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TDC part – I Mathematics (honours) paper-II sample paper

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1. if $y=x^n$ then

   a. $y_n=n!$ b. $y_n=(n+1)!$ c. $y_n=(n-1)!$ d. none of these

2. if $y=e^{ax}$ then

   a. $y_n=ne^{ax}$ b. $y_n=a^n e^{ax}$ c. $y_n=a^{n+1}e^{ax}$ d. $y_n=a^{n-1}e^{ax}$

3. if y= sin (ax+b) then

   a. $y_n=\sin(n\pi\backslash 2+ax+b)$ b. $y_n=\cos(n\pi\backslash 2+ax+b)$

   c. $y_n=a^n\sin(n\pi\backslash 2\ ax+b)$ d. none of these

4. if y= sin (m $\sin^{-1}x$) then

   a. $(1-x^2)y_2-xy_1+m^2y=0$ b. $(1+x^2)y_2-xy_1+m^2y=0$

   c. $(1-x^2)y_2+xy_1+m^2y=0$ d. $(1+x^2)y_2+xy_1+m^2y=0$

5. if $y=(\sin^{-1}x)^2$ then

   a. $(1-x^2)y_2-xy_1-2=0$ b. $(1+x^2)y_2-xy_1+2=0$

   c. $(1-x^2)y_2+xy_1-2=0$ d. $(1+x^2)y_2+xy_1+2=0$

6. if y = f(x) be any function then n^{th} derivative of y is deuolid by

   a. y_{n+1} b. y_{n-1}

   c. y_n d. y^n

7. if x= sin(logy) then

   a. $(1-x^2)y_2+xy_1=y$ b. $(1-x^2)y_2-xy_1=y$

   c. $(1+x^2)y_2-xy_1=y$ d. $(1+x^2)y_2+xy_1=y$

8. if x = cos(logy) then

   a. $(1-x^2)y_2-xy_1=y$ b. $(1-x^2)y_2+xy_1=y$

   c. $(1+x^2)y_2-xy_1=y$ d. $(1+x^2)y_2+xy_1=y$

9. if $y=(\tan^{-1}x)^2$ then

   a. $(1+x^2)y_2+2x(1+x^2)y_1=2$ b. $(1+x^2)^2y_2+2x(1+x^2)y_1=2$

   c. $(1-x^2)y_2-2x(1+x^2)y_1=2$ d. $(1-x^2)^2y_2-2x(1-x^2)y_1=2$

10. Leibnitz's theorem is used to find the n^{th} derivatives of

a. product of two functions of x

b. difference of two functions of x

c. quotient of two functions of x

d. none of these

11. A function is said to be explicit when expressed directly in terms of the

a. independent variable   b. dependent variable

c. both a & b   d. none of these

12. A series $\sum_{n=1}^{\infty} u_n$ is said to be convergent if the sum of n terms s_n tends to

a. A definite finite limit S

b. does not tend to a definite finite limit S

c. may or may not tend to a definite finite limit S

d. none of these as n tends to infinity

13. Taylor's theorem is used to find the expansion of

a. f(x + h)   b. f(x – h)   c. f(x)   d. None of these

14. We can expand sin(x + h) in terms of ascending powers of h using

a. Taylor's theorem   b. Maclaurin's theorem   c. Euler's theorem   d. None

15. We can expand $\sin x$ in terms of ascending powers of x using

a. Taylor's theorem   b. Maclaurin's theorem   c. Euler's theorem   d. None

16. Partial derivative of u = f(x,y) with respect to x is denoted by

a. $\frac{\partial u}{\partial x}$ b. $\frac{\partial u}{\partial y}$ c. $\frac{du}{dx}$ d. None of these

17. An expression in which every term is of the same degree is called

a. Homogeneous function   b. Non –homogeneous function

c. Heterogeneous function   d. None of these

18. If u is a Homogeneous function of x and y of degree n then

a. $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} \neq nu$ b. . $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = nu$

c. . $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = u$ d. None of these

19. If u is a homogeneous function of n^{th} degree in x , y and z , then

a. . $x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}+z\frac{\partial u}{\partial z}=nu$

b. $x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}+z\frac{\partial u}{\partial z}\neq nu$

c. $x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}+z\frac{\partial u}{\partial z}=0$

d. None of these

20. If u be a homogeneous function of x and y of the n^{th} degree then

a. $x^2\frac{\partial^2 u}{\partial x^2}+2xy\frac{\partial^2 u}{\partial x\partial y}+y^2\frac{\partial^2 u}{\partial y^2}=n(n-1)u$

b. $x^2\frac{\partial^2 u}{\partial x^2}+2xy\frac{\partial^2 u}{\partial x\partial y}+y^2\frac{\partial^2 u}{\partial y^2}\neq n(n-1)u$

c. $x^2\frac{\partial^2 u}{\partial x^2}+2xy\frac{\partial^2 u}{\partial x\partial y}+y^2\frac{\partial^2 u}{\partial y^2}=n(n+1)u$

d. None of these.

21. If u be a function of x and y then the total differential of u is

a. $du\neq\frac{\partial u}{\partial x}dx+\frac{\partial u}{\partial x}dy$

b. $du=\frac{\partial u}{\partial x}dx+\frac{\partial u}{\partial x}dy$

c. $du=\frac{\partial^2 u}{\partial x^2}dx+\frac{\partial^2 u}{\partial y^2}dy$

d. None of these

22. If f (x,y) = a constant then

a. $\frac{dy}{dy}=\frac{f_x}{f_y}$

b. $\frac{dy}{dy}=-\frac{f_x}{f_y}$

c. $\frac{dy}{dy}=\frac{f_y}{f_x}$

d. $\frac{dy}{dy}=-\frac{f_y}{f_x}$

23. The necessary and sufficient condition that the expression M*dx* + Ndy

be exact differential is

a. $\frac{\partial M}{\partial y}\neq\frac{\partial N}{\partial x}$

b. $\frac{\partial M}{\partial x}=\frac{\partial N}{\partial y}$

c. $\frac{\partial M}{\partial y}=\frac{\partial N}{\partial x}$

d. None of these

24. The equation $\nabla^2 V=0$ is called

a. Poisson's equation

b. Gauss's equation

c. Laplace's equation

d. None of these

25. Any of homogeneous equation of x , y , z which satisfies Laplace's equation is called

a. Spherical Harmonic

b. Harmonic

c. Non spherical Harmonic

d. None of these

26. The expression (4x + 3y – 4)dx + (3x – 7y – 3)dy is

a. Not exact differential

b. Exact differential

c. Differential equation

d. None of these

27. A function of the form $\frac{0}{0}$ is called

a. Indeterminate form   b. Determinate form

c. Exact form   d. Non – exact form

28. Equation of tangent of the curve y = f(x) at (x,y) is

a. Y – y = $\frac{dy}{dx}$(X – x)   b. Y – y = $\frac{dx}{dy}$(X – x)

c. X– x= $\frac{dy}{dx}$(Y – y)   d. X – x = $\frac{dx}{dy}$(Y – y)

29. . Equation of Normal of the curve y = f(x) at (x,y) is

a. X – x - $\frac{dy}{dx}$(Y – y) = 0   b. X – x + $\frac{dy}{dx}$(Y – y) = 0

c. Y– y + $\frac{dy}{dx}$(X – x) = 0   d. Y– y - $\frac{dy}{dx}$(X – x) = 0

30. Intercept which the tangent cuts off form the axis of x is

a. $x + \frac{y}{\frac{dy}{dx}}$ b. $x - \frac{y}{\frac{dy}{dx}}$ c. $y - x\frac{dy}{dx}$ d. $x - y\frac{dy}{dx}$

31. Intercept which the tangent cuts off form the axis of y is

a. $y - x\frac{dy}{dx}$ b. $y + x\frac{dy}{dx}$ c. $x - y\frac{dy}{dx}$ d. $x + y\frac{dy}{dx}$

32. Length of tangent in Cartesian form is

a. $\frac{y\sqrt{1+y^2{}_1}}{y_1}$ b. . $\frac{y_1\sqrt{1+y^2{}_1}}{y}$ c. . $\frac{y}{y_1\sqrt{1+y^2{}_1}}$ d. None of these

33. Length of Normal in Cartesian form is

a. $\frac{\sqrt{1+y^2{}_1}}{y}$ b. $y\sqrt{1+y^2{}_1}$ c. $y_1\sqrt{1+y^2{}_1}$ d. None of these

34. Length of sub-tangent in Cartesian form is

a.$\frac{y_1}{y}$ b.$\frac{y}{y_1}$ c. yy_1 d. None of these

35. Length of sub-normal in Cartesian form is

a.$\frac{y}{y_1}$ b. yy_1 c.$\frac{y_1}{y}$ d. None of these

36. If Ψ be the slope of the tangent then

a. $\tan\Psi = \frac{dy}{dx}$ b. $\tan\Psi = \frac{dx}{dy}$ c. $\tan\Psi = \frac{dy}{ds}$ d. $\tan\Psi = \frac{ds}{dx}$

37. Length of polar tangent is

a. $r\sqrt{1+r^2\left(\frac{d\theta}{dr}\right)^2}$ b. $\frac{1}{r}\sqrt{1+r^2\left(\frac{d\theta}{dr}\right)^2}$ c. $\sqrt{1+r^2\left(\frac{d\theta}{dr}\right)^2}$ d. None of these

