S.B. Roll No. _____

APPLIED MATHEMATICS-I

1st Exam/Common/0251/5402/Dec'11

A

Duration : 2½ Hrs. M. Marks: 75

1) The smallest integer n for which $\left(\frac{1+i}{1-i}\right)^n = 1$ is
(a) 2 (b) 4
(c) 8 (d) 12

2) The multiplicative inverse of –i is
(a) 0 (b) 1
(c) i (d) –i

3) Modulus of complex number $\sqrt{\frac{1-i}{1+i}}$ is
(a) 1 (b) -1
(c) $\frac{1}{\sqrt{2}}$ (d) $\sqrt{2}$

4) If $(1+3i)^3 = x + iy$ then x =
(a) 1 (b) 8
(c) -8 (d) 10

5) In which quadrant of the complex plane the point $\frac{1+2i}{1-i}$ lies?
(a) I (b) II
(c) III (d) IV

6) The product of $9^{1/3}.9^{1/9}.9^{1/27}$.... to infinity is
(a) 9 (b) 2
(c) 81 (d) 3

7) If 5th, 8th and 11th term of G.P are P,Q and S respectively then
(a) $P^2 = qs$ (b) $q^2 = ps$
(c) $s = pq$ (d) $s^2 = pq$

8) The third term of a G.P is 4. Then the product of first five terms is
(a) 4^3 (b) 4^6
(c) 4^4 (d) 4^5

9) If a, a +1, a + 3 are in G.P then a =
(a) 1 (b) 0
(c) 2 (d) -1

10) A man was appointed in the scale Rs. 600-50-1800, then the number of years after which he will get maximum scale is
(a) 18 (b) 20
(c) 24 (d) 25

11) The common ratio of G.P $1-\sqrt{3}+3-3\sqrt{3}+....\infty$ is
(a) 3 (b) -3
(c) $\sqrt{3}$ (d) $-\sqrt{3}$

12) The sum of 6 terms of G.P 1, 2, 4 ….. is
(a) 62 (b) 64
(c) 52 (d) 65

13) If $\frac{5x-23}{(x-3)(x-7)} = \frac{A}{x-3} + \frac{A}{x-7}$ then A-B =
(a) -1 (b) 1
(c) 2 (d) -2

14) The fraction $\frac{(x-1)^2}{x^2+x}$ is
(a) Proper (b) improper
(c) both (d) none

15) If $\frac{x^5}{x^4-1}$ = f(x) + $\frac{x}{x^4-1}$ then f(x) =
(a) 1 (b) -1
(c) x (d) –x

16) If $\frac{2x+3}{(x-2)(x+3)} = \frac{A}{x-2} + \frac{3}{5(x+3)}$ then A
(a) 5/7 (b) -5/7
(c) 7/5 (d) -7/5

17) In a G.P second term is 2 and sum to infinite terms is 8, then its first term is
(a) 8 (b) 6
(c) 4 (d) 2

18) The positive integer r, such that ${}^{15}C_{3r} = {}^{15}C_{r+3}$ is equal to
(a) 3 (b) 4
(c) 5 (d) 6

19) The number of diagonals that can be drawn by joining the vertices of an octagon is
(a) 28 (b) 20
(c) 36 (d) 24

20) The number of ways in which 6 different beads can be string into a necklace is
(a) 120 (b) 720
(c) 240 (d) 60

21) The number of words that can be formed from the letters of the word DAUGHTER so that the vowels always come together is
(a) 4320
(b) 3470
(c) 3420
(d) 4370

22) If there are 12 persons in a party, and if each of them shakes hands with each other, then number of handshakes will be
(a) 48 (b) 72
(c) 66 (d) 132

23) The number of non-zero terms in the expansion of $\left(1+\sqrt{2}x\right)^9 + \left(1-\sqrt{2}x\right)^9$ is
(a) 18
(b) 9
(c) 10
(d) 5

24) The term independent of x in $\left(x^2 - \frac{1}{x}\right)^9$ is
(a) 1 (b) 49
(c) 84 (d) –1

25) If $(1 + ax)^n = 1 + 8x + 24x^2 +$ ……. then the valves of a and n are equal to
(a) 2,4 (b) 2,3
(c) 1,2 (d) 3,6

26) The coefficient of x^4 in $\left(\frac{x}{2} - \frac{3}{x^2}\right)^{10}$ is
(a) $\frac{450}{263}$ (b) $\frac{405}{256}$
(c) $\frac{504}{259}$ (d) $\frac{404}{253}$

27) The valves of x for which the expansion of $\frac{1}{\sqrt{9-4x^2}}$ is valid is
(a) $|x| < \frac{2}{3}$ (b) $|x| < \frac{3}{2}$
(c) $|x| > \frac{2}{3}$ (d) $|x| > \frac{3}{2}$

28) Radian measure of 72^0 is

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

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

29) The minute hand of a clock is 14 cm long. The extremity of the hand moved in 15 minutes is
(a) 14cm
(b) 28cm
(c) 22cm
(d) 11cm

30) The angle -640° lies in the quadrant
(a) 1st (b) 2nd
(c) 3rd (d) 4th

31) If $Sin^2 33^0 + Sin^2 57^0$ =
(a) 0 (b) 2
(c) -1 (d) 1

32) The value of Sin (690^o) is

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

(c) 1 (d) -1

33) $\frac{\cos 8^\circ - \sin 8^\circ}{\cos 8^\circ + \sin 8^\circ}$ =
(a) $Tan53^0$ (b) $Tan37^0$
(c) $Tan82^0$ (d) $Cot53^0$

34) If Sinθ + Cosθ =1, then Sin2θ =
(a) 0 (b) 1

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

35) If Sin A= $\frac{1}{2}$ then Sin 3A =
(a) 0 (b) 1
(c) -1 (d) infinity

36) If A + B = 45^0, then (1 + tanA) (1 + TanB) =
(a) 1 (b) -1
(c) 2 (d) none

37) $Cos^2 30^0$, $Cos^2 45^0$, $Cos^2 60^0$ are in
(a) G.P (b) A.P
(c) both (d) none

