



PRACTICE PAPER- 6
Mathematics-Basic (241)
CLASS X
Session: 2021-22
TERM II

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. Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.
3. Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question.
4. 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

1. Find the equations have real roots. If real roots exist, find them : $-2x^2 + 3x + 2 = 0$ [2]

OR

Find the value of k for which the given value is a solution of the given equation $7x^2 + kx - 3 = 0$; $x = \frac{2}{3}$

2. A 20 m deep well with diameter 7m is dug and the earth from digging is evenly spread out to form a platform 22 m by 14 m. Find the height of the platform. [2]
3. The following data gives the information on the observed lifetimes (in hours) of 225 electrical components: [2]

Lifetimes (in hours)	0-20	20-40	40-60	60-80	80-100	100-120
Frequency	10	35	52	61	38	29

Determine the modal lifetimes of the components.

4. Find the value of x for which $(8x + 4)$, $(6x - 2)$ and $(2x + 7)$ are in A.P. [2]

5. [2]

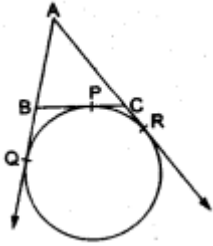
Marks	Number of Students	c.f.
0 - 10	5	5
10 - 30	15	F
30 - 60	f	50
60 - 80	8	58
80 - 90	2	60
	N = 60	$N = \sum f_i = 60$

Find f and F.

6. Two concentric circles are of radii 6.5 cm and 2.5 cm. Find the length of the chord of the larger circle which touches the smaller circle. [2]

OR

A circle is touching the side BC of $\triangle ABC$ at P and touching AB and AC produced at Q and R respectively. Prove that $AQ = \frac{1}{2}(\text{perimeter of } \triangle ABC)$.



Section B

7. If $(m + 1)^{\text{th}}$ term of an A.P. is twice the $(n + 1)^{\text{th}}$ term, prove that $(3m + 1)^{\text{th}}$ term is twice the $(m + n + 1)^{\text{th}}$ term. [3]
8. The angle of elevation of an aeroplane from a point A on the ground is 60° . After a flight of 30 seconds, the angle of elevation changes to 30° . If the plane is flying at a constant height of $3600\sqrt{3}m$, find the speed in km/hr of the plane. [3]

OR

A tower subtends an angle α at a point A in the plane of its base and the angle of depression of the foot of the tower at a point b metres just above A is β . Prove that the height of tower is $b \tan \alpha \cot \beta$.

9. From an external point P, a tangent PT and a line segment PAB is drawn to a circle with centre O. ON is perpendicular on the chord AB. Prove that. [3]

i. $PA \cdot PB = PN^2 - AN^2$

ii. $PN^2 - AN^2 = OP^2 - OT^2$

iii. $PA \cdot PB = PT^2$

10. Solve: $\frac{3x-4}{7} + \frac{7}{3x-4} = \frac{5}{2}, x \neq \frac{4}{3}$ [3]

Section C

11. Draw a line segment AB of length 6.5 cm and divide it in the ratio 4:7. Measure each of the two parts. [4]

OR

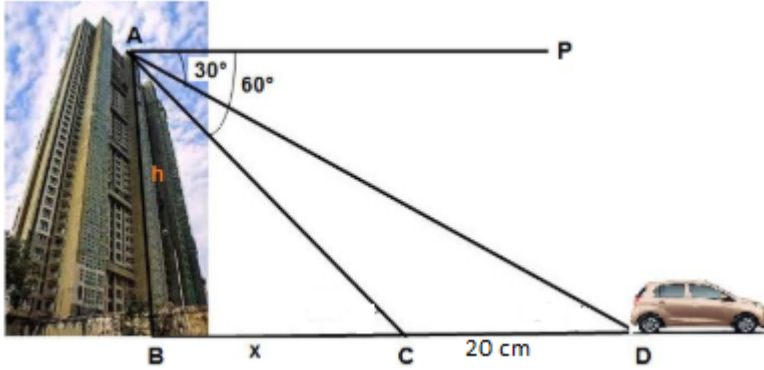
Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of 60° .

12. The median of the following data is 52.5. Find the values of x and y, if the total frequency is 100. [4]

C.I.	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80	80 - 90	90 - 100
Frequency	2	5	x	12	17	20	y	9	7	4

13. Vijay lives in a flat in a multi-story building. Initially, his driving was rough so his father keeps eye on his driving. Once he drives from his house to Faridabad. His father was standing on the top of the building at point A as shown in the figure. At point C, the angle of depression of a car from the building was 60° . After accelerating 20 m from point C, Vijay stops at point D to [4]

buy ice-cream and the angle of depression changed to 30° .

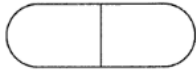


By analysing the above given situation answer the following questions:

- Find the value of x .
- Find the height of the building AB.

14. Seema a class 10th student went to a chemist shop to purchase some medicine for her mother who was suffering from Dengue. After purchasing the medicine she found that the upcount capsule used to cure platelets has the dimensions as followed: **[4]**

The shape of the upcount capsule was a cylinder with two hemispheres stuck to each of its ends. The length of the entire capsule is 14 mm and the diameter of the capsule is 5 mm.



By reading the above-given information, find the following:

- The surface area of the cylinder.
- The surface area of the capsule.