Periodic Test (2) 2019-20

Sub. : Maths

Class : X

Time : 2.30 Hrs. M.M. : 40

Section-A (1×4=4 marks)

Q.1 What is the HCF of two consecutive even no.

a) 1 b) 2 c) 4 d) 8

Q.2 Next term of the A.P. $\sqrt{8}$, $\sqrt{18}$, $\sqrt{32}$, ...is

a) $5\sqrt{2}$ b) $5\sqrt{3}$ c) $3\sqrt{3}$ d) $4\sqrt{3}$

Q.3 If $\sin\theta+\cos\theta=\sqrt{2}\cos\theta$ then value of $\tan\theta$ is-

a) $\sqrt{2}+1$ b) $\sqrt{2}-1$ c) $\sqrt{2}$ d) $-\sqrt{2}$

Q.4 Area of two similar triangles are in ratio 4 :9. Sides of these triangles are in the ratio -

a) 2 :3 b) 4 :9 c) 81 :16 d) 15 :81

Section-B (2×4=8 marks)

Q.5 The larger of two supplementary angles exceeds the smaller by 18^0 find them.

Q.6 Find relation between x and y such that point (x, y) is equidistant from the points (7, 1) & (3, 5).

Q.7 If A, B & C are interior angle of a Δ ABC than show that :

$$Sin\left(\frac{B+C}{2}\right)=Cos\frac{A}{2}$$

Q.8 Show that any positive odd integer is of the form 6q + 1 or 6q + 3, or 6q +5, where q is some integer.

Section-C ($3\times4=12$ marks)

Q.9 Prove that the area of equilateral triangle described on one side of a square is equal to half the area of the equilateral triangle described on one of its diagonal.

Q.10 Find the area of triangle formed by joining the mid points of the sides of triangle whose vertices are $(0, -1)$ $(2, 1)$ and $(0, 3)$.

Q.11 Prove that :

$$(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A.$$

Q.12 If the sum of first m terms of an AP is the same as the sum of first n terms. Show that the sum of first $(m+n)$ terms is zero.

Section-D ($4\times4=16$ marks)

Q.13 Find the co-ordinates of the points which divide the line segment joining $A(-2, 2)$ and $B(2, 8)$ into four equal parts.

Q.14 If the sum of the first n terms of an AP is $4n-n^2$ than find :

a) First term

b) Sum of first two terms

c) Second term

d) n^{th} term.

Q.15 Two poles of equal height are standing opposite each other on either side of the road. Which is 80m wide. From a point between them on the road. The angle of elevation of the top of the poles are 60^0 & 30^0 respectively. Find the height of the pole and the distances of the point from the poles.

Q.16 A train travels 360 km at a uniform speed. If the speed had been 5km/hr more, it would have taken 1 hour less for the same journey. Find the speed of the train.

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Sub: Maths

CLASS-X

MARKING SCHEME

PERIODIC TEST-II (2019-20)

Section A

1) (b) 2 — 1 Marks

2) (a) $5\sqrt{2}$ — 1 ''

3) (b) $\sqrt{2}-1$ — 1 ''

4) (d) ~~16 : 81~~ 2 : 3 — 1 ''

Section-B

5) $x-y=18$

$x+y=180$ — 1 Marks

$x=99, \quad y=81$ — 1 Marks

6) $(x-7)^2+(y-1)^2=(x-3)^2+(y-5)^2$ — 1 Marks

$x-y=2$ — 1 Marks

7) $A+B+C=180$ — 1/2 Marks

$\frac{B+C}{2}=90-\frac{A}{2}$ — 1/2 ''

$\sin\left(\frac{B+C}{2}\right)=\cos\frac{A}{2}$ — 1 ''

8) $a=bq+r \quad 0\leq r<b$ — 1/2 Marks

$r=0,1,2,3,4,5$

for all possible values — 1 Marks

$6q+1$, $6q+3$ & $6q+5$ are odd — 1/2 Marks.