38) If θ = 60^0, then $\frac{1+\tan^2\theta}{2\tan\theta}$ =

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

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

39) If cosecθ - cotθ = $\frac{1}{2}$, $0 < \theta < \frac{\pi}{2}$ then cosθ =

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

(c) $-\frac{3}{5}$ (d) $-\frac{5}{3}$

40) The minimum value of sinθ + cosθ is
(a) 0 (b) -1

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

41) The value of θ for which secθ and cosecθ are equal is
(a) 30^0 (b) 60^0
(c) 90^0 (d) 45^0

42) If sin (A-B) = $\frac{1}{2}$, cos (A +B) = $\frac{1}{2}$ and $0 < B < 90^0$ then B =
(a) 15^0
(b) 30^0
(c) 45^0
(d) 60^0

43) $\frac{\cot 54^\circ}{\tan 36^\circ} - \frac{\tan 20^\circ}{\cot 70^\circ}$ =
(a) -1 (b) 1
(c) 0 (d) 2

44) If $Cot^2 45^0 - Sint^2 60^0$ = x $Tan60^0$ $Cot30^0$, then x =
(a) 1/4 (b) 1/3
(c) 1/12 (d) 1/2

45) $Cos70^0 Cos10^0 + Sin70^0 Sin10^0$ =
(a) -1/2 (b) 1/2
(c) -1 (d) 1

46) Cot A – Cot2A=
(a) Cosec2A
(b) Sin2A
(c) Tan 2A
(d) Cot2A

47) The value of $Tan20^0 + Tan25^0 + Tan20^0 + Tan25^0$
(a) 1/2
(b) 0
(c) 1
(d) 3/2

48) $Cos5^0 - Sin25^0 - Sin35^0$ =
(a) 0 (b) 1

(c) $\frac{1}{\sqrt{2}}$ (d) $\frac{\sqrt{3}}{2}$

49) $Cos^2\frac{\theta}{2}$ =
(a) 1 + cosθ (b) 1-cosθ

(c) $\frac{1-\cos\theta}{2}$ (d) $\frac{1+\cos\theta}{2}$

50) $\frac{\sin 2A}{1+\cos 2A}$ =
(a) Cot A
(b) Tan A
(c) –Tan A
(d) –Cot A

51) Which of the following is not possible

(a) $\sin\theta = \frac{1}{4}$

(b) $\cos\theta = \frac{5}{3}$

(c) $\tan\theta = -1$
(d) $\sec\theta = 2$

52) The polar co-ordinates of the point $\left(1, \sqrt{3}\right)$ is

(a) $\left(2, \frac{\pi}{6}\right)$ (b) $\left(2, \frac{\pi}{3}\right)$

(c) $\left(4, \frac{\pi}{6}\right)$ (d) $\left(4, \frac{\pi}{3}\right)$

53) Equation of the locus of point which moves so that its distance from the origin is 3 units is
(a) $x^2 + y^2 = 3$
(b) $x^2 + y^2 = 2$
(c) $x^2 + y^2 = 9$
(d) x + y = 3

54) Centre of the circle $x^2 + (y-1)^2 =$ 9 is
(a) (0,1)
(b) (1,0)
(c) (0,0)
(d) (1,1)

55) Slope of a line whose inclination is $\frac{\pi}{4}$ is
(a) 2 (b) 1/2
(c) -1 (d) 1

56) The co-ordinates of the mid-point of a line joining the points (-4,-6) and (2,-4) are
(a) (3,5)
(b) (-1,-5)
(c) (1,5)
(d) (1,-5)

57) The valve of P for which the points (1,2), (-2,-10) and (3,p) are collinear is
(a) 8 (b) 9
(c) 10 (d) 12

58) The area of triangle whose vertices are given by (2,1),(3,-2) and (4,3) is
(a) 4 sq. units
(b) 8 sq. units
(c) 16 sq. units
(d) 2 sq. units

59) The Y-intercept of the line 2x-3y+6=0 is
(a) 6 (b) 3
(c) 2 (d) 1

60) The line $\sqrt{3}x - 3y = 7$ makes rectangle with x-axis
(a) 60^0
(b) 30^0
(c) 45^0
(d) 90^0

61) Perpendicular distance of the point (3,4) from the line 8x+15y +1=0 is
(a) 5 (b) 4
(c) 3 (d) 2

62) The point of intersection of the lines x + y – 6 = 0 and x-3y-2=0 is
(a) (1,1)
(b) (1,5)
(c) (-1,5)
(d) (5,1)

63) The radius of the circle drawn on the line joining the points (1,3) and (4,5) as diameter is
(a) 25 (b) 13
(c) $\sqrt{13}$ (d) $\frac{\sqrt{13}}{2}$

64) The value of K for which the equation $kx^2+3y^2-2x+6y+8=0$ represents a circle is
(a) 1 (b) 2
(c) 3 (d) 14

65) Centre of the circle $x^2+y^2-4x-2y-5=0$ is
(a) (2,1)
(b) (4,1)
(c) (2,2)
(d) (2,0)

66) The length of perpendicular from (–3,5) to X-axis is
(a) 3 (b) 5
(c) 4 (d) 2

67) The distance between the lines 4x + 3y=11 and 8x + 6y=15 is
(a) $\frac{7}{10}$ (b) $\frac{7}{2}$
(c) 4 (d) 6

68) Slope of a line perpendicular to y-axis is
(a) 1 (b) -1
(c) 2 (d) 0

69) The value of x so that the slope of the line joining (2,5) and (x,3) is 2 is
(a) 5 (b) 3
(c) 1 (d) -1

70) Equation of a line through (3,4) and slope 5 is
(a) 5x+y=13
(b) 5x-y=13
(c) x+5y=13
(d) x-5y=13

71) The x-intercept of the line 2x+y-16=0 is
(a) 8 (b) 16
(c) 1 (d) 1/2

72) The line 2x + y–4=0 intersects the x-axis at the point
(a) (0,1)
(b) (1,0)
(c) (0,2)
(d) (2,0)

73) The angle between the lines x-2y=5 and 2x + y=9 is
(a) 30^0
(b) 60^0
(c) 90^0
(d) 45^0

74) The co-ordinator of the centroid of the triangle whose vertices are (5,3), (7,-1), (9,4) are
(a) (6,2)
(b) (7,1)
(c) (7,2)
(d) (2,6)

