SET NO. 2

Exam ID

DAV PUBLIC SCHOOLS, ODISHA ZONE-I
PA-II EXAMINATION, 2021-22

- **Check that this question paper contains   7 printed pages.**
- **Set number given on the right hand side of the question paper should be written on the OMR SHEET by the candidate.**
- **Check that this question paper contains 50 questions**

CLASS - X
SUB : MATHEMATICS (BASIC)-241
Time Allowed : 90 Minutes   **Maximum Marks: 40**

General Instructions:

1. *The Question paper contains three parts A,B and C.*
2. *Section A consist of 20 questions of 1 mark each. Any 16 questions are to be attempted.*
3. *Section B consist of 20 questions of 1 mark each. Any 16 questions are to be attempted.*
4. *Section C consists of 10 questions based on two case studies. Attempt any 8 questions.*
5. *There is no negative marking.*

SECTION A

Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted. The first attempted 16 questions would be evaluated.)

Q1 The HCF of 135 and 225 is   **1**

(A)15   (B) 75   (C) 45   (D) 5

Q2 The pair of equations y=0 and y= -7 has   **1**

(A) One Solution   (B) Two Solutions

(C) Infinitely many solutions   (D) No solutions.

Q3 If $\Delta ABC \sim \Delta DEF \frac{ar(\Delta ABC)}{ar(\Delta DEF)} = \frac{9}{25}$,BC=21cm, then EF is equal to

                                                                                   1

(A) 9cm   (B) 6cm   (C) 35   (D) 25

Q4 The ratio of areas of two similar triangles is equal to   **1**

(A) ratio of their corresponding sides

(B) ratio of their corresponding altitudes

(C) ratio of square of their corresponding sides

(D) ratio of their perimeter

Q5 A dice is thrown once, the probability of getting a prime number is   **1**

(A) $\frac{2}{3}$ (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) $\frac{1}{6}$

Q6 If D, E and F are mid points of sides BC, CA, AB respectively of $\Delta\,ABC$, then   **1** the ratio of the areas of triangle DEF and ABC is

(A) 2:3   (B) 1:4   (C) 1:2   (D) 4:5

Q7 The value of the expression $\frac{sin60^0}{cos30^0}$ is   **1**

(A) $\frac{\sqrt{3}}{2}$ (B) $\frac{1}{2}$ (C) 1   (D) 2

Q8 The product of two numbers is 320 and their LCM is 80. The HCF of   **1** the number is

(A) 8   (B) 4   (C) 16   (D) 10

Q9 The value of k for which the system of linear equations 4x+5y=3 and **1** kx+15y=9 has infinitely many solutions is

(A) k=3   (B) 4   (C) k=12   (D) k=8

Q10 The mid-point of the line segment joining the points A(-2,8) and B(-6,-4) is **1**

(A) (-4,-6)   (B) (2,6)   (C) (-4,2)   (D) (4,2)

Q11 The decimal expansion of the rational number $\frac{14587}{1250}$ will terminate after: **1**

(A) One decimal place   (B) Two decimal places

(C) Three decimal places   (D) Four decimal places

Q12 The sum of the exponents of prime factors in the prime factorisation of 196 is **1**

(A) 3   (B) 4   (C) 5   (D) 2

Q13 If 4tanx=3, then $\frac{cosx+sinx}{cosx-sinx}$ is equal to   **1**

(A) 7   (B) $\frac{1}{7}$ (C) -7   (D) $-\frac{1}{7}$

Q14 If $sin\theta = \frac{7}{\sqrt{85}}$ then find $tan\theta$ **1**

(A) $\frac{2}{7}$ (B) $\frac{3}{7}$ (C) $\frac{7}{6}$ (D) $\frac{6}{7}$

Q15   The diameter of a wheel is 1m. The number of revolutions it will make to   1
       travel a distance of 22km will be
       (A) 2,800   (B) 4,000   (C) 5,500   (D) 7,000

