Question No.	Questions
1.	The number of abelian groups upto isomorphism of order 105 is
	(1) 5 (2) 7 (3) 45 (4) 49
2.	A communicative division ring is
de miss	(1) group (2) vector space
	(3) field (4) integral domain
3.	Ring of polynomial over a field is a
	(1) prime field (2) unique factorization domain
	(3) irreducible (4) integral domain
4.	If integral domain D is of finite characteristic, then its characteristic is
	(1) prime number (2) natural number
	(3) even number (4) odd number
5.	Number of prime ideals of Z <sub>10</sub> is
	(1) 4 (2) 3 (3) 2 (4) 1
6.	Starting with $x_0 = 1$ , the next approximation $x_1$ to $2^{\frac{1}{3}}$ obtained by
	Newton's method is
	(1) $\frac{4}{3}$ (2) $\frac{5}{3}$ (3) $\frac{5}{4}$ (4) $\frac{6}{5}$
7.	In Simpson's $\frac{1}{3}$ rd rule, the curve $y = f(x)$ is assumed to be a
	(1) circle (2) hyperbola
	(3) parabola (4) straight line

PG-EE-2013-Maths & Maths with (1) Comp. Sc.-Code-D

Question No.	Questi	ons
8.	Gauss quadrature formula is used for	
	(1) Numerical integration (2) N	umerical differentiation
	(3) Interpolation (4) So	olution of equations
9.	Let $f(0) = 1$ , $f(1) = 2.72$ , then the t value of $\int_{0}^{1} f(x) dx$ as	rapezoidal rule gives approximate
	(1) 3.72 (2) 1.	86
	(3) 1.76 (4) 0.	92 Hadramas (C. 1997)
10.	Normal distribution becomes standard	d normal distribution when
	(1) $\mu = 0, \ \sigma = 0$ (2) $\mu$	$=1, \sigma=0$
	(3) $\mu = 1, \ \sigma = 1$ (4) $\mu$	$=0, \ \sigma=1$
11.	$L\left\{ e^{at} t^{n} \right\} =$	
	$(1)  \frac{n}{\left(s-a\right)^{n+1}} \qquad (2)  \frac{1}{\left(s-a\right)^{n+1}}$	$\frac{\Gamma(n)}{(-a)^n}$
	$(3)  \frac{\underline{ n }}{(s-a)^n} \qquad (4)  \overline{(s-a)^n}$	$\frac{\lfloor n \rfloor}{(a-a)^{n+1}}$
12.	$L^{-1}\left\{\frac{1}{(s-4)^3}\right\} =$	
	(1) $t^2 e^{4t}$ (2) $\frac{1}{2}$	$\mathbf{t^2}\mathbf{e^{4t}}$
	(3) $\frac{1}{2}$ t e <sup>4t</sup>	e <sup>4t</sup>

Question No.	Questions
13.	Generating function for Bessel function $J_n(x)$ is
	(1) $e^{x}\left(\frac{1}{t}-t\right)$ (2) $e^{\frac{x}{2}}\left(\frac{1}{t}-t\right)$
	(3) $e^{x}\left(t-\frac{1}{t}\right)$ (4) $e^{\frac{x}{2}}\left(t-\frac{1}{t}\right)$
14.	$\left\{J_{\frac{1}{2}}(x)\right\}^{2} + \left\{J - \frac{1}{2}(x)\right\}^{2} = 0$
	$(1)  \frac{\pi x}{2} \qquad (2)  \frac{2}{\pi x}$
	$(3)  \frac{\sqrt{2}}{\pi x} \qquad (4)  \frac{2}{\sqrt{\pi x}}$
15.	If $P_n$ (x) is Legendre polynomial of degree n, then $P_2$ (x) =
	(1) $\frac{1}{2} (3 x^2 - 1)$ (2) $\frac{1}{2} (3 x^2 + 1)$ (3) $\frac{3}{2} x^2 - 1$ (4) $x^2 - \frac{1}{2}$
	(3) $\frac{3}{2} x^2 - 1$ (4) $x^2 - \frac{1}{2}$
16.	Maximum size of a float variable is
	(1) 2 bytes (2) 3 bytes
	(3) 4 bytes (4) 8 bytes
17.	Which of following Keyword is used for the storage class 2
	(1) auto (2) printf
	(3) external (4) scanf