38. Length of polar normal is

a. $r\sqrt{1+r^2\left(\frac{d\theta}{dr}\right)^2}$ b. $\sqrt{1+r^2\left(\frac{d\theta}{dr}\right)^2}$ c. $\sqrt{r^2+\left(\frac{d\theta}{dr}\right)^2}$ d. None of these

39. Length of polar sub-tangent is

a. $\frac{dr}{d\theta}$ b. $r^2\ \frac{d\theta}{dr}$ c. $\frac{1}{r^2}\frac{dr}{d\theta}$ d. $r\frac{d\theta}{dr}$

40. Length of polar sub-normal is

a. $\frac{dr}{d\theta}$ b. $r^2\ \frac{dr}{d\theta}$ c. $r^2\ \frac{d\theta}{dr}$ d. $r\ \frac{dr}{d\theta}$

41.If u = $\frac{1}{r}$ then . $\frac{du}{d\theta}$ is

a. $r^2\ \frac{dr}{d\theta}$ b. $\frac{1}{r^2}\frac{dr}{d\theta}$ c. $-\frac{1}{r^2}\frac{dr}{d\theta}$ d. $r^2\ \frac{d\theta}{dr}$

42. If p = $\mathrm{r}\sin\emptyset$ then $\frac{1}{p^2}$ is equal to

a. $u^2+\left(\frac{du}{d\theta}\right)^2$ b. $\frac{1}{u^2}+\left(\frac{du}{d\theta}\right)^2$ c. $u^2+\left(\frac{d\theta}{du}\right)^2$ d. None of these

where u = 1/r

43. Pedal equation of a curve is a relation between

a. p and r b. r and θ c. r , θ *and* $\emptyset$ d. p , r and $\emptyset$

44. Maximum number of tangents form a given point to a curve of the n^{th} degree is

a. n(n+1) b. n(n-1) c. n(n + 1)/2 d. n(n-1)/2

45. Maximum number of normal form a given point to a curve of the n^{th} degree is

a. n X n b. n/n c. n X n X n d. None of these

46. If a perpendicular be drawn from a fixed point on a variable tangent to a curve ,

The locus of the foot of perpendicular is called the

a. Second positive Pedal b. First positive pedal

c. Positive pedal d. Negative pedal

47. The pedal equation of the first positive pedal curve is

a. p = r^2/f (r) b. r = p/f(r) c. p = r/ f (r) d. r = p^2/ f (r)

48. If p (r,θ) be any given point and let there be any other point Q on OP where O is the pole such that OP. OQ = k^2 (say) then, with regard to the circle of radius K and centre O

a. Q is called inverse point of P   b. Q is called focal point of P

c. P is called direct point of P   d. None of these

49. Polar equation of tangent is

a. u = U $\cos(\theta-\alpha)$ +U'$\sin(\theta-\alpha)$ b. u = U'$\cos(\theta-\alpha)$ + U $\sin(\theta-\alpha)$

c. u = U $\sin(\theta-\alpha)-$ U'$\cos(\theta-\alpha)$ d. None of these

50. Polar equation of normal is

a. $\frac{U'}{U}$ u = U $\cos(\theta-\alpha)-$ U'$\sin(\theta-\alpha)$ b. $\frac{U'}{U}$ u = U'$\cos(\theta-\alpha)-$ U $\sin(\theta-\alpha)$

c. $\frac{U'}{U}$ u = U' $\sin(\theta-\alpha)$ + U$\cos(\theta-\alpha)$ d. None of these

51. The relation between s and ψ for any curve is called

a. Polar equation   b. Pedal equation

c. Cartesian equation   d. Intrinsic equation

52. If ρ be the radius of curvature of a curve then

a. $\rho=\frac{ds}{d\phi}$ b. $\rho=\frac{ds}{d\theta}$ c. $\rho=\frac{ds}{d\psi}$ d. None of these

53. Radius of curvature in Cartesian form is

a. $\rho=\frac{(1+y_1)^{3/2}}{y_2}$ b. $\rho=\frac{(1+{y_1}^2)^{3/2}}{y_2}$ c. $\rho=\frac{(1+{y_1}^2)^{1/2}}{y_2}$ d. None of these

54. Radius of curvature in Pedal form is

a. $\rho=r\frac{dr}{dp}$ b. $\rho=\frac{1}{r}\frac{dr}{dp}$ c. $\rho=r\frac{dp}{dr}$ d. $\rho=\frac{1}{r}\frac{dp}{dr}$

55. Radius of curvature is polar form r

a. $\rho=\frac{(r^2+{r^2}_1)^{1/2}}{r^2+2{r^2}_1-rr_2}$ b . $\rho=\frac{(r+r_1)^{3/2}}{r^2+2{r^2}_1-rr_2}$ c. $\rho=\frac{(r^2+{r^2}_1)^{3/2}}{r^2+2{r^2}_1-rr_2}$ d. None of these

56. Radius of curvature in tangent polar form is

a. $\rho=p^2+\frac{d^2p}{d\psi^2}$ b. $\rho=p+\frac{d^2p}{d\psi^2}$ c. $\rho=p+\frac{d^2p}{d\theta^2}$ d. None of these

57. If x axis is a tangent at the origin to the curve then radius of curvature at the origin is

a. $\rho=\lim_{\substack{x\to 0\\ y\to 0}}(\frac{x^2}{2y})$ b. $\rho=\lim_{\substack{y\to 0\\ x\to 0}}(\frac{y^2}{2x})$ c. $\rho=\lim_{\substack{x\to 0\\ y\to 0}}(\frac{2y}{x^2})$ d. $\rho=\lim_{\substack{y\to 0\\ x\to 0}}(\frac{2x}{y^2})$

58. If p^2 = ar the radius of curvature

a. $\frac{p^3}{a^2}$ b. $\frac{23}{a^2}$ c. $\frac{a^2}{p^3}$ d. $\frac{a^2}{2p^3}$

59. For the curve $r^m = a^m \cos m\theta$

a. $a\,p = r^m$ b. $a\,p^m = r^m$ c. $a^m p = r^{m+1}$ d. $ap = r^m$

60. Radius of curvature at the point (r ,θ) on the curve r = $a sin\theta$ is

a. a b. a/2 c. a/3 d. a^2

61. Chord of curvature parallel to the x axis is

a. $2\rho\cos\psi$ b. $2\rho\, sec\,\psi$ c. $2\rho\sin\psi$ d. None of these

62. Chord of curvature parallel to the y axis is

a. $2\rho\cos\psi$ b. $2\rho\, sin\,\psi$ c. $2\rho\,\mathrm{cosec}\,\psi$ d. $2\rho\sec\psi$

63. Chord of curvature along the radius vector

a. $2\rho\cos\emptyset$ b. $2\rho\, sec\,\emptyset$ c. $2\rho\sin\emptyset$ d. None of these

64. . Chord of curvature perpendicular to the radius vector is

a. $2\rho\sin\emptyset$ b. $2\rho\cos\emptyset$ c. $2\rho\, sec\,\emptyset$ d. None of these

65. $\lim_{x\to\frac{\pi}{2}}\frac{\sec x}{\sec 3x}$ is equal to

a. 3 b. -3 c. 1/3 d. -1/3

66. $\lim_{x\to 0} x^{sinx}$is equal to

a. 0 b. 2 c. 1 d. None of these

67. $\lim_{x\to 0}\frac{\mathrm{f}(x)}{\emptyset(x)}$ assumes the form 0/0 it is called

a. Indeterminate form b. Determinate form

c. Accurate form d. None of these

68. L ' Hospital Rule is used to find the

a. Exact value of a function

b. limiting value of a function

c. Critical value of a function

d. None of these

69. $\lim_{x\to 0}\frac{x-tanx}{x^3}$ is

a. -1/3 b. 1/3 c. 3 d. -3

70. $\lim_{x \to 0} x^x$ is

a. 0 b. 1 c. 2 d. 3

71. $\lim_{x \to 0} (cosx)^{sin2x}$ is

a. 1 b. 0 c. 3 d. 2

72. $\lim_{x \to 0} (sinx)^{tanx}$ is

a. 0 b. 2 c. 1 d. 3

73. $\lim_{x \to 0} \left(\frac{1}{x}\right)^{tanx}$ is

a. 0 b. 1 c. 2 d. 3

74. $\lim_{x \to \frac{\pi}{2}} (secx)^{tanx}$ is

a. 0 b. 1 c. 3 d. 2

75. $\lim_{x \to \frac{\pi}{2}} (tanx)^{cosx}$ is

a. 1 b. 0 c. 2 d. 3

76. $\int \frac{x^2+x-1}{x(x+3)(x-2)} dx = Alogx + B\log(x+3) + C\log(x-2)$ then B is equal to

a. 1/3 b. 1/6 c. ½ d. ¼

77. $\int \frac{x-1}{(x-3)(x+2)} dx = Alog(x-3) + B\log(x+2)$ then A is equal to

a. 1/5 b. 2/5 c. 3/5 d. None of these

78. $\int \frac{x}{x^4-1} dx = C\log\left(\frac{x^2-1}{x^2+1}\right)$ then C is equal to

a. 1/2 b. 1/3 c. 1/4 d. None of these

79. $\int \frac{2x+3}{x^3+x^2-2x} dx = Alogx + B\log(x-1) + C\log(x+2)$ then A is equal to

a. -3/2 b. 3/2 c.2/3 d.-2/3

80. $\int \frac{x^2+1}{x(x^2-1)} dx = Alogx + B\log(x-1) + C\log(x+1)$ then A is equal to

a. -1 b. 1 c.2 d. -2

81. $\int \frac{dx}{a^2-x^2}$ is

a. $\frac{1}{2a}\log\left|\frac{a+x}{a-x}\right|$ b. $\frac{1}{2a}\log\left|\frac{a-x}{a+x}\right|$ c. $\frac{1}{a}\log\left|\frac{a+x}{a-x}\right|$ d. $\frac{1}{a}\log\left|\frac{a-x}{a+x}\right|$

