} = \frac{z+4}{3}$ ij yEc dk ikn gS
(a) $(-2, 3, 4)$
(b) $(2, -1, 3)$
(c) $(2, 3, -1)$
(d) $(3, 2, -1)$

34. The line $\frac{x-2}{3} = \frac{y-3}{4} = \frac{z-4}{5}$ is parallel to the plane/ js[kk $\frac{x-2}{3} = \frac{y-3}{4} = \frac{z-4}{5}$ ry ds lekukarj gS
(a) $2x + y - 2z = 0$
(b) $3x + 4y + 5z = 7$
(c) $x + y + z = 2$
(d) $2x + 3y + 4z = 0$

35. Area lying in the first quadrant and bounded by the circle $x^2 + y^2 = 4$ and the line $x = y\sqrt{3}$ equals to/ {ks=Qy igys prqFkkaZ'k esa fLFkr gS vkSj o`Ùk $x^2 + y^2 = 4$ vkSj js[kk $x = y\sqrt{3}$ ls f?kjk gS
(a) π
(b) π/2
(c) π/3
(d) π/4

36. Area bounded by the curves $y = x \sin sin\, x$ and X −axis between $x = 0$ and $x = 2\pi$ is/ $x = 0$ vkSj $x = 2\pi$ ds chp oØ $= x \sin sin\, x$ vkSj X &v{k ls f?kjk {ks= gS
(a) 2π
(b) 3π
(c) 4π
(d) 6π

37. What is the area of the triangle formed by the lines joining the vertex of the parabola $x^2 = 12y$ to the latusrectum?/ ijoy; $x^2 = 12y$ ds 'kh"kZ dks ySVljsDVe ls feykus okyh js[kkvksa ls cus f=Hkqt dk {ks=Qy D;k gS\
(a) 9 $sq\ units$/ 9 oxZ bdkb;k¡
(b) 12 $sq\ units$/ 12 oxZ bdkb;k¡
(c) 14 $sq\ units$/14 oxZ bdkb;k¡
(d) 18 $sq\ units$/18 oxZ bdkb;k¡

38. If position vectors of four points A, B, C and D are $\hat{i} + \hat{j} + \hat{k}, 2\hat{i} + 3\hat{j}, 3\hat{i} + 5\hat{j} - 2\hat{k}$ and $\hat{k} - \hat{j}$ respectively, then AB and CD are related as/;fn pkj fcanqvksa A, B, C vkSj D ds fLFkfr lfn'k Øe'k% $\hat{i} + \hat{j} + \hat{k}, 2\hat{i} + 3\hat{j}, 3\hat{i} + 5\hat{j} - 2\hat{k}$ vkSj $\hat{k} - \hat{j}$ gSa] rks AB vkSj CD bl çdkj lacaf/kr gSa
(a) Perpendicular/ yacor
(b) Parallel/ lekukarj
(c) Independent/ Lora=
(d) None of these/ buesa ls dksbZ ugha

39. If $(3a - b) \times (a + 3b) = ka \times b$, then what is the value of k?/ ;fn $(3a - b) \times (a + 3b) = ka \times b$, rks k dk eku D;k gS\
(a) 10
(b) 5
(c) 8
(d) − 8

40. Point A is $a + 2b$, P is a and P divides AB in the ratio 2:3. The position vector of B is/ fcan $a + 2b$, gS] P, a gS vkSj P, AB dks 2:3 ds vuqikr esa foHkkftr djrk gSA B dk fLFkfr osDVj gS
(a) $2a - b$
(b) $b - 2a$
(c) $a - 3b$
(d) b

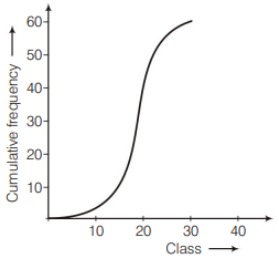
41. If $a + b + c = pd, b + c + d = q\ a$ and a, b, c are non-coplanar, then $a + b + c + d$ is equal to/ ;fn $a + b + c = pd, b + c + d = q\ a$ vkSj a, b, c xSj&leryh; gSa] rks $a + b + c + d$ cjkcj gS a
(a) 0
(b) pa
(c) qb
(d) $(p + q)c$

42. If a is a non-zero vector of modulus α and λ is a non-zero scalar and λ, a is a unit vector, then / ;fn a ekikad α dk ,d xSj&'kwU; osDVj gS vkSj λ ,d xSj&'kwU; vfn'k jkf'k gS vkSj λ] a,d bdkbZ osDVj gS] rks
(a) $\lambda + \pm 1$
(b) $a = |\lambda|$
(c) $a = \frac{1}{|\lambda|}$
(d) $a = \frac{1}{\lambda}$

43. If a and b represent the sides AB and BC of a regular hexagon $ABCDEF$, then FA is equal to/ ;fn A vkSj B ,d fu;fer "kV~Hkqt $ABCDEF$, dh Hkqtkvksa AB vkSj BC dks n'kkZrs gSa] rks FA cjkcj gS
(a) $b - a$

(b) $a - b$
(c) $a + b$
(d) None of these/ buesa ls dksbZ ugha

44. The curve given below represent a/an/ uhps fn;k x;k oØ a/an dks n'kkZrk gS

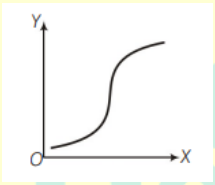


(a) Pie diagram/ ikbZ vkjs[k
(b) Bar diagram/ ckj vkjs[k
(c) Ogive/ v,fxo
(d) Histogram/ fgLVksxzke

