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SL. No. : RR

ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ : 50]
Total No. of Questions : 50]

[ಒಟ್ಟು ಮುದ್ರಿತ ಪುಟಗಳ ಸಂಖ್ಯೆ : 12
[Total No. of Printed Pages : 12

ಈ ಪುಟವನ್ನು ತೆರೆಯಿರಿ

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REVISED & UN-REVISED

ಸಂಕೇತ ಸಂಖ್ಯೆ : 81-E

Code No. : 81-E

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version)

(ಹೊಸ ಪಠ್ಯಕ್ರಮ / New Syllabus)

(ಪುನರಾವರ್ತಿತ ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ/ Private Repeater)

ದಿನಾಂಕ : 21. 06. 2018]
[Date : 21. 06. 2018

ಸಮಯ : ಬೆಳಿಗ್ಗೆ 9-30 ರಿಂದ ಮಧ್ಯಾಹ್ನ–12-45 ರವರೆಗೆ] [Time : 9-30 A.M. to 12-45 P.M.

ಗರಿಷ್ಠ ಅಂಕಗಳು : 100]
[Max. Marks : 100

TEAR HERE TO OPEN THE QUESTION PAPER
ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು –ಶೆರೆಯಲು ಇಲ್ಲಿ ಕತ್ತರಿಸಿ

General Instructions to the Candidate :

1. This Question Paper consists of 50 objective and subjective types of questions.
2. This question paper has been sealed by reverse jacket. You have to cut on the right side to open the paper at the time of commencement of the examination. Check whether all the pages of the question paper are intact.
3. Follow the instructions given against both the objective and subjective types of questions.
4. Figures in the right hand margin indicate maximum marks for the questions.
5. The maximum time to answer the paper is given at the top of the question paper. It includes 15 minutes for reading the question paper.

Tear here

I. *Four* alternatives are given for each of the following questions / incomplete statements. Only one of them is correct or most appropriate. Choose the correct alternative and write the complete answer along with its letter of alphabet.

$8 \times 1 = 8$

1. A and B are two sets, such that $n(A) = 37$, $n(B) = 26$ and $n(A \cup B) = 51$; then $n(A \cap B)$ is

   (A) 12 (B) 63

   (C) 14 (D) 25

2. Geometric mean between $\frac{1}{2}$ and $\frac{1}{8}$ is

   (A) 16 (B) $\frac{1}{16}$

   (C) $\frac{1}{4}$ (D) 4

3. HCF of any two prime numbers is

   (A) a prime number (B) a composite number

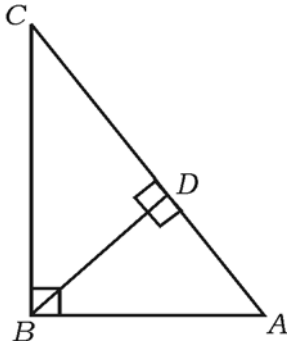
   (C) an odd number (D) an even number

4. If $f(x) = 2x^3 + 3x^2 - 11x + 6$ then the value of $f(-1)$ is

   (A) 0 (B) – 10

   (C) – 18 (D) 18

5. In $\triangle ABC$, $\angle ABC = 90°$, $BD \perp AC$ if $BD = 8$ cm and $AD = 4$ cm then the length of CD is



   (A) 16 cm (B) 4 cm

   (C) 64 cm (D) 12 cm

6. $\frac{\sin(90° - \theta)}{\cos(90° - \theta)}$ where 'θ' is acute, is equal to

(A) sec θ (B) cot θ

(C) tan θ (D) cosec θ

7. The co-ordinates of the mid-point of the line segment joining the points (2, 3) and (4, 7) are

(A) (– 3, – 5) (B) (1, 2)

(C) (3, 5) (D) (6, 10)

8. Formula used to find the surface area of a sphere whose radius *'r'* units is

(A) πr^2 (B) $2\pi r^2$

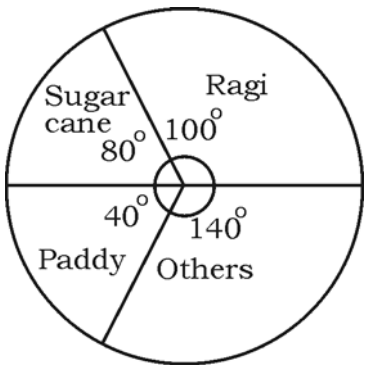
(C) $3\pi r^2$ (D) $4\pi r^2$

II. Answer the following : $6 \times 1 = 6$

9. A boy has 2 pants and 4 shirts. How many different pairs of a pant and a shirt can he dress up with ?

10. Write sample space for the random experiment 'tossing two fair coins simultaneously once'.

11. The given pie chart shows the annual agricultural yield of different crops in a certain place. If the total production is 3600 tons, what is the yield of Ragi in tons ?



12. If $(x + 3)$ is one of the factor of $f(x) = x^2 + 5x + 6$, find the other factor.

13. What are concentric circles ?

14. Two straight lines are perpendicular to each other. If the slope of one line is $\frac{1}{\sqrt{3}}$, find the slope of the other line.

