Section–B

Attempt any Ten parts. All parts carry equal marks (4 × 10 = 40 marks)

Q # 2(i) Express the expression complex number $\left(1-\sqrt{3}i\right)^5$ in form of $a+bi$.	**Ex 1.3 – Exp 5(ii) – p27**
(ii) If A and B are non-singular matrices, then show that; $(AB)^{-1}=B^{-1}A^{-1}$	**Ex 3.3 – 17(i) – p114**
(iii) Prove that inverse element in a group is unique.	**Ex 2.8 –Theorem– p78**
(iv) Find the condition that $\dfrac{a}{x-a}+\dfrac{b}{x-b}=5$ may have roots equal in magnitude but opposite in signs.	**Ex 4.6 – 5 – p164**
(v) Resolve $\dfrac{2}{x^2(x+1)}$ into partial fraction.	**Ex 5.2 – – p185**
(vi) If $a=1-x+x^2-x^3+\dots$, $b=1+x+x^2+x^3+\dots$, $\lvert x\rvert<1$, then show that $2ab=a+b$.	**Ex 6.8 – Exp6– p214**
(vii) There are 8 men and 10 women members of a club. How many committees of seven can be formed having at least 4 women?	**Ex 7.4 – 9(iii) – p242**
(viii) Find the coefficient of x^n in the expansion of $\dfrac{1-x}{(1+x)^2}$	**Ex 8.3 – Exp5– p278**
(ix) Prove that; $\dfrac{\tan\theta+\sec\theta-1}{\tan\theta-\sec\theta+1}=\tan\theta+\sec\theta$.	**Ex 9.4 – 18 – p312**
(x) Draw the graph of $y=\sin x$ from -2π to 2π	**Ex 11.2– Art 11.5- p343**
(xi) Reduce $\sin^4\theta$ to an expression involving only functions of multiples of θ raised to the first power	**Ex10.3 – 14 – p332**
(xii) If a, b, c are the sides of triangle ABC, and R be the circum-radius then Prove that $R=\dfrac{abc}{4\Delta}$.	**Ex 12.8– Art – p379**
(xiii) Prove that $\tan^{-1}A+\tan^{-1}B=\tan^{-1}\dfrac{A+B}{1-AB}$.	**Ex 13.2 – Pro(v) – p399**
(xiv) Solve the equation $\sin 2x=\cos x$	**Ex 14– Exp 4- p404**

Section_C

Attempt any FIVE questions. All questions carry equal marks ($5\times8=40$)

Q # 3 : If $S=\{1,-1,i,-i\}$. Set up its multiplication table and show that the set is an abelian group under multiplication.	**Ex 2.8 – Exp15– p75**
Q # 4 : Find the value of λ for which the following system does not possess a unique solution. Also solve the system for the value of λ. $x_1+4x_2+\lambda x_3=2$, $2x_1+x_2-2x_3=11$, $3x_1+2x_2-2x_3=16$	**Ex 3.5 – 6 – p138**
Q # 5 : Solve the equation; $\left\{\begin{matrix} x^2-y^2=5 \\ 4x^2-3xy=18 \end{matrix}\right\}$	**Ex 4.9 – Exp3 – p171**
Q # 6: If the numbers $\frac{1}{2}$, $\frac{4}{21}$ and $\frac{1}{36}$ are subtracted from the three consecutive terms of a G.P., the resulting numbers are in H.P. Find the numbers if their product is $\frac{1}{27}$.	**Ex 6.10 – 18 – p225**
Q # 7 : Show that: $\binom{n}{0}+\frac{1}{2}\binom{n}{1}+\frac{1}{3}\binom{n}{2}+\frac{1}{4}\binom{n}{3}+\ldots+\frac{1}{n+1}\binom{n}{n}=\frac{2^{n+1}-1}{n+1}$	**Ex 8.2 – 14 – p274**
Q # 8: Prove without using table/calculator that $\cos 20^\circ \cos 40^\circ \cos 80^\circ=\frac{1}{8}$.	**Ex 10.4 – Exp 5 – p335**
Q # 9: Two forces of 20 Newton and 15 Newton, inclined at an angle of 45° are applied at a point on a body. If these forces are represented by two adjacent sides of a parallelogram and their resultant is represented by its diagonal, find the resultant force and also the angle which the resultant makes with the force of 20 Newton.	**Ex 12.5 – Exp 3 – p370**

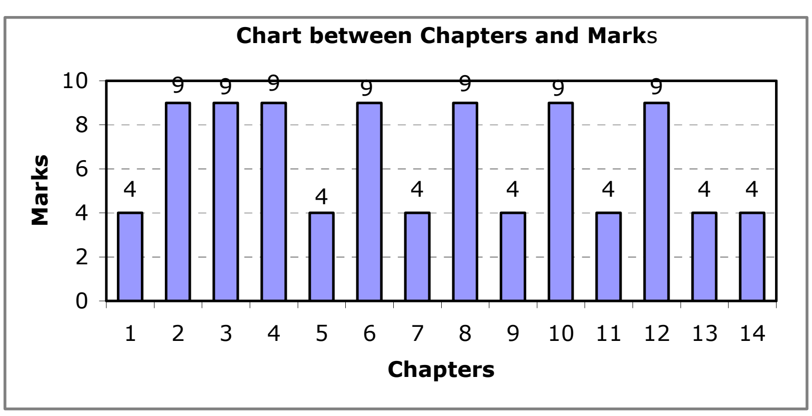

Chart between questions from exercises and examples (not from exercises)