75) The locus of a point whose abscissa and ordinate are always equal is
(a) x + y = 0
(b) x - y = 0
(c) x + y = 1
(d) x - y = 1

S.B. Roll No. _____

APPLIED MATHEMATICS-I

1st Exam/Common/0251/5402/Dec'11

B

Duration : 2½ Hrs. M. Marks: 75

1) The number of words that can be formed from the letters of the word DAUGHTER so that the vowels always come together is
(a) 4320
(b) 3470
(c) 3420
(d) 4370

2) If there are 12 persons in a party, and if each of them shakes hands with each other, then number of handshakes will be
(a) 48 (b) 72
(c) 66 (d) 132

3) The number of non-zero terms in the expansion of
$\left(1+\sqrt{2}x\right)^9+\left(1-\sqrt{2}x\right)^9$ is
(a) 18
(b) 9
(c) 10
(d) 5

4) The term independent of x in $\left(x^2-\frac{1}{x}\right)^9$ is
(a) 1 (b) 49
(c) 84 (d) –1

5) If $(1 + ax)^n = 1 + 8x + 24x^2 +$ …….. then the valves of a and n are equal to
(a) 2,4 (b) 2,3
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6) The coefficient of x^4 in $\left(\frac{x}{2}-\frac{3}{x^2}\right)^{10}$ is
(a) $\frac{450}{263}$ (b) $\frac{405}{256}$
(c) $\frac{504}{259}$ (d) $\frac{404}{253}$

7) The valves of x for which the expansion of $\frac{1}{\sqrt{9-4x^2}}$ is valid is
(a) $|x|<\frac{2}{3}$ (b) $|x|<\frac{3}{2}$
(c) $|x|>\frac{2}{3}$ (d) $|x|>\frac{3}{2}$

8) Radian measure of 72^0 is
(a) $\frac{2\pi}{5}$ (b) $\frac{\pi}{5}$
(c) $\frac{2\pi}{3}$ (d) $\frac{\pi}{3}$

9) The minute hand of a clock is 14 cm long. The extremity of the hand moved in 15 minutes is
(a) 14cm
(b) 28cm
(c) 22cm
(d) 11cm

10) The angle -640° lies in the quadrant
(a) 1st (b) 2nd
(c) 3rd (d) 4th

11) If $Sin^233^0 + Sin^257^0$ =
(a) 0 (b) 2
(c) -1 (d) 1

12) The value of Sin (690º) is
(a) $\frac{1}{2}$ (b) $-\frac{1}{2}$
(c) 1 (d) -1

13) $\frac{\cos 8^\circ-\sin 8^\circ}{\cos 8^\circ+\sin 8^\circ}$ =
(a) $Tan53^0$
(b) $Tan37^0$
(c) $Tan82^0$
(d) $Cot53^0$

14) If Sinθ + Cosθ =1, then Sin2θ =
(a) 0 (b) 1
(c) -1 (d) $\frac{1}{2}$

15) If Sin A= $\frac{1}{2}$ then Sin 3A =
(a) 0 (b) 1
(c) -1 (d) infinity

16) If A + B =45^0, then (1 + tanA) (1 + TanB) =
(a) 1 (b) -1
(c) 2 (d) none

17) Cos^230^0, Cos^245^0 , Cos^260^0 are in
(a) G.P
(b) A.P
(c) both
(d) none

18) If θ =60^0, then $\frac{1+\tan^2\theta}{2\tan\theta}$ =
(a) $\frac{1}{\sqrt{3}}$ (b) $\sqrt{3}$
(c) $\frac{2}{\sqrt{3}}$ (d) $\frac{\sqrt{3}}{2}$

19) If cosecθ - cotθ = $\frac{1}{2}$, $0 < \theta < \frac{\pi}{2}$ then cosθ =
(a) $\frac{5}{3}$ (b) $\frac{3}{5}$
(c) $-\frac{3}{5}$ (d) $-\frac{5}{3}$

20) The minimum value of sinθ + cosθ is
(a) 0 (b) -1
(c) $-\frac{1}{\sqrt{2}}$ (d) $-\sqrt{2}$

21) The value of θ for which secθ and cosecθ are equal is
(a) 30^0 (b) 60^0
(c) 90^0 (d) 45^0

22) If sin (A-B) = $\frac{1}{2}$, cos (A +B) = $\frac{1}{2}$ and $0 < B < 90^0$ then B =
(a) 15^0 (b) 30^0
(c) 45^0 (d) 60^0

23) $\frac{\cot 54^\circ}{\tan 36^\circ}-\frac{\tan 20^\circ}{\cot 70^\circ}$ =
(a) -1 (b) 1
(c) 0 (d) 2

24) If $Cot^245^0 - Sint^260^0 = x\ Tan60^0 Cot30^0$, then x =
(a) 1/4 (b) 1/3
(c) 1/12 (d) 1/2

25) $Cos70^0Cos10^0 + Sin70^0Sin10^0$ =
(a) -1/2 (b) 1/2
(c) -1 (d) 1

26) Cot A – Cot2A=
(a) Cosec2A
(b) Sin2A
(c) Tan 2A
(d) Cot2A

27) The value of $Tan20^0 + Tan25^0 + Tan20^0 + Tan25^0$
(a) 1/2
(b) 0
(c) 1
(d) 3/2

28) $Cos5^0 - Sin25^0 - Sin35^0$ =
(a) 0 (b) 1
(c) $\frac{1}{\sqrt{2}}$ (d) $\frac{\sqrt{3}}{2}$

29) $Cos^2\frac{\theta}{2}$ =
(a) $1 + \cos\theta$ (b) $1-\cos\theta$
(c) $\frac{1-\cos\theta}{2}$ (d) $\frac{1+\cos\theta}{2}$

30) $\frac{\sin 2A}{1+\cos 2A}$ =
(a) Cot A
(b) Tan A
(c) –Tan A
(d) –Cot A

31) Which of the following is not possible
(a) $\text{Sin}\theta = \frac{1}{4}$
(b) $\text{Cos}\theta = \frac{5}{3}$
(c) $\text{Tan}\theta = -1$
(d) $\text{Sec}\theta = 2$

