P.V.G.'s

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Terminal Examination (2025-26)

Standard - XI

Subject : Mathematics | Marks - 50

Date : 14.10.2025 | Time : 8.30 am to 11.00 am

General Instructions:

The question paper is divided into four sections :

1) Section A : Q. No. 1 contains eight multiple choice type questions carrying two mark each. Q. No. 2 contains four very short answer type questions carrying one mark each.
2) Secton B : Q. No. 3 to Q. No. 12 are ten very short answer type questions carrying two marks each. (Attempt any Eight)
3) Section C : Q. No. 13 to Q. No. 16 are four short answer type questions carrying three marks each. (Attempt any Two)
4) Section D : Q. No. 17 to Q. No. 20 are four long answer type questions carrying four marks each. (Attempt any Two)
5) Figures to the right indicate full marks.
6) For each multiple choice of questions, only the first attempt will be considered for evaluation.

Section - A

Q1. A) Select the correct option from the given alternatives. (2 marks each) (16)

i) 156^0 is equal to _____

a) $\left(\frac{17\pi}{15}\right)^c$ b) $\left(\frac{13\pi}{15}\right)^c$ c) $\left(\frac{11\pi}{15}\right)^c$ d) $\left(\frac{7\pi}{15}\right)^c$

ii) The value of $\tan 1^0.\tan 2^0.\tan 3^0 \ldots\ldots \tan 89^0$ is _____

a) -1 b) 1 c) $\frac{\pi}{2}$ d) 2

iii) The value of $\tan\left(\frac{\pi}{4} + \theta\right)$ =

a) $\frac{1 - \tan\theta}{1 + \tan\theta}$ b) $\frac{1 + \tan\theta}{1 - \tan\theta}$ c) $\frac{\tan\theta - 1}{\tan\theta + 1}$ d) $\frac{\tan\theta + 1}{\tan\theta - 1}$

iv) If $\cos x = \frac{4}{5}$ then value of $\cos 2x$ =

a) $\frac{9}{25}$ b) $\frac{4}{25}$ c) $\frac{1}{25}$ d) $\frac{7}{25}$

v) The value of $i + i^2 + i^3 + i^4$ =

a) 1 b) -1 c) 0 d) 2

vi) If ω is a complex cube root of unity, then the value of $\omega^{99} + \omega^{100} + \omega^{101}$ is _____.

a) -1 b) 1 c) 0 d) 3

vii) For any non-empty set A, if n(A) = 4 then n(P(A)) =

a) 4 b) 16 c) 8 d) 2

viii) For any non-empty set A, $(A \cup A') \cap A$ =

a) $\cup$ b) ϕ c) A d) A′

Q2. Answer the following questions. (1 mark each) **(4)**

i) Verify whether the given angles are co-terminal -405^0 and 675^0.

ii) Evaluate $\text{cosec}\ 45^0 + \cot 45^0 + \tan 0^0$.

iii) Find the conjugate of $\sqrt{2} + \sqrt{3}\,i$

iv) Write the Set - Builder form of [-3, 4)

Section B

Attempt any eight of the following questions. (2 marks each) **(16)**

Q3. Draw the angles of the following measures and determine their quadrants.

i) -330^0 ii) 420^0

Q4. If $\tan\theta = \frac{1}{2}$, evaluate $\frac{2\sin\theta + 3\cos\theta}{4\cos\theta + 3\sin\theta}$

Q5. Find the value of $\tan(840^0)$

Q6. Prove that $\frac{1 - \cos 2\theta}{1 + \cos 2\theta} = \tan^2\theta$

Q7. Express $2\cos 35^0 \cos 75^0$ as sum or difference of two trigonometric function.

Q8. If A = (-7,3], B = [2,6] and C = [4,9] then determine the following.

i) $A \cap B$ ii) $B' \cap C'$

Q9. If $A = \{x \mid 6x^2 + x - 15 = 0\}$

$B = \{x \mid 2x^2 - 5x - 3 = 0\}$

$C = \{x \mid 2x^2 - x - 3 = 0\}$

then find i) $(A \cup B \cup C)$ ii) $(A \cap B \cap C)$

Q10. Find a & b if $a + 2b + 2ai = 4 + 6i$

Q11. If $z = 2 + 3i$, then find the following

(i) $z - \overline{z}$ (ii) $z + \overline{z}$

Q12. If w is complex cube root of unity then find the following

i) ω^{-105} ii) ω^{18}

Section C

Attempt any two of the following. (3 marks each) **(6)**

Q13. Find the angle between hour - hand and minute - hand in a clock at Quarter to twelve.

Q14. Prove that $\dfrac{\tan\theta}{\sec\theta - 1} = \dfrac{\sec\theta + 1}{\tan\theta}$

Q15. Express the complex number in polar and exponential form : $z = -\sqrt{3} + i$

Q16. Solve the following inequality and write the solution set using interval notation:

$-9 < 2x + 7 \leq 19$

Section D

Attempt any two of the following. (4 marks each) **(8)**

Q17. Find the other trigonometric functions if $\sec A = -\frac{25}{7}$ and A lies in the second quadrant.

Q18. Prove that $\frac{\tan 5A - \tan 3A}{\tan 5A + \tan 3A} = \frac{\sin 2A}{\sin 8A}$

Q19. Use De- Moivres theorem and simplify

$$\frac{\cos 5\theta + i \sin 5\theta}{(\cos 3\theta - i \sin 3\theta)^2}$$

Q20. In a class of 200 students who appeared certain examinations, 35 students failed in in CET, 40 in NEET and 40 in JEE, 20 failed in CET and NEET, 17 in NEET and JEE, 15 in CET and JEE, and 5 failed in all three examinations. Find how many students,

i) did not fail in any examination.

ii) failed in NEET or JEE entrance.

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