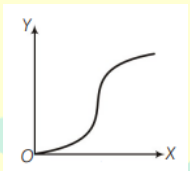
45. Cumulative frequency curve of give table is/ rkfydk dk lap;h vko`fÙk oØ gS

Class interval	0-10	10-20	20-30	30-40	40-50
Frequency	4	10	25	8	2

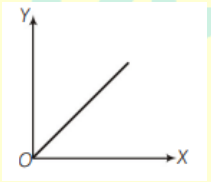
(a)



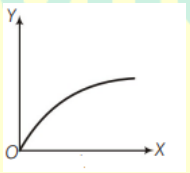
(b)



(c)



(d)



46. If the values of a set are measured in cm, what will be the unit of variance?/ ;fn fdlh leqPp; dk eku lseh esa ekik tkrk gS] rks fopj.k dh bdkbZ D;k gksxh\
(a) cm
(b) cm^2
(c) cm^3
(d) No unit/ dksbZ bdkbZ ugha

47. Consider the following frequency distribution

Class interval	0-10	10-20	20-30	30-40	40-50
Frequency	14	f_2	28	f_4	15

If the sum of the frequencies is 100 and median is 25, then f_2 and f_4 will be/ ;fn vko`fÙk;ksa dk ;ksx 100 gS vkSj ekf/;dk 25 gS] rks f_2 vkSj f_4 gksaxs
(a) 15 and 28/ 15 vkSj 28
(b) 20 and 23/ 20 vkSj 23
(c) 22 and 21/ 22 vkSj 21
(d) 21 and 22/ 21 vkSj 22

48. If the standard deviation of 15 items is 6 and each item is decreased by 1, then standard deviation will be/ ;fn 15 oLrqvksa dk ekud fopyu 6 gS vkSj çR;sd oLrq esa 1 dh deh dh tkrh gS] rks ekud fopyu gksxk
(a) 5
(b) 7
(c) 9
(d) 6

49. The standard deviation in a variable x is σ. The standard deviation of the variable $\frac{ax+b}{c}$; where a, b and c are constants, is/ ,d pj x esa ekud fopyu σ gSA pj dk ekud fopyu $\frac{ax+b}{c}$; tgka a, b vkSj c fLFkjkad gSa]
(a) $\left(\frac{a}{c}\right)\sigma$
(b) $\left|\frac{a}{c}\right|\sigma$
(c) $\left(\frac{a^2}{c^2}\right)\sigma$
(d) None of these/ buesa ls dksbZ ugha

50. If $\bar{x} = \bar{y} = 0, \sum x_i y_1 = 12, \sigma_x = 2, \sigma_y = 3$ and $n = 10$, then the coefficient of correlation is/ ;fn $\bar{x} = \bar{y} = 0, \sum x_i y_1 = 12, \sigma_x = 2, \sigma_y = 3$ vkSj $n = 10$, rks lglaca/k dk xq.kkad gS
(a) 0.4
(b) 0.3
(c) 0.2
(d) 0.1

51. If b_{yx} and b_{xy} are regression coefficients of y on x and x on y respectively, then which of the following statements is true?/ ;fn b_{yx} vkSj b_{xy} Øe'k% y ij x vkSj x ij y ds çfrxeu xq.kkad gSa] rks fuEufyf[kr esa ls dkSu lk dFku lR; gS\
(a) $b_{yx} = 1.5 \; and \; b_{yx} = 1.4$
(b) $b_{yx} = 1.5 \; and \; b_{yx} = 0.9$
(c) $b_{yx} = 1.5 \; and \; b_{yx} = 0.8$
(d) $b_{yx} = 1.5 \; and \; b_{yx} = 0.6$

52. If n=10, $\sum x = 4, \sum y = 3, \sum x^2 = 8, \sum y^2 = 9,$ and $\sum xy = 3$, then coefficient of correlat

ion is / ;fn n=10,

$\sum x = 4, \sum y = 3, \sum x^2 = 8, \sum y^2 = 9$, vkSj

$\sum xy = 3$, fQj lglaca/k dk xq.kkad

vk;u gS

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

(b) $\frac{7}{12}$

(c) $\frac{15}{4}$

(d) $\frac{14}{3}$

53. The standard deviation of some consecutive integers is found to be 2. Which of the following statements best describes the nature of the consecutive integers?/ dqN Øekxr iw.kkaZdksa dk ekud fopyu 2 ik;k tkrk gSA fuEufyf[kr esa ls dkSu lk dFku Øekxr iw.kkaZdksa dh ç—fr dk lcls vPNk o.kZu djrk gS\

(a) The integers are any set of eight consecutive integers/ iw.kkaZd vkB yxkrkj iw.kkaZdksa dk dksbZ lsV gS

(b) The integers are any set of eight consecutive positive integers/ iw.kkaZd vkB yxkrkj ldkjkRed iw.kkaZdksa dk dksbZ lsV gS

(c) The integers are any set of seven consecutive integers/ iw.kkaZd lkr yxkrkj iw.kkaZdksa dk dksbZ lewg gS

(d) None of the above/ mijksä esa ls dksbZ ugha

54. Two cards are drawn at random from a deck of 52 cards. The probability of these two being aces is / 52 iÙkksa dh ,d xìh esa ls nks iÙks ;k–fPNd :i ls fudkys tkrs gSaA bu nksuksa ds bDds gksus dh çkf;drk gS

(a) 1/26

(b) 1/221

(c) 1/2

(d) 1/18

55. A card is drawn from a well-shuffled deck cards. The probability of getting a queen of club or king of heart is/ rk'k ds iÙkksa dh vPNh rjg ls QsaVh xbZ Msd ls ,d iÙkk fudkyk tkrk gSA Dyc dh jkuh ;k fny dh jkuh feyus dh laHkkouk gS

(a) 1/52

(b) 1/26

(c) 1/13

(d) 1/56

56. In shuffling a pack of cards 3 are accidently dropped, then the chance that missing card should be of different suits is/ dkMksaZ dh ,d xìh dks QsaVrs le; xyrh ls 3 dkMZ fxj tkrs gSa] rks laHkkouk gS fd xk;c dkMZ vyx&vyx lwV ds gksaxs\

(a) 169/425 (b) 261/425

(c) 104/425 (d) 425/196

57. If there are 4 addressed envelopes and 4 letters. Then, the chance that all the letters are not mailed through proper envelope is / ;fn 4 irs okys fyQkQs vkSj 4 i= gSaA fQj] laHkkouk ;g gS fd lHkh i= mfpr fyQkQs ds ek/;e ls ugha Hksts tk,axs

(a) 1/24 (b) 1

(c) 23/24 (d) 9/2

58. A and B are two events such that $P(A) = 0.3$ and $(A \cup B) = 0.8$. If A and B are independent, then $P(B)$ is/ A vkSj B nks ?kVuk,¡ bl çdkj gSa fd $P(A) = 0.3$ vkSj $P(A \cup B) = 0.8$;fn A vkSj B Lora= gSa] rks $P(B)$ gS

(a) 2/3

(b) 3/8

(c) 2/7

(d) 5/7

59. A speaks truth in 60% cases and B speaks truth in 70% cases. The probability that they will say the same thing while describing single event, is/ A 60% ekeyksa esa lp cksyrk gS vkSj B 70% ekeyksa esa lp cksyrk gSA laHkkouk ;g gS fd os ,d gh ?kVuk dk o.kZu djrs le; ,d gh ckr dgsaxs

(a) 0. 56

(b) 0. 54

(c) 0. 38

(d) 0. 94

60. The probability that in the toss of two dice, we obtain an even sum or a sum less than 5 is/ nks ikIksa dks mNkyus ij gesa le ;ksx ;k 5 ls de ;ksx çkIr gksus dh çkf;drk gS

(a) 1/2

(b) 1/6

(c) 1/3

(d) 5/9

61. f $f(x) = \frac{\sin \sin x}{x}$, where $x \in R$, is to be continuous at $x = 0$, then the value of function $x = 0$/;fn $f(x) = \frac{\sin \sin x}{x}$]tgk¡ $x \in R$ dks $x = 0$ ij larr gksuk gS] rks $x = 0$ ij Qyu dk eku

(a) Should be 0/ 0 gksuk pkfg,

(b) Should be 1/1 gksuk pkfg,

(c) Should be 2/ 2 gksuk pkfg,

(d) Cannot be determined/fu/kkZfjr ugha fd;k tk ldrk

62. The solution of the differential equation $dy = \left(1 + y^2\right)dx$ *is* :/vody lehdj.k $dy = \left(1 + y^2\right)dx$ dk gy gS

(a) $y = \tan tan\, x + c$

(b) $y = \tan tan\, (x + c)$

(c) $tan^{-1}(y + c) = x$

(d) $tan^{-1}(y + c) = 2c$

63. What is $\int (e^{loglog\, x} + \sin sin\, x)\ \cos cos\, x\, dx$ equal to ?/fdlds cjkcj gS\

(a) $\sin sin\, x + x \cos cos\, x + \frac{sin^2 x}{2} + c$

(b) $\sin sin\, x - x \cos cos\, x + \frac{sin^2 x}{2} + c$

(c) $x \sin sin\, x + \cos cos\, x + \frac{sin^2 x}{2} + c$

(d) $x \sin sin\, x - x \cos cos\, x + \frac{sin^2 x}{2} + c$

64. What is the domain of the function $f(x) = cos^{-1}(x - 2)$?/Qyu dk Mksesu ¼izkar½ D;k gS\

(a) $[-1, 1]$ (b) $[1, 3]$

(c) $[0, 5]$ (d) $[-2, 1]$

65. What is the area of the region enclosed between the curve $y^2 = 2x$ and the straight line $y = x$?/oØ $y^2 = 2x$ vkSj ljy js[kk $y = x$ ds chp ifjc} {ks= dk {ks=Qy D;k gS\

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

(c) $\frac{2}{3}$ (d) 2

66. If $f(x) = 2x - x^2$, then what is the value of $f(x + 2) + f(x - 2)$ when $x = 0$?/;fn $f(x) = 2x - x^2$ gks] rks $f(x + 2) + f(x - 2)$ dk eku] ml fLFkfr esa tc $x = 0$ gks] D;k gksxk\

(a) -8 (b) -4

(c) 8 (d) 4

67. If $x^m y^n = a^{m+n}$, then what is $\frac{dy}{dx}$ equal to ?/;fn $x^m y^n = a^{m+n}$ gks] rks $\frac{dy}{dx}$ fdlds cjkcj gS\

(a) $\frac{my}{nx}$ (b) $-\frac{my}{nx}$

(c) $\frac{mx}{ny}$ (d) $-\frac{ny}{mx}$

68. What is $\int \frac{dx}{x(x^2+1)}$ equal to ?/ $\int \frac{dx}{x(x^2+1)}$ fdlds cjkcj gS\

(a) $\frac{1}{2} In\left(\frac{x^2}{x^2+1}\right) + C$

(b) $In\left(\frac{x^2+1}{x^n}\right) + C$

(c) $In\left(\frac{x^n}{x^n+1}\right) + C$

(d) $\frac{1}{n} In\left(\frac{x^n+1}{x^n}\right) + C$

69. What is the minimum value of $|x - 1|$, where $x \in R$?/ $|x - 1|$dk U;wure eku D;k gS] tgk¡ $x \in R$ gS\

(a) 0 (b) 1

(c) 2 (d) -1

70. What is the value of k such that integration of $\frac{3x^2+8-4k}{x}$ with respect to x, may be a rational function ?/ k dk og eku D;k gS ftlds fy, $\frac{3x^2+8-4k}{x}$ dk x ds lkis{k lekdyu] ,d ifjes; Qyu gks ldrk gS\

(a) 0 (b)1

(c) 2 (d) -2

71. What is the derivative of e^x with respect to x^e ?/ x^e ds lkis{k e^xdk vodyt D;k gS\

(a) $\frac{xe^x}{ex^e}$ (b) $\frac{e^x}{x^e}$

(c) $\frac{xe^x}{x^e}$ (d) $\frac{e^x}{ex^e}$

72. If a differentiable function $f(x)$ satisfies $lim\, x \to -1\ \frac{f(x)+1}{x^2-1} = -\frac{3}{2}$ then what is $lim\, x \to -1\ f(x)$ equal to?/;fn dksbZ vody Qyu $f(x)$ $lim\, x \to -1\ \frac{f(x)+1}{x^2-1} = -\frac{3}{2}$dks larq'V djrk gS] rks $lim\, x \to -1\ f(x)$ fdlds cjkcj gS\

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

(c) 0 (d) 1

If the function $f(x) = \{a + bx, x < 1\ 5, x = 1\ b - ax, x > 1$

73. is continuous, then what is the value of (a + b)?/;fn Qyu $f(x) = \{a + bx, x < 1\ 5, x = 1\ b - ax, x > 1$ larr gS] rks (a + b) dk eku D;k gS\

(a) 5 (b) 10

(c) 15 (d) 20

74. Consider the following statement in respect of the function $(x) = \sin sin\, x$: /Qyu ds lanHkZ esa fuEufyf[kr dFkuksa ij fopkj dhft,%

1. $f(x)$ increases in the interval $(0, \pi)$. / varjky $(0, \pi)$. esa $f(x)$ o/kZeku gSA

2. $f(x)$ decreases in the interval $\left(\frac{5\pi}{2}, 3\pi\right)$./ varjky $\left(\frac{5\pi}{2}, 3\pi\right)$ esa $f(x)$ gkleku gSA

Which of the above statements is/are correct?/mi;qZä dFkuksa esa ls dkSu&lk@ls lgh gS@gS\

(a) 1 only /dsoy 1

(b) 2 only/ dsoy 2

(c) Both 1 and 2/ 1 vkSj 2 nksuksa

(d) neither 1 nor 2/ u rks 1 vkSj u gh 2

75. What is the domain of the function $f(x) = 3^x$? /Qyu $f(x) = 3^x$ dk izkar D;k gS\

(a) $(-\infty, \infty)$ (b) $(0, \infty)$

(c) $[0, \infty)$ (d) $(-\infty, \infty) - \{0\}$

76. If the general solution of a differential equation is $y^2 + 2cy - cx + c^2 = 0$, where c is an arbitrary constant, then what is the order of the differential equation?/;fn ,d vody lehdj.k dk O;kid gy gS] tgk¡ ,d LosPN vpj gS] rks vody lehdj.k dh dksfV D;k gS\

(a) 1 (b) 2

(c) 3 (d) 4

77. What is the degree of the following differential equation? $x = \sqrt{1 + \frac{d^2y}{dx^2}}$/ vody lehdj.k $x = \sqrt{1 + \frac{d^2y}{dx^2}}$ dk ?kkr ¼fMxzh½ D;k gS\

(a) 1

(b) 2

(c) 3

(d) Degree is not defined/?kkr ifjHkkf'kr ugha gS

78. Which one of the following differential equations has the general solution $y = ae^x + be^{-x}$? / fuEufyf[kr esa ls fdl vody lehdj.k dk O;kid gy $y = ae^x + be^{-x}$ gS\

(a) $\frac{d^2y}{dx^2} + y = 0$ (b) $\frac{d^2y}{dx^2} + y = 0$

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

79. What is the solution of the following differential equation? $In\left(\frac{dy}{dx}\right) + y = x$/vody lehdj.k $In\left(\frac{dy}{dx}\right) + y = x$ dk gy D;k gS\

(a) $e^x + e^y = c$ (b) $e^x + y = c$

(c) $e^x - e^y = c$ (d) $e^x - y = c$

80. What is $\int e^{(2\,In\,x + In\,x^2)}$ dx equal to?/ $\int e^{(2\,In\,x + In\,x^2)} dx$ fdlds cjkcj gS\

(a) $\frac{x^4}{4} + c$ (b) $\frac{x^3}{3} + c$

(c) $\frac{2x^5}{5} + c$ (d) $\frac{x^5}{5} + c$

81. Consider the following relations for two events E and F:/ nks vuqo`Ÿk ¼bosaV½ vkSj ds fy, fuEufyf[kr O;atdks ij fopkj dhft,%

1. $P(E \cap F) \geq P(E) + P(F) - 1$

2. $P(E \cup F) = P(E) + P(E) + P(E \cap F)$

3. $P(E \cup F) \leq P(E) + P(F)$

Which of the above relations is/are correct?/mi;qZä O;atdksa esa ls dkSu&lk@dkSu&ls lgh gS@ gS\

(a) 1 Only/dsoy 1

(b) 3 Only/ dsoy 3

(c) 1 and 3 Only/ dsoy 1 vkSj 3

(d) 1, 2 and 3/1, 2 vkSj 3

82. If $P(B) < P(A)$, then which one of the following is correct?/;fn gS] rks fuEufyf[kr esa ls dkSu&lk lgh gS\

(a) $P(BA) < P(B)$

(b) $P(A) > P(B)$

(c) $P(A) = P(B)$

(d) $P(A) > P(A)$

83. When the measures of central tendency is available in the form of mean, which one of the following is the most reliable and accurate measure of variability?/tc dsUnzh; izo`fŸk dh eki ek/; ds :Ik esa miyCk/k gS] rks fuEufyf[kr esa ls dkSu&lh ifjofrZrk dh lcls vf/kd foJluh; vkSj ;FkkFkZ eki gS\

(a) Range/ ifjlj ¼jsat½

(b) Mean deviation/ek/; fopyu

(c) Standard deviation/ekud fopyu

(d) Quartile deviation/prqFkZd fopyu

84. A problem is given to three students A,B and C, whose probabilities of solving the problem

independently are $\frac{1}{2}, \frac{3}{4}$ and P respectively. If the probability that the problem can be solved is $\frac{29}{32}$, then what is the value of P?/ rhu Nk= A,B vkSj C dks ,d iz"u fn;k tkrk gSA iz"u dks Lora= :Ik ls gy djus dh izkf;drk,¡ Øe"k% $\frac{1}{2}, \frac{3}{4}$ vkSj P gSa ;fn iz"u gy djus dh izkf;drk $\frac{29}{32}$ gS] rks P dk eku D;k gS\

(a) $\frac{2}{5}$ (b) $\frac{2}{3}$

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

85. In a cricket match, a batsman hits a six 8 times out of 60 balls he plays. What is the probability that on a ball played he does not hit a six?/,d fØdsV eSp esa] ,d cysckt mlds }kjk [ksyh xbZ 60 xsnksa esa 8 ckj Ndk ¼N%½ ekjrk gSA bl ckr dh D;k izkf;drk gSA fd mlds }kjk [ksyh xbZ fdlh xasn esa og Ndk ¼N%½ u ekjs\

(a) $\frac{2}{3}$ (b) $\frac{1}{15}$

(c) $\frac{2}{15}$ (d) $\frac{13}{15}$

Direction: Consider the following for the next two (02) items that follow./funsZ"k% vkxs vkus okys nks ¼02½ iz"uksa"kksa ds fy, fuEufyf[kr ij fopkj dhft,A

Two regression lines are given as $3x - 4y + 8 = 0$ and $4x - 3y - 1 = 0$./ nks lekJ;.k ¼fjxzs"ku½ js[kk,¡ $3x - 4y + 8 = 0$ vkSj $4x - 3y - 1 = 0$ ds :Ik esa nh xbZ gSA

86. Consider the following statements:/fuEufyf[kr dFkuksa ij fopkj dhft,%

1. The regression line of y on x is $y = \frac{3}{4}x + 2$/ x ij y dh lekJ;.k js[kk $y = \frac{3}{4}x + 2$ gSaA

2. The regression line of x on y is $x = \frac{3}{4}y + \frac{1}{4}$./ y ij x dh lekJ;.k js[kk $x = \frac{3}{4}y + \frac{1}{4}$ gSS

Which of the above statements is /are correct/mi;qZä dFkuksa esa ls dkSu&lk@dkSu&ls lgh gS@gS\

(a) 1 Only/dsoy 1

(b) 2 Only/ dsoy 2

(c) Both 1 and 2/ 1 vkSk 2 nksuksa

(d) Neither 1 nor 2/ u rks 1 vkSj u gh 2

87. Consider the following statements:/fuEufyf[kr dFkuksa ij fopkj dhft,%

1. The coefficient of correlations r is $\frac{3}{4}$./ lglaca/k xq.kkad $r, \frac{3}{4}$ gSA

2. The means of x and y are 3 and 4 respectively./ x vkSj y ds ek/; Øe"k% 3 vkSj 4 gSA

Which of the above statement is /are correct?/mi;qZä dFkuksa esa ls dkSu&lk@ dkSu&ls lgh gS@ gS\

(a) 1 Only/dsoy 1

(b) 2 Only/ dsoy 2

(c) Both 1 and 2/ 1 vkSj 2 nksuksa

(d) Neither 1 nor 2/ u rks 1 vkSj u gh 2

88. What is the equation of the ellipse whose vertices are $(\pm 5, 0)$ and foci are at $(\pm 4, 0)$?/ml nh?kZo`Ÿk dk lehdj.k D;k gS ftlds "kh'kZ $(\pm 5, 0)$gS vkSj ukfHk;k¡ $(\pm 4, 0)$ij gS\

(a) $\frac{x^2}{25} + \frac{y^2}{9} = 1$ (b) $\frac{x^2}{16} + \frac{y^2}{9} = 1$

(c) $\frac{x^2}{25} + \frac{y^2}{16} = 1$ (d) $\frac{x^2}{y} + \frac{y^2}{25} = 1$

89. What is the equation of the straight line passing through the point (2,3) and making an intercept on the positive Y-axis equal to twice its intercept on the positive X-axis?/ml ljy js[kk dk lehdj.k D;k gS tks fcUnq (2,3) ls gksdj xqt+jrh gS] vkSj /kukRed Y-v{k ij mldk var% [kaM] /kukRed X-v{k ij mlds var%[kaM dk nqxquk curk gS\

(a) $2x + y = 5$ (b) $2x + y = 7$

(c) $x + 2y = 7$ (d) $2x - y = 1$

90. Let the coordinates of the points A, B, C be $(1, 8, 4), (0, -11, 4)$ and $(2, -3, 1)$ respectively. What are the coordinates of the point D which is the foot of the perpendicular from A on BC?/eku yhft, fcUnqvksa A, B vkSj Cds funsZ"kkad Øe"k% $(1, 8, 4), (0, -11, 4)$ vkSj $(2, -3, 1)$ gSaA ml fcUnq D ds funsZ"kkad D;k gSa tks A ls BC ij yacikn gSA\

(a) $(3, 4, -2)$ (b) $(4, -2, 5)$

(c) $(4, 5, -2)$ (d) $(2, 4, 5)$

91. Suppose ω is a cube root of unity with ω≠1. Suppose P and Q are the points on the complex plane defined by ωand ω^2. If O is the origin, then what is the angle between OP and OQ? /eku yhft, fd ω ,d ¼;wfufV½ dk ?kuewy gS vkSj ω≠1 gSA eku yhft, PvkSj Q] ωrFkk ω^2}kjk ifjHkkf'kr lfEeJ lery ij fcnq,¡ gSA ;fn O ewyfcnq gS] rks OPvkSj OQds chp dk dks.k D;k gS\

(a) 60° (b) 90°
(c) 120° (d) 150°

92. If $x^2 - px + 4 > 0$ for all real values of x, then which one of the following is correct?/;fn x ds lHkh okLrfod ekuksa ds fy, $x^2 - px + 4 > 0$ gS] rks fuEufyf[kr esa ls dkSu&lk ,d lgh gS\
(a) $|p| < 4$ (b) $|p| \leq 4$
(c) $|p| > 4$ (d) $|p| \geq 4$

93. If $z = x + iy = \left(\frac{1}{\sqrt{2}} - \frac{i}{\sqrt{2}}\right)^{-25}$, where $i = \sqrt{-1}$, Then what is the fundamental amplitude of $\frac{z-\sqrt{2}}{z-i\sqrt{2}}$?/ ;fn $z = x + iy = \left(\frac{1}{\sqrt{2}} - \frac{i}{\sqrt{2}}\right)^{-25}$,tgk¡ $i = \sqrt{-1}$,gS] rks $\frac{z-\sqrt{2}}{z-i\sqrt{2}}$dk ewy vk;ke D;k gS\
(a) π (b) $\frac{\pi}{2}$
(c) $\frac{\pi}{3}$ (d) $\frac{\pi}{4}$

94. What is the number of distinct solutions of the equation $z^2 + |z| = 0$ (Where z is a complex number)?/lehdj.k $z^2 + |z| = 0$ ds ¼tgk¡ z ,d lfEeJ la[;k gS½ fHk= ¼fMfLVaDV½ gyksa dh la[;k D;k gS\
(a) One /,d (b) Two/nks
(c) Three/rhu (d) Five/ik¡p

95. How many geometric progressions is/are possible containing 27, 8 and 12 as three of its/their terms?/ ,slh fdruh xq.kksŸkj Jsf<+;k¡ laHko gS] ftlds/ ftuds inksa esa ls rhu in 27] 8 vkSj 12 gS\
(a) One/,d
(b) Two/nks
(c) Four/pkj
(d) Infinitely many/vuarr% vusd

96. A five- digit number divisible by 3 is to be formed using the digits 0, 1, 2, 3 and 4 without repetition of digits. What is the number of ways this can be done?/ 0, 1, 2, 3vkSj 4 vadksa dk iz;ksx vadksa dks nksgjk, fcuk djrs gq,] 3 ls foHkkT;] ,d ik¡p&vadksa okyh la[;k cukbZ tkuh gSA ,slk djus ds fdrus rjhds gks ldrs gS\
(a) 96
(b) 48
(c) 32
(d) No number can be formed/dksbZ la[;k ugha cu ldrh

97. What is ${}^{47}C_4 + {}^{51}C_a + \sum_{j-2}^{5} 52 - j_{C_3}$ equal to?/${}^{47}C_4 + {}^{51}C_a + \sum_{j-2}^{5} 52 - j_{C_3}$ fdlds cjkcj gSA
(a) ${}^{52}C_4$ (b) ${}^{51}C_5$
(c) ${}^{53}C_4$ (d) ${}^{52}C_5$

Consider the following for the next three (03) items that follow:/vxys rhu ¼03½ iz”uka”kksa ds fy, fuEufyf[kr ij fopkj dhft,%
Let a, x, y, z, b, be in AP, where $x + y + z = 15$. Let a, p, q, r, b be in HP, where $p^{-1} + q^{-1} + r^{-1} = 5/3$.eku yhft, a, x, y, z, b, lekarj Js<+h (AP) esa gS]tgk¡ $x + y + z = 15$ gSA eku yhft, , p, q, r, b gjkRed Js.kh (HP) esa gS] tgk¡ $p^{-1} + q^{-1} + r^{-1} = 5/3$ gSA

98. What is the value of ab?/ab dk eku D;k gS\
(a) 10
(b) 9
(c) 8
(d) 6

99. What is the value of xyz?/ xyzdk eku D;k gS\
(a) 120
(b) 105
(c) 90
(d) Cannot be determined/fu/kkZfjr ugha fd;k tk ldrk

100. What is the value of pqr? / pqrdk eku D;k gS\
(a) 35/243
(b) 81/ 35
(c) 243/35
(d) Cannot be determined//fu/kkZfjr ugha fd;k tk ldrk

Consider the following for the next two (2) items that follows:/vxysa nks ¼02½ iz”uka”kksa ds fy, fuEufyf[kr ij fopkj dhft,%
The sixth term of an AP is 2 and its common difference is greater than 1./fdlh lekarj Js<+h (AP) dk NBok¡ in 2 gS vkSj mldk lkoZ varj 1 ls vf/kd gSA

101. What is the common difference of the AP so that the product of the first, fourth and fifth terms is greatest?/ lekarj Js<+h (AP) dk lkoZ varj fdruk gS] rkfd igys] pkSFks vkSj ik¡poas inksa dk xq.kuQy vf/kdre gks\
(a) 8/5
(b) 9/5
(c) 2
(d) 11/5

102. What is the first term of the AP so that the product of the first, fourth and fifth terms is greatest?/lekarj Js<+h (AP)dk igyk in D;k gS] rkfd igys] pkSFks vkSj ik¡posa inksa dk xq.kQy vf/kdre gks\

(a) -4
(b) -6
(c) -8
(d) -10

103. The sum of all of two- digit odd numbers is/nks & vadh; lHkh fo'k; la[;kvksa dk ;ksx fdlds cjkcj gS\
(a) 2475
(b) 2530
(c) 4905
(d) 5049

104. The sum of the first n terms of the series $\frac{1}{2}+\frac{3}{4}+\frac{7}{8}+\frac{15}{16}+$ ... is equal to /Js.kh $\frac{1}{2}+\frac{3}{4}+\frac{7}{8}+\frac{15}{16}+$ ...ds izFke n inksa dk ;ksx fdlds cjkcj gS\
(a) 2^n-n-1
(b) $1-2^{-n}$
(c) $2^{-n}+n-1$
(d) 2^n-1

105. Consider the following in respect of sets A and B:/leqPp;ksa A o B ds lEcU/k esa fuEufyf[kr ij fopkj dhft,%
1. $(A-B)\cup B=A$
2. $(A-B)\cup A=A$
3. $(A-B)\cap B=\phi$
4. $A\sqsubseteq B\Rightarrow A\cup B=B$

Which of the above are correct?/mi;qZä esa ls dkSu&ls lgh gS\
(a) 1, 2 and 3/1, 2vkSj 3
(b) 2, 3 and 4/2, 3 vkSj 4
(c) 1, 3 and 4/1, 3vkSj 4
(d) 1, 2 and 4/1, 2 vkSj 4

106. In the binary equation $(1p101)_2+(10q1)_2=(100r00)_2$ where p, q and r are binary digits, what are the possible values of p, q and r respectively?/,d f}&vk/kkjh lehdj.k $(1p101)_2+(10q1)_2=(100r00)_2$ tgk¡ p, qo rf}&vk/kkjh vad gS esa p, q vkSj $r$ds laHkkfor eku Øe"k% fdlds cjkcj gS\
(a) 0, 1, 0 (b) 1, 1, 0
(c) 0, 0, 1 (d) 1, 0, 1

107. If $S=\{x: x^2+1=0, x \text{ is real}\}$, then S is/;fn $S=\{x: x^2+1=0, x$ okLrfod gS$\}$,rks S fdlds cjkcj gS\ dk
(a) $\{-1\}$ (b) $\{0\}$
(c) $\{1\}$ (d) An empty set/,d fjä leqPp;

108. The expansion of $(x-y)^n, n\geq 5$ is done in the descending powers of x. If the sum of the fifth and sixth terms is zero, then $\frac{x}{y}$ is equal to/ $(x-y)^n, n\geq 5$dk izlkj x dh ?kkr ds vojksgh Øe esa fd;k x;k gSA ;fn ik¡posa o NBsa inksa dk ;ksx "kwU; gS] rks $\frac{x}{y}$fdlds cjkcj gS\
(a) $\frac{n-5}{6}$ (b) $\frac{n-4}{5}$
(c) $\frac{5}{n-4}$ (d) $\frac{6}{n-5}$

109. If the second term of a GP is 2 and the sum of its infinite terms is 8, then the GP is/;fn ,d xq.kksŸkj Js.kh (GP) dk nwljk in 2 gS vkSj blds vuar inksa dk ;ksxQy 8 gS] rks xq.kksŸkj Js.kh (GP) gS
(a) 8, 2, $\frac{1}{2}, \frac{1}{8}$, ... (b) 10, 2, $\frac{2}{5}, \frac{2}{25}$, ...
(c) 4, 2, 1, $\frac{1}{2}, \frac{1}{2^2}$, ... (d) 6, 3, $\frac{3}{2}, \frac{3}{4}$, ...

110. If a, b, c are in AP or GP or HP, then $\frac{a-b}{b-c}$ is equal to/;fn a, b, clekarj Js.kh ;k xq.kksŸkj Js.kh ;k gjkRed Js.kh esa gS] rks $\frac{a-b}{b-c}$fdlds cjkcj gS\
(a) $\frac{b}{a}$ or 1 or $\frac{b}{c}$ /$\frac{b}{a}$vFkok 1vFkok$\frac{b}{c}$
(b) $\frac{c}{a}$ or $\frac{c}{b}$ or 1/ $\frac{c}{a}$vFkok$\frac{c}{b}$vFkok 1
(c) 1 or $\frac{a}{b}$ or $\frac{a}{c}$ / 1vFkok $\frac{a}{b}$ vFkok $\frac{a}{c}$
(d) 1 or $\frac{a}{b}$ or$\frac{c}{a}$/ 1 vFkok$\frac{a}{b}$ vFkok $\frac{c}{a}$

111. What is the sum of all three-digit numbers that can be formed using all the digits 3,4 and 5, when repetition of digits is not allowed?/ rhu vadksa dh ,slh lHkh la[;kvksa dk ;ksxQy D;k gS tks lHkh rhu vadksa 3]4 vkSj 5 ls cukbZ tk ldrh gS] tgk¡ vadksa dh iqujko`fŸk Lohdk;Z ughsa gS\
(a) 2664
(b) 3882
(c) 4044
(d) 4444

112. The ratio of roots of the equations $ax^2+bx+c=0$ and $px^2+qx+r=0$ are equal. If D_1 and D_2 are respective discriminants, then what is $\frac{D_1}{D_2}$ equal to?/lehdj.kksa $ax^2+bx+c=0$ vkSj $px^2+qx+r=0$ ds ewyksa dk vuqikr cjkcj gSA ;fnD_1 vkSj D_2Øe"k% bu lehdj.kksa ds fofoädj gS] rks $\frac{D_1}{D_2}$fdlds cjkcj gS\
(a) $\frac{a^2}{p^2}$

(b) $\frac{b^2}{q^2}$

(c) $\frac{c^2}{r^2}$

(d) None of these above/mi;qZä esa ls dksbZ ugha

113. Consider the following statements:/fuEufyf[kr dFkuksa ij fopkj dhft,%

1. $f(\theta) = 2$ has no solution. / dk dksbZ gy ugha gSA

2. $f(\theta) = \frac{7}{2}$ has a solution. / dk ,d gy gSA

Which of the above statements is/are correct? / mi;qZä dFkuksa esa ls dkSu&lk@ls lgh gS@gS\

(a) 1 only/ dsoy 1

(b) 2 only / dsoy 2

(c) both 1 and 2/ 1vkSj 2 nksukas

(d) Neither 1 nor 2/ u rks 1 vkSj u gh 2

For the next two (2) items that follow:/ vkxs vkus okys nks ¼2½ iz"uka"kksa ds fy,%

Dircection (Q. No. 114 and 115)

Consider the curves $f(x) = x|x| - 1$ and

$g(x) = \{\frac{3x}{2}, x > 0\ 2x, x \leq 0$

oØksa $f(x) = x|x| - 1$ vkSj

$g(x) = \{\frac{3x}{2}, x > 0\ 2x, x \leq 0$ ij fopkj dhft,A

114. Where do the curves intersect?/ ;s oØ dgk¡ izfrPNsn djrs gS\

(a) At (2, 3) only/ dsoy (2, 3) ij

(b) At (-1, -2) only / dsoy (-1, -2) ij

(c) At (2, 3) and (-1, -2)/ (2, 3) vkSj (-1, -2) ij

(d) Neither at (2, 3) nor at (-1, -2) / u rks (2, 3) ij vkSj u gh (-1, -2) ij

115. What is the area bounded by the curves?@ bu oØksa }kjk ifjc) {ks=Qy D;k gS\

(a) $\frac{17}{6}$ square units/ $\frac{17}{6}$ oxZ bdkbZ

(b) $\frac{8}{3}$ square units / $\frac{8}{3}$oxZ bdkbZ

(c) 2 square units /2 oxZ bdkbZ

(d) $\frac{1}{3}$ square unit/$\frac{1}{3}$ oxZ bdkbZ

For the next two (2) items that follow:/ vkxs vkus okys nks ¼2½ iz"uka"kksa ds fy,%

Consider the function $f(x) = \frac{27(x^{\frac{2}{3}} - x)}{4s}$

Qyu $f(x) = \frac{27(x^{\frac{2}{3}} - x)}{4s}$ ij fopkj dhft,A

116. How many solutions does the function $f(x) = 1$ have?/ Qyu $f(x) = 1$ ds fdrus gy gS\

(a) One/ ,d (b) Two/ nks

(c) Three / rhu (d) Four/ pkj

117. How many solutions does the function $f(x) = 1$ have? / Qyu function $f(x) = 1$ ds fdrus gy gS\

(a) One/,d (b) Two/ nks

(c) Three / rhu (d) Four/ pkj

For the next two (02) items that follw:/ vkxs vkus okys nks ¼2½ iz"uka"kksa ds fy,%

Consider the functions $f(x) = x\, g(x)$ and $g(x) = \left[\frac{1}{x}\right]$ / Qyu vkSj]

where [.] is the greatest integer function/ tgk¡ [.] vf/kdre iw.kkZd Qyu gS] ij fopkj dhft,A

118. What is $\int_{\frac{1}{3}}^{\frac{1}{2}} g(x)dx$ equal to? / $\int_{\frac{1}{3}}^{\frac{1}{2}} g(x)dx$ fdlds cjkcj gS\

(a) $\frac{1}{6}$ (b) $\frac{1}{3}$

(c) $\frac{5}{18}$ (d) $\frac{5}{36}$

119. What is $\int_{\frac{1}{3}}^{1} f(x)dx$ equal to? / $\int_{\frac{1}{3}}^{1} f(x)dx$ fdlds cjkcj gS\

(a) $\frac{37}{72}$ (b) $\frac{2}{3}$

(c) $\frac{17}{72}$ (d) $\frac{37}{144}$

For the next two (05) items that follow: / vkxs vkus okys nks ¼2½ iz"uka"kksa ds fy,%

Consider the function $f(x) = |x - 1| + x^2$

where $x \epsilon R$ / Qyu $f(x) = |x - 1| + x^2$] tgk¡ $x \epsilon R$ gS] ij fopkj dhft,A

120. Which one of the following statements is correct? fuEufyf[kr dFkuksa esa ls dkSu&lk ,d lgh gS\

(a) $f(x)$ is continuous but not differentiable at $x = 0$ / $f(x)$, $x = 0$ ij larr gS fdUrq vodyuh; ugha gS

(b) $f(x)$ is continuous but not differentiable at $x = 1$ / $f(x)$, $x = 1$ ij larr gS fdUrq vodyuh; ugha gS

(c) $f(x)$ is differentiable at $x = 1$ / ij vodyuh; gS

(d) $f(x)$ is not differentiable at $x = 0$ and $x = 1$/
$f(x)$, $x = 0$ vkSj $x = 1$ ij vodyuh; ugha gSa

NDA Mathematics Mock Test Paper
Answer key

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

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