32) The polar co-ordinates of the point $\left(1,\sqrt{3}\right)$ is
(a) $\left(2,\frac{\pi}{6}\right)$ (b) $\left(2,\frac{\pi}{3}\right)$
(c) $\left(4,\frac{\pi}{6}\right)$ (d) $\left(4,\frac{\pi}{3}\right)$

33) Equation of the locus of point which moves so that its distance from the origin is 3 units is
(a) $x^2 + y^2 = 3$
(b) $x^2 + y^2 = 2$
(c) $x^2 + y^2 = 9$
(d) $x + y = 3$

34) Centre of the circle $x^2 + (y-1)^2 = 9$ is
(a) (0,1)
(b) (1,0)
(c) (0,0)
(d) (1,1)

35) Slope of a line whose inclination is $\frac{\pi}{4}$ is
(a) 2 (b) 1/2
(c) -1 (d) 1

36) The co-ordinates of the mid-point of a line joining the points (-4,-6) and (2,-4) are
(a) (3,5)
(b) (-1,-5)
(c) (1,5)
(d) (1,-5)

37) The valve of P for which the points (1,2), (-2,-10) and (3,p) are collinear is
(a) 8 (b) 9
(c) 10 (d) 12

38) The area of triangle whose vertices are given by (2,1),(3,-2) and (4,3) is
(a) 4 sq. units
(b) 8 sq. units
(c) 16 sq. units
(d) 2 sq. units

39) The Y-intercept of the line 2x-3y+6=0 is
(a) 6 (b) 3
(c) 2 (d) 1

40) The line $\sqrt{3}x - 3y = 7$ makes rectangle with x-axis
(a) 60^0
(b) 30^0
(c) 45^0
(d) 90^0

41) Perpendicular distance of the point (3,4) from the line 8x+15y +1=0 is
(a) 5 (b) 4
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42) The point of intersection of the lines x + y – 6 = 0 and x-3y-2=0 is
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(c) (-1,5)
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43) The radius of the circle drawn on the line joining the points (1,3) and (4,5) as diameter is
(a) 25 (b) 13
(c) $\sqrt{13}$ (d) $\frac{\sqrt{13}}{2}$

44) The value of K for which the equation $kx^2+3y^2-2x+6y+8=0$ represents a circle is
(a) 1 (b) 2
(c) 3 (d) 14

45) Centre of the circle $x^2+y^2-4x-2y-5=0$ is
(a) (2,1)
(b) (4,1)
(c) (2,2)
(d) (2,0)

46) The length of perpendicular from (–3,5) to X-axis is
(a) 3 (b) 5
(c) 4 (d) 2

47) The distance between the lines 4x + 3y=11 and 8x + 6y=15 is
(a) $\frac{7}{10}$ (b) $\frac{7}{2}$
(c) 4 (d) 6

48) Slope of a line perpendicular to y-axis is
(a) 1 (b) -1
(c) 2 (d) 0

49) The value of x so that the slope of the line joining (2,5) and (x,3) is 2 is
(a) 5 (b) 3
(c) 1 (d) -1

50) Equation of a line through (3,4) and slope 5 is
(a) 5x+y=13
(b) 5x-y=13
(c) x+5y=13
(d) x-5y=13

51) The x-intercept of the line 2x+y-16=0 is
(a) 8 (b) 16
(c) 1 (d) 1/2

52) The line 2x + y–4=0 intersects the x-axis at the point
(a) (0,1) (b) (1,0)
(c) (0,2) (d) (2,0)

53) The angle between the lines x-2y=5 and 2x + y=9 is
(a) 30^0 (b) 60^0
(c) 90^0 (d) 45^0

54) The co-ordinator of the centroid of the triangle whose vertices are (5,3), (7,-1), (9,4) are
(a) (6,2)
(b) (7,1)
(c) (7,2)
(d) (2,6)

55) The locus of a point whose abscissa and ordinate are always equal is
(a) x + y = 0
(b) x - y = 0
(c) x + y = 1
(d) x - y = 1

56) The smallest integer n for which $\left(\frac{1+i}{1-i}\right)^n$ =1 is
(a) 2 (b) 4
(c) 8 (d) 12

57) The multiplicative inverse of –i is
(a) 0 (b) 1
(c) i (d) –i

58) Modulus of complex number $\sqrt{\frac{1-i}{1+i}}$ is
(a) 1 (b) -1
(c) $\frac{1}{\sqrt{2}}$ (d) $\sqrt{2}$

59) If $(1+3i)^3 = x + iy$ then x =
(a) 1 (b) 8
(c) -8 (d) 10

60) In which quadrant of the complex plane the point $\frac{1+2i}{1-i}$ lies?
(a) I (b) II
(c) III (d) IV

61) The product of $9^{1/3}.9^{1/9}.9^{1/27}$.... to infinity is
(a) 9 (b) 2
(c) 81 (d) 3

62) If 5th, 8th and 11th term of G.P are P,Q and S respectively then
(a) $P^2 = qs$
(b) $q^2 = ps$
(c) s = pq
(d) $s^2 = pq$

63) The third term of a G.P is 4. Then the product of first five terms is
(a) 4^3 (b) 4^6
(c) 4^4 (d) 4^5

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(a) 62 (b) 64
(c) 52 (d) 65

68) If $\frac{5x-23}{(x-3)(x-7)} = \frac{A}{x-3} + \frac{A}{x-7}$ then A-B =
(a) -1 (b) 1
(c) 2 (d) -2

69) The fraction $\frac{(x-1)^2}{x^2+x}$ is
(a) Proper (b) improper
(c) both (d) none

70) If $\frac{x^5}{x^4-1}$ = f(x) + $\frac{x}{x^4-1}$ then f(x) =
(a) 1 (b) -1
(c) x (d) –x

71) If $\frac{2x+3}{(x-2)(x+3)} = \frac{A}{x-2} + \frac{3}{5(x+3)}$ then A
(a) 5/7
(b) -5/7
(c) 7/5
(d) -7/5

72) In a G.P second term is 2 and sum to infinite terms is 8, then its first term is
(a) 8 (b) 6
(c) 4 (d) 2