III. 15. If $A = \{ 1, 2, 3 \}$ and $B = \{ 2, 3, 4, 5 \}$ are the subsets of $U = \{ 1, 2, 3, 4, 5, 6, 7, 8 \}$, verify $(A \cap B)^{l} = A^{l} \cup B^{l}$. 2

16. Find the sum of infinite terms of the geometric series $2 + \frac{2}{3} + \frac{2}{9} + ...$ 2

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

18. Find the number of diagonals that can be drawn in an octagon. 2

19. Find the sum of all two digit natural numbers which are divisible by 5. 2

20. Find how many 4 digit numbers can be formed by using the digits 1, 2, 3, 4, 5 without repetition ? How many of these are less than 2000 ? 2

OR

If $2 ({}^{n}P_{2}) + 50 = {}^{2n}P_{2}$, find the value of n.

21. Two unbiased dice whose faces are numbered 1 to 6 are rolled once. Find the probability of getting a sum equal to 7 on their top faces. 2

22. Rationalise the denominator and simplify : 2

$$\frac{3\sqrt{2}}{\sqrt{5} - \sqrt{2}}.$$

23. Simplify $(\sqrt{75}-\sqrt{45})(\sqrt{20}+\sqrt{12})$. 2

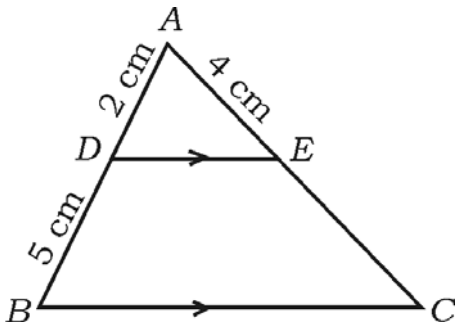
24. Find the quotient and remainder by using synthetic division : 2

$(3x^3-2x^2+7x-5)\div(x-3)$

OR

Verify whether $(x-2)$ is a factor of $f(x) = x^3-3x^2+6x-20$ by using factor theorem.

25. In ΔABC, $DE \parallel BC$, if $AD = 2$ cm, $DB = 5$ cm and $AE = 4$ cm, find AC. 2



26. Draw a circle of radius 4·5 cm and a chord PQ of length 7 cm in it. Construct a tangent at P. 2

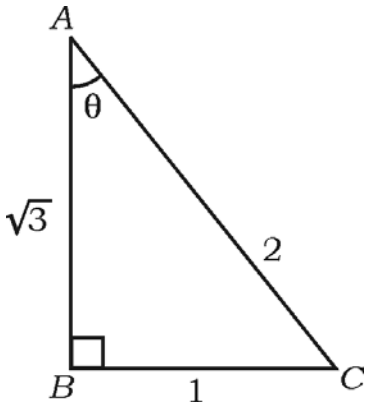
27. Find the distance between the co-ordinates of the points (2, 4) and (8, 12) by using distance formula. 2

28. In a hockey match team *'A'* scored one goal less than twice the number of goals scored by team *'B'*. If the product of the number of goals scored by both the teams is 15, find the number of goals scored by each team. 2

29. In the given $\triangle ABC$, 'θ' is acute. Write the values of the following trigonometric ratios related to θ : 2

(a) sin θ (b) cos θ

(c) cosec θ (d) sec θ.



30. Draw a plan by using the information given below :

(Scale 20 metres = 1 cm)

	Metre to C	
	140	
80 to D	90	
	60	60 to B
30 to E	20	
	From A	

2

31. If $P = \{1, 2, 3, 4\}$, $Q = \{2, 3, 4, 5, 6\}$ are the subsets of $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, then draw Venn diagram to represent $(P \cup Q)'$. 2

32. Write the formula used to find the following : 2

(a) Sum of first '*n*' natural numbers

(b) Harmonic mean between a and b ($a > b$).

33. Write the values of the following : 2

(a) ${}^{100}P_0$

(b) ${}^{10}C_1$.

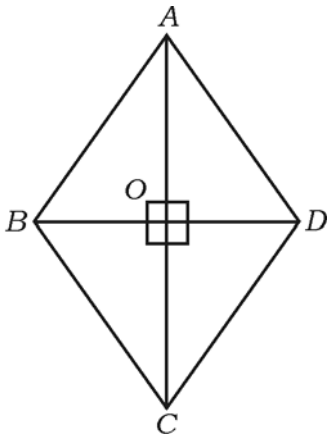
34. Draw a pie chart to represent the survey carried out in the class regarding places of visit for excursion and the number of students who opted each place. 2

Places	*Mysuru*	*Vijayapura*	*Gokorna*	*Chitradurga*
Number of students	14	6	2	18

35. Find the product of $\sqrt[3]{2}$ and $\sqrt[4]{3}$. 2

36. Determine the nature of the roots of the equation $2x^2 - 5x - 1 = 0$. 2

37. In Rhombus *ABCD*, prove that $4AB^2 = AC^2 + BD^2$. 2



38. Find the remainder when $P(x) = x^3 + 3x^2 - 5x + 8$ is divided by $(x - 3)$ by remainder theorem. 2

39. Find the distance between origin and the point $(-8, 15)$. 2

40. If $\cos\theta = \frac{5}{13}$, find the value of $\frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta}$. 2

IV. 41. In a harmonic progression 5th term is $\frac{1}{12}$ and 11th term is $\frac{1}{15}$. Find its 25th term. 3

OR

If the third term of a geometric progression is 12 and its sixth term is 96, find the sum of first 9 terms.