PG-EE-2013-Maths & Maths with (3) Comp. Sc.-Code-D

Questio No.	Questions
18.	The continue statement cannot be used with
	(1) while (2) for
	(3) switch (4) do
19.	The bitwise AND operator is used for
	(1) shifting bits (2) sorting
	(3) comparison (4) masking
20.	Number of real roots of the equation $x^{2n} - 1 = 0$ is
	(1) 2 (2) n (3) 2 n (4) n-1
21.	The value of 'c' of Lagrange's mean value theorem for $f(x) = x(x-1)$
	in [1, 2] is given by
	(1) $\frac{2}{3}$ (2) $\frac{3}{4}$ (3) $\frac{3}{2}$ (4) $\frac{4}{3}$
22.	Which of the following functions is not uniformly continuous in $[2, \infty)$ ,
	(1) $\sin x$ (2) $e^x$ (3) $\frac{1}{x}$ (4) $\frac{1}{x^2}$
23.	For what value of k, the function
N The state of the	$f(x, y) = \begin{cases} \frac{\sin^{-1}(xy-2)}{\tan^{-1}(3xy-6)}, & (x, y) \neq (1, 2) \\ K, & (x, y) = (1, 2) \end{cases}$
	K , $(x, y) = (1, 2)$ is continuous?
	(1) 2 (2) $\frac{1}{2}$ (3) $\frac{1}{3}$ (4) $\frac{1}{4}$

PG-EE-2013-Maths & Maths with (4) Comp. Sc.-Code-D

Question No.	Questions
24.	The function $f(x, y) = 2 x^4 - 3 x^2 y + y^2$ has
	(1) maxima at (0, 0) (2) neither maxima nor minima at (0, 0)
	(3) minima at (0, 0) (4) doubtful case at (0, 0)
25.	A unit vector perpendicular to the tangent and normal at a point of a
	space curve is called
	(1) Principal normal (2) Involute
	(3) Standard normal (4) Binormal
26.	The partial differential equation of all spheres whose centre lies
	on z-axis is
	(1) $qx - py = 0$ (2) $px - qy = 0$
	(3) $qx + py = 0$ (4) $px + qy = 0$
27.	Solution of $px + qy = z$ is
	(1) $f\left(\frac{x}{y}, \frac{y}{z}\right) = 0$ (2) $f(xy, yz) = 0$
	(3) $f(x^2, y^2) = 0$ (4) $f(x, y + z) = 0$
28	The differential equation $f_{xx} + 2 f_{xy} + 4 f_{yy} = 0$
	(1) parabolic (2) hyperbolic
	(3) linear (4) elliptic

Questio No.	Questions
29.	The partial differential equation of the transverse vibrations of a string is  (1) $\frac{\partial^2 y}{\partial t^2} = c^2 \frac{\partial^2 y}{\partial x^2}$ (2) $\frac{\partial^2 y}{\partial t^2} = c^2 \frac{\partial y}{\partial x}$ (3) $\frac{\partial^2 y}{\partial t^2} = c^2 \frac{\partial^3 y}{\partial x^3}$ (4) $\frac{\partial y}{\partial t} = c^2 \frac{\partial y}{\partial x}$
30.	The solution of $\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial y^2} = \frac{z}{a}$ is  (1) $z = e^{\frac{y}{a}} f(x+y)$ (2) $z = e^{\frac{y}{a}} f(x-y)$ (3) $z = e^a f(x-y)$ (4) $z = e^{\frac{y}{a}} f(x+y)$
31.	Length of the arc of the curve $x^2 + y^2 - 2$ ax = 0 in the first quadrant is  (1) $\frac{\pi a}{4}$ (2) $\frac{\pi a}{2}$ (3) $\pi a$ (4) $2 \pi a$
	Area between the parabolas $y^2 = 4$ ax and $x^2 = 4$ ay is  (1) $\frac{16}{3}$ $a^2$ (2) $\frac{16}{5}$ $a^2$ (3) $\frac{8}{3}$ $a^2$ (4) $\frac{8}{5}$ $a^2$