82. $\int \frac{dx}{a^2-x^2}$ is

a. $\frac{1}{2a}\log\left|\frac{a+x}{a-x}\right|$ b. $\frac{1}{2a}\log\left|\frac{x-a}{x+a}\right|$ c. $\frac{1}{2a}\log\left|\frac{a-x}{a+x}\right|$ d. $\frac{1}{2a}\log\left|\frac{x+a}{x-a}\right|$

83. $\int \frac{dx}{a^2+x^2}$ is

a. $\frac{1}{a}\tan^{-1}\frac{x}{a}$ b. $\frac{1}{a}\tan^{-1}\frac{a}{x}$ c. $\frac{1}{a}\cot^{-1}\frac{x}{a}$ d. $\frac{1}{a}\cot^{-1}\frac{a}{x}$

84. $\int \frac{dx}{x^2+6x+13}$ is

a. $\frac{1}{2}\tan^{-1}\frac{x+4}{2}$ b. $\frac{1}{2}\tan^{-1}\frac{x+3}{2}$ c. $\frac{1}{2}\tan^{-1}\frac{2}{x+3}$ d. $\frac{1}{2}\tan^{-1}\frac{2}{x+4}$

85. $\int \frac{dx}{a+bcos^2x}$ can be integrated by dividing N^r andΔ^r by

a. sin^2x b. cos^2x c. $\cos x$ d. $\sin x$

86. $\int \frac{dx}{a+bsin^2x}$ can be integrated by dividing N^r andΔ^r by

a. cos^2x b. sin^2x c. $\tan x$ d. $\sec x$

87. $\int \frac{dx}{acos^2x+bsinx\ xosx+csin^2x}$ can be integrated by dividing N^r andΔ^r by

a. cos^2x b. sin^2x c. tan^2x d. cot^2x

88. If the degree of x in the numerator is greater than or equal to that in the denominator ,

It can integrated by

a. Making it a proper fraction
b. Without making a proper fraction
c. Both (a) and (b)
d. None of these

89. $\int \frac{dx}{1-4x^2}$ is

a. $\frac{1}{4}\log\left|\frac{1-2x}{1+2x}\right|$ b. $\frac{1}{4}\log\left|\frac{2x-1}{2x+1}\right|$ c. $\frac{1}{4}\log\left|\frac{1+2x}{1-2x}\right|$ d. None of these

90. $\int \frac{dx}{x^4-9}$ is

a. $\frac{1}{12}\log\left|\frac{x^2+3}{x^2-3}\right|$ b. $\frac{1}{12}\log\left|\frac{x^2-3}{x^2+3}\right|$ c. $\frac{1}{12}\log\left|\frac{x+3}{x-3}\right|$ d. . $\frac{1}{12}\log\left|\frac{x-3}{x+3}\right|$

91. $\int \frac{dx}{\sqrt{a^2-x^2}}$ is

a. $\cos^{-1}\frac{x}{a}$ b. $\sin^{-1}\frac{x}{a}$ c. $\tan^{-1}\frac{x}{a}$ d. $\cot^{-1}\frac{x}{a}$

92. $\int \frac{dx}{\sqrt{x^2-a^2}}$ is

a. $\log|x+\sqrt{x^2-a^2}|$

b. $\log|x-\sqrt{x^2-a^2}|$

c. $\log|\sqrt{a^2-x^2}-x|$

d. None of these

93. $\int \frac{dx}{\sqrt{x^2+a^2}}$ is

a. $\log|x+\sqrt{x^2+a^2}|$

b. $\log|x-\sqrt{x^2+a^2}|$

c. $\log|x+\sqrt{x^2-a^2}|$

d. . $\log|x-\sqrt{x^2-a^2}|$

94. . $\int \frac{dx}{\sqrt{9-25x^2}}$ is

a. $\frac{1}{5}\cos^{-1}\frac{5x}{3}$

b. $\frac{1}{5}\tan^{-1}\frac{5x}{3}$

c. $\frac{1}{5}\sin^{-1}\frac{5x}{3}$

d. None of these

95. $\int \frac{dx}{\sqrt{4x^2-9}}$ is

a. $\frac{1}{2}\log|2x+\sqrt{4x^2-9}|$

b. $\frac{1}{2}\log|2x-\sqrt{4x^2-9}|$

c. $\frac{1}{2}\log|2x+\sqrt{9-4x^2}|$

d. None of these

96. $\int \frac{dx}{\sqrt{16x^2+25}}$ is

a. $\frac{1}{4}\log|4x+\sqrt{16x^2+25}|$

b. $\frac{1}{4}\log|4x-\sqrt{16x^2+25}|$

c. $\frac{1}{4}\log|25+\sqrt{16x^2+25}|$

d. None of these

97. $\int \sqrt{a^2-x^2}\, dx$ is

a. $\frac{x}{2}\sqrt{a^2+x^2}+\frac{a^2}{2}\sin^{-1}\frac{x}{a}$

b. $\frac{x}{2}\sqrt{a^2-x^2}+\frac{a^2}{2}\cos^{-1}\frac{x}{a}$

c. $\frac{x}{2}\sqrt{a^2-x^2}+\frac{a^2}{2}\sin^{-1}\frac{x}{a}$

d. None of these

98. $\int \sqrt{x^2-a^2}\, dx$ is

a. $\frac{x}{2}\sqrt{x^2-a^2}-\frac{a^2}{2}\log|x+\sqrt{x^2-a^2}|$

b. $\frac{x}{2}\sqrt{x^2+a^2}-\frac{a^2}{2}\log|x+\sqrt{x^2-a^2}|$

c. $\frac{x}{2}\sqrt{x^2+a^2}-\frac{a^2}{2}\log|x+\sqrt{x^2-a^2}|$

d. None of these

99. $\int \sqrt{x^2+a^2}\, dx$ is

a. $\frac{x}{2}\sqrt{x^2-a^2}+\frac{a^2}{2}\log|x+\sqrt{x^2+a^2}|$

b. $\frac{x}{2}\sqrt{x^2+a^2} + \frac{a^2}{2}\log|x + \sqrt{x^2+a^2}|$

c. $\frac{x}{2}\sqrt{x^2+a^2} - \frac{a^2}{2}\log|x + \sqrt{x^2+a^2}|$

d. None of these

100. We can integrate $\int \frac{px+q}{\sqrt{ax^2+bx+c}}dx$ by putting

a. px + q = A.(ax^2 + bx + c) + B

b. px + q = $\frac{A}{(\text{ax2} + \text{bx} + \text{c})}$ + B

c. px + q = A$\frac{d}{dx}$(ax^2 + bx + c) + B

d. None of these

101. $\lim_{n\to\infty} \sum_{r=1}^{n} \frac{1}{\sqrt{nr}}$ is equal to

a. 2 b. 1 c. 0 d. None of these

102. $\lim_{n\to\infty} \sum_{r=0}^{n-1} \frac{1}{\sqrt{n^2-r}}$ is equal to

a. π b. $\frac{\pi}{2}$ c. $\frac{\pi}{4}$ d. None of these

103. $\lim_{n\to\infty} \sum_{r=1}^{n} \frac{1}{n} e^{\frac{r}{n}}$ is equal to

a. e b. e - 1 c. 1 - e d. e + 1

104. $\lim_{n\to\infty} \sum_{r=1}^{n} \frac{1}{n} \sin\frac{r\pi}{2n}$ is equal to

a. $\frac{\pi}{2}$ b. 2 c. $\frac{2}{\pi}$ d. None of these

105. $\lim_{n\to\infty} \sum_{r=1}^{n} \frac{1}{n+1}$ is equal to

a. $\log_e 5$ b. 0 c. $\log_e 4$ d. None of these

106. $\lim_{n\to\infty} \frac{1}{n} \sum_{r=1}^{2n} \frac{r}{\sqrt{n^2+r^2}}$ is

a. $1 + \sqrt{5}$ b. $-1 + \sqrt{5}$ c. $-1 + \sqrt{2}$ d. $1 + \sqrt{2}$

107. $\lim_{n\to\infty} \{\frac{n!}{(kn)^n}\}^{\frac{1}{n}}$ where k $\neq 0$ is a constant and n $\in N$ is equal to

a. k e b. k^{-1} e c. k e^{-1} d. k^{-1} e^{-1}

108. $\lim_{n\to\infty} \frac{2^k+4^k+6^k+\ldots\ldots\ldots\ldots 2n^k}{n^{k+1}}$, $k \neq -1$ is

