TED (21) – 1002 REVISION 2021

FIRST SEMESTER DIPLOMA EXAMINATION IN
ENGINEERING AND TECHNOLOGY
(Common to all Diploma Programmes)

MATHEMATICS I

MODEL QUESTION PAPER – SET-1

Time: 3 hours Maximum Marks: 75

PART A

I. Answer all questions in one word or one sentence. Each question carries one mark.

(9 x 1 = 9 Marks)

1	Find the conjugate of 3-2i	M1.01	U
2	Write the equation to a straight line in slope-intercept form	M1.02	U
3	Write the expression for sin2A	M2.03	R
4	Evaluate $\sin 60^0.\cos 30^0+\cos 60^0.\sin 30^0$	M2.03	R
5	Evaluate $\lim_{x\to 0}\frac{2x+3}{3x-5}$	M3.01	U
6	State Product Rule of differentiation	M3.04	R
7	Differentiate x.logx w.r.to x	M3.04	R
8	Find $\frac{dy}{dx}$ if $x^2+y^2=25$	M4.02	U
9	If y=sin x, find $\frac{d^2y}{dx^2}$	M4.03	A

PART B

II. Answer any eight questions from the following. Each question carries 3 marks

(8 x 3 = 24 Marks)

1	Find the sum and difference of complex numbers 2-3i and -4-i	M1.01	U
2	Find the modulus and amplitude of $\sqrt{3}+i$	M1.01	U
3	Find the equation to a straight line having x and y intercepts 3 and 5 respectively	M1.02	U
4	If $\tan\theta=1$, find $\sin\theta$ and $\cos\theta$	M2.02	R

5	Prove that tanA = $\frac{sin2A}{1+cos2A}$	M2.03	U
6	Evaluate $\lim_{\theta \to 0} \frac{sin2\theta}{3\theta}$	M3.02	R
7	Differentiate $y=e^x.sinx$ w.r.to x	M3.04	R
8	Differentiate y= $\frac{sinx}{1+cosx}$ w.r.to x	M3.04	R
9	If x=asecθ, y=btanθ, find $\frac{dy}{dx}$	M4.02	U
10	Find the second derivative of y=x.logx	M4.03	A

PART C

Answer all questions. Each question carries seven marks

(6 x 7 = 42 Marks)

III	Multiply i) (4-i)(3-5i) (4 Marks) ii) (4+i)(3-i) (3 Marks) OR	M1.01	U
IV	Find the equation to a straight line parallel to 2x+3y-4=0 and passing through the point (2,-3)	M1.04	U
V	Find the modulus and amplitude of i) 2-3i (4 Marks) ii) -1+2i (3 Marks) OR	M1.01	U
VI	Find the equation to a straight line passing through the points (-3,2) and (5,-3)	M1.02	U
VII	Show that $\frac{sinA}{1-cosA} + \frac{1-cosA}{sinA}$ = 2cosecA OR	M2.03	U
VIII	Show that $cos20^o\ cos40^o\ cos80^o = 1/8$	M2.03	U
IX	Evaluate $\lim_{x \to 3} \frac{x^4-81}{x^2-9}$ OR	M3.02	R

X	Differentiate w.r.to x i) $y = x^2.\sec x$ (3 Marks) ii) $y = \frac{1-x^2}{1+x^2}$ (4 Marks)	M3.04	R
XI	Evaluate $\lim_{x\to 0} \frac{\sin 4x+\sin 2x}{3x}$ OR	M3.02	R
XII	Find the derivative of tanx and cotx using quotient rule. (4+3 Marks)	M3.04	A
XIII	Differentiate w.r.to x i) y = log(secx+tanx) (4 Marks) ii) $y = \frac{\sin 2x}{1+\cos 2x}$ (3 Marks) OR	M4.01	A
XIV	If y=x.sinx, prove that $\frac{d^2y}{dx^2}$ + y=2cosx	M4.03	A

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MATHEMATICS I

MODEL QUESTION PAPER – SET-2

Time: 3 hours Maximum Marks: 75

PART A

I. Answer all questions in one word or one sentence. Each question carries one mark.

(9 x 1 = 9 Marks)

1	Find the sum of 2 + i and 1 - i	M1.01	U
2	Write the equation of a straight line passes through (a, b) and slope m	M1.02	R
3	Evaluate $\tan 45^0 - \cos 60^0$	M2.02	U
4	$\sin(180^0 + A)$ = ……..	M2.02	U
5	Evaluate $\lim_{x\to 1} \frac{x+1}{x+2}$	M3.01	U
6	Differentiate sinx – cosx with respect to x.	M3.03	R
7	Differentiate x.logx w.r.to x	M3.04	R
8	State quotient rule of differentiation	M4.01	A
9	If $y=e^x$, find $\frac{d^2y}{dx^2}$	M4.03	R

PART B

II. Answer any eight questions from the following. Each question carries 3 marks

(8 x 3 = 24 Marks)

1	Find the product of (2+i) and its conjugate?	M1.01	R
2	Find the modulus and amplitude of 1+i	M1.01	U
3	Find the equation to a straight-line having x and y intercepts 2 and 3 respectively	M1.02	R

4	If $\sin\theta = \frac{1}{2}$ then find $\cos\theta$	M2.02	R
5	If tanθ=2, find sin2θ	M2.03	A
6	Evaluate $\lim_{\theta \to 0} \frac{\sin 3\theta \cos\theta}{\theta}$	M3.02	U
7	Differentiate $\frac{\log x}{x}$ w.r.t. x	M3.04	U
8	Differentiate $x^2 \sin x$ w.r.to x	M3.04	A
9	Find $\frac{dy}{dx}$ if $x = at^2, y = 2at$	M4.02	U
10	If y = cosx then show that y"+ y = 0	M4.03	R

PART C

Answer all questions. Each question carries seven marks

(6 x 7 = 42 Marks)

III	Multiply i) (2+3i) and (4-5i) (4 marks) ii) (3+i)(1+i) (3 marks) OR	M1.01	R
IV	Find the equation to a straight line perpendicular to 2x-3y =5 and passes through the point (1,0)	M1.04	U
V	V i) Multiply (3+4i) and (1+2i) ii) Find the modulus and amplitude of √3+i (4 +3 marks) OR	M1.01	U
VI	Find the angle between the lines 2x-y+1=0 and x-3y+2=0	M1.03	A
VII	Show that $\frac{1+\sin\theta}{\cos\theta} + \frac{\cos\theta}{1+\sin\theta} = 2\sec\theta$ OR	M2.02	A
VIII	Show that $\sin 10^o \sin 50^o \sin 70^o = 1/8$	M2.03	A

IX X	XI Evaluate i) $\lim_{x\to 0}\frac{1-\cos 2x}{x^2}$ ii) $\lim_{x\to 0}\frac{\tan 3x}{x}$ (5+2) OR Differentiate $\frac{x^2\cos x}{\log x}$ i)	M3.02 M3.04	U U
XI XII	Evaluate i) $\lim_{x\to 0}\frac{1-\cos 2x}{x^2}$ ii) $\lim_{x\to 0}\frac{\tan 3x}{x}$ (5+2) OR Differentiate the following i) $x\,e^x\sin^{-1}x$ ii) $\frac{\sin x}{\sqrt{x}}$	M3.02 M3.04	U U
XIII XIV	Find $\frac{dy}{dx}$ if $ax^2+2hxy+by^2=0$ where a, h and b are constants. OR Differentiate the following i) $e^{2x}\cos 3x$ ii) $\sqrt{x^2+x+1}$ (4+3)	M4.02 M4.01	U U