Roll No. | | | | | | | |

DAV PUBLIC SCHOOLS, ODISHA ZONE-I

TERM-II EXAMINATION [2021-22]

- Please check that this question paper contains **4** printed pages.
- Check this question paper contains **14** questions.
- Write down the Serial Number of the question in the left side of the margin before attempting it.
- **10 minutes** cooling time has been allotted to read this question paper. The question paper will be distributed **10 minutes** prior to the commencement of the examination. The students will read the question paper only and will not write any answer on the answer script during this period .

CLASS-IX
SUBJECT: MATHEMATICS(041)

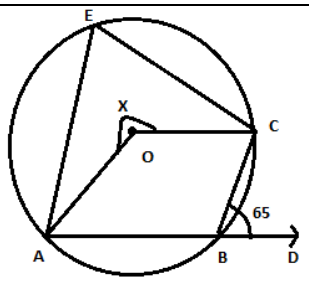
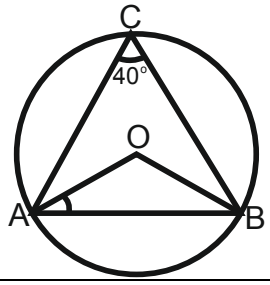
Time Allowed: 2 Hours **Maximum Marks:40**

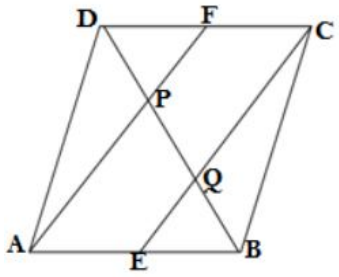
General Instructions:

1. The question paper consists of **14 questions** divided into **3 sections** A, B, C.
2. All questions are compulsory.
3. Section A comprises of **6 questions** of **2 marks** each. Internal choice has been provided in two questions.
4. Section B comprises of **4 questions** of **3 marks** each. Internal choice has been provided in one question.
5. Section C comprises of **4 questions** of **4 marks** each. An internal choice has been provided in one question. It contains **two case study-based questions**.

Section-A

Q.No.		Marks Alloted
1.	Factorise: $27 - 125a^3 - 135a + 225a^2$.	**[2]**

2.	Diagonals AC and BD of a parallelogram ABCD intersect at O. If $\angle BOC = 90°$ and $\angle BDC = 50°$, find $\angle OAB$. **OR** A diagonal of a rectangle is inclined to one side of the rectangle at 25°.Calculate the acute angle between the diagonals.	**[2]**
3.	In the given figure, if O is the centre of the circle, then find the value of "X" .  **OR** In the given figure, if O is the centre of the circle and ∠ACB = 40°, then find the measure of ∠OAB.  	**[2]**
4.	The radii of two cylinders are in the ratio of 2: 3 and their heights are in the ratio of 5: 3. Find the ratio of their volumes.	**[2]**
5.	The record of a weather station shows that out of the past 250 consecutive days, its weather forecast was correct 175 times. i. What is the probability that on a randomly selected day it was correct? ii. What is the probability that it was not correct on a randomly selected day?	**[2]**
6.	Three coins are tossed simultaneously 200 times with the following frequencies of different outcomes: Outcomes | 3 heads | 2 heads | 1 head | no head Frequency | 23 | 72 | 77 | 28 If the three coins are simultaneously tossed again, compute the probability of i. 2 heads coming up. ii. At least one head.	**[2]**
	Section-B	
7.	For the polynomial $\frac{x^3+2x+1}{5} - \frac{7}{2}x^2 - x^6 + 2$, write i. the degree of the polynomial. ii. coefficient of x^3 . iii. the constant term.	**[3]**

8.	If $x^2 + \frac{1}{x^2} = 14$, find the value of $x^3 + \frac{1}{x^3}$ $(x > 0)$ **OR** i. If $\frac{x}{y} + \frac{y}{x} = -1$ $(x, y \neq 0)$ Find the value of $x^3 - y^3$. ii. If $49x^2 - b^2 = (7x + \frac{1}{2})(7x - \frac{1}{2})$, then find the value of b $(b > 0)$.	**[3]**
9.	Construct a triangle ABC in which $BC = 7\ cm, \angle B = 75°$ and $AB + AC = 13\ cm$.	**[3]**
10.	The paint in a certain container is sufficient to paint an area equal to 9.375 m^2. How many bricks of dimensions of $22.5\ cm \times 10\ cm \times 7.5\ cm$ can be painted out of the paint of this container?	**[3]**
	Section-C	
11.	In a parallelogram ABCD, E and F are the mid-points of sides AB and CD respectively. Show that the line segments AF and EC trisect the diagonal BD. 	**[4]**
12.	If a pair of opposite sides of a cyclic quadrilateral are equal, then prove that its diagonals are also equal. **OR** For all possible cases, prove that the quadrilateral formed by the internal angle bisectors of any quadrilateral is cyclic.	**[4]**
	CASE STUDY-1	
13.	   	

	A DAV school of Odisha decided different types of tours for students to educate them. So, in class-IX, $\frac{1}{12}^{th}$ times the square of the total number of students planned to visit historical monuments, $\frac{7}{12}^{th}$ times the number of students planned to visit old age homes while 15 students decided to teach poor children. i. Assuming total number of students of class-IX as x , express number of students visited historical monuments, old age homes and to teach poor children in polynomial form of $p(x)$. ii. Find the value of $p(2) + p(-2)$.	**[2]** **[2]**
CASE STUDY-2		
14.	A Mathematics teacher of DAV School took her 9th standard students to show "Buland Darwaza". It was a part of their educational trip. She narrated the facts of "Buland Darwaza". There are two pillars which are cylindrical in shape. Also, two domes at the corners which are conical.  i) Find the cost of white washing of curved surface area of each dome having base diameter 14m and slant height 25m at the rate of Rs 210 per 100 m^2. ii) Find the lateral surface area of two pillars if the height of the pillar is 21m and radius of the base is 2.1m.	**[2]** **[2]**