a. 2^k b. $\frac{2^k}{k+1}$ c. $\frac{1}{K+1}$ d. None of these

109. If $I_n = \int_0^{\frac{\pi}{2}} sin^n x dx$ then I_n is equal to

a. $I_n = \frac{n-1}{n} I_{n-2}$ b. $I_n = \frac{n}{n-1} I_{n-2}$

c. $I_n = \frac{n(n-1)}{2} I_{n-2}$ d. $I_n = \frac{2}{n(n-1)} I_{n-2}$

110. If $I_n = \int_0^{\frac{\pi}{4}} tan^n x dx$ is

a. $I_n = \frac{1}{n+1} - I_{n-2}$ b. $I_n = \frac{1}{n-1} - I_{n-2}$

c. $I_n = n + 1 + I_{n-2}$ d. $I_n = n - 1 - I_{n-2}$

111. Reduction formula for $I_n = \int sin^n x dx$ is

a. $\frac{sin^{n-1}x\ cosx}{n} + \frac{n-1}{n} I_{n-2}$ b. $-\frac{sin^{n-1}x\ cosx}{n} + \frac{n-1}{n} I_{n-2}$

c. $\frac{sin^{n-1}x\ cosx}{n} - \frac{(n-1)}{n} I_{n-2}$ d. None of these

112. Reduction formula for $I_n = \int tan^n x dx$ is

a. $\frac{tan^{n-1}x}{n-1} - I_{n-2}$ b. $\frac{tan^{n-1}x}{n-1} + I_{n-2}$

c. $\frac{tan^{n-1}x}{n-1} - I_{n-3}$ d. None of these

113. The area bounded by the curve y = f(x) , the x – axis and the two fixed ordinates x=a and y = b is given by

a. $\int_a^b xdy$ b. $\int_a^b ydx$ c. $\int_b^a xdy$ d. $\int_b^a ydx$

114. The area bounded by any curve , two given abscissa y = c and y = d and y-axis is given by

a. $\int_a^b xdy$ b. $\int_a^b ydx$ c. $\int_c^d xdy$ d. $\int_c^d ydx$

115. Area of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ between the major and minor axis is

a. $\frac{1}{4}\pi ab$ b. $\frac{1}{2}\pi ab$ c. πab d. None of these

116. The area of the circle $x^2 + y^2 = a^2$ is

a. $\frac{1}{4}\pi a^2$ b. πa^2 c. $\frac{1}{2}\pi a^2$ d. None of these

117. The loop of the curve $xy^2 + (x + a)^2 (x + 2a) = 0$ lies between

a. x = -a and x = -2a
b. x = a and x = 2a
c. x = -a and x = 2a
d. x = a and x = -2a

118. Area between two given curves and two given ordinates is given by

a. $\int_a^b (y_1 - y_2)dx$
b. $\int_a^b (y_1 + y_2)dx$
c. $\int_a^b \left(\frac{y}{y_2}\right) dx$
d. None of these

119. Area between the curve $y^2 = \{ \frac{(a-x)^3}{a+x} \}$ and its asymptote is

a. πa^2 b. $3\pi a^2$ c. $2\pi a^2$ d. None of these

120.Area of the curve r = f(θ) bounded by the curve and radii vectors $\theta = \alpha$ and $\theta = \beta$ is given by

a. $\int_\alpha^\beta r^2 d\theta$ b. $\int_\alpha^\beta r d\theta$ c. $\frac{1}{2}\int_\alpha^\beta r^2 d\theta$ d. None of these

121. The area bounded by the two curve $r_1 = f_1(\theta)$ and $r_2 = f_2(\theta)$ and two given radii vectors $\theta = \alpha$ and $\theta = \beta$ is given by

a. $\frac{1}{2}\int_\alpha^\beta ({r_2}^2 - {r_1}^2)d\theta$
b. $\frac{1}{2}\int_\alpha^\beta (r_1 - r_2)d\theta$
c. $\int_\alpha^\beta ({r_2}^2 - {r_1}^2)d\theta$
d. $\int_\alpha^\beta (r_1 - r_2)d\theta$

122. Area bounded by the cardioid $r = a(1 - cos\theta)$ is

a. $\frac{2}{3}\pi a^2$ b. $\frac{3}{2}\pi a^2$ c. $\frac{1}{2}\pi a^2$ d. $\frac{1}{3}\pi a^2$

123. Area included between parabolas $y^2 = 4x$ and $x^2 = 4y$ is

a.4/3 sq. units b. 1/3 sq. units c. 16/3 sq. units d. 8/3 sq.units

124. Area between $y = 2 - x^2$ and x + y = 0 is

a. 7/2 sq. units b. 9/2 sq. units c. 9 sq. units d. None of these

125.The area bounded by the parabola $y^2 = 4ax$, latus-rectum and x-axis is

a. 0 b. 4/3 a^2 c. 2/3 a^2 d. $a^2/3$

126. The area common to parabola $y = 2x^2$ and $y = x^2 + 4$ is

a.2/3 sq. units b. 3/2 sq.units c. 32/3 sq. units d. 3/32 sq. units

127. The area bounded by the parabola $y = x^2 + 1$ and the straight line x+y = 3 is

a. 45/7 b. 25/4 c. π/18 d. 9/2

128. The curve represented by the equation r = $a\, cos2\theta$ contains

a. 4 loops b. 3 loops c. 2 loops d. 8 loops

129. The area of one loop of the curve r = $a\ cos2\theta$ is

a.$\frac{1}{4}\pi a^2$ b. $\frac{1}{8}\pi a^2$ c. $\frac{1}{2}\pi a^2$ d. None of these

130. The area enclosed by the circle $x^2 + y^2 = 2$ equal to

a. 4π sq units b. $2\sqrt{2}\pi$ sq units c. $4\pi^2$sq units d. 2π sq units

131. The process of finding the length of an arc of a curve i.e of finding a straight line whose Length is the same as that of a specified arc is called

a. Rectification b. Quadrature c. Curve tracing d. None of these

132. The length S of a Cartesian curve y = f(x) between suitable limits is

a. S = $\int \sqrt{1 + (\frac{dy}{dx})^2}\, dx$ b. S = $\int \sqrt{1 + (\frac{dx}{dy})^2}\, dy$

c. both (a) and (b) d. None of these

133.The length of an arc of cycloid x = a $(\theta + \sin\theta)$, y = a $(1 - \cos\theta)$, measured form Vertex is

a. 4a $\cos\frac{1}{2}\theta$ b. 4a $\sin\frac{1}{2}\theta$ c. 4a $\cos\theta$ d. 4 a $sin\theta$

134. The whole length of the loop of curve $3ay^2 = x(x - a)^2$ is

a. $\frac{2}{3}\sqrt{3}a$ b. $\frac{1}{3}\sqrt{3}a^2$ c. $\frac{1}{3}\sqrt{3}a$ d.$\frac{1}{3}\sqrt{3}a^3$

135. The length of an arc of a polar curve is expressed as

a. S = $\int_{\theta_1}^{\theta} \sqrt{r^2 + (\frac{dr}{d\theta})^2} d\theta$ b. S = $\int_{r_1}^{r_2} \sqrt{1 + r^2(\frac{d\theta}{dr})^2} dr$

c. both (a) and (b) d. None of these

136. The perimeter of the cardioide r = a$(1 - \cos\theta)$ is

a.4a b. 2a c. 8a d. None of these

137. The length of an arc of a pedal curve between r = r_1 to r = r_2 is given by

a.$\int_{r_1}^{r_2} \frac{rdr}{\sqrt{r^2-p^2}}$ b. $\int_{r_1}^{r_2} \frac{pdr}{\sqrt{r^2-p^2}}$ c. $\int_{r_1}^{r_2} \frac{rdp}{\sqrt{r^2-p^2}}$ d. $\int_{r_1}^{r_2} \frac{2pdp}{\sqrt{r^2-p^2}}$

138. Intrinsic equation of a curve is a relation between

a. r and p b. s and ψ c. . r and θ d. . s and θ

139. The intrinsic equation of the catenary y = c $\cosh\frac{x}{c}$ is

a. $c = s \tan\psi$ b. $s = c \tan\psi$ c. $s = y \tan\theta$ d. $c = x \tan\psi$

140. The intrinsic equation of the cardioide r = a (1 $-\cos\theta$) is

a. $s = 4a(1 - \cos\frac{1}{3}\psi)$ b. $s = 4a(1 - \cos\psi)$

c. $s = a\,(1 - \cos\theta)$ d. None of these

141. The curve $y^2 = (2x - 1)^3$ is symmetric with respect to

a. y-axis b. x-axis c. the line x + y =1 d. None of these

142. If $\theta < \pi$ and S be the arc of the cycloid x = a ($\theta + sin\theta$) , y = a ($1 - \cos\theta$)

Between the origin and the point (x, y) on the curve , then

a. $S^2 = 4ay$ b. S = 2ay c. $S^2 = 8ay$ d. None of these

143. Length of the involute of the circle x = a ($cos\theta - \theta sin\theta$) , y = a ($sin\theta - \theta cos\theta$)

Between $\theta = 0$ *to* $\theta = 2\pi$

a. $2\pi^2 a$ b. $\pi^2 a$ c. πa^2 d. $2\pi a$

144. For the cycloid x = a ($\theta - sin\theta$) , y = a ($1 - \cos\theta$)

a. $s = a\sin\psi$ b. $s = a\cos\psi$ c. $s = 4a\sin\psi$ d. $s = 4a\cos\psi$

145. The total volume of a solid of revolution about x- axis between $x = x_1$ and

$x = x_2$ is given by

a. $\pi\int_{x_1}^{x_2} y^2 dx$ b. $\int_{x_1}^{x_2} y^2 dx$ c. $\frac{\pi}{2}\int_{x_1}^{x_2} y^2 dx$ d. $\pi\int_{x_1}^{x_2} y dx$

