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222012

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

Time : 3 Hrs. M.M. : 60

Section-A

Note: Multiple Choice questions. All questions are compulsory. (6x1=6)

Q.1 Conjugate of $-1+i$ is _____. (CO2)

(a) $-1 + i$ (b) $-1 - i$

(c) $1 - i$ (d) $1 + i$

Q.2 The number of terms in the expansion of $(x+y)^{10}$ is _____ (CO2)

(a) 10 (b) 9

(c) 11 (d) 3

Q.3 In which quadrant the point (7, –3) lies? (CO2)

(a) 1st (b) 3rd

(c) 2nd (d) 4th

Q.4 $\frac{d}{dx}(3x^2) =$ _____ (CO1)

(a) $3x$ (b) x

(c) x^2 (d) $6x$

Section-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

Q.23 Solve the following equation using Cramer's rule (CO2)

$$x + 3y = 4$$
$$4x - y = 3$$

Q.24 Using Trapezodial Rule, evaluate $\int_1^5 (x^2 + 1)dx$ by taking four equal intervals. (CO4)

Q.25 Find mean deviation about mean for the following data (CO5)

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	6	8	15	12	18	20	14	8

Q.5 $\int \frac{1}{x}\,dx =$ _____ (CO4)

(a) $\log x + c$ (b) $x^{-1} + c$

(c) $e^x + c$ (d) $\sin x + c$

Q.6 What is the mode of the individual series : 3, 3, 6, 10, 13 (CO5)

(a) 6 (b) 3

(c) 10 (d) None of these

Section-B

Note: Objective/Completion type questions. All questions are compulsory. (6x1=6)

Q.7 $135° =$ _____ Radians (CO3)

Q.8 Evaluate i^{24} (CO2)

Q.9 $\lim_{x\to 0} \frac{e^x - 1}{x} =$ _____ (CO1)

Q.10 The comment line used in *SCILAB* begins with _____. (CO5)

Q.11 $\int (x^2 - 3x + 4)dx =$ _____ (CO4)

Q.12 Find the value of ${}^{10}P_2$. (CO2)

Section-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 If $A = \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}$ then find AB. (CO1)

Q.14 The angles of elevation of the top of a rock from the top and food of 100mm high tower are respectively 30° and 45°. Find the height of the rock. (CO3)

Q.15 Write four advantages of *SCILAB*. (CO5)

Q.16 Evaluate $\lim_{x\to 3} \frac{x^2 - 9}{x - 3}$ (CO1)

Q.17 Expand $(x + y)^7$ by using binomial theorem. (CO2)

Q.18 Prove that: $\tan 13x - \tan 9x - \tan 4x = \tan 13x \tan 9x \tan 4x$. (CO3)

Q.19 Find the area under the curve $y = 2x^2$, when $0 \le x \le 4$. (CO4)

Q.20 Find the centre and radius of given equation of circle (CO3)

$$x^2 + y^2 + 2x + 4y - 4 = 0$$

Q.21 Differentiate $y = x^2 . e^x$ with respect to x. (CO1)

Q.22 Prove that the line joining (6, –4) & (–3, 2) is parallel to the line joining (1, 3) & (–2, 5) (CO3)