

General Instructions :-**The question paper is divided into Four section.**

- Section - A : Q. No. 1 contains Seven multiple choice type of questions carrying two mark each.
Q. No. 2 contains four very short answer type of questions carrying One mark each.
- Section - B : Q. No. 3 to Q. No. 13 contains Eleven short answer type of questions carrying two marks each. (Attempt any Eight)
- Section - C : Q. No. 14 to Q. No. 19 contains Six short answer type of questions marks each. (Attempt any Four)
- Section - D : Q. No. 20 to Q. No. 23 contains Four long answer type of questions carrying Four mark each. (Attempt any two)
- Figures to the right indicate full mark.
- For each MCQ, correct answer must be written along with its alphabet.
e.g (a) / (b) / (c) / (d)
Only first attempt will be considered.

Section - A**Q.1. Select and write the most appropriate answer for the given alternatives for each questions:**

- $(-140)^\circ$ lies in _____ quadrant.
a) I b) II c) III d) IV
- If cartesian co-ordinate of point $(-1, -1)$ then its polar co-ordinate will be _____
a) $(\sqrt{2}, \frac{5\pi}{4})$ b) $(\sqrt{2}, -\frac{5\pi}{4})$ c) $(1, \frac{\pi}{4})$ d) $(1, -\frac{\pi}{4})$
- $\cos(600)^\circ =$ _____
a) $\frac{1}{2}$ b) $-\frac{1}{2}$ c) $\frac{\sqrt{3}}{2}$ d) $-\frac{\sqrt{3}}{2}$
- If $(x + \frac{1}{3}, \frac{y}{3} - 1) = (\frac{1}{2}, \frac{3}{2})$ then $(x, y) =$ _____
a) $(-\frac{1}{6}, \frac{15}{2})$ b) $(\frac{1}{6}, \frac{15}{2})$ c) $(-\frac{1}{6}, -\frac{15}{2})$ d) $(\frac{1}{6}, -\frac{15}{2})$
- If $r = \frac{1}{3}$, $a = 9$ in G.P then $t_7 =$ _____
a) $\frac{1}{3^2}$ b) $\frac{1}{3^3}$ c) $\frac{1}{3^4}$ d) $\frac{1}{3^7}$

Q.2. Answer the following questions.

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- 1) Convert $\left(\frac{7\pi}{12}\right)^c$ into degree.
- 2) Find the value of $\tan 105^\circ$.
- 3) Find the slope of line passing through points G (7,1) & H (-3, 1).
- 4) Write the roster form of :

$$A = \{x/x = 2n + 1, n \in N\}$$

Section B**Attempt any Eight of the following question:**

16

- Q.3. Express the following angle in degree, minute & second.
 $(183.7)^\circ$
- Q.4. Evaluate : $4\cot 45^\circ - \sec^2 60^\circ + \sin 30^\circ$
- Q.5. If $\cos \theta = -\frac{3}{5}$ and $180^\circ < \theta < 270^\circ$ then find $\sin \theta$ & $\tan \theta$.
- Q.6. Prove : $\tan\left(\frac{\pi}{4} + \theta\right) = \frac{1 + \tan \theta}{1 - \tan \theta}$
- Q.7. Find the value $\sec (-855)^\circ$.
- Q.8. Find the equation of line containing point A (3,5) and having slope $\frac{2}{3}$.
- Q.9. If A and B are subsets of universal set X where $n(X) = 50$, $n(A \cap B) = 10$ find $n(A \cup B)$
- Q.10. If $A = \{a, b, c\}$ & $B = \{x, y\}$ find $A \times B$ & $B \times A$.
- Q.11. Describe the following set in set builder form

$$\left\{\frac{1}{2}, \frac{2}{5}, \frac{3}{10}, \frac{4}{17}, \frac{5}{26}, \frac{6}{37}, \frac{7}{50}\right\}$$
- Q.12. If the common ratio of G.P is $\frac{2}{3}$ and sum to infinity is 12. Find the first term.
- Q.13. Find A.M. of two positive numbers whose G.M. and H.M. are 4 and $\frac{16}{5}$ respectively.

Section C**Attempt any Four of the following subquestions:**

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- Q.14. The measures of the angles of a triangle are in the ratio 3 : 7 : 8. Find their measures in degree and radian.
- Q.15. Find the slope, X intercept, Y intercept of the line $2x + 3y - 6 = 0$
- Q.16. For a G.P, if $t_4 = 16$, $t_9 = 512$ then find S_{10} .
- Q.17. Find the sum : $\sum_{r=1}^n (r+1)(2r-1)$.
- Q.18. Solve the inequality and write solution set using interval notation :
 $-9 < 2x + 7 \leq 19$

- Q.19.** Write the relation in Roster form. State its domain & range :

$$R_6 = \{(a, b) / a \in N, a < 6 \text{ and } b = 4\}$$

Section D

Attempt any Two of the following.

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- Q.20.** Prove : $16 \sin \theta \cdot \cos \theta \cdot \cos 2\theta \cdot \cos 4\theta \cdot \cos 8\theta = \sin 16\theta$
- Q.21.** N (3, - 4) is the foot of the perpendicular drawn from the origin to line L.
Find the equation of line L.
- Q.22.** There are 260 persons with a skin disorder. If 150 had been exposed to the chemical A, 74 to the chemical B, and 36 to both chemical A and B. Find the number of person exposed to (i) Chemical A but not Chemical B (ii) Chemical A or Chemical B.
- Q.23.** Find the sum to n terms.
 $3 + 33 + 333 + 3333 + \dots$