ETOSKFT

SUMMATIVE ASSESSMENT – I, 2016-17.
MATHEMATICS
Class – IX

Time Allowed : 3 hours **Maximum Marks: 90**

General Instructions:

1. All questions are **compulsory**.
2. The question paper consists of 31 questions divided into **four sections A, B, C and D**. **Section-A** comprises of 4 questions of **1 mark** each; **Section-B** comprises of 6 questions of **2 marks** each; **Section-C** comprises of 10 questions of **3 marks** each and **Section-D** comprises of 11 questions of **4 marks** each.
3. There is no overall choice in this question paper.
4. Use of calculator is not permitted.

SECTION-A

Question numbers 1 to 4 carry one mark each.

1 Simplify $\left(\sqrt{x^3}\right)^{\frac{2}{3}}$ 1

2 Factorise : $125x^3+y^3$. 1

3 The measures $(30-a)^\circ$ and $(125+2a)^\circ$ of two angles are supplement of each other. Find the value of a. 1

4 If the area of a parallelogram is 64 cm^2, base is 12 cm, then find the altitude of the parallelogram. 1

SECTION-B

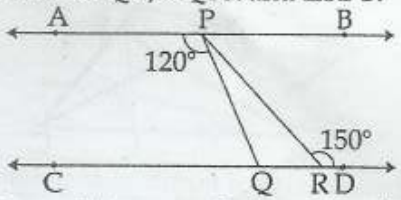
Question numbers 5 to 10 carry two marks each.

5 Express $0.00\overline{875}$ in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$. 2

6 Determine whether $3x-2$ is a factor of $3x^3+x^2-20x+12$. 2

7 State playfair's axiom. Is it equivalent to one of the Euclid's postulate. 2

8 In given figure AB || CD. Determine ∠PQR, ∠QPR and ∠RPB. 2



9 A point lies on x-axis at a distance of 5 units from y-axis. What are its co-ordinates ? What will be its co-ordinates, if it lies on y-axis at a distance of 5 units from x-axis ? 2

10 The semiperimeter of a triangle is 132 cm and the product of the differences of semi – perimeter and its respective sides (in cm) is 13200. Find the area of the triangle. 2

22 Simplify : $\left(\frac{81}{16}\right)^{-\frac{3}{4}} \times \left[\left(\frac{25}{9}\right)^{\frac{-3}{2}} \div \left(\frac{5}{2}\right)^{-3}\right]$ 4

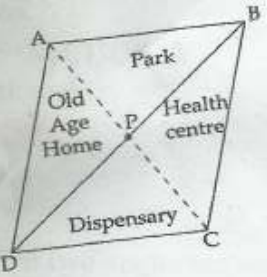
23 Find the values of p and q so that $(x+1)$ and $(x-1)$ are the factors of the polynomial $x^4+px^3+2x^2-3x+q$. 4

24 Show by long division that $2x+3$ is a factor of $p(x)=4x^4+8x^3+5x^2+x-3$. 4

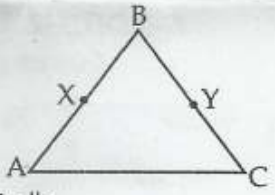
25 Factorise : $27p^3(4q-2r)^3+64q^3(2r-3p)^3+8r^3(3p-4q)^3$ 4

26 If $f(x)=x^2-5x+7$, evaluate $f(2)-f(-1)+f\left(\frac{1}{3}\right)$. 4

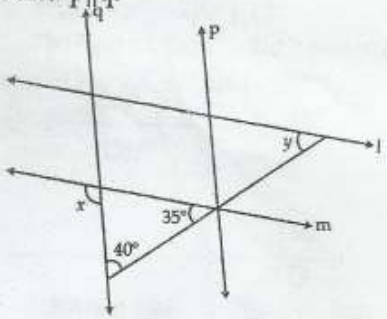
27 In figure, a plot is in the form of a parallelogram ABCD. Owner of this plot wants to build OLD AGE HOME, DISPENSARY, PARK and HEALTH CENTRE for elderly people as shown in the fig. P is a point on the diagonal BD such that DP is half of DB and PB is also half of DB. What is the relation between DP and PB ? Which Euclid Axiom supports the answer ? State the value exhibited by the owner of plot. 4



28 In the given figure, we have X and Y are the mid-points of AB and BC and $AX = BY$. Show that $AB = BC$. State which axiom you use here. Also give two more axioms other than the axiom used in the above situation. 4



29 In the figure, find x and y, if $l \| m$ and $p \| q$. 4



30 Prove that sum of the angles of a triangle is 180°. If in ΔABC, $\angle A+\angle B=120°$ and $\angle B+\angle C=100°$, then find $\angle B$. 4

31 AB is a line-segment and P and Q are points on opposite sides of AB such that each of them is equidistant from the points A and B. Show that PQ is perpendicular bisector of AB. 4

SECTION-C

Question numbers **11** to **20** carry three marks each.

11 Simplify : $\dfrac{\sqrt{72}}{5\sqrt{72}+3\sqrt{288}-2\sqrt{648}}$ 3

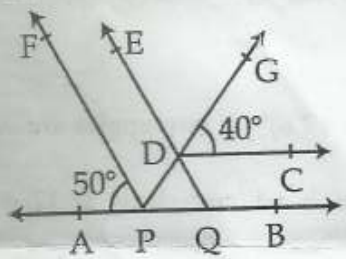
12 Rationalise the denominator of $\dfrac{y^2}{\sqrt{x^2+y^2}+x}$ 3

13 Find the value of $27x^3+8y^3$ if $3x+2y=14$ and $xy=8$. 3

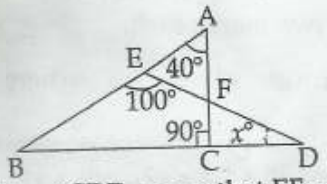
14 Evaluate 111^3, using a suitable identity. 3

15 Prove that the bisectors of pairs of vertically opposite angles are in the same straight line. 3

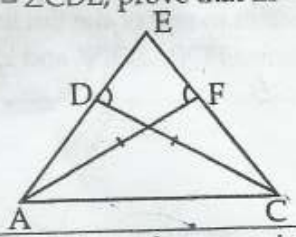
16 In the figure, AB||CD and DE||PF. If $\angle APF=50°$ and $\angle CDG=40°$, find 3
(i) $\angle AQD$ (ii) $\angle EDG$ and (iii) $\angle DPF$.



17 In the given figure, find x. 3



18 In the figure, if AF = CD and $\angle AFE=\angle CDE$, prove that EF = ED. 3



19 Plot the following ordered pairs (x, y) of numbers as points in the cartesian plane : 3

x	0	−4.5	−1	2	−3	4
y	2.5	0	3	5	−2	−6

20 If two diagonals of a rhombus are of lengths 90 m and 400 m, then find the height and perimeter of the rhombus. 3

SECTION-D

Question numbers **21** to **31** carry four marks each.

21 If $a=\dfrac{\sqrt{5}+\sqrt{10}}{\sqrt{10}-\sqrt{5}}$ and $b=\dfrac{\sqrt{10}-\sqrt{5}}{\sqrt{10}+\sqrt{5}}$, then show that $\sqrt{a}-\sqrt{b}-2\sqrt{ab}=0$. 4