Q16   QA and PB are perpendicular on AB, if AO=10cm, BO=6cm and   1
       PB=9cm, then measure of AQ(see figure) is
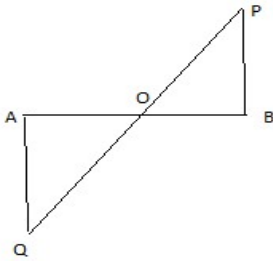
       (A) 15cm   (B) 25cm   (C)10cm   (D) None

Q17   If in a triangle ABC and DEF , $\frac{AB}{DE} = \frac{BC}{FD}$, then they will be similar when   1
       (A) $\angle B = \angle E$ (B) $\angle A = \angle D$
       (C) $\angle B = \angle D$ (D) $\angle A = \angle F$

Q18   If x= $a\cos\theta$ and y=$b\sin\theta$, then the value of b²x²+a²y² is   1
       (A)a^2+b^2 (B)$\frac{a^2}{b^2}$ (C) a^2b^2 (D)none of these

Q19   If 7x+9y=42 and 9x+7y=22, then x + y is :   1
       (A)1   (B)2   (C) 3   (D) 4

Q20   The probability of a sure event is :   1
       (A) 0   (B)1   (C)-1   (D)2

SECTION – B

Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted. The first attempted 16 questions would be evaluated.)

Q21   The line 3x+4y=12 meets x-axis at: 1
       (A) (3,0)   (B) (0,3)   (C) (4,0)   (D) (0,4)

Q22   Three bulbs red, green and yellow flash at intervals of 80   1
       seconds, 90 seconds and 110 seconds . All three flash together at
       8:00am. At what time will the three bulbs flash altogether
       again?
       (A) 8:12am (B) 9:12 am (C)10:12am   (D)11:12am

Q23   If cotA=$\frac{12}{5}$, then the value of (sinA + cosA) × cosec A is :   1
       (A) $\frac{13}{5}$ (B)$\frac{17}{5}$ (C) $\frac{14}{5}$ (D) 1

Q24 The pair of equations x+2y+5=0 and -3x-6y+1=0 have: 1
(A) a unique solution   (B) exactly two solutions
(C) infinitely many solutions   (D) No solution

Q25 The largest number which divides 70 and 125 ,leaving   1
remainders 5 and 8 ,respectively, is:
(A) 13   (B) 65   (C) 875   (D) 1750

Q26 A box contains 90 discs, numbered from 1 to 90. If one disc is   1
drawn at random from the box, the probability that it bears a
prime number less than 23 is
(A) $\frac{7}{90}$ (B) $\frac{1}{9}$ (C) $\frac{4}{45}$ (D) $\frac{9}{89}$

Q27 A card is drawn from a well-shuffled deck of 52 cards .The   1
Probability that the card will not be an ace is
(A) $\frac{1}{13}$ (B) $\frac{1}{4}$ (C) $\frac{12}{13}$ (D) $\frac{3}{4}$

Q28 If one card is drawn from a deck of 52 cards, then the   1
probability of getting black king is:
(A) $\frac{1}{26}$ (B) $\frac{1}{52}$ (C) $\frac{1}{13}$ (D) $\frac{3}{52}$

Q29 If the ratio of the circumference of two circles is 3:1, then the
ratio of their areas is :
(A) 1:9   (B) 9:1   (C) 3:1   (D) 1:3   1

Q30 If $\Delta ABC \sim \Delta PQR$,then x is equal to

                      1
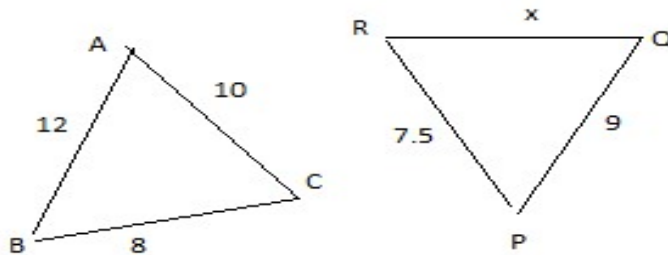
(A) $\frac{8}{3}$ (B) 6   (C) 4   (D) $\frac{16}{3}$

