

- 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. (2x10=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 $f(x) = 2x^3 - 21x^2 + 36x - 20$.

No. of Printed Pages : 4
Roll No.

202012

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)

- Q.1 If the sum of n terms of A.P. 2,4,6, is 240, then value of n is
(a) 14 (b) 15
(c) 16 (d) 17
- Q.2 π radian is equal to
(a) 60° (b) 45°
(c) 180° (d) 90°
- Q.3 $\sin(90^\circ + \theta)$ is (a) $\sin \theta$ (b) $\sec \theta$
(c) $\tan \theta$ (d) $\cos \theta$
- Q.4 If the slope of line AB is 6 and CD is parallel to AB, then slope CD is
(a) 3 (b) $\frac{1}{6}$
(c) 6 (d) $\frac{1}{3}$
- Q.5 If A (a, 4), B (4, 6), C (6, 8) are the vertices of a triangle then centroid is
(a) (1, 2) (b) (4, 6)
(c) (0, 0) (d) None of the above

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- Q.6 $\frac{d}{dx} (X^{\frac{-3}{4}})$ is
 (a) -6 (b) -9
 (c) 6 (d) -3
- Q.7 If $f(x) = \frac{x-1}{x+1}$ then $f(1)$ is
 (a) -1 (b) 1
 (c) 0 (d) $1/2$
- Q.8 $\int \frac{1}{4} x^9 dx$ is
 (a) $-\frac{1}{2x^8} + C$ (b) $x^{-10} + C$
 (c) x^8 (d) x^9
- Q.9 $\int_0^\pi \frac{x}{2} dx$ is equal to
 (a) π^2 (b) π
 (c) $\pi^2/3$ (d) $\pi^3/4$
- Q.10 Value of y in the following differential equation $= 5x + 7$ is
 (a) $5x^2$ (b) $\frac{5x^2}{2} + 7x + c$
 (c) $3x$ (d) $7x$

Section-B

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

- Q.11 Value of ${}^{18}P_3$ is _____
- Q.12 Area of triangle by Heron's formula is $S =$ _____
- Q.13 $\sin(A-B) =$ _____

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- 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 $(\frac{4}{7}x - y^2)^5$
- 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 $\frac{d}{dx} (\frac{f(x)}{g(x)})$
- 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).

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