73) The positive integer r, such that ${}^{15}c_{3r} = {}^{15}c_{r+3}$ is equal to
(a) 3 (b) 4
(c) 5 (d) 6

74) The number of diagonals that can be drawn by joining the vertices of an octagon is
(a) 28
(b) 20
(c) 36
(d) 24

75) The number of ways in which 6 different beads can be string into a necklace is
(a) 120
(b) 720
(c) 240
(d) 60

S.B. Roll No. _____

APPLIED MATHEMATICS-I

1st Exam/Common/0251/5402/Dec'11

C

Duration : 2½ Hrs. M. Marks: 75

1) The value of θ for which secθ and cosecθ are equal is
(a) 30^0 (b) 60^0
(c) 90^0 (d) 45^0

2) If sin (A-B) = $\frac{1}{2}$, cos (A +B) = $\frac{1}{2}$ and $0 < B < 90^0$ then B =
(a) 15^0
(b) 30^0
(c) 45^0
(d) 60^0

3) $\frac{\cot 54°}{\tan 36°} - \frac{\tan 20°}{\cot 70°}$ =
(a) -1 (b) 1
(c) 0 (d) 2

4) If $Cot^2 45^0 - Sint^2 60^0 = x\ Tan60^0\ Cot30^0$, then x =
(a) 1/4 (b) 1/3
(c) 1/12 (d) 1/2

5) $Cos70^0Cos10^0 + Sin70^0Sin10^0$ =
(a) -1/2 (b) 1/2
(c) -1 (d) 1

6) Cot A – Cot2A=
(a) Cosec2A
(b) Sin2A
(c) Tan 2A
(d) Cot2A

7) The value of $Tan20^0 + Tan25^0 + Tan20^0 + Tan25^0$
(a) 1/2 (b) 0
(c) 1 (d) 3/2

8) $Cos5^0 - Sin25^0 - Sin35^0$ =
(a) 0 (b) 1
(c) $\frac{1}{\sqrt{2}}$ (d) $\frac{\sqrt{3}}{2}$

9) $Cos^2\frac{\theta}{2}$ =
(a) 1 + cosθ (b) 1-cosθ
(c) $\frac{1-\cos\theta}{2}$ (d) $\frac{1+\cos\theta}{2}$

10) $\frac{\sin 2A}{1+\cos 2A}$ =
(a) Cot A
(b) Tan A
(c) –Tan A
(d) –Cot A

11) Which of the following is not possible
(a) $\text{Sin}\theta = \frac{1}{4}$
(b) $\text{Cos}\theta = \frac{5}{3}$
(c) Tanθ = –1
(d) Secθ = 2

12) The polar co-ordinates of the point $\left(1,\sqrt{3}\right)$ is
(a) $\left(2,\frac{\pi}{6}\right)$ (b) $\left(2,\frac{\pi}{3}\right)$
(c) $\left(4,\frac{\pi}{6}\right)$ (d) $\left(4,\frac{\pi}{3}\right)$

13) Equation of the locus of point which moves so that its distance from the origin is 3 units is
(a) $x^2 + y^2 = 3$
(b) $x^2 + y^2 = 2$
(c) $x^2 + y^2 = 9$
(d) x + y = 3

14) Centre of the circle $x^2 + (y-1)^2 = 9$ is
(a) (0,1) (b) (1,0)
(c) (0,0) (d) (1,1)

15) Slope of a line whose inclination is $\frac{\pi}{4}$ is
(a) 2 (b) 1/2
(c) -1 (d) 1

16) The co-ordinates of the mid-point of a line joining the points (-4,-6) and (2,-4) are
(a) (3,5) (b) (-1,-5)
(c) (1,5) (d) (1,-5)

17) The valve of P for which the points (1,2), (-2,-10) and (3,p) are collinear is
(a) 8 (b) 9
(c) 10 (d) 12

18) The area of triangle whose vertices are given by (2,1),(3,-2) and (4,3) is
(a) 4 sq. units
(b) 8 sq. units
(c) 16 sq. units
(d) 2 sq. units

19) The Y-intercept of the line 2x-3y+6=0 is
(a) 6 (b) 3
(c) 2 (d) 1

20) The line $\sqrt{3}x - 3y = 7$ makes rectangle with x-axis
(a) 60^0
(b) 30^0
(c) 45^0
(d) 90^0

21) Perpendicular distance of the point (3,4) from the line 8x+15y +1=0 is
(a) 5 (b) 4
(c) 3 (d) 2

22) The point of intersection of the lines x + y – 6 = 0 and x-3y-2=0 is
(a) (1,1)
(b) (1,5)
(c) (-1,5)
(d) (5,1)

23) The radius of the circle drawn on the line joining the points (1,3) and (4,5) as diameter is
(a) 25 (b) 13
(c) $\sqrt{13}$ (d) $\frac{\sqrt{13}}{2}$

24) The value of K for which the equation $kx^2+3y^2-2x+6y+8=0$ represents a circle is
(a) 1 (b) 2
(c) 3 (d) 14

25) Centre of the circle $x^2+y^2-4x-2y-5=0$ is
(a) (2,1)
(b) (4,1)
(c) (2,2)
(d) (2,0)

26) The length of perpendicular from (–3,5) to X-axis is
(a) 3 (b) 5
(c) 4 (d) 2

27) The distance between the lines 4x + 3y=11 and 8x + 6y=15 is
(a) $\frac{7}{10}$ (b) $\frac{7}{2}$
(c) 4 (d) 6

28) Slope of a line perpendicular to y-axis is
(a) 1 (b) -1
(c) 2 (d) 0

29) The value of x so that the slope of the line joining (2,5) and (x,3) is 2 is
(a) 5 (b) 3
(c) 1 (d) -1

30) Equation of a line through (3,4) and slope 5 is
(a) 5x+y=13
(b) 5x-y=13
(c) x+5y=13
(d) x-5y=13

31) The x-intercept of the line 2x+y-16=0 is
(a) 8 (b) 16
(c) 1 (d) 1/2

32) The line 2x + y–4=0 intersects the x-axis at the point
(a) (0,1)
(b) (1,0)
(c) (0,2)
(d) (2,0)

33) The angle between the lines x-2y=5 and 2x + y=9 is
(a) 30^0
(b) 60^0
(c) 90^0
(d) 45^0