Question No.	Questions
33.	The number of arbitrary constants in the equation of a sphere are
	(1) 2 (2) 3 (3) 4 (4) 6
34.	Angle between the lines represented by $x^2 + 2 bxy - y^2 = 0$ is
	(1) $\pi$ (2) $\frac{\pi}{2}$
	$(3)  \frac{\pi}{3} \qquad \qquad (4)  \frac{\pi}{4}$
35.	If a right circular cone has three mutually perpendicular generators, then semi-vertical angle of the cone is
	(1) $\frac{\pi}{4}$ (2) $\tan^{-1}\left(\frac{1}{\sqrt{2}}\right)$
	(3) $\frac{\pi}{3}$ (4) $\tan^{-1}(\sqrt{2})$
36.	If a/bc and (a, b) = 1, then a/c is the statement of
	(1) Gauss theorem
	(2) Wilson theorem
	(3) Fermat's theorem
	(4) Chinese Remainder theorem
37.	Which of the following congruences have solution?
	(1) $x^2 \equiv -2 \pmod{61}$ (2) $x^2 \equiv 2 \pmod{61}$
	(3) $x^2 \equiv -2 \pmod{59}$ (4) $x^2 \equiv 2 \pmod{59}$

Questio No.	Questions
38.	The highest power of 2 dividing  533 is
	(1) 528 (2) 529
	(3) 530 (4) 532
39.	If $\sin^{-1} x + \sin^{-1} y = \frac{2\pi}{3}$ , then $\cos^{-1} x + \cos^{-1} y =$
	(1) $\frac{\pi}{2}$ (2) $\frac{\pi}{3}$
	(3) $\frac{\pi}{6}$ (4) $\frac{2\pi}{3}$
40.	If $\cosh x = 2$ , then $x =$
	(1) $\log (2-\sqrt{5})$ (2) $\log (2-\sqrt{3})$
	(3) $\log (2 + \sqrt{5})$ (4) $\log (2 + \sqrt{3})$
41.	Dimension of $Q\left(\sqrt{2}\right)$ over $Q$ is
	(1) 4 (2) 2 (3) 1 (4) 3
42.	Which of the following is an orthogonal set?
	(1) $\{(1,0,1), (1,0,-1), (-1,0,1)\}$
	$2)  \left\{ (1,0,1), \ (1,0,-1), \ (0,1,0) \right\}$
(	3) $\{(1,0,1), (1,0,-1), (0,2,3)\}$
(4	4) none of these

PG-EE-2013-Maths & Maths with (8) Comp. Sc.-Code-D

Ph-Pic-20 ship-hadis & diga Compa deselvadores

Question No.	Questions
43.	Let u, v be orthogonal set in an inner product space V. Then   u-v   is
	(1) 0 (2) $\sqrt{3}$ (3) 2 (4) $\sqrt{2}$
44.	Let $u = (1, 0, i), v = (2, 0, 1 + i)$ . Then $< u, v > is$
	(1) $1+i$ (2) $1-i$ (3) $2 + i$ (4) $-1+i$
45.	Tangential velocity of a particle at a point is
	$(1)  \frac{dx}{dt} \qquad (2)  \frac{dy}{dt}$
	$(3)  \frac{dt}{ds} \qquad \qquad (4)  \frac{ds}{dt}$
46.	A person weighing 70 Kg. is in a lift ascending with an acceleration of 1.4 m/sec <sup>2</sup> . The thrust of his feet on the lift is
l u i	(1) 584 N (2) 780 N
	(3) 784 N (4) 980 N
47.	A particle is projected at such an angle that the horizontal range is three
	times the greatest height. Then the angle of projection is
	(1) $\tan^{-1} \cdot \frac{2}{3}$ (2) $\tan^{-1} \frac{4}{3}$
	(3) $\tan^{-1} \frac{3}{2}$ (4) $\tan^{-1} \frac{5}{3}$