Section-C

9) correct fig, given, to prove — $[\frac{1}{2}\times 3=1\frac{1}{2}]$

Proof :-

$AC = \sqrt{2}a$, $\Delta DCF \sim \Delta AEC$

$$\frac{ar(\Delta DCF)}{ar(\Delta AEC)} = \frac{DC^2}{AC^2}$$

$$= \frac{a^2}{(\sqrt{2}a)^2} = \frac{a^2}{2a^2} = \frac{1}{2}$$

10) Mid points $\left(\frac{0+0}{2}, \frac{3-1}{2}\right) = (0,1)$ ½ Marks

$\left(\frac{0+2}{2}, \frac{-1+1}{2}\right) = (1,0)$ ½ Marks

$\left(\frac{0+2}{2}, \frac{3+1}{2}\right) = (1,2)$ ½ Marks

Area of $\Delta = \frac{1}{2}[1(2-1)+1(1-0)+0(0-2)]$ 1/2

$= 1$ sq unit 1

11) $L.H.S = \sin^2 A + \operatorname{cosec}^2 A + 2\sin A \operatorname{cosec} A$ 1 Mark

$+ \cos^2 A + \sec^2 A + 2\cos A \sec A$

$= (\sin^2 A + \operatorname{cosec}^2 A + 2) + (\cos^2 A + \sec^2 A + 2)$

$= 1 + (1 + \cot^2 A) + (1 + \tan^2 \theta) + 4$ 1 Mark

$= 7 + \tan^2\theta + \cot^2\theta = RHS$ 1 Marks

12) $S_m = S_n \Rightarrow \frac{m}{2}[2a + (m-1)d] = \frac{n}{2}[2a + (n-1)d]$ 1

or $2a = -d(m+n-1)$ —— (1) 1

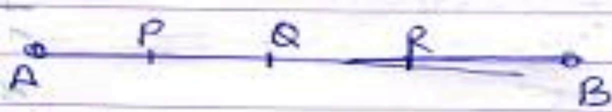
½ $S_{m+n} = \frac{m+n}{2}[2a + (m+n-1)d]$

$\frac{m+n}{2}\left[-d(m+n-1)+d(m+n-1)\right)$

$= \frac{m+n}{2} \times 0 = 0$ 1

Section-D

(13)



1

P div in ratio 1:3

$P \to \left(-1, \frac{7}{2}\right)$ 1

Q div in ratio 1:1

$Q \to (0, 5)$ 1

R div in ratio 3:1

$R \to \left(1, \frac{13}{2}\right)$ 1

14) (a) $S_1 = a_1 = 3$ 1

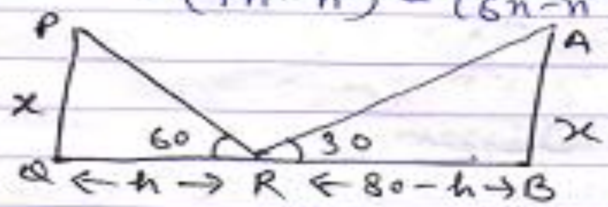
(b) $S_1 + S_2 = 3 + 4 = 7$ 1

(c) $S_2 = 4(2) - (2)^2 = 4$ 1

(d) $a_n = S_n - S_{n-1}$

$= (4n - n^2) - (6n - n^2 - 5) = 5 - 2n$ 1

15)



1

ΔPRQ $\tan 60 = \frac{PQ}{QR} \Rightarrow x = h\sqrt{3}$ —(1) ½

In ΔABR $\tan 30 = \frac{AB}{Br} \Rightarrow \frac{1}{\sqrt{3}} = \frac{x}{8-h}$ ½

or $4h = 80 \Rightarrow h = 20$

16) Let speed of train = x Km/hr

$\therefore \frac{360}{x} - \frac{360}{x+5} = \frac{48}{60}$ 2 Marks

$x^2+5x-2250=0$ 1 "

$(x+50)(x-45)=0$

$x=45$ 1 "

original speed of train = 45 Km/hr