34) The co-ordinator of the centroid of the triangle whose vertices are (5,3), (7,-1), (9,4) are
(a) (6,2)
(b) (7,1)
(c) (7,2)
(d) (2,6)

35) The locus of a point whose abscissa and ordinate are always equal is
(a) x + y = 0
(b) x - y = 0
(c) x + y = 1
(d) x - y = 1

36) The smallest integer n for which $\left(\frac{1+i}{1-i}\right)^n$ =1 is
(a) 2 (b) 4
(c) 8 (d) 12

37) The multiplicative inverse of –i is
(a) 0 (b) 1
(c) i (d) –i

38) Modulus of complex number $\sqrt{\frac{1-i}{1+i}}$ is
(a) 1 (b) -1
(c) $\frac{1}{\sqrt{2}}$ (d) $\sqrt{2}$

39) If $(1+3i)^3 = x + iy$ then x =
(a) 1 (b) 8
(c) -8 (d) 10

40) In which quadrant of the complex plane the point $\frac{1+2i}{1-i}$ lies?
(a) I (b) II
(c) III (d) IV

41) The product of $9^{1/3}.9^{1/9}.9^{1/27}$.... to infinity is
(a) 9 (b) 2
(c) 81 (d) 3

42) If 5^{th}, 8^{th} and 11^{th} term of G.P are P,Q and S respectively then
(a) $P^2 = qs$
(b) $q^2 = ps$
(c) s = pq
(d) $s^2 = pq$

43) The third term of a G.P is 4. Then the product of first five terms is
(a) 4^3 (b) 4^6
(c) 4^4 (d) 4^5

44) If a, a +1, a + 3 are in G.P then a =
(a) 1 (b) 0
(c) 2 (d) -1

45) A man was appointed in the scale Rs. 600-50-1800, then the number of years after which he will get maximum scale is
(a) 18 (b) 20
(c) 24 (d) 25

46) The common ratio of G.P $1-\sqrt{3}+3-3\sqrt{3}+....\infty$ is
(a) 3 (b) -3
(c) $\sqrt{3}$ (d) $-\sqrt{3}$

47) The sum of 6 terms of G.P 1, 2, 4 ….. is
(a) 62 (b) 64
(c) 52 (d) 65

48) If $\frac{5x-23}{(x-3)(x-7)} = \frac{A}{x-3} + \frac{A}{x-7}$ then A-B =
(a) -1 (b) 1
(c) 2 (d) -2

49) The fraction $\frac{(x-1)^2}{x^2+x}$ is
(a) Proper (b) improper
(c) both (d) none

50) If $\frac{x^5}{x^4-1}$ = f(x) + $\frac{x}{x^4-1}$ then f(x) =
(a) 1 (b) -1
(c) x (d) –x

51) If $\frac{2x+3}{(x-2)(x+3)} = \frac{A}{x-2} + \frac{3}{5(x+3)}$ then A
(a) 5/7 (b) -5/7
(c) 7/5 (d) -7/5

52) In a G.P second term is 2 and sum to infinite terms is 8, then its first term is
(a) 8 (b) 6
(c) 4 (d) 2

53) The positive integer r, such that ${}^{15}C_{3r} = {}^{15}C_{r+3}$ is equal to
(a) 3 (b) 4
(c) 5 (d) 6

54) The number of diagonals that can be drawn by joining the vertices of an octagon is
(a) 28 (b) 20
(c) 36 (d) 24

55) The number of ways in which 6 different beads can be string into a necklace is
(a) 120 (b) 720
(c) 240 (d) 60

56) The number of words that can be formed from the letters of the word DAUGHTER so that the vowels always come together is
(a) 4320
(b) 3470
(c) 3420
(d) 4370

57) If there are 12 persons in a party, and if each of them shakes hands with each other, then number of handshakes will be
(a) 48 (b) 72
(c) 66 (d) 132

58) The number of non-zero terms in the expansion of $\left(1+\sqrt{2}x\right)^9 + \left(1-\sqrt{2}x\right)^9$ is

(a) 18
(b) 9
(c) 10
(d) 5

59) The term independent of x in $\left(x^2 - \frac{1}{x}\right)^9$ is

(a) 1 (b) 49
(c) 84 (d) –1

60) If $(1 + ax)^n = 1 + 8x + 24x^2 + \ldots\ldots\ldots$ then the valves of a and n are equal to
(a) 2,4 (b) 2,3
(c) 1,2 (d) 3,6

61) The coefficient of x^4 in $\left(\frac{x}{2} - \frac{3}{x^2}\right)^{10}$ is

(a) $\frac{450}{263}$ (b) $\frac{405}{256}$

(c) $\frac{504}{259}$ (d) $\frac{404}{253}$

62) The valves of x for which the expansion of $\frac{1}{\sqrt{9-4x^2}}$ is valid is

(a) $|x| < \frac{2}{3}$ (b) $|x| < \frac{3}{2}$

(c) $|x| > \frac{2}{3}$ (d) $|x| > \frac{3}{2}$

63) Radian measure of 72^0 is

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

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

64) The minute hand of a clock is 14 cm long. The extremity of the hand moved in 15 minutes is
(a) 14cm
(b) 28cm
(c) 22cm
(d) 11cm

65) The angle -640° lies in the quadrant
(a) 1st (b) 2nd
(c) 3rd (d) 4th

66) If $Sin^2 33^0 + Sin^2 57^0$ =
(a) 0 (b) 2
(c) -1 (d) 1

67) The value of Sin (690^o) is

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

68) $\frac{\cos 8° - \sin 8°}{\cos 8° + \sin 8°}$ =
(a) $Tan53^0$ (b) $Tan37^0$
(c) $Tan82^0$ (d) $Cot53^0$

69) If $Sin\theta + Cos\theta = 1$, then $Sin2\theta$ =
(a) 0 (b) 1

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

70) If Sin A= $\frac{1}{2}$ then Sin 3A =
(a) 0 (b) 1
(c) -1 (d) infinity

71) If A + B = 45^0, then (1 + tanA) (1 + TanB) =
(a) 1 (b) -1
(c) 2 (d) none

72) $Cos^2 30^0$, $Cos^2 45^0$, $Cos^2 60^0$ are in
(a) G.P (b) A.P
(c) both (d) none