Questio		
No.	Questions	
48.	A body of mass m has momentum M. Its Kinetic energy will be	
	(1) $\frac{M^2}{2 \text{ m}}$ (2) $\frac{M^2}{m}$	
	(3) $\frac{1}{2}$ m M <sup>2</sup> (4) $\frac{1}{2}$ m M	
49.	The expression for frequency of a S. H. M. is	
	(1) $n = \frac{m}{\sqrt{2\pi}}$ (2) $n = \frac{\sqrt{m}}{2\pi}$	
	(3) $n = \sqrt{\frac{m}{2\pi}}$ (4) $n = \frac{m}{2\pi}$	
50.	The law of force towards the pole under the curve $r^2 = 2$ ap is	
	(1) $F \propto \frac{1}{r^2}$ (2) $F \propto \frac{1}{r^3}$	
	(3) $F \propto \frac{1}{r^5}$ (4) $F \propto \frac{1}{r^{\frac{3}{2}}}$	
51.	The integral $\int_0^1 x^{m-1} (1-x)^{n-1} dx$ is convergent, when	
41	(1) $n > 0, m = 0$ (2) $m > 0, n = 0$	
	(3) $m > 0, n > 0$ (4) $m = 0, n > 1$	
52.	Let f be a bounded function defined on the bounded interval [a, b]. Then, f is Riemann integral on [a, b] iff	
	(1) $\int_{a}^{b} f \leq \int_{a}^{\overline{b}} f$ (2) $\int_{a}^{b} f = \int_{a}^{\overline{b}} f$ (3) $\int_{a}^{b} f \geq \int_{a}^{\overline{b}} f$ (4) $\int_{a}^{b} f + \int_{a}^{\overline{b}} f = 0$	
	(3) $\int_a^b \mathbf{f} \ge \int_a^{\overline{b}} \mathbf{f} $ (4) $\int_a^b \mathbf{f} + \int_a^{\overline{b}} \mathbf{f} = 0$	

Question No.	Questions	
53.	The integral $\int_{0}^{\infty} x^{n-1} e^{-x} dx$ is divergent, when	
	(1) $n > 0$ (2) $n \le 0$ (3) $n > 1$ (4) $n = \frac{1}{2}$	
54.	If A is an open set and B is a closed set in R <sup>n</sup> , then	
	(1) B-A is null set (2) B-A is semi-open set	
	(3) B-A is open set (4) B-A is closed set	
55.	Which of the following is not correct about the cantor ternary set?	
	(1) It is dense (2) It is closed	
	(3) It is uncountable (4) It is perfect set	
56.	The complement of non-empty open set of metric space is	
	(1) null set (2) open set	
4	(3) closed set (4) semi-open set	
57.	If X is a complete metric space, E is non-empty open subset of X, then	
	(1) E is of first category (2) E is of second category	
	(3) E is a null set (4) None of these	
58.	If G is a set of integers and $a.b \equiv a - b$ , then G is	
	(1) semi-group (2) non-group	
	(3) monoid (4) quasi-group	

Question No.	Questions
59.	If $G = \{1, -1, i, -i\}$ is a multiplicative group, then order of $-i$ is
	(1) 5 (2) 4 (3) 3 (4) 2
60.	Every group of prime order is  (1) abelian (2) sub-group (3) normal group (4) cyclic
61.	In Binomial distribution the parameter n ranges over the  (1) positive real numbers  (2) positive rational numbers  (3) positive integers  (4) integers
62.	The Jacobi's iteration method for the set of equations $x_1 + ax_2 = 2$ , $ax_1 + x_2 = 7\left(a \neq \frac{1}{\sqrt{2}}\right)$ converges for
	(1) $a = 1$ (2) $ a  < \frac{1}{\sqrt{2}}$
	(3) $a = \frac{1}{\sqrt{2}}$ (4) $\frac{1}{\sqrt{2}} < a < \frac{3}{\sqrt{2}}$
63.	$\int_{0}^{2} (8-x^{3})^{-\frac{1}{3}} dx =$
	(1) $\beta\left(\frac{1}{3}, \frac{2}{3}\right)$ (2) $\frac{1}{2}\beta\left(\frac{1}{3}, \frac{2}{3}\right)$ (3) $\frac{2}{3}\beta\left(\frac{1}{3}, \frac{2}{3}\right)$ (4) $\frac{1}{3}\beta\left(\frac{1}{3}, \frac{2}{3}\right)$
. (	3) $\frac{2}{3} \beta \left(\frac{1}{3}, \frac{2}{3}\right)$ (4) $\frac{1}{3} \beta \left(\frac{1}{3}, \frac{2}{3}\right)$

