MATHS

BOOKS - KUMAR PRAKASHAN

QUESTION PAPER -1

Section A State Whether The Following Statements Are True Or False

1. The degree of the polynomial.

$p(x) = 3 + 5x + x^3 + x^2$ is 3

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2. The formula to find the discriminant of a quadratic equation is $D = b^2 - 4ac.$

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3. 3, 3, 3, ... is an AP.

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4. $(\cos 45^\circ) = \frac{1}{\sqrt{2}}$

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Section A Fill In The Blanks By Selecting The Proper Alternative From Those Given Below Each Statement

1. If $\bar{x} = 25$ and $Z = 25$, then M=.....

A. 0.25

B. 0

C. 0.1

D. 0.2

Answer:

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2. $P(A) + P(\overline{A}) = \ldots.$

A. 1

B. 0

C. -1

D. 0.2

Answer:

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3. A card is drawn at random from a well-shuffled deck of 52 playing cards.

The probability of the drawn card being a king of a red suit is .....

A. $\frac{1}{13}$

B. $(\frac{1}{26})$

C. $(\frac{1}{52})$

D. $(\frac{3}{26})$

Answer:

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4. If $17x + 23y = 40$ and $23x + 17y = 80$, then $x + y = ...$

A. 120

B. 40

C. 3

D. 80

Answer:

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Section A Fill In The Blanks So As To Make Each Of The Following Statements True

1. If (1,0) is a solution of the equation $8x + 5k = 18$, then k=.....

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2. The distance between the points $(2, 3)$ and $(4, 1)$ is....

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3. $\tan^2\theta - \sec^2\theta = \ldots.$

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4. Point P lies in the exterior of a circle with centre O. Tangents through P touch the circle at A and B. If the angle formed by PA and PB is of 80°, $\angle POA$=

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Section A Answer The Following By A Number Or A Word Or A Sentence

1. In a circle with radius R, the measure of the angle of a sector is P°. Find the area of that sector.

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2. Find the volume of a hemisphere with radius 7 cm.

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3. Find the probability of receiving a prime number in the experiment of throwing a balanced die once.

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4. The probablitiy that Ramesh wins a match is 0.48. Find the probability that Ramesh does not win the match.

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Section B Answer The Following Briefly With Calculations

1. Prove that $3 + \sqrt{2}$ is an irrational number.

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2. Find the HCF and LCM of 12, 72 and 120 by prime factorisation method.

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3. Find a quadratic polynomial with the sum of its zeroes being $\left(-\frac{1}{4}\right)$ and the product of its zero being $\frac{1}{4}$.

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4. Solve the following pair of linear equations by the method of substitution : $7x - 15y - 2 = 0$ and $x + 2y = 3$

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5. Solve the following pair of linear equations by the method of elimination : $x + y = 5$ and $2x - 3y - 4 = 0$

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6. If $\sec\theta = \frac{13}{12}$, find $\sin\theta$ and $\cot\theta$.

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7. Evaluate : $2\tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60^\circ$

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8. Prove the following identities. where the angles involved are acute angles for which the expressions are defined.

$$\frac{\tan\theta}{1-\cot\theta} + \frac{\cot\theta}{1-\tan\theta} = 1 + \sec\theta\,\cos ec\theta$$

[Hint: Write the expression in terms of $\sin\theta$ and $\cos\theta$]

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9. Point p lies on a circle with centre O and radius 5 cm. A line through centre O intersects the tangent through P at Q. If OQ=12 cm, find the

length of PQ.

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10. Qradrilateral ABCD circumscribes a circle. Prove that $AB + CD = AD + BC.$

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11. The following data gives the information on the observed lifetime (in hours) of 225 electrical components :

Lifetime (in hours)	$0-20$	$20-40$	$40-60$	$60-80$	$80-100$	100
Frequency	10	35	52	61	38	2

Determine the modal lifetime of the components :

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12. A ladder is placed againt a wall such that its foot remains at a distance of 2.5 m from the wa and its top reaches a window 6 m above the ground.

Find the length of the ladder in cm.

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13. The sum of the squares of two consecutive odd positive integers is 290. Find those integers.

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14. Find the roots of the quadratic equation $2x^2 = 7x - 3$ by the method of completing the square.

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Section C Answer The Following As Required With Calculations

1. On dividing $x^3 - 3x^2 + x + 2$ by a polynomial g(x), the quotient and remainder are $x - 2$ and $-2x + 4$ respectively. Find g(x).

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2. Find the roots of the equation $\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}, x \neq -4, 7.$

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3. Which term of the AP 21, 18, 15,.. Is -81? Also, is any term 0? Give reason for your answer

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4. For an AP, if $a_n = 4, d = 2$ and $S_n = -14$, find n and a.

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5. In what ratio does the point $(-4, 6)$ divide the line segment joining the points $A(-6, 10)$ and $B(3, -8)$?

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6. The distribution below gives the weights of 30 students of a class. Find the median weight of the students :

Weight (in kg)	$40-45$	$45-50$	$50-55$	$55-60$	$60-65$	65
Number of students	2	3	8	6	6	

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7. The table below shows the daily expenditure on food of 25 households in a locality :

Daily expenditure (in ₹)	100 – 150	150 – 200	200 – 250	250 – 300	300 – 350
Number of households	4	5	12	2	2

Find the mean daily expenditure on food by the step-deviation method.

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8. Prove that the lengths of tangents drawn from an external point to a circle are equal.

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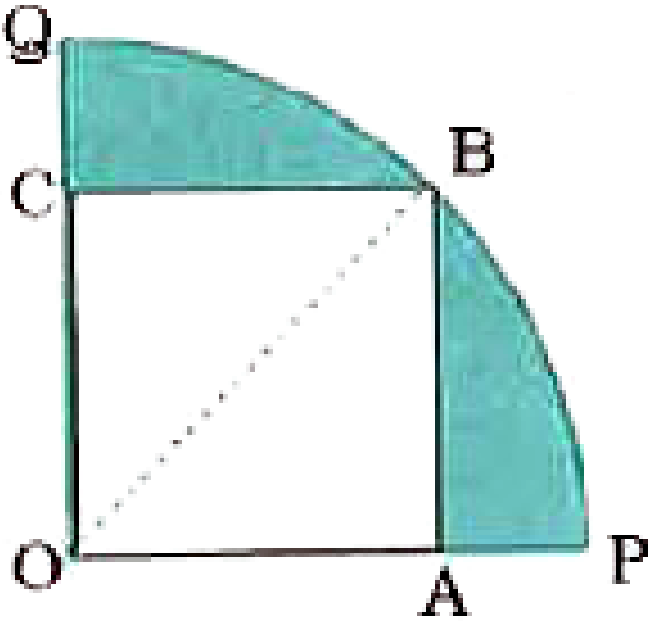
9. In the given figure, a square OABC is inscribed in a quadrant OPBQ. If $OA = 20cm$, find the area of the shaded region. (Use $\pi = 3.14$)



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10. From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest cm^2.

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11. Metallic spheres of radii 6 cm, 8 cm, and 10 cm respectively, are melted to form a single solid sphere. Find the radius of the resulting sphere.

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Section D Answer The Following As Required With Calculations

1. Draw a line segment of length 6.5 cm and divide it in the ratio 3:4. Measure the two parts and write the steps of construction.

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