Q.28 Find the points of maxima and minima and correcponding maximum and minimum values of the following $y=x^3-6x^2+9x-9$.

Q.29 Evaluate $\int_0^{\frac{\pi}{2}} \cos^6 x dx$

Q.30 A curve is drawn to pass through the points given by the following table

X	1	1.5	2	2.5	3	3.5	4
Y	2	2.4	2.7	2.8	3	2.6	2

Find the area bounded by the curves, the x-axis and the lines X=1 to X=4 (using Trapezoidal Rule)

Q.31 If $f(x)=(3-4x)$, $g(x)=\log x$, find $\frac{d}{dx}\left(\frac{f(x)}{g(x)}\right)$

Q.32 Find $\frac{d^2y}{dx^2}$ if $y=x^3+e^x$

Q.33 Prove that $Sin(45°+A)Sin(45°-A)=\frac{1}{2}Cos2A$.

Q.34 Form the differential equation of the family of curves represented by $y^2=(x-c)3$.

Q.35 Prove that ${}^nC_r + {}^nC_{r-1} = {}^{n+1}C_r$

Section-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 Find the coefficient of x^{32} in the expansion of $\left(x^4-\frac{1}{x^3}\right)^{15}$

Q.37 Prove that $sin10° \; sin50° \; sin70° = \frac{1}{8}$

Q.38 Find the equation of the line through the point (2,2) and making an angle of 60° with the x-axis. Also determine the length of line from P to the point where it meets the line $x-\sqrt{3}\sqrt{y}+4=0$.

1st Year / Advance Diploma in Tool & Die Making
Subject : Applied Maths

Time : 3 Hrs. M.M. : 100

Section-A

Note: Multiple Choice questions. All questions are compulsory. (10x1=10)

Q.1 The 10^{th} term of A.P. 2,7,12,17, ... is

(a) 27 (b) 62
(c) 47 (d) 52

Q.2 The value of $Sin\ 60°$

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

Q.3 Value of $\lim_{x\to 0}\frac{sinx}{x}$ is

(a) 0 (b) 1
(c) -1 (d) none of the above

Q.4 $\frac{d}{dx}(\cos x) =$

(a) $Cos\ x$ (b) $sin\ x$
(c) $-\ sin\ x$ (d) $sec\ x$

Q.5 $\int 4x^7\ dx$ is

(a) $4x^6 + c$ (b) $\frac{x^8}{2}+C$
(c) $4x^8$ (d) x^8

Q.6 Value of $\int_2^3 \frac{1}{x}\,dx$ is

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

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

Q.7 The coordinates of the centre of the circles $x^2+y^2-8x-16y+78 = 0$ is

(a) (2,4) (b) (4,0)

(c) (4,8) (d) (0,8)

Q.8 Area of the triangle whose vertices are (4,5), (0,7), (-1,1) is

(a) 10 (b) 12

(c) 13 (d) 15

Q.9 Solution of differential equation $xdy - ydx = 0$ represents

(a) Parabola (b) Circle

(c) Hyperbola (d) Straight line

Q.10 The sum of infinite geometric series is $\frac{4}{3}$ and its first term is $\frac{3}{4}$ then its common ratio is

(a) $\frac{7}{16}$ (b) $\frac{9}{16}$

(c) $\frac{1}{9}$ (d) $\frac{7}{9}$

Section-B

Note: Objective/Completion type questions. All questions are compulsory. (10x1=10)

Q.11 The value of $^7P_2$ is _____

Q.12 1 right angles = _____ grades

Q.13 $Sin\ (A+B)$=_____

Q.14 By trapezoidal Rule formula for area under curve is $\int_a^b ydx$ = _____

Q.15 $\int e^x\,dx$ = _____

Q.16 $\frac{d}{dx}(x^n)$ = _____

Q.17 $\frac{d}{dx}(\sec^2 x)$ = _____

Q.18 Equation of a straight line passes through (2,–3) and makes an angle of 45° with *x-axis* is _____.

Q.19 Standard form of a Hyperbola is _____.

Q.20 The equation of line bisecting perpendicularly the line segment oining the points (-4,6) and (8,8).

Section-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Fifth term of an G.P. in 2 then the product of its 9 terms.

Q.22 Find the third term from the end in the expressions $\left(x+\frac{1}{x}\right)^6$

Q.23 Prove that $\frac{cos17°+sin17°}{cos17°-sin17°} = \tan 62°$

Q.24 The Vertices of a triangle are A(10,4), B(-4,9), C(-2,-1). Find the equation of median through A.

Q.25 Obtain the equation of a circle which passes through the intersection of lines $3x-2y-1=0$, $4x+y-27=0$ and whose centre is (2,-3)

Q.26 Find the equation of the hyperbola whose foci are (2,0), (-2,0) abd ecentricity is $\frac{3}{2}$.

Q.27 Evaluate $\lim_{x\to 0}\frac{sin5x+sin3x}{sin6x-sin2x}$