Q31 The area of the square that can be inscribed in a circle of   1
radius 8cm is:
(A) 256cm^2 (B) 128 cm^2 (C) 64$\sqrt{2}$ cm^2 (D) 64cm^2

Q32 The expression $\sec^4\theta - \sec^2\theta$ is equal to   1
(A) $\tan^2\theta - \tan^4\theta$ (B) $-\tan^4\theta - \tan^2\theta$
(C) $\tan^2\theta + \tan^4\theta$ (D) $\tan^4\theta - \tan^2\theta$

Q33 The decimal expression of $\frac{63}{72\times175}$ is   1
  (A) terminating   (B) non-terminating
  (C) Non-terminating and repeating   (D) none of these
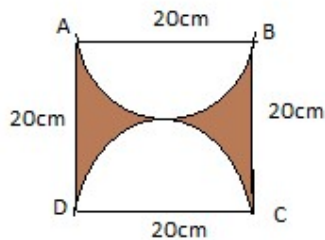
Q34 In an equilateral triangle ABC, if $AD \perp BC$, then   1
  (A) $3AB^2 = 2AD^2$ (B) $3AB^2 = 4AD^2$
  (C) $4AB^2 = 3AD^2$ (D) $2AB^2 = 3AD^2$

Q35 The ratio in which the line segment joining the points (-3,5) and   1
  (4,-9) is divided by (2,-5) is
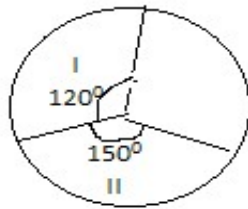 (A) 2:3   (B) 5:2   (C) 2:5   (D) 3:2

Q36 The area of the shaded region in the adjoining figure is   1

  (A) $\frac{700}{6}$ cm^2 (B) $\frac{600}{7}$ cm^2 (C) $\frac{1300}{6}$ cm^2 (D) $\frac{1300}{7}$ cm^2

Q37 The ratio of the areas of sector I and sector II is   1

  (A) 5:2   (B) 3:5   (C) 5:3   (D) 4:5

Q38 If one zero of $2x^2-3x+k$ is reciprocal to the other, then the value   1
  of k is :
  (A) 2   (B) $-\frac{2}{3}$ (C) $-\frac{3}{2}$ (D) -3

Q39 The circumference of a circle is 22cm. The area of its quadrant   1
  is :
  (A))$\frac{77}{2}$cm^2 (B) $\frac{77}{4}$cm^2 (C))$\frac{77}{8}$cm^2 (D))$\frac{77}{16}$cm^2

Q40   **4 chairs   and 3 tables cost   Rs.2100   and 5 chairs and 2tables**   **1**
       cost Rs. 1750, then the cost of a chair and a table is:
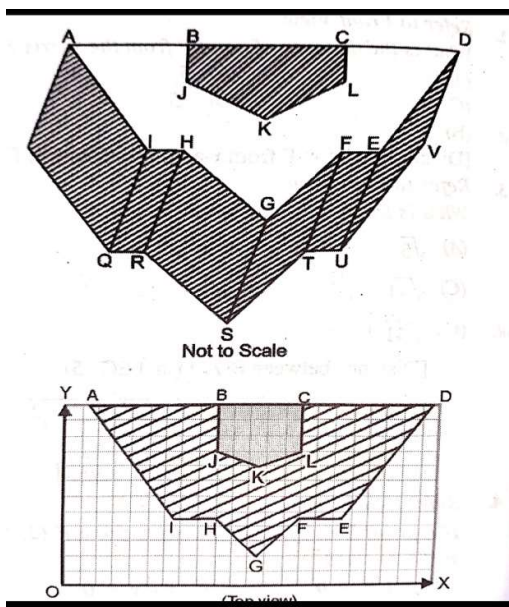   (A) Rs.990   (B) Rs.550   (C) Rs.650   (D)Rs.750