Question No.	Questions					
64.	<ul> <li>If f (x) is an even function of x in [-π, π], then Fourier series of f (x) consists of terms</li> <li>(1) with sines only</li> <li>(2) with cosines only</li> <li>(3) with constants</li> <li>(4) with sines and cosines both</li> </ul>					
65.	$ \begin{array}{lll} \hline{n.} & \hline{1-n} = \\ \hline (1) & \frac{\pi}{\sin n\pi} \\ \hline (3) & \frac{2}{\sin n\pi} \\ \hline (4) & \frac{\pi}{\sin \frac{n\pi}{2}} \end{array} $					
66.	The function $f(z) =  z ^2$ is  (1) everywhere analytic (2) nowhere analytic  (3) analytic at $z = 0$ (4) not defined at $z = 0$					
67.	If $f(z) = u(x, y) + i v(x, y)$ is analytic, then $f'(z) =$ $(1) \frac{\partial u}{\partial x} - i \frac{\partial u}{\partial y}$ $(2) \frac{\partial u}{\partial x} - i \frac{\partial v}{\partial x}$ $(3) \frac{\partial u}{\partial y} + i \frac{\partial v}{\partial x}$ $(4) \frac{\partial u}{\partial y} - i \frac{\partial v}{\partial x}$					

Questio	Code-I			
No.	Questions			
68.	Fixed point of the mapping $w = \frac{3z-4}{z-1}$ is			
	(1) $z = 2$ (2) $z = 4$			
	(3) $z = 3$ (4) $z = 1$			
69.	If V is the vector space of all polynomials of degree ≤ n over R, then dim V is			
	(1) n-1 (2) n			
	(3) $n+1$ (4) $n^2$			
70.	A bijective linear transformation is called			
	(1) monomorphism (2) homomorphism			
	(3) isomorphism (4) epimorphism			
71.	Absolute units of moment in S. I. system is			
	(1) Kg. m (2) Dyne centimeter			
	(3) Newton meter (4) gm. cm.			
72.	The centre of gravity of a thin uniform triangular lamina divides every			
	median in the ratio			
	(1) 2:1 (2) 1:2			
	(3) 2:3			

PG-EE-2013-Maths & Maths with (14) Comp. Sc.-Code-D

Question No.	Questions				
73.	The line of action of a force such that axis of the couple is coincident with this line, is called  (1) screw  (2) central line  (3) wrench  (4) central axis				
74.	The constant ratio which the limiting friction bears to the normal reaction is called  (1) Limiting Reaction (2) Co-efficient of Friction				
	(3) Statical Friction (4) Saturated Friction				
75.	Minimum distance between two forces which are equivalent to given system (R, K) and inclined at a given angle $2\alpha$ is  (1) $\frac{K}{R} \sin \alpha$ (2) $\frac{K}{R} \cos \alpha$ (3) $\frac{K}{R} \cot \alpha$ (4) $\frac{R}{K} \cot \alpha$				
76.	If p and q are positive real numbers, then the series $\frac{2p}{1^q} + \frac{3p}{2^q} + \frac{4p}{3^q} + \cdots \text{ is convergent for}$ (1) $p < q + 1$ (2) $p < q - 1$				
	(3) $p = q$ (4) $p < q$				

