

Roll No.

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Serial No. of Q. C. A. B.

ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ : 58]

[ಒಟ್ಟು ಮುದ್ರಿತ ಪುಟಗಳ ಸಂಖ್ಯೆ : 40

Total No. of Questions : 58]

[Total No. of Printed Pages : 40

ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**

ವಿಷಯ : ಗಣಿತ

Code No. : **81-E**

Subject : **MATHEMATICS**

(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version)

ದಿನಾಂಕ : 16. 06. 2014]

[Date : 16. 06. 2014

ಸಮಯ : ಬೆಳಿಗ್ಗೆ 9-30 ರಿಂದ ಮಧ್ಯಾಹ್ನ 12-45 ರವರೆಗೆ]

[Time : 9-30 A.M. to 12-45 P.M.

ಪರಮಾವಧಿ ಅಂಕಗಳು : 100]

[Max. Marks : 100

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Q. No.	Marks	Q. No.	Marks	Q. No.	Marks	Q. No.	Marks	Q. No.	Marks
1.		14.		27.		40.		53.	
2.		15.		28.		41.		54.	
3.		16.		29.		42.		55.	
4.		17.		30.		43.		56.	
5.		18.		31.		44.		57.	
6.		19.		32.		45.		58.	
7.		20.		33.		46.		x	
8.		21.		34.		47.		x	
9.		22.		35.		48.		x	
10.		23.		36.		49.		x	
11.		24.		37.		50.		x	
12.		25.		38.		51.		x	
13.		26.		39.		52.		x	
Total Marks									
Total Marks in words					Grand Total				
1. ✓									
2. ✓				✓				✓	
Signature of Evaluators			Registration No.		Signature of the Deputy Chief		Signature of the Room Inuigilator		

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[Turn over

General Instructions :

- i) The Question-cum-Answer Booklet consists of objective and subjective types of questions having 58 questions.
 - ii) Space has been provided against each objective type question. You have to choose the correct choice and write the complete answer along with its alphabet in the space provided.
 - iii) For subjective type questions enough space for each question has been provided. You have to answer the questions in the space.
 - iv) Follow the instructions given against both the objective and subjective types of questions.
 - v) Candidate should not write the answer with pencil. Answers written in pencil will not be evaluated. (Except Graphs, Diagrams & Maps)
 - vi) In case of Multiple Choice, Fill in the blanks and Matching questions, scratching / rewriting / marking is not permitted, thereby rendering to disqualification for evaluation.
 - vii) Candidates have extra 15 minutes for reading the question paper.
 - viii) **Space for Rough Work** has been printed and provided at the bottom of each page.
- 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 alphabet in the space provided against each question.* $20 \times 1 = 20$

1. If matrix $A = \begin{bmatrix} 1 & 2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 2 & 1 \end{bmatrix}$ then the matrix AB^t is

(A) $\begin{bmatrix} 3 \\ 4 \\ 3 \end{bmatrix}$

(B) $\begin{bmatrix} 3 & 4 & 3 \end{bmatrix}$

(C) $\begin{bmatrix} 2 & 4 & 3 \end{bmatrix}$

(D) $\begin{bmatrix} 1 & 0 \end{bmatrix}$.

Ans. : _____

(SPACE FOR ROUGH WORK)

2. The value of 5P_1 is

- (A) 5 (B) 6
(C) 0 (D) 5!

Ans. : _____

3. The meaningful among the following is

- (A) 2P_5 (B) 5P_2
(C) ${}^{-5}P_2$ (D) ${}^5P_{-2}$

Ans. : _____

4. If ${}^{11}P_r = 990$