## Section –B ($4 \times 10 = 40$ marks)

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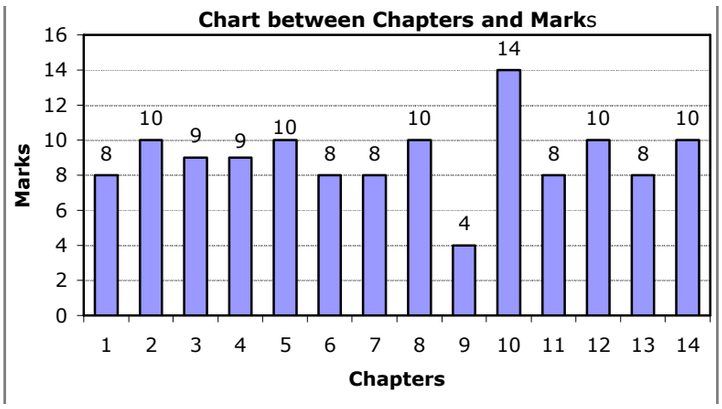
|---|---|
| **Q # 2 (i)** If $(G,*)$ is a group and $a \in G$, there is a unique inverse of $a$ in $G$.<br>**OR** Prove that sum as well as product of any two conjugate complex number is a real number. | **Ex 1.3 – Exp5(i) – p27**<br>**Ex 2.8 – Th. – p78** |
| **(ii)** If $A = \begin{bmatrix} i & 1+i \\ 1 & -i \end{bmatrix}$, show that $A + (\overline{A})$ is hermitian.<br>**OR** Which term of the sequence $x^2 - y^2, x+y, \frac{x+y}{x-y}, \ldots$ is $\frac{x+y}{(x-y)^9}$. | **Ex 3.3 – 6(ii) – p113**<br>**Ex 6.8 – 6(v) – p215** |
| **(iii)** Find the value of $n$ when ${}^{n}P_4 : {}^{n-1}P_3 = 9 : 1$<br>**OR** Using bionomial theorem, find the value of $(0.98)^{\frac{1}{2}}$ up to three places of decimal. | **Ex 8.3 – 2(vi) – p283**<br>**Ex 7.8 – 8 – p255** |
| **(iv)** Find the condition that one root of $x^2 + px + q = 0$ is double the other. | **Ex 4.6 – 8 – p164** |
| **(v)** Resolve into partial fraction $\frac{7x+25}{(x+3)(x+4)}$. | **Ex 5.2 – 3 – p185** |
| **(vi)** Find the value of the trigonometric functions of $\frac{-71}{3}\pi$, with out using calculator. | **Ex 9.3 – 6(viii) – p309** |
| **(vii)** If $\alpha + \beta + \gamma = 180^\circ$, show that<br>$\tan\alpha + \tan\beta + \tan\gamma = \tan\alpha \tan\beta \tan\gamma$ | **Ex 10.2 – 12 – p328** |
| **(viii)** Find the measure of the greatest angle if sides of a triangle are 16, 20, 33. | **Ex 12.8 – Exp3 – p383** |
| **(ix)** Solve the equation: $\text{cosec}^2\theta = \frac{4}{3}$. | **Ex 14 – 2(i) – p407** |
| **(x)** Prove that: $2Tan^{-1}\frac{2}{3} = Sin^{-1}\frac{12}{13}$.<br>**OR** Prove that tangent is periodic function and its period is $\pi$. | **Ex 13.2 – Exp6(i)-p397**<br>**Ex 11.1 – Note(i)-p340 (Not Proved in book)** |

## Section C ( 40 Marks )

***Note:*** *Attempt any four questions. Graph paper will be supplied on demand.*

| | | |
|---|---|---|
| **Q # 3 (a)** Show that $\overline{\left(\frac{z_1}{z_2}\right)} = \frac{\overline{z_1}}{\overline{z_2}}$ | **6** | **Ex 2.4 – 3(iv) – p55** |
| **(b)** Show that $\sim q \wedge (p \to q) \to \sim p$ is a tautology. | | **Ex 1.3 – Exp3 – p24** |

| | |
|---|---|
| **Q # 4 (a)** Find the value of $x$ if $\begin{vmatrix} 1 & x-1 & 3 \\ -1 & x+1 & 2 \\ 2 & -2 & x \end{vmatrix} = 0$. | **Ex 3.4 – 10(i) – p127** |
| **(b)** The area of a rectangular field is 297 square meters. Had it been 3 meter longer and one meter shorter, the area would have been 3 square meter more. Find its length and breadth. | **Ex 4.10 – 18 – p177** |
| **Q # 5 (a)** If $a, b, c$ and $d$ are in G.P, show that $a^2+b^2$, $b^2+c^2$, $c^2+d^2$ are in G.P. **4** | **Ex 6.7 – 6 – p209** |
| **(b)** Resolve into partial fraction: $\dfrac{6x^3+5x^2-7}{2x^2-x-1}$. | **Ex 5.3 – Exp2 – p186** |
| **Q # 6 (a)** Prove that ${}^{n-1}C_r + {}^{n-1}C_{r-1} = {}^{n}C_r$. | **Ex 7.2 – 13 – p236** |
| **(b)** If $x$ is so small that its square and higher powers can be neglected. Then show that $\dfrac{(1+x)^{\frac{1}{2}}(4-3x)^{\frac{3}{2}}}{(8+5x)^{\frac{1}{3}}} \approx 4\left(1-\dfrac{5}{6}x\right)$ | **Ex 8.3 – 12 – p284** |
| **Q # 7 (a)** Prove without using calculator, that $\sin 19^\circ \sin 11^\circ + \sin 71^\circ \sin 11^\circ = \dfrac{1}{2}$ | **Ex 10.2 – Exp5(ii) – p324** |
| **(b)** Reduce $\cos^4\theta$ to an expression involving only functions of multiple of $\theta$, raised to the first power. | **Ex 10.3 – 14 – p332** |
| **Q # 8 (a)** Draw graph of $y = \tan x$, $x \in [-\pi, \pi]$. **4** | **Ex 11.2 – 1(vi) – p351** |
| **(b)** With usual notation, prove that; $r = \dfrac{\Delta}{s}$. **6** | **Ex 12.8 – Art – p381** |
| **Q # 9 (a)** Show that $\cos\left(2\sin^{-1}x\right) = 1-2x^2$ **4** | **Ex 13.2 – Exp6 – p399** |
| **(b)** Find the solution set of $\sin 2x + \cos x = 0$. **6** | **Ex 14 – 12 – p407** |



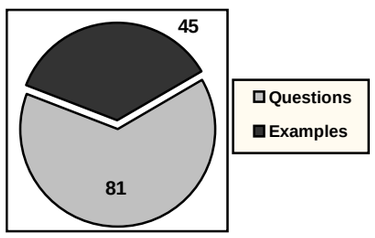




**Chart between questions from exercises and examples (not from exercises)**