Sahaj Adhyayan (सहज अध्ययन)

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तर ते आम्हाला WhatsApp वर पाठवा,

इतर विद्यार्थी मित्रांना त्या सर्वांचा उपयोग होईल.

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of Arts, Science & Commerce, Baramati.
Terminal Examination Dec.-Jan.2021-22

STD: - XI Science | **Mathematics and Statistics** | Max. Marks: - 50

Date :- 05/01/2022 | Time :- 10: 00 *to* 12: 30 pm

Instructions :-

1) **Section A : Q.1** contains 5 multiple choice type questions carrying 2 marks each. **Q.2** contains 4 very very short answer type questions carrying one mark each.
2) **Section B : Q.3** to **Q.13** are very short answer type of questions carrying two marks each.
3) **Section C: Q.14** to **Q.19** contains six short answer type of questions carrying three marks each.
4) **Section D : Q.20** to **Q.23** are long answer type of questions carrying 4 marks.
5) Use of calculator is not allowed.
6) Figures to the right indicate full marks.

SECTION –A

Q.1 Select and write the most appropriate answer from the given alternatives for each question. **[10 Marks]**

1) The measure of co-terminal angles differ by an integral multiple of.....

(A) 90° (B) 180° (C) 360° (D) 270°

2) The quadrant in which θ lies if $sin\theta > 0$ and $cos\theta < 0$....

(A) First quadrant (B) Second quadrant

(C) Third quadrant (D) Fourth quadrant

3) The value of $\tan\left(\frac{\pi}{2} + \theta\right) = \cdots$

(A) $-cot\theta$ (B) $cot\theta$ (C) $tan\theta$ (D) $-tan\theta$

4) The value of $i^{20} + i^{22} = ...$

(A) -1 (B) 0 (C) 1 (D) 2

5) The 6^{th} term of G.P. 2 , 4 , 8, 16,---- is.....

(A) 64 (B) 256 (C) 32 (D) 128

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[04 Marks]

Q.2) Answer the following questions:

1) Convert the angle $\left(\frac{11\pi}{18}\right)^c$ in degree.

2) State the sign of $tan230^0$.

3) Write the real part and imaginary part of complex number $(7+\sqrt{2}i)$.

4) Write the conjugate of $z = 5 + 3i$.

SECTION –B

Attempt any EIGHT of the following questions : [16 Marks]

Q.3 Find the angle between hour-hand and minute-hand in a clock at 2 : 20 .

Q.4 Find the degree and radian measure of interior and exterior angle of regular hexagon.

Q.5 Eliminate θ if $x = 3sec\theta, y = 4tan\theta$.

Q.6 Evaluate : $sin30° + cos45° + tan180°$.

Q.7 Find the value of $sin75°$.

Q.8 Find the modulus and amplitude of the complex number $3 + 3i$.

Q.9 If $z_1 = 2 + 5i$ and $z_2 = 3 + 4i$ are two complex numbers then find

(a) $z_1 + z_2$ (b) $z_1 - z_2$.

Q.10 If ω is complex cube root of unity, then show that

$(1+\omega)^3 - (1+\omega^2)^3 = 0$.

Q.11 Check whether the sequence 2, 6 , 18, 54, ... is in G.P. .

Q.12 For the G.P. , if $a = 1$, $r = 2$ find S_n.

Q.13 Find A.M. and G.M. of the numbers 3 and 27 .

SECTION –C

Attempt any FOUR of the following questions : [12 Marks]

Q.14 If $2\,sin^2\theta + 3sin\theta = 0$, find the possible values of $cos\,\theta$.

Q.15 Prove that : $cos\left(\frac{\pi}{4}+x\right) + cos\left(\frac{\pi}{4}-x\right) = \sqrt{2}cosx$.

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Q.16 Prove that : $\frac{\cot\left(\frac{\pi}{2}+\theta\right)\sin(-\theta)\cot(\pi-\theta)}{\cos(2\pi-\theta)\sin(\pi+\theta)\tan(2\pi-\theta)} = -\operatorname{cosec}\theta$.

Q.17 If ω is complex cube root of unity, find the value of

(a) ω^{18} , (b) ω^{30} (c) $\omega + \frac{1}{\omega}$.

Q.18 If $\frac{a+3i}{2+ib} = 1 - i$, show that $5a - 7b = 0$.

Q.19 The numbers $(x-6)$, $(2x)$ *and* (x^2) are in G.P.

Find i) x ii) 1^{st} term iii) n^{th} term

SECTION –D

Attempt any TWO of the following questions : **[8 Marks]**

Q.20 Two angles of a triangle are $\frac{5\pi^c}{9}$ and $\frac{5\pi^c}{18}$. Find the degree and radian measure of third angle.

Q.21 If $\tan x = -\frac{5}{12}$, x lies in the fourth quadrant then find the values of other trigonometric functions.

Q.22 If $z_1 = 2 + 5i$ and $z_2 = 3 + 4i$ then represent z_1 , $\bar{z}_1$, z_2 , $\bar{z}_2$ in Argands diagram. Hence find $(z_1 \cdot z_2)$.

Q.23 Find the sum to n terms $8 + 88 + 888 + 8888 + \cdots$.

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