SECTION C

(Section C consists of 10 questions of 1 mark each. Any 8 questions are to be attempted. The first attempted 4 questions each would be evaluated in Case Study 1 & 2)
CASE STUDY BASED QUESTIONS:
Q41- Q45 are based on case Study -1

CASE STUDY -1

The diagram show the plan for a sun room. It will be built onto the wall of a house

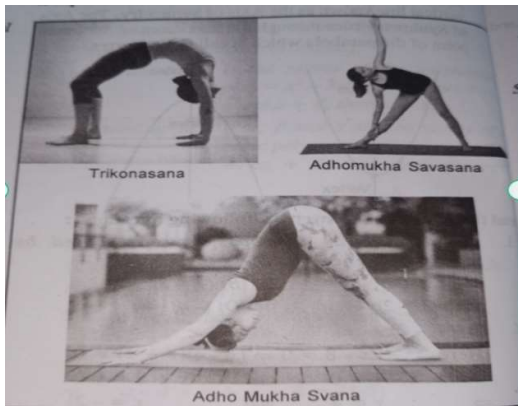**Observe the above and answer the following questions:**

Q41   **Find the mid-point of the segment joining the points   J(9,9) and**   **1**
       L(14,9)
       (A) $(\frac{15}{2},\frac{9}{2})$ (B) (11,9)   (C) $(\frac{23}{2},9)$ (D) $(\frac{5}{2},0)$

Q42   **What   is the distance between A $(\frac{3}{2},12)$ and D $\left(\frac{43}{2},12\right)$?**   **1**
       (A)20   (B)40   (C)15   (D) 10

Q43   **Find the distance of point G from the x-axis.**   **1**
       (A)0   (B)1   (C) 3   (D)2

Q44   **Find the coordinate of the point which divides the line segment**   **1**
       joining the points A and I in the ratio 2:3 internally.
       (A) (3,7)   (B) $(\frac{7}{2},9)$ (C)(2,3)   (D) (7,18)

Q45 If a point (x,y) is equidistant from $H(9,\frac{9}{2})$ and $F(14,\frac{9}{2})$, 　　　　**1**

(A) x+y=9　　　　(B) x - y=23　　　(C) 2x - 23=0　　(D) x+23=0

Q46-Q50 are based on Case Study -2

CASE STUDY -2

An Asana is a body posture, originally and still a general term for a sitting meditation pose and later extended in hatha yoga and modern yoga as exercise, to any type of pose or position , adding reclining, standing, inverted, twisting and balancing Poses. In the figure, one can observe that poses can be related to representation of quadratic polynomial.

Trikonasana

Adhomukha Savasana

Adho Mukha Svana

Observe the above and answer the following questions.

Q46 The shapeof the poses shown is:　　　　　　　　　　　　　　**1**
(A) Spiral　　　　　(B) Ellipse　(C)Linear　(D) Parabola

Q47 The graph of parabola ax^2+bx+c, $a \neq 0$ *opens* downwards ,if　　**1**
(A) a≥ 0(B) a=0
(C)a< 0(D) > 0

Q48 In the graph, how many zeroes are there for the polynomial?

　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　1
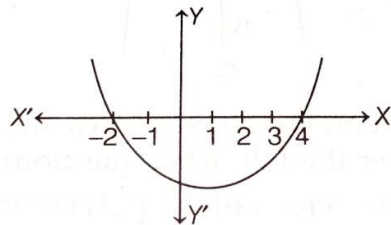
(A) 0　　　　　　(B) 1　　　　　　(C)2　　　　　　(D) 3

Q49 The two zeroes in the above shown graph are :　　　　　　　**1**
(A) 2,4　　　　(B)-2,4　　　　(C) -8,4　　　(D) 2,-8

Q50 The zeroes of the quadratic polynomial $x^2 - x - 12$ are:
(A) 3,4　　　(B) 3, −4　　　(C)−3,4　　　(D) −3, −4　　　**1**