73) If $\theta = 60^0$, then $\frac{1+\tan^2\theta}{2\tan\theta}$ =

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

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

74) If $\operatorname{cosec}\theta - \cot\theta = \frac{1}{2}$, $0 < \theta < \frac{\pi}{2}$ then $\cos\theta$ =

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

(c) $-\frac{3}{5}$ (d) $-\frac{5}{3}$

75) The minimum value of $\sin\theta + \cos\theta$ is
(a) 0 (b) -1

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

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APPLIED MATHEMATICS-I

1st Exam/Common/0251/5402/Dec'11

D

Duration : 2½ Hrs. M. Marks: 75

1) Perpendicular distance of the point (3,4) from the line 8x+15y +1=0 is
(a) 5 (b) 4
(c) 3 (d) 2

2) The point of intersection of the lines x + y – 6 = 0 and x-3y-2=0 is
(a) (1,1) (b) (1,5)
(c) (-1,5) (d) (5,1)

3) The radius of the circle drawn on the line joining the points (1,3) and (4,5) as diameter is
(a) 25 (b) 13
(c) $\sqrt{13}$ (d) $\frac{\sqrt{13}}{2}$

4) The value of K for which the equation $kx^2+3y^2-2x+6y+8=0$ represents a circle is
(a) 1 (b) 2
(c) 3 (d) 14

5) Centre of the circle $x^2+y^2-4x-2y-5=0$ is
(a) (2,1) (b) (4,1)
(c) (2,2) (d) (2,0)

6) The length of perpendicular from (–3,5) to X-axis is
(a) 3 (b) 5
(c) 4 (d) 2

7) The distance between the lines 4x + 3y=11 and 8x + 6y=15 is
(a) $\frac{7}{10}$ (b) $\frac{7}{2}$
(c) 4 (d) 6

8) Slope of a line perpendicular to y-axis is
(a) 1 (b) -1
(c) 2 (d) 0

9) The value of x so that the slope of the line joining (2,5) and (x,3) is 2 is
(a) 5 (b) 3
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10) Equation of a line through (3,4) and slope 5 is
(a) 5x+y=13
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(c) x+5y=13
(d) x-5y=13

11) The x-intercept of the line 2x+y-16=0 is
(a) 8 (b) 16
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12) The line 2x + y–4=0 intersects the x-axis at the point
(a) (0,1)
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13) The angle between the lines x-2y=5 and 2x + y=9 is
(a) 30^0
(b) 60^0
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14) The co-ordinator of the centroid of the triangle whose vertices are (5,3), (7,-1), (9,4) are
(a) (6,2)
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15) The locus of a point whose abscissa and ordinate are always equal is
(a) x + y = 0
(b) x - y = 0
(c) x + y = 1
(d) x - y = 1

16) The smallest integer n for which $\left(\frac{1+i}{1-i}\right)^n = 1$ is
(a) 2 (b) 4
(c) 8 (d) 12

17) The multiplicative inverse of –i is
(a) 0 (b) 1
(c) i (d) –i

18) Modulus of complex number $\sqrt{\frac{1-i}{1+i}}$ is
(a) 1 (b) -1
(c) $\frac{1}{\sqrt{2}}$ (d) $\sqrt{2}$

19) If $(1+3i)^3 = x + iy$ then x =
(a) 1 (b) 8
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20) In which quadrant of the complex plane the point $\frac{1+2i}{1-i}$ lies?
(a) I (b) II
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21) The product of $9^{1/3}.9^{1/9}.9^{1/27}....$ to infinity is
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22) If 5th, 8th and 11th term of G.P are P,Q and S respectively then
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(a) 18 (b) 20
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29) The fraction $\frac{(x-1)^2}{x^2+x}$ is
(a) Proper
(b) improper
(c) both
(d) none

30) If $\frac{x^5}{x^4-1}$ = f(x) + $\frac{x}{x^4-1}$ then f(x) =
(a) 1 (b) -1
(c) x (d) –x

31) If
$$\frac{2x+3}{(x-2)(x+3)}=\frac{A}{x-2}+\frac{3}{5(x+3)}$$
then A
(a) 5/7 (b) -5/7
(c) 7/5 (d) -7/5

32) In a G.P second term is 2 and sum to infinite terms is 8, then its first term is
(a) 8 (b) 6
(c) 4 (d) 2

33) The positive integer r, such that ${}^{15}c_{3r} = {}^{15}c_{r+3}$ is equal to
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34) The number of diagonals that can be drawn by joining the vertices of an octagon is
(a) 28 (b) 20
(c) 36 (d) 24

35) The number of ways in which 6 different beads can be string into a necklace is
(a) 120 (b) 720
(c) 240 (d) 60

36) The number of words that can be formed from the letters of the word DAUGHTER so that the vowels always come together is
(a) 4320
(b) 3470
(c) 3420
(d) 4370

37) If there are 12 persons in a party, and if each of them shakes hands with each other, then number of handshakes will be
(a) 48 (b) 72
(c) 66 (d) 132

38) The number of non-zero terms in the expansion of
$\left(1+\sqrt{2}x\right)^9+\left(1-\sqrt{2}x\right)^9$ is
(a) 18
(b) 9
(c) 10
(d) 5

39) The term independent of x in $\left(x^2-\frac{1}{x}\right)^9$ is
(a) 1 (b) 49
(c) 84 (d) –1

40) If $(1 + ax)^n = 1 + 8x + 24x^2 +$ …….. then the valves of a and n are equal to
(a) 2,4 (b) 2,3
(c) 1,2 (d) 3,6

41) The coefficient of x^4 in $\left(\frac{x}{2}-\frac{3}{x^2}\right)^{10}$ is
(a) $\frac{450}{263}$ (b) $\frac{405}{256}$
(c) $\frac{504}{259}$ (d) $\frac{404}{253}$

42) The valves of x for which the expansion of $\frac{1}{\sqrt{9-4x^2}}$ is valid is
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(c) $|x|>\frac{2}{3}$ (d) $|x|>\frac{3}{2}$