146. The surface area of a solid of revolution about x- axis between $x = x_1$ and

$x = x_2$ is given by

a. $2\pi\int_{x_1}^{x_2} y\sqrt{1 + (\frac{dy}{dx})^2}\, dx$ b. $\pi\int_{x_1}^{x_2} y\sqrt{1 + (\frac{dy}{dx})^2}\, dx$

c. $2\pi\int_{x_1}^{x_2} x\sqrt{1 + \left(\frac{dy}{dx}\right)^2}\, dx$ d. $\frac{\pi}{2}\int_{x_1}^{x_2} \sqrt{1 + (\frac{dy}{dx})^2}\, dx$

147. The area of the surface generated by rotating one arch of the

cycloid x = a ($\theta - sin\theta$) , y = a ($1 - \cos\theta$) about x-axis is

a. $\frac{64}{3}a^2$ b. $\frac{64}{3}\pi a^2$ c. $\frac{3}{64}\pi a^2$ d. None of these

148. Area of the surface of a sphere of the radius a is

a. 4π b. $2\,\pi$ c. $4\pi^2$ d. $2\pi^2$

149. Area of surface generated by rotating the hypocycloid $x^{2/3} + y^{2/3} = a^{2/3}$ is

a. $\frac{12}{5}\pi a^2$ b. $\frac{12}{5}\pi a$ c. $\frac{5}{12}\pi a^2$ d. None of these

150. Area of the surface generated by rotating the cardioid $r = a\,(1 - \cos\theta)$ is

a. $32\,\pi a^2$ b. $\frac{32}{5}\pi a^2$ c. $32\pi a$ d. $\frac{32}{5}\pi^2 a$

151.The necessary and sufficient condition for the

Circles $x^2 + y^2 + 2g_1x + 2f_1 y + c_1 = 0$ and $x^2+y^2 +2g_2x+2f_2y + c_2 = 0$

To cut orthogonally is

a. $2g_1g_2 + 2f_1f_2 = c_1 + c_2$ b. $2g_1g_2 + 2f_1f_2 = c_1 - c_2$

c. $2g_1g_2 + 2f_1f_2 = 0$ d. None of these

152.Radical axis of two circles is the locus of a point which moves so that the lengths of tangents drawn from it to the two circles are

a. Unequal b. Parallel c. Equal d . None of these

153. The equation of the radical axis of two circles

Circles $x^2 + y^2 + 2g_1x + 2f_1 y + c_1 = 0$ and $x^2+y^2 +2g_2x+2f_2y + c_2 = 0$ is

a. $2(g_1 - g_2)x + 2(f_1 - f_2)y + c_1 - c_2 = 0$ b. $2(g_1 - g_2)x + 2(f_1 - f_2)y = c_1 - c_2$

c. $2(g_1 - g_2)x + 2(f_1 - f_2)y = 0$ d. None of these

154. The radical axis of two circles is

a. Parallel b. Perpendicular c. Intersect d. None

to the line joining their centres .

155. The radical axis of the three circles taken in pairs

a. Meet in a point b. does not meet at any point

c. both (a) and (b) c. None of these

156. The point of concurrence of the three radical axis of the three circles taken

in pair is called

a. Circumcentre b. orthocentre c. Radical centre d. None of these

157. If two circles cut a third circle orthogonally , the radical axis of two circles passes

Through the centre of the

a. First circle b. Second circle c. Third Circle d. None of these

158. A system of circles is said to be coaxal if every pair of circles of the system has

a. The same radical axis b. Different radical axis

c. Same tangent d. None of these

159. The equation of the radical axis of the circle $x^2 + y^2 + 2gx + c = 0$

And $x^2 + y^2 + 2g'x + c' = 0$ is

a. $2(g - g')x + c - c' = 0$ b. $2(g - g')x = c - c'$

c. $2(g - g')x = 0$ d. None of these

160. The limiting points of the coaxal system of circle $x^2 + y^2 + 2gx + c = 0$ are

a. $(\sqrt{c}, 0)$ and $(-\sqrt{c}, 0)$ b. $(\sqrt{c}, g)$ and $(-\sqrt{c}, g)$

c. $(0, \sqrt{c})$ and $(0, -\sqrt{c})$ d. None of these

161. The system of circles through the limiting points $(\pm\sqrt{c}, 0)$ of the coaxal system

$x^2 + y^2 + 2gx + c = 0$ is

a. $x^2 + y^2 + 2fy + c = 0$ b. $x^2 + y^2 + 2fy - c = 0$

c. $x^2 + y^2 - 2fy + c = 0$ d. $x^2 + y^2 - 2fy - c = 0$

162. The locus of a point which moves such that it is equidistance form a fixed point

And a fixed line is called a

a. Parabola b. Circle c. Ellipse d. Hyperbola

163. A second degree equation in x and y in which second degree terms from a perfect

Square is a

a. Ellipse b. Hyperbola c. Circle d. Parabola

164. Equation of the tangent to the parabola $y^2 = 4ax$ at the point (x_1, y_1) is

a. $yy_1 = a(x + x_1)$ b. $yy_1 = x + x_1$ c. $yy_1 = 2a(x + x_1)$ d. None of these

165. The condition that the line $y = mx + c$ becomes tangent to the

Parabola $y^2 = 4ax$ is

a. $C = a/m$ b. $C = m/a$ c. $C = am$ d. None of these

166. If $yy_1 = 2a(x + x_1)$ be the tangent at the point (x_1, y_1) to the parabola $y^2 = 4ax$

Then the slope of the normal at that point is

a. $y_1/2a$ b. $2a/y_1$ c. $-y_1/2a$ d. None of these

167. Number of normal that can be drawn to a parabola from an external point is

a. Three   b. Two   c. One   d. Four

168. Equation of the chord of contact of the tangents drawn from a point (x_1 , y_1) to the parabola $y^2 = 4ax$ is

a. $yy_1 = 2a(x + x_1)$ b. $yy_1 = a(x + x_1)$ c. $yy_1 = \frac{a}{2}(x + x_1)$ d. None of these

169. If tangents be drawn to the parabola $y^2 = 4ax$ from a point on the line $x + 4a = 0$, Their chord of contact will be subtended a

a. Acute angle at vertex   b. Right angle at the vertex

c. Abtuse angle at the vertex   d. None of these

170. Equation of polar of the point (x_1 ,y_1) with respect to the parabola $y^2 = 4ax$ is

a. $yy_1 = 2a(x + x_1)$ b. $yy_1 = \frac{2}{a}(x + x_1)$ c. $yy_1 = a(x + x_1)$ d. $yy_1 = \frac{a}{2}(x + x_1)$

171. The equation $x^2 + 4xy + 4y^2 - 3x - 6y - 4 = 0$ represents a

a. Circle   b. Parabola   c. A pair of lines   d. None of these

172. The equation $\lambda x^2 + 4xy + y^2 + \lambda x + 3y + 2 = 0$ is represents a parabola if λ *is*

a. – 4   b. 0   c. 4   d. None of these

173. Focus of the parabola $y^2 - x - 2y + 2 = 0$ is

a. (5/4 , 1)   b. (1/4 , 0)   c. (1 , 1)   d. None of these

174. The vertex of the parabola $(y - a)^2 = 4a (x + a)$ is

a. (-a , a)   b. (a , -a)   c. (-2a , 2a)   d. (- a /2 , a/2)

175. The number of distinct real tangents that can be drawn from (0 , -2) to the parabola $y^2 = 4x$ is

a. One   b. two   c. Zero   d. None of these

176. The tangents to the parabola $y^2 = 4x$ at the points (1 , 2) and (4, 4) meet on the line

a. $x = 3$ b. $x + y = 4$ c. $y = 3$ d. None of these

177. If Two tangents drawn from the point (α , β) to the parabola $y^2 = 4x$ be such that the Slope of one tangent is double of the other then

a. $\beta = \frac{2}{9}\alpha^2$ b. $\alpha = \frac{2}{9}\beta^2$ c. $2\alpha = 9\beta^2$ d. None of these

178. The tangent from the origin to the parabola $y^2 + 4 = 4x$ are inclined at

a. $\frac{\pi}{6}$ b. $\frac{\pi}{4}$ c. $\frac{\pi}{3}$ d. $\frac{\pi}{2}$

179. The equation of the common tangent to the parabolas $y^2 = 4ax$ and $x^2 = 4ay$ is

a. x + y + a = 0 b. x + y = a c. x – y = a d. None of these

180. The normal to the curve $x = at^2$, y = 2at at the point p(t) meets the curve again at Q(t') then t' is

a.t+1/t b. – t – 2/t c. t + 2/t d. t -1/t

181. The locus of a point from which tangents to a parabola are at right angles is a

a. Straight line b. Pair of straight line c. Circle d. Parabola

182. The eccentricity e of the ellipse $x^2/a^2 + y^2/b^2 = 1$ is

a. less than 1 b. greater than 1 c. equal to 1 d. None of these

183. for the ellipse $x^2/a^2 + y^2/b^2 = 1$ the eccentricity e is equal to

a. $e = \sqrt{1+\frac{b^2}{a^2}}$ b. $e = \sqrt{1-\frac{b^2}{a^2}}$ c. $e = \sqrt{1+\frac{a^2}{b^2}}$ d. $e = \sqrt{1-\frac{a^2}{b^2}}$