Questio No.	Questions
77.	If $a_n = \frac{\cos (n \pi/2)}{n}$ , then the sequence $\{a_n\}$ is
	(1) Convergent to 0
	(2) Convergent to 1
	(3) Convergent to $\frac{1}{2}$
	(4) diverges
78.	The limit superior and limit inferior of $\left\{\frac{(-1)^n}{n^2}\right\}$ are respectively equal to
	(1) $1,0$ (2) $-1,1$
	(3) 0, 0 (4) 0, 1
79.	If $\delta_n$ denotes the sum of n terms of the series $1 + \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{3}} + \cdots + \frac{1}{\sqrt{n}} + \cdots$ ,
	then $\sqrt{2} \sqrt{3}$
	(1) $\delta_n > n$ (2) $\delta_n > n^{3/2}$
	(3) $\delta_n > n^2$ (4) $\delta_n > n^{\frac{1}{2}}$
80.	If m is fixed positive integer, then
	$\lim_{n\to\infty}\frac{1}{n}\left[\left(m+1\right)\left(m+2\right)\cdot\cdots\cdot\left(m+n\right)\right]^{\frac{1}{n}}=$
(	1) $\frac{1}{e}$ (2) e (3) $\frac{2}{e}$ (4) $\frac{3}{e}$

PG-EE-2013-Maths & Maths with (16) Comp. Sc.-Code-D

Question No.	Questions				
81.	If $x_r = \cos \frac{\pi}{2^r} + i \sin \frac{\pi}{2^r}$ , then $x_1 x_2 x_3 \dots x_n \dots x_n = 0$				
	(1) $\frac{\pi}{2}$ (2) $-\frac{\pi}{2}$ (3) 1 (4) = 1				
	(3) 1 (4) = 1				
82.	The value of Wronskion W (x, x <sup>2</sup> , x <sup>3</sup> ) is				
	(1) $3 x^3$ (2) $3 x^2$ (3) $2 x^3$ (4) $2 x^2$				
	(1) $3x^3$ (2) $3x^3$ (4) $2x^2$				
83.	Which of the following is not an integrating factor of $x dy = y dx$ ?				
	$(1)  \frac{x}{y} \qquad \qquad (2)  \frac{1}{xy}$				
75.20	(1) $\frac{x}{y}$ (2) $\frac{1}{xy}$ (3) $\frac{1}{x^2}$ (4) $\frac{1}{x^2 + y^2}$				
84.	The orthogonal trajectory of the family $x^2 - y^2 = c$ are given by				
	(1) $\frac{x}{y} = c$ (2) $xy = c$				
	(3) $x - y = c$ (4) $x^2 + y^2 = c$				
85.	If $y(x) = x \cos 2x$ is a particular solution of $\frac{d^2y}{dx^2} + ay = -4 \sin 2x$ ,				
	then a = (1) 2 (2) -4 (3) 4 (4) 3				

PG-EE-2013-Maths & Maths with (17) Comp. Sc.-Code-D

Question	0			
No.	Questions			
86.	The magnitude of maximum directional derivative of			
	$\phi(x, y, z) = x^2 - 2y^2 + 4z^2$ at the point $(1, 1, -1)$ is			
	(1) $\sqrt{21}$ (2) $3\sqrt{21}$			
	(3) $2\sqrt{21}$ (4) 21			
87.	If $\vec{f}$ and $\vec{g}$ are irrotational, then $\vec{f} \times \vec{g}$ is			
	(1) 0 (2) solenoidal			
	(3) irrotational (4) constant			
88.	If n is outward unit normal drawn to a closed surface S, having volume			
	then $\iiint_{V} \operatorname{div}(\hat{\mathbf{n}}) dV =$			
	(1) 2 V . (2) V . (3) 2 S . (4) S			
89.	In an orthogonal curvilinear system, which one of the following statements			
	is correct?			
	(1) $\operatorname{div}\left(\operatorname{curl}\vec{\mathbf{f}}\right) = 0$			
	(2) $\operatorname{curl}\left(\operatorname{curl}\vec{\mathbf{f}}\right) = \vec{0}$			
	(3) $\operatorname{curl}\left(\operatorname{div}\vec{\mathbf{f}}\right) = 0$			
	(4) $\operatorname{div}\left(\operatorname{grad}\phi\right)=0$			
90.	Using Stoke's theorem, ∮ (yz dx +xz dy + xy dz), where c is the curve			
	$x^2 + y^2 = 1$ , $z = y^2$ ; is			
	(1) 2 (2) 1 (3) $\frac{1}{2}$ (4) 0			

