

ANNEXURE A

MATHEMATICS LEVEL 3: GUIDELINE FOR QUESTION PAPERS

The following mark distribution between paper 1 and paper 2 is proposed for setting national examination papers

Paper 1 (3 hours)

TOPICS	MARKS
1. Complex Numbers	30
2. Functions and Algebra	
2.1 Functions	20
2.2 Algebra	
2.2.1 Manipulate and simplify algebraic expressions, solve algebraic equations and inequalities	20
2.2.2 Linear Programming	10
2.2.3 Differential Calculus	20
TOTAL	100

Paper 2 (3 hours)

TOPICS	MARKS
3. Space, Shape and Measurement	
3.1 Geometry	25
3.2 Trigonometry	25
4. Data Handling	30
5. Financial Mathematics	20
TOTAL	100

ANNEXURE B

MATHEMATICS LEVEL 3: GUIDELINE FOR TEACHING AND LEARNING

RECOMMENDED YEAR PLAN: The number of days spent on topics could differ based on the learning abilities of the students.

DAY	CONTENT TO COVER
1	Write imaginary numbers to its simplest form
2	Write imaginary numbers to its simplest form
3	Simplify negative roots
4	Use Argand diagrams to convert from rectangular to polar form.
5	Use Argand diagrams to convert from rectangular to polar form
6	Use Argand diagrams to convert from rectangular to polar form
7	Convert from polar to rectangular form
8	Perform addition and subtraction on complex numbers
9	Multiplication of complex numbers in polar form.
10	Multiplication of complex numbers in rectangular form
11	Division of complex numbers in polar form
12	Division of complex numbers in rectangular form using conjugates.
13	Division of complex numbers in rectangular form using conjugates.
14	Factorisation
15	Factorisation
16	Solve for unknown variables by factorisation
17	Multiplication and division of algebraic fractions
18	Multiplication and division of algebraic fractions
19	Addition and subtraction of algebraic fractions
20	Addition and subtraction of algebraic fractions
21	Manipulate algebraic expressions by completing the square
22	Manipulate algebraic expressions by completing the square
23	Solve quadratic equations by completing the square.
24	Solve quadratic equations by using the quadratic formula.
25	Simultaneous equations
26	Simultaneous equations
27	Algebraic graphs: Parabola
28	Algebraic graphs: Parabola
29	Algebraic graphs: Parabola
30	Simultaneous equations : Graphically
31	Algebraic graphs: Hyperbola
32	Algebraic graphs: Hyperbola
33	Algebraic graphs: Hyperbola
34	Algebraic graphs: Exponential
35	Algebraic graphs: Exponential
36	Quadratic Inequalities
37	Quadratic Inequalities

38	Quadratic Inequalities
39	Linear programming
40	Linear programming
41	Linear programming
42	Linear programming
43	Linear programming
44	Limits
45	First principles
46	First principles
47	Application of standard rule
48	Application of standard rule
49	Sum and difference rule
50	Sum and difference rule
51	Sum and difference rule
52	MAXIMA AND MINIMA
53	MAXIMA AND MINIMA
54	MAXIMA AND MINIMA
55	Recap of averages
56	Work out the 5 number summary
57	Work out the 5 number summary
58	Simple box and whisker
59	Fence values and outliers on a box and whisker
60	Fence values and outliers on a box and whisker
61	Grouped data : Recap Stem and leaf
62	Frequency Distribution table
63	Frequency Distribution table
64	Ogives and estimating quartiles
65	Ogives and estimating quartiles
66	Ogives and estimating quartiles
67	Histograms
68	Mean, median and mode of grouped data
69	Mean, median and mode of grouped data
70	Mean, median and mode of grouped data
71	Areas of lamina's
72	Areas of lamina's
73	Area and Volume of pyramids : Square base
74	Area and Volume of pyramids : Triangular base
75	Area and Volume of pyramids : Hexagonal base
76	Area and volume of cone
77	Area and volume of sphere.
78	Combinations
79	Co-ordinate geometry
80	Co-ordinate geometry
81	Co-ordinate geometry
82	Co-ordinate geometry
83	Special angles

