

- Q.28 Find the equation of the circle which passes through center $(-1, 5)$ and which passes through the point $(4, -3)$

Q.29 In the parabola $x^2 = -8y$. Find the length of the latus rectum and the co-ordinates of the focus of the parabola.

Q.30 Evaluate $\lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2}$

Q.31 Differentiate w.r.t. x $\frac{d}{dx} \left(\frac{\sin x}{1 - \cos x} \right)$

Q.32 Find the area under the curve $y = x^2 + 7$ between x-axis and $1 \leq x \leq 4$

Q.33 Evaluate $\int (x^3 + 5x^2 - 4 + \frac{7}{x} + \frac{2}{\sqrt{x}}) dx$

Q.34 Solve the differential equation $\frac{dy}{dx} = \frac{1 + \cos x}{1 - \cos x}$

Q.35 $\int_0^{\frac{\pi}{2}} \sin^7 x dx$

Section-D

Note: Long answer type questions. Attempt any two questions out of three questions. $(2 \times 10 = 20)$

- Q.36 Apply Simpson's rule to find the approximate value of $\int_0^1 \frac{1}{1+x^2} dx$ taking four equal intervals. hence obtain an approximate value of π correct to three places of decimal.

Q.37 Prove that $\sin 20^\circ \sin 40^\circ \sin 60^\circ \sin 80^\circ = \frac{3}{16}$

Q.38 Find the points of maxima and minima and corresponding maximum and minimum values of the function $f(x) = 2x^3 - 21x^2 + 36x - 20$.

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

Time : 3 Hrs.

M.M. : 100

Section-A

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

(20)

(4)

202012

(1)

202012

Section-B

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

- Q.11 Value of ${}^{18}\text{P}_3$ is _____
Q.12 Area of triangle by Heron's formula is $S =$ _____
Q.13 $\sin(A-B) =$

- Q.14 The equation of the circle is $X^2 + Y^2 + 2gx + 2fy + C = 0$
then its radius is _____

Q.15 Distance between the two points $P(x_1, y_1)$ and
 $Q(x_2, y_2)$ is _____

Q.16 Value of $\lim_{x \rightarrow 4} \frac{x^3 + 4}{1-x}$ is _____

Q.17 Value of $\frac{d}{dx}(5e^x)$ is _____

Q.18 The Area bounded by the curve $y=x^3$ the x -axis
and ordinates at $x=-2$ and $x=1$ is _____

Q.19 The order and degree of differential equation
 $\frac{d^3y}{dx^3} + y = 0$ is _____

Q.20 $\frac{d}{dx}(f(x)*g(x))$ is _____.

Section-C

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

- Q.21 Three numbers are in G.P. such that their sum is 38 and their product is 1728. Find the greatest number among them.

Q.22 Find 'n' if ${}^{2n}C_3:{}^nC_1 = 12:1$

Q.23 Find the fourth term in the expansion $\left(\frac{4}{7}x - y^2\right)^5$

Q.24 Evaluate $\tan 105^\circ$.

Q.25 Prove that $\sin 47^\circ + \cos 47^\circ = \cos 17^\circ$.

Q.26 If $f(x) = 2 - 8x$, $g(x) = \log x$ find $\frac{d}{dx}\left(\frac{f(x)}{g(x)}\right)$

Q.27 Find the equation of the triangle which bisect the line of $(5, 4)$ and $(-7, 0)$ and also bisect the line of $(6, -5)$ and $(0, -3)$.