184. The eccentricity of the ellipse $16x^2 + 25y^2 = 400$ is

a. 3/5 b. 5/3 c. 1/5 d. 2/5

185. Equation of tangent at the point (x_1 , y_1) to the ellipse is $x^2/a^2 + y^2/b^2 =1$ is

a. $\frac{xx_1}{a^2}+\frac{yy_1}{b^2}=1$ b. $\frac{xx_1}{a^2}+\frac{yy_1}{b^2}=0$ c. $\frac{xx_1}{a^2}-\frac{yy_1}{b^2}=1$ d. None of these

186. If the line y = mx + c is tangent to the ellipse is $x^2/a^2 + y^2/b^2 =1$ then

a. $c=\sqrt{a^2+b^2}$ b. $c=\sqrt{a^2m^2+b^2}$ c. $c=\sqrt{a^2+m^2b^2}$ d. None of these

187. Equation of normal at the point (x_1 , y_1) to the ellipse is $x^2/a^2 + y^2/b^2 =1$ is

a. $\frac{x-x_1}{\frac{x_1}{a^2}}=\frac{y-y_1}{\frac{y_1}{b^2}}$ b. $\frac{x-x_1}{\frac{y_1}{b^2}}=\frac{y-y_1}{\frac{x}{a^2}}$ c. $\frac{x-x_1}{a^2}=\frac{y-y_1}{b^2}$ d. None of these

188. Equation of the chord of contact of the tangents drawn from (x_1 , y_1) to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ is

a. $\frac{xx_1}{b^2}+\frac{yy_1}{a^2}=1$ b. $\frac{xx_1}{a^2}+\frac{yy_1}{b^2}=0$ c. $\frac{xx_1}{a^2}+\frac{yy_1}{b^2}=1$ d. None of these

189. Equation of polar of the point (x_1 ,y_1) with respect to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ is

a. $\frac{xx_1}{a^2}+\frac{yy_1}{b^2}=1$ b. $\frac{xx_1}{b^2}+\frac{yy_1}{a^2}=1$ c. $\frac{xx_1}{a^2}+\frac{yy_1}{b^2}=0$ d. None of these

190. The pole of the line lx + my + n = 0 with respect to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ is

a.$(\frac{a^2 l}{n}, \frac{b^2 m}{n})$ b.$(-\frac{a^2 l}{n}, -\frac{b^2 m}{n})$ c.$(\frac{a^2 l}{n}, \frac{-b^2 m}{n})$ d.$(\frac{-a^2 l}{n}, \frac{b^2 m}{n})$

191. Equation of the director circle to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is given by

a. $x^2 + y^2 = a^2 + b^2$ b. $x^2 - y^2 = a^2 + b^2$ c. $x^2 + y^2 = a^2 - b^2$ d. None of these

192. The circle described on the major axis of an ellipse as diameter is called

a. Auxiliary circle d. Director circle d. Circle d. None of these

193. Number of normal that can be drawn to an ellipse from a point in its plane is

a. two b. Three c. Four d. None of these

194. If a circle and an ellipse intersect then the sum of the eccentric angles of the

Four points of intersection is an

a.Even multiple of π b. odd multiple of π c. both (a) and (b) d. None of these

195. The tangents drawn at the extremities of a diameter of an ellipse are

a. Perpendicular b. Parallel c. Concurrent d. None of these

196. If the line y = x + c touches the ellipse $2x^2 + 3y^2 = 6$ then c is equal to

a. $\pm\sqrt{5}$ b. $\pm\sqrt{6}$ c. $\pm\sqrt{3}$ d. $\pm\sqrt{2}$

197. If any tangent to the ellipse to the $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ intercepts lengths h and k on

the axis then

a. $\frac{a^2}{h^2} + \frac{b^2}{k^2} = 0$ b. $\frac{a^2}{h^2} + \frac{b^2}{k^2} = 1$ c. $\frac{a^2}{h^2} + \frac{b^2}{k^2} = -1$ d. None of these

198. Equation of the tangent to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ at a point (a $\cos\theta$, b $\sin\theta$)

a. $x\frac{\cos\theta}{a} + y\frac{\sin\theta}{b} = 0$ b. $x\frac{\cos\theta}{a} + y\frac{\sin\theta}{b} = 1$

c. $x\frac{\cos\theta}{a} - y\frac{\sin\theta}{b} = 1$ d. None of these

199. Equation of the normal to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ at a point (a $\cos\theta$, b $\sin\theta$) is

a. $\mathrm{a\,x}\sec\theta - b\,y\ \mathrm{cosec}\,\theta = a^2 - b^2$ b. $\mathrm{a\,x}\sec\theta + b\,y\ \mathrm{cosec}\,\theta = a^2 - b^2$

c. $\mathrm{a\,x}\sec\theta + b\,y\ \mathrm{cosec}\,\theta = 0$ d. None of these

200. The line x + 2y – 4 = 0 touches the ellipse $3x^2 + 4y^2 = 12$ at the point

a. (1 , 2) b. (2 , 3/2) c. (1 , 1/2) d. (1 , 3/2)

201. A hyperbola is the locus of all points the difference of whose distances from two

Fixed points called foci is a

a. Positive constant b. Negative constant c. Variable d. None of these

202.The equation of the tangents at the point (x_1 , y_1) to the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ is

a. $\frac{xx_1}{a^2} + \frac{yy_1}{b^2} = 1$ b. $\frac{xx_1}{a^2} - \frac{yy_1}{b^2} = 1$ c. $\frac{xx_1}{a^2} - \frac{yy_1}{b^2} = 0$ d. None of these

203. If the line y = mx + c is tangent to the hyperbola is x^2/a^2 - y^2/b^2 =1 if

a. $c = \sqrt{a^2m^2 - b^2}$ b. $c = \sqrt{b^2 - m^2a^2}$ c. $c = \sqrt{am - b^2}$ d. None of these

204. . Equation of the chord of contact of the tangents drawn from (x_1 , y_1) to the hyperbola

$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ is

a. $\frac{xx_1}{b^2} - \frac{yy_1}{a^2} = 0$ b. $\frac{xx_1}{a^2} + \frac{yy_1}{b^2} = 1$ c. $\frac{xx_1}{a^2} - \frac{yy_1}{b^2} = 1$ d. None of these

205. Equation of polar of the point (x_1 ,y_1) with respect to the hyperbola is

a. $\frac{xx_1}{a^2} - \frac{yy_1}{b^2} = 1$ b. $\frac{xx_1}{a^2} + \frac{yy_1}{b^2} = 1$ c. $\frac{xx_1}{a^2} - \frac{yy_1}{b^2} = 0$ d. None of these

206. Equation of asymptotes of a hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1\ are$

a. y = $\frac{b}{a}x$ b. y = $\pm\frac{b}{a}x$ c. x = $\frac{b}{a}y$ d. x = $\pm\frac{b}{a}y$

207. A hyperbola whose asymptotes are perpendicular is called

a. Rectangular hyperbola b. Circular hyperbola

c. Equilateral hyperbola d. None of these

208. The equation of the rectangular hyperbola is written as xy = c^2 where

a. c^2 = a/2 b. a^2 = c/2 c. c^2 = a^2/2 d. None of these

209. Number of normal that can be drawn to the hyperbola xy = c^2 from any given point is

a. Two b. Three c. Four d. None of these

210. The equation of tangent at the point (x_1 , y_1) to the hyperbola xy = c^2 is

a. x y_1 + y x_1 = $2c^2$ b. xy_1 + yx_1 = - $2c^2$ c. xy_1 + yx_1 =0 d. None of these

211. The equation of normal at the point (x_1 , y_1) to the hyperbola xy = c^2 is

a. $xx_1 - yy_1 = {x_1}^2 + {y_1}^2$ b. $xx_1 - yy_1 = {x_1}^2 - {y_1}^2$

c. $xx_1 + yy_1 = {x_1}^2 + {y_1}^2$ d. $xx_1 + yy_1 = {x_1}^2 - {y_1}^2$

212. The equation of polar of the point (x_1 , y_1) with respect to the hyperbola xy = $2c^2$ is

a. $x y_1 + y x_1 = 2c^2$ b. $xy_1 - yx_1 = 2c^2$ c. $xy_1 + yx_1 = 0$ d. None of these

213. The equation of chord with given middle point (x_1 , y_1) to the hyperbola $xy = 2c^2$ is

a. $x y_1 + y x_1 = 2x_1y_1$ b. $xy_1 + yx_1 = x_1y_1$ c. $xy_1 - yx_1 = 2x_1y_1$ d. None of these

214. The equation $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represents a parabola if

a. $h^2 = ab$ b. $h^2 < ab$ c. $h^2 > ab$ d. None of these

215. The equation $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represents a ellipse if

a. $h^2 = ab$ b. $h^2 < ab$ c. $h^2 > ab$ d. None of these

216. The equation $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represents a hyperbola if

a. $h^2 = ab$ b. $h^2 < ab$ c. $h^2 > ab$ d. None of these

217. . The conic represented by the equation $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$

May be represents a rectangular hyperbola if

a. $a + b = 0$ b. $a - b = 0$ c. $a + b = 1$ d. $a - b = 1$

218. The polar equation of a conic whose focus is at the pole is

a. $\frac{l}{r} = 1 - e\ \cos\theta$ b. $\frac{l}{r} = 1 + e\ \cos\theta$ $r = l(1 - e\ \cos\theta)$ d. None of these