PG-EE-2013-Maths & Maths with (18) Comp. Sc.-Code-D

Question No.	Questions				
91.	. The sum of the characteristic roots of the matrix				
	[3 7 6] 2 24 3 is 0 1 -8] (1) 17 (2) 19 (3) 21 (4) 25				
92.	If the given matix A is				
ran.	$\mathbf{A} = \begin{bmatrix} 1 & 0 & 1 \\ \sin \theta & \cos \theta & -\sin \theta \\ -\cos \theta & \sin \theta & \cos \theta \end{bmatrix}, \text{ then }  Adj A  =$				
	(1) 3 (2) 4 (3) sin 20 (4) 0				
93.	Determinant of an orthogonal matrix is				
	(1) -1 (2) 1 (3) 0 (4) ±1				
94.	The quadratic form ax <sup>2</sup> + 2 h xy + by <sup>2</sup> is positive definite iff				
	(1) $a > 0, b > 0, h > 0$ (2) $a > 0, h^2 - ab > 0$				
	(3) $a > 0$ , $ab - h^2 > 0$ (4) $a > 0$ , $h^2 - ab = 0$				
95.	If $\alpha$ , $\beta$ , $\gamma$ are the roots of the equation $x^3 - px^2 + qx - r = 0$ ,				
	then $\sum \alpha^2 \beta^2 =$				
	(1) $q^2 - 2 pr$ (2) $p^2 - 2 qr$				
	(3) $r^2 - 2 pq$ (4) 0				

PG-EE-2013-Maths & Maths with (19)
Comp. Sc.-Code-D

Question No.	Questions			
96.	The least number of imaginary roots of the equation $x^3 + 5x^3 + 2x - 3 = 0$ is			
	(1) 6 (2) 4 (3) 2 (4) 0			
97.	$\lim_{x \to -\infty} \left( \sqrt{9 x^2 - x} + 3 x \right) = 0$			
	(1) 3 (2) $\frac{1}{3}$			
	(3) $\frac{1}{4}$ (4) $\frac{1}{6}$			
98.	If $f(x) = a  \sin x  + b e + c  x ^3$ and $f(x)$ is differentiable at $x = 0$ , then			
	(1) $a = 0; b \in R, c = 0$			
	(2) $a = 0, b = 0; c \in \mathbb{R}$			
	(3) $a \in R; b = 0, c = 0$			
	(4) $a = 0, b = 0; c = 0$			
99.	If a curve of nth degree has n asymptotes, then they cut the curve in ho many points?			
	(1) $n(n-1)$ (2) $n-2$			
	(3) $n(n-2)$ (4) $n$			
100.	For the curve $r = a \sin n\theta$ , radius of curvature at the pole is			
	(1) na (2) $\frac{na}{3}$			
	(3) $2 \text{ na}$ (4) $\frac{\text{na}}{2}$			

PG-EE-2013-Maths & Maths with (20) Comp. Sc.-Code-D (DO NOT OPENTHIS QUESTION BOOKLET BEFORETIME OR UNTIL YOU ARE ASKED TO DO SO)

## PG-EE-2013

## Mathematics & Math with Computer Sc.

Code



Time: 1¼ hours	Max	. Marks : 100	Total Questions: 100
Roll No	_(in figure)	*2	(in words
Name	7.5	Father's Name	e
Mother's Name		Date of Exami	nation:
(Signature of the candid	late)		(Signature of the Invigilator)

## CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

- 1. All questions are compulsory and carry equal marks.
- 2. The candidate must return the Question book-let as well as OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means/misbehaviour will be registered against him/her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
- 3. In case there is any discrepancy in any question(s) in the Question Booklet, the same may be brought to the notice of the Controller of Examinations in writing within two hours after the test is over. No such complaint(s) will be entertained thereafter.
- 4. The candidate MUST NOT do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question book-let itself. Answers MUST NOT be ticked in the Question book-let.
- 5. Use only blue or black **BALL POINT PEN** of good quality in the OMR Answer-Sheet.
- 6. There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 7. BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE BOOK-LET. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER STARTING OF THE EXAMINATION.

