SAMPLE PAPER

CREST Mathematics Olympiad (CMO)

CLASS 10

Syllabus for CMO is available at https://www.crestolympiads.com/cmo-syllabus

Pattern And Marking Scheme

Class	Topic/Section	No. of Questions	Marks per Questions	Total Marks
	Practical Mathematics	25	1	25
1st to 4th	Achiever's Section	10	2	20
	Grand Total	**35**	-	**45**
	Practical Mathematics	40	1	40
5th to 10th	Achiever's Section	10	2	20
	Grand Total	**50**	-	**60**

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1. If $\sqrt{a} > \sqrt{b} > \sqrt{c} > \sqrt{d}$, where a, b, c and d are consecutive natural numbers, then which of the following is true?

(a) $\sqrt{a} - \sqrt{b} > \sqrt{c} - \sqrt{d}$
(b) $\sqrt{c} - \sqrt{d} > \sqrt{a} - \sqrt{b}$
(c) $\sqrt{c} - \sqrt{d} = \sqrt{a} - \sqrt{b}$
(d) None of the above

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2. Places A and B are 100 km apart on a highway. One car starts from A and another from B at the same time. If the car travels in the same direction, then they meet in 5 hours. If they travel towards each other, then they meet in 1 hour. Find the speeds of both the cars:

(a) 60 km/h, 40 km/h
(b) 30 km/h, 45 km/h
(c) 45 km/h, 60 km/h
(d) 75 km/h, 90 km/h

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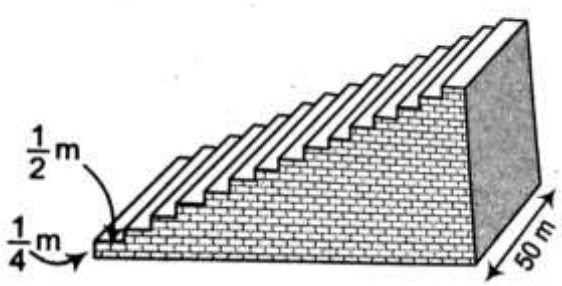
3. A small terrace at a football ground comprises of 15 steps, each of which is 50 m long and built of solid concrete. Each step has a rise of 1/4 m and a tread of 1/2 m. Calculate the total volume of concrete required to build the terrace:



(a) 650 m^3
(b) 750 m^3
(c) 795 m^3
(d) 845 m^3

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4. The co-ordinates of the mid-points of the sides of a triangle are (4, 2), (3, 3) and (2, 2). What will be the co-ordinates of the centroid of the triangle?

(a) (3, 7/3)
(b) (-3, -7/3)
(c) (3, -7/3)
(d) (-3, 7/3)

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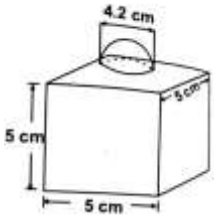
5. The decorative block shown in the figure given below is made of two solids, a cube and a hemisphere. The base of the block is a cube with the edge 5 cm and the hemisphere fixed on the top has a diameter of 4.2 cm. Find the total surface area of the block:

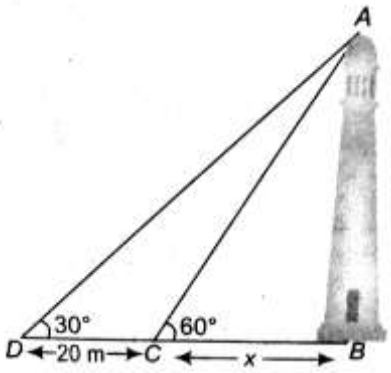


(a) 150 cm^2
(b) 160.86 cm^2
(c) 162.86 cm^2
(d) 163.86 cm^2

6. There are 35 cards numbered from 1 to 35. A card is selected at random. What is the probability that the drawing card will be a:
(i) multiple of 3 or 5.
(ii) prime number
(iii) multiple of 7, respectively?

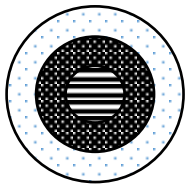
(a) 15/35, 9/35, 1/5
(b) 19/35, 12/35, 12/35
(c) 16/35, 11/35, 1/7
(d) 21/35, 10/35, 9/35

7. A TV tower stands vertically on a bank of a canal. From the point on the other bank, directly opposite the tower, the angle of elevation of the top of the tower is 60º. From another point 20 m away from this point on line joining this point to the foot of the tower, the angle of elevation of the top of the tower is 30º. Find the height of the tower:



(a) 10√3 m
(b) 10 m
(c) 15 m
(d) 24 m

8. An archery target has three regions formed by three concentric circles as shown in the figure given below. If the diameters of the circles are in the ratio 1: 2: 3, then find the ratio of the areas of three regions:



(a) 1: 2: 4
(b) 1: 3: 4
(c) 1: 3: 5
(d) 2: 3: 4

Achiever's Section

9. Let ABC be a right-angled triangle in which AB = 3 cm, BC = 4 cm and angle B = 90º. BD is the perpendicular from B on AC. The circle through B, C and D is drawn. The steps of constructions of a pair of tangents from A to this circle is given below. Which of the following steps is incorrect?

Step I: Draw triangle ABC and perpendicular BD from B on AC.
Step II: Draw a circle with BC as a diameter. This circle will pass through D.
Step III: Let O be the mid-point of BC. Join AO.
Step IV: draw a circle with AO as diameter. This circle cuts the circle drawn in step II at B and P. Join AO, AP and AB are desired tangents drawn from A to the circle passing through B, C and D.

(a) Only step I
(b) Only step II
(c) Only step III
(d) Only step IV

10. If the four sides of a quadrilateral ABCD are tangential to a circle, then which of the following is true?

(a) AC + AD = BD + CD
(b) AB + CD = BC + AD
(c) AB + CD = AC + BD
(d) AC + AD = BC + AB

Answers

1. (b), 2. (a), 3. (b), 4. (a), 5. (d), 6. (c), 7. (a), 8. (c), 9. (d), 10. (b)