42. Calculate the variance of the following data : 3

Class-interval	0-4	5-9	10-14	15-19	20-24
Frequency (f)	1	2	5	4	3

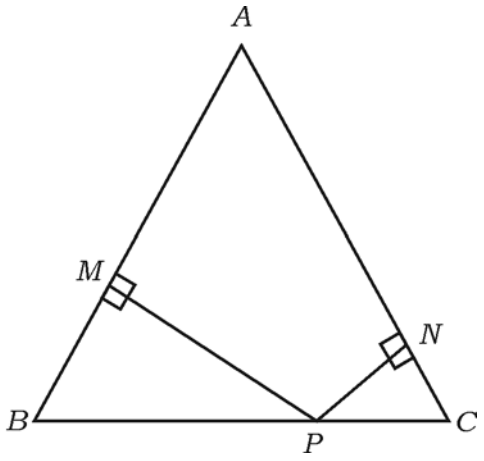
43. Solve $(2x + 3)(3x - 2) + 2 = 0$ by using formula. 3

OR

If one root of the equation $x^2 + px + q = 0$ is four times the other, prove that $4p^2 - 25q = 0$.

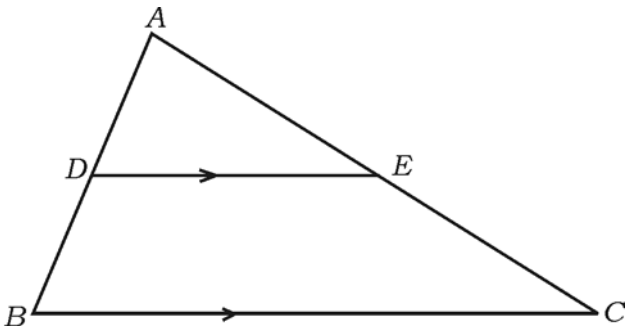
44. Prove that "The tangents drawn from an external point to a circle are equal". 3

45. In ΔABC, $AB = AC$. P is a point on BC such that $PN \perp AC$ and $PM \perp AB$ as shown in the figure. Prove that $\overline{MB} \cdot \overline{CP} = \overline{NC} \cdot \overline{BP}$. 3



OR

In ΔABC, $DE \parallel BC$. If $3DE = 2BC$ and the area of ΔABC is 81 cm^2, show that the area of ΔADE is 36 cm^2.



46. Prove that $(1 + \cot A - \operatorname{cosec} A)(1 + \tan A + \sec A) = 2$. 3

OR

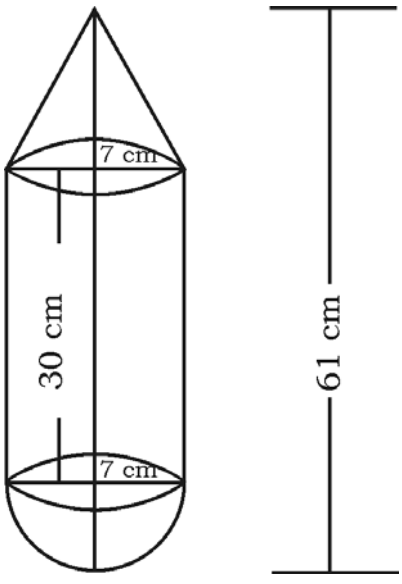
From the top of a building 20 m high, the angle of elevation of the top of a vertical pole is 30° and the angle of depression of the foot of the same pole is 60°. Find the height of the pole.

V. 47. Solve the equation $x^2 + x - 6 = 0$ graphically. 4

48. Construct a direct common tangent to two circles of radii 4 cm and 2 cm whose centres are 9 cm apart. Measure and write the length of the direct common tangent. 4

49. Prove that "In a right angled triangle, square on the hypotenuse is equal to sum of the squares on the other two sides". 4

50. A solid is in the shape of a cylinder with a cone attached at one end and a hemisphere attached to the other end as shown in the figure. All of them are of the same radius 7 cm. If the total length of the solid is 61 cm and height of the cylinder is 30 cm, calculate the cost of painting the outer surface of the solid at the rate of Rs. 10 per 100 cm^2. 4



OR

A solid metallic cylinder of diameter 12 cm and height 15 cm is melted and recast into toys in the shape of right circular cone mounted on a hemisphere as shown in the figure. If radii of the cone and hemisphere are each equal to 3 cm and the height of the toy is 7 cm, calculate the number of such toys that can be formed.