84	Special angles
85	Reduction formula
86	Reduction formula
87	Reduction formula
88	Trigonometric identities
89	Trigonometric identities
90	Trigonometric equations
91	Trigonometric Graphs
92	Trigonometric Graphs
93	Trigonometric Graphs
94	Trigonometric Graphs :Obtaining equations
95	Trigonometric Graphs :Obtaining equations
96	Trigonometric equations
97	Trigonometric equations
98	Right angle triangles / Sine rule
99	Sine rule
100	Cosine rule
101	Cosine rule
102	Area rule
103	Area rule
104	Two dimensional problems
105	Two dimensional problems
106	Two dimensional problems
107	Social clubs budgets
108	Social clubs budgets
109	Income and expenditure Sheets
110	Income and expenditure Sheets (variance)
111	Simple interest
112	Compound interest
113	Compound interest
114	Compound interest
115	Compound interest
116	Time line and applications
117	Time line and applications
118	Time line and applications
119	Time line and applications

ANNEXURE C

MATHEMATICS LEVEL 3: FORMULAE SHEETS

Formulae Sheet: PAPER 1

$$1. Z = r \cos \theta + r j \sin \theta$$

$$2. Z = a \pm bj \text{ or } Z = a \pm bi \quad \text{where } i = j = \sqrt{-1}$$

$$3. r \angle \theta = r \operatorname{cis} \theta$$

$$4. m = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

$$5. \frac{d}{dx} x^n = nx^{n-1}$$

$$6. \frac{d}{dx} k = 0$$

$$7. D[kf(x)] = kD[f(x)]$$

$$8. D[f(x) \pm g(x)] = D[f(x)] \pm D[g(x)]$$

$$9. x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Formulae Sheet: PAPER 2

1. Slant surface area of a pyramid = $\frac{1}{2} a l n$
2. Volume of a pyramid = $\frac{1}{3} (\text{area of base}) \times \perp \text{ height}$
3. $s = \frac{1}{2}(a + b + c)$ and a, b, c are the sides of the triangle
4. $A = \sqrt{s(s-a)(s-b)(s-c)}$
5. Circumference of circle = $2\pi r$
6. Area of curved surface of a cone = $\pi r l$
7. Slant height of a cone = $l = \sqrt{h^2 + r^2}$
8. Volume of cone = $V_{\text{cone}} = \frac{1}{3} \pi r^2 h$
9. Area of a sphere = $A = 4\pi r^2$
10. Volume of a sphere = $V = \frac{4}{3} \pi r^3$
11. $m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$
12. $(x_m; y_m) = \left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2} \right)$
13. $\theta = \tan^{-1} m$
14. Distance = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
15. $\frac{\sin \theta}{\cos \theta} = \tan \theta$
16. $\sin^2 \theta + \cos^2 \theta = 1$
17. $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$
18. $a^2 = b^2 + c^2 - 2bc \cos \hat{A}$
19. $A = \frac{1}{2} ab \sin \hat{C}$
20. $\bar{x} = \frac{\sum_{i=1}^n x_i}{n}$

$$21. \bar{x} = \frac{\sum f_i x_i}{n}$$

$$22. Q_{j \text{ position}} = \frac{j}{4}(n+1)$$

$$23. Q_i = Q_3 - Q_1$$

$$24. \text{Fence} = Q_3 + 1.5(Q_i)$$

$$25. \text{Fence} = Q_1 - 1.5(Q_i)$$

$$26. Me = l + \frac{\left(\frac{n}{2} - F\right)}{f} \times c$$

$$27. Mo = l + \frac{f_m - f_{m-1}}{2f_m - f_{m-1} - f_{m+1}} \times c$$

$$28. I = A_0 \times \frac{r}{100} \times t \quad \text{or} \quad I = \frac{Prt}{100} \quad \text{or} \quad A_t = P(1 + in)$$

$$29. A_t = A_0 \left(1 + \frac{r}{100 \times m}\right)^{t \times m} \quad \text{or} \quad A_t = P(1 + i)^n$$

$$30. A_t = A_0 \left(1 - \frac{r}{100}\right)^t \quad \text{or} \quad A_t = P(1 - i)^n$$