219. Equation of a directrix to the conic $\frac{l}{r} = 1 + e\ \cos\theta$ is

a. $\frac{l}{r} = e\ \cos\theta$ b. $\frac{l}{r} = e\ \sin\theta$ c. $l = re\ \cos\theta$ d. $l = re\ \sin\theta$

220. the semi latus rectum of any conic between the segments of any focal chord is its

a. Arithmetic Mean b. Geometric Mean c. Harmonic Mean d. None of these

221. The equation of tangent at any point whose vectorial angle is α to the conic

. $\frac{l}{r} = 1 + e\ \cos\theta$ is

a. $\frac{l}{r} = \cos(\theta - \alpha) + e\cos(\theta - \gamma)$ b. $\frac{l}{r} = \sin(\theta - \alpha) + e\cos(\theta - \gamma)$

c. $\frac{l}{r} = \cos(\theta - \alpha) - e\cos(\theta - \gamma)$ d. None of these

222. The condition that the line $\frac{l}{r} = A\cos\theta + B\sin\theta$ may be a tangent to the conic

$\frac{l}{r} = 1 + e\ \cos\theta\ is$

a.$(A + e)^2 + B^2 = 0$ b. $(A - e)^2 + B^2 = 1$

c. $(A - e)^2 + B^2 = 0$ d. None of these

223. The polar equation of the director circle of a conic $\frac{l}{r} = 1 + e \ \cos\theta \ is$

a. $r^2 (1 – e^2) + 2elr\cos\theta – 2l^2 = 0$ b. $r^2 (1 + e^2) - 2elr\cos\theta – 2l^2 = 0$

c. $r^2 (1 – e^2) + 2elr\cos\theta + 2l^2 = 0$ d. None of these

224. If e = 0 , the equation $\frac{l}{r} = 1 + e \ \cos\theta$ reduces to $\frac{l}{r} = 1$ represents a

a. Circle of radius l and centre at pole

b. Parabola

c. Hyperbola

d. None of these

225. If e = 1 the equation of the conic reduces to $\frac{l}{r} = 1 + \cos\theta$ it represents a

a. Circle b. Parabola c. Hyperbola d. None of these

226. Co-ordinates of the middle point of the line joining the points (x_1 , y_1 , z_1) and (x_2 , y_2 , z_2) are

a. $(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}, \frac{z_1+z_2}{2})$ b. $(\frac{x_1-x_2}{2}, \frac{y_1-y_2}{2}, \frac{z_1-z_2}{2})$

c. $(\frac{x_1+x_2}{3}, \frac{y_1+y_2}{3}, \frac{z_1+z_2}{3})$ d. None of these

227. If l , m , n are the direction cosines of a line then

a. $l^2 + m^2 + n^2 = 0$ b. $l^2 + m^2 + n^2 \neq 0$

c. $l^2 + m^2 + n^2 = 1$ d. None of these

228. The direction ratios of the line joining the points (x_1 , y_1 , z_1) and (x_2 , y_2 , z_2) are

a. $x_1 + x_2$, $y_1 + y_2$, $z_1 + z_2$ b. $x_2 – x_1$, $y_2 - y_1$, $z_2 – z_1$

c. $\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}, \frac{z_1+z_2}{2}$ d. None of these

229. Angles between the lines whose direction cosines are l_1 , m_1 , n_1 and l_2, m_2 , n_2 is

a. $\cos\theta = l_1l_2 + m_1m_2 + n_1n_2$ b. $\sin\theta = l_1l_2 + m_1m_2 + n_1n_2$

c. $\tan\theta = l_1l_2 + m_1m_2 + n_1n_2$ d. None of these

230. Direction cosines of the line joining the points (4 , 3 , -5) and (-2 , 1 , -8) are

a. 6/5 , 2/5 , 3/5 b. 6/7 , 2/7 , 3/7 c. 2/7 , 3/7 , 5/7 d. None of these

231. Equation of yz plane is

a. x = 0 b. y = 0 c. z = 0 d . None of these

232. Equation of the plane in normal form is

a. lx + my + nz = 0 b. lx + my + nz = 1

c. lx + ly + lz = p d. None of these

233. Equation of the plane which cuts the line intercepts a, b , c on the axis is

a. x/a + y/b + z/c = 0 b. x/a + y/b + z/c =2

c. x/a + y/b + z/c = 1 d. None of these

334. The general equation of first degree in x , y , z represents a

a. Circle b. Line c. Ellipse d. Plane

235. Equation of the plane passing through the origin is

a. ax + by + cz = 0 b. ax + by + cz = 1

c. ax + by + xz $\neq 0$ d. None of these

236. The planes Ax + By + Cz + D = 0 and A'x + B'y + C'z + D' = 0 are parallel if

a. A/A' $\neq$ B/B' $\neq$ C/C' b. A/A' = B/B' = C/C'

c.A/B = B/C = C/A d. None of these

237. The planes Ax + By + Cz + D = 0 and A'x + B'y + C'z + D' = 0 are Perpendicular if

a. AA' + BB'+ CC' = 1 b. AA' + BB' + CC' $\neq 0$

c. AA' + BB' +CC' = 0 d. None of these

238. Perpendicular distance of the origin from the plane ax + by + cz + d = 0 is

a. $\pm\frac{a}{\sqrt{a^2+b^2+c^2}}$ b. $\pm\frac{b}{\sqrt{a^2+b^2+c^2}}$ c. $\pm\frac{c}{\sqrt{a^2+b^2+c^2}}$ d. $\pm\frac{d}{\sqrt{a^2+b^2+c^2}}$

239. The point (x_1 ,y_1 , z_1) and the origin are on the same side of the plane

ax + by + cz + d = 0 iff ax_1 + by_1 + cz_1 + d and d have the

a. Same singh b. Different singh c. are zero d. None of these

240. Bisectors of angles between the two planes is the locus of a point which moves

Such that its distance from the two planes are

a.Equal in Magnitude b. Not equal in magnitude

c. Have a same sign d. None of these

241. In the equation of the plane x/a + y/b + z/c = 1 the constants a , b , c are called

a. Family of constants b. Parameters

c. Barometers d. None of these

242. The equation of the system of planes through the point (x_1 , y_1 , z_1) given by

($x - x_1$) + λ ($y - y_1$) + μ ($z - z_1$) = 0 is a system of planes having

a.one parameter b. Two parameter c. three parameter d. None of these

243. The equation $ax^2 + by^2 + cz^2 + 2fyz + 2gzx + 2hxy = 0$ represents a plane if

a. $abc + 2fgh - af^2 - bg^2 - ch^2 = 0$ b. $abc + 2fgh - af^2 - bg^2 - ch^2 \neq 0$

c. . $abc + 2fgh - af^2 - bg^2 - ch^2 = 1$ d. None of these

244. The plane represented by the equation $ax^2 + by^2 + cz^2 + 2fyz + 2gzx + 2hxy = 0$

Are perpendicular if

a.a + b + c ≠ 0 b. a + b + c = 1 c. a + b + c = 0 d. None of these

245. The equation o $2x^2 - 2y^2 + 4z^2 + 2yz + 6zx + 3xy = 0$ is represents a

a. Circle b. Straight line c. Parabola d. Pair of planes

246. Equation of the line passing through a point (α , β , γ) and having direction

Cosines l , m , n is

a. $\frac{x-\alpha}{l} = \frac{y-\beta}{m} = \frac{z-\gamma}{n} = r$ b. $\frac{x+\alpha}{l} = \frac{y+\beta}{m} = \frac{z+\gamma}{n} = r$

c. $x - \alpha = y - \beta = z - \gamma$ d. None of these

247. The line $\frac{x-\alpha}{l} = \frac{y-\beta}{m} = \frac{z-\gamma}{n}$ is parallel to the plane ax + by + cz + d = 0 if

a. al + bm + cn ≠ 0 b. al + bm + cn = 1

c. al + bm + cn = 0 d. None of these

248. The conditions that the line $\frac{x-\alpha}{l} = \frac{y-\beta}{m} = \frac{z-\gamma}{n}$ lie in the plane ax + by + cz + d = 0 are

a. al + bm + cn = 0 , a $\alpha + b\beta + c\gamma d \neq 0$

b. al + bm + cn = 0 , a $\alpha + b\beta + c\gamma d \neq 0$

c. al + bm + cn ≠ 0 , a $\alpha + b\beta + c\gamma d \neq 0$

d. None of these

249. The shortest distance between two skew lines is the length of the line segment which is

a. Right angles to both of them b. Parallel to both of them

c. At equal distance from them d. None of these

250. The locus of a point which moves such that it remains at a fixed distance from a fixed

Point in the space is called

a. Circle b. Straight line c. Sphere d. None of these

251. A equation of the second degree in x , y , z in which coefficients of x^2 , y^2 , z^2

Are equal and does not contain terms having products xy , yz, zx represents a

a. Circle b. Sphere c. Ellipse d. Hyperbola

252. Equation of the sphere passing through the points (α , 0 , 0) , (0 , β , 0) , (0 , 0 , γ)

And origin is given by

a. $x^2+y^2+z^2 - \alpha x - \beta y - \gamma z = 0$ b. $x^2+y^2+z^2 + \alpha x + \beta y + \gamma z = 0$

c. $x^2+y^2+z^2 - \alpha x - \beta y - \gamma z \neq 0$ d. None of these

253. A sphere of constant radius k passes through the origin and meets the axis at

A , B , C . The centroid of the triangle ABC lies on the sphere

a. $x^2 + y^2 + z^2 = k^2$ b. $x^2 + y^2 + z^2 = 4k^2$

c. $9(x^2 + y^2 + z^2) = 4k^2$ d. None of these

254. Section of a sphere by a plane is a

a. circle b. Plane c. Sphere d. None of these

255. If the radius of the circle is less than the radius of the sphere , the circle is called

a. great circle b. Small circle c. Imaginary circle d. big circle

256. If the radius of the circle is equal to the radius of the sphere the circle is called

a. great circle b. Small circle c. Imaginary circle d. big circle

257. If the radius of the circle is greater than the radius of the sphere the circle is called

a. Small circle b. great circle c. Imaginary circle d. big circle

258. The curve of intersection of two sphere is a

a. Circle b. Sphere c. Plane d. None of these

259. A line which meets a sphere in two coincident points is called the

a. Tangent line to the sphere b. Normal line to the sphere

c. Tangent plane to the sphere d. None of these

260. The locus of the tangent line to a sphere at a point on it is called the

a. tangent plane b. Normal plane

c. Tangent line d. Normal line

261. The tangent plane to a sphere at any point on it

a. Parallel b. Normal c. Perpendicular d. None of these

to the radius of the sphere through that point

262. Two spheres are said to cut orthogonally if their angle of intersection is

a. Right angle b. Acute angle c. Abtuse angle d. none of these

263. Two spheres $x^2 + y^2 + z^2 + 2u_1x + 2v_1y + 2w_1z + d_1 = 0$

And $x^2 + y^2 + z^2 + 2u_2x + 2v_2y + 2w_2z + d_2 = 0$ intersect orthogonally if

a. $2u_1u_2 + 2v_1v_2 + 2w_1w_2 = 0$ b. $2u_1u_2 + 2v_1v_2 + 2w_1w_2 \neq 0$

c. $2u_1u_2 + 2v_1v_2 + 2w_1w_2 = d_1 + d_2$ d. None of these

264. Two sphere of radii r_1 and r_2 intersect orthogonally , the radius of the common circle is

a. $\frac{r_1r_2}{\sqrt{r_1{}^2+r_2{}^2}}$ b. $\frac{r_1r_2}{\sqrt{r_1{}^2-r_2{}^2}}$ c. $\frac{r_1}{\sqrt{r_1{}^2+r_2{}^2}}$ d. $\frac{r_2}{\sqrt{r_1{}^2+r_2{}^2}}$

265. If two points P and Q are conjugate with respect to a sphere S , the sphere on PQ

As diameter cuts S

a. Orthogonally b. At an angle $\pi/3$ c. At angle π d. None of these

266. The locus of a point whose powers with respect to two spheres are equal is called

a. Tangent plane b. Normal Plane c. Radical Plane d. None of these

of the two spheres.

267. The radical plane of two spheres is ....

a. Parallel b. Perpendicular c. Touches d. None of these

to the line joining their centre

268. The radical planes of three spheres taken in pairs pass through a

a. Point b. Line c. Intersect d. None of these

269. If every pair of spheres of the system has the same radical plane the

system of spheres is said to be

a.Coaxal b. Parallel c. Tangential d. None of these

270. The limiting points of the coaxal system $x^2 + y^2 + z^2 + 2ux + d = 0$ are

a. ($\pm\sqrt{d}$, 0 , 0) b. (0 , $\pm\sqrt{d}$, 0) c.(0 , 0 , $\pm\sqrt{d}$) d. (0 , 0 , 0)

271. A surface generated by a variable line which passes through a fixed point and

Intersects a given curve is called

a. Sphere b. Circle c. Cone d. None of these

272. A homogeneous equation of a second degree in x , y , z represents

a. Cone b. Circle c. Sphere d. None of these

273. The equation by + cz + d = 0 represents a plane

a. Parallel to x –axis b. Parallel to y –axis

c. Parallel to z –axis d. None of these

274. The equation ax + cz+ d = 0 represents a plane

a. Parallel to x –axis b. Parallel to y –axis

c. Parallel to z –axis d. None of these

275. The equation ax + by + d = 0 represents a plane

a. Parallel to x –axis b. Parallel to y –axis

c. Parallel to z –axis d. None of these

276. The equation ax + by + cz = 0 represents a plane

a. Parallel to x –axis b. Parallel to y –axis

c. Parallel to z –axis d. passes through the origin

277. The equation cz+ d = 0 represents a plane

a. Parallel to xy –plane

b. Parallel to yz –plane

c. Parallel to z x–plane

d. None of these

278. The equation ax + d = 0 represents a plane

a. Parallel to x y –plane

b. Parallel to y z–plane

c. Parallel to z x –plane

d. None of these

279. The equation by + d = 0 represents a plane

a. Parallel to x y –plane

b. Parallel to y z–plane

c. Parallel to z x –plane

d. None of these

280.If in the equation ax + by + cz + d = 0 , a = b = c = 0 and d is finite , the plane is at

a.an infinite distance

b. a finite distance

c. The origin

d. None of these

281. Every equation of second degree in x , y and z

a. Need not represent a cone

b. Always represent a cone

c. May or may not represent a cone

d. None of these

282. Every homogeneous equation of second degree in x , y , and z represents a cone with

a. Vertex on x – axis

b. Vertex on y – axis

c. Vertec on z – axis

d. Vertex at the origin

283. The direction cosine of the generator of the cone

$f(x , y, z) \equiv ax^2 + by^2 + cz^2 + 2fyz + 2gzx + 2hxy = 0$

a. Does not satisfy the equation

b. Satisfies the equation

c. Both (a) and (b)

d. None of these

284. The general equation of the cone of second degree passing through the axes is

a. $fyz + gzx + hxy = 0$

b. $ax^2 + by^2 + cz^2 = 0$

c. $2fyz + 2gzx + 2hxy \neq 0$

d. None of these

285. The cone of second degree can be found to pass through two sets of rectangular axes Through the

a. Different origin

b. same origin

c. Both (a) and (b)

d. None of these

286. A cone is cut by a line through the vertex of the cone is

a. Two generating lines

b. One generating line

c. Three generating lines

d. None of these

287. The plane $ax + by + cz = 0$ cuts the cone $yz + zx + xy = 0$ in two perpendicular lines if

a. $a + b + c = 0$

b. $a + b + c \neq 0$

c. $1/a + 1/b + 1/c = 0$

d. $1/a + 1/b + 1/c \neq 0$

288. A line which meets a cone in two coincident points is called the

a. tangent line to the cone

b. Normal line to the cone

c. Concurrent lines to the cone

d. None of these

289. The locus of the tangent line to a cone at a point on it is called

a. Normal plane

b. Tangent plane

c. Concurrent plane

d. None of these

290. The tangent plane at any point of a cone passes through

a. X –axis b. Y –axis c. Z –axis d. Vertex

291. The condition that a cone may have three mutually perpendicular generators is

a. a + b + c = 1

b. a + b + c ≠ 0

c. a + b + c = 0

d. a + b + c ≠1

292. A cone having three distinct perpendicular generators is called a

a. Rectangular cone

b. Circular cone

c. Elliptic cone

d. None of these

293. The cones $ax^2 + by^2 + cz^2 = 0$ and $x^2/a + y^2/b + z^2/c = 0$ are

a. Proportional b. Reciprocal c. Parallel d. None of these

294. The tangent plane at (α , β , γ) to the cone $ax^2 + by^2 + cz^2 =0$ is

a. $ax + by + cz = 0$

b. $\alpha x + \beta y + \gamma z = 0$

c. $a\alpha x + b\beta y + c\gamma z = 0$

d. None of these

295. The plane $lx + my + nz = 0$ is a tangent plane to the cone $ax^2 + by^2 + cz^2 = 0$ is perpendicular

a. $bcl^2 + cam^2 + abn^2 = 0$

b. $l^2 + m^2 + n^2 = 0$

c. $al^2 + bm^2 + cn^2 = 0$

d. None of these

296. The plane $lx + my + nz = 0$ is a tangent plane to the cone $ax^2 + by^2 + cz^2 = 0$

is perpendicular generators if

a. $al^2 + bm^2 + cn^2 = 0$

b. $(b + c) l^2 + (c + a)m^2 + (a + b)n^2 = 0$

c.al + bm + cn = 0 d. None of these

297.The semi-vertical angle of a right circular cone which has three mutually Perpendicular tangent is

a.$\tan^{-1}\sqrt{2}$ b. $\cot^{-1}\sqrt{2}$ c. $\sin^{-1}\sqrt{2}$ d.$\cos^{-1}\sqrt{2}$

298. The lines of intersection of the plane lx + my + nz = 0 and the cone fyz + gzx + hxy = 0 are parallel if

a.fmn + gnl + hlm = 0 b. $\sqrt{fl} + \sqrt{gm} + \sqrt{hn} = 0$

c. mn + nl + jm = 0 d. None of these

299. The lines of intersection of the plane lx + my + nz = 0 and the cone fyz + gzx + hxy = 0 are perpendicular if

a.fmn + gnl + hlm = 0 b. $\sqrt{fl} + \sqrt{gm} + \sqrt{hn} = 0$

c. mn + nl + jm = 0 d. None of these

300. The surface generated by a line passing through a fixed point and making a constant angle with a fixed line through the fixed point is called

a.Right circular cone b. Right circular cylinder

c. Enveloping cylinder d. Enveloping Cone