43) Radian measure of 72^0 is
(a) $\frac{2\pi}{5}$ (b) $\frac{\pi}{5}$
(c) $\frac{2\pi}{3}$ (d) $\frac{\pi}{3}$

44) The minute hand of a clock is 14 cm long. The extremity of the hand moved in 15 minutes is
(a) 14cm
(b) 28cm
(c) 22cm
(d) 11cm

45) The angle -640° lies in the quadrant
(a) 1st (b) 2nd
(c) 3rd (d) 4th

46) If $Sin^2 33^0 + Sin^2 57^0$ =
(a) 0 (b) 2
(c) -1 (d) 1

47) The value of Sin (690^o) is
(a) $\frac{1}{2}$ (b) $-\frac{1}{2}$
(c) 1 (d) -1

48) $\frac{\cos 8^\circ-\sin 8^\circ}{\cos 8^\circ+\sin 8^\circ}$ =
(a) $Tan53^0$ (b) $Tan37^0$
(c) $Tan82^0$ (d) $Cot53^0$

49) If Sinθ + Cosθ =1, then Sin2θ =
(a) 0 (b) 1
(c) -1 (d) $\frac{1}{2}$

50) If Sin A= $\frac{1}{2}$ then Sin 3A =
(a) 0 (b) 1
(c) -1 (d) infinity

51) If A + B = 45^0, then (1 + tanA) (1 + TanB) =
(a) 1 (b) -1
(c) 2 (d) none

52) $Cos^2 30^0$, $Cos^2 45^0$, $Cos^2 60^0$ are in
(a) G.P (b) A.P
(c) both (d) none

53) If θ = 60^0, then $\frac{1+\tan^2\theta}{2\tan\theta}$ =
(a) $\frac{1}{\sqrt{3}}$ (b) $\sqrt{3}$
(c) $\frac{2}{\sqrt{3}}$ (d) $\frac{\sqrt{3}}{2}$

54) If cosecθ - cotθ = $\frac{1}{2}$, $0 < \theta < \frac{\pi}{2}$ then cosθ =
(a) $\frac{5}{3}$ (b) $\frac{3}{5}$
(c) $-\frac{3}{5}$ (d) $-\frac{5}{3}$

55) The minimum value of sinθ + cosθ is
(a) 0 (b) -1
(c) $-\frac{1}{\sqrt{2}}$ (d) $-\sqrt{2}$

56) The value of θ for which secθ and cosecθ are equal is
(a) 30^0 (b) 60^0
(c) 90^0 (d) 45^0

57) If sin (A-B) = $\frac{1}{2}$, cos (A +B) = $\frac{1}{2}$ and $0 < B < 90^0$ then B =
(a) 15^0 (b) 30^0
(c) 45^0 (d) 60^0

58) $\frac{\cot 54^\circ}{\tan 36^\circ} - \frac{\tan 20^\circ}{\cot 70^\circ}$ =
(a) -1 (b) 1
(c) 0 (d) 2

59) If $\text{Cot}^2 45^0 - \text{Sint}^2 60^0 = x \text{ Tan}60^0 \text{ Cot}30^0$, then x =
(a) 1/4 (b) 1/3
(c) 1/12 (d) 1/2

60) $\text{Cos}70^0\text{Cos}10^0 + \text{Sin}70^0\text{Sin}10^0$ =
(a) -1/2 (b) 1/2
(c) -1 (d) 1

61) Cot A – Cot2A=
(a) Cosec2A
(b) Sin2A
(c) Tan 2A
(d) Cot2A

62) The value of $\text{Tan}20^0 + \text{Tan}25^0 + \text{Tan}20^0 + \text{Tan}25^0$
(a) 1/2
(b) 0
(c) 1
(d) 3/2

63) $\text{Cos}5^0 - \text{Sin}25^0 - \text{Sin}35^0$ =
(a) 0 (b) 1
(c) $\frac{1}{\sqrt{2}}$ (d) $\frac{\sqrt{3}}{2}$

64) $\text{Cos}^2\frac{\theta}{2}$ =
(a) 1 + cosθ (b) 1-cosθ
(c) $\frac{1-\cos\theta}{2}$ (d) $\frac{1+\cos\theta}{2}$

65) $\frac{\sin 2A}{1+\cos 2A}$ =
(a) Cot A
(b) Tan A
(c) –Tan A
(d) –Cot A

66) Which of the following is not possible
(a) $\text{Sin}\theta = \frac{1}{4}$
(b) $\text{Cos}\theta = \frac{5}{3}$
(c) $\text{Tan}\theta = -1$
(d) $\text{Sec}\theta = 2$

67) The polar co-ordinates of the point $\left(1, \sqrt{3}\right)$ is
(a) $\left(2, \frac{\pi}{6}\right)$ (b) $\left(2, \frac{\pi}{3}\right)$
(c) $\left(4, \frac{\pi}{6}\right)$ (d) $\left(4, \frac{\pi}{3}\right)$

68) Equation of the locus of point which moves so that its distance from the origin is 3 units is
(a) $x^2 + y^2 = 3$
(b) $x^2 + y^2 = 2$
(c) $x^2 + y^2 = 9$
(d) x + y = 3

69) Centre of the circle $x^2 + (y-1)^2 = 9$ is
(a) (0,1) (b) (1,0)
(c) (0,0) (d) (1,1)

70) Slope of a line whose inclination is $\frac{\pi}{4}$ is
(a) 2 (b) 1/2
(c) -1 (d) 1

71) The co-ordinates of the mid-point of a line joining the points (-4,-6) and (2,-4) are
(a) (3,5)
(b) (-1,-5)
(c) (1,5)
(d) (1,-5)

72) The valve of P for which the points (1,2), (-2,-10) and (3,p) are collinear is
(a) 8 (b) 9
(c) 10 (d) 12

73) The area of triangle whose vertices are given by (2,1),(3,-2) and (4,3) is
(a) 4 sq. units
(b) 8 sq. units
(c) 16 sq. units
(d) 2 sq. units

74) The Y-intercept of the line 2x-3y+6=0 is
(a) 6 (b) 3
(c) 2 (d) 1

75) The line $\sqrt{3}x - 3y = 7$ makes rectangle with x-axis
(a) 60^0
(b) 30^0
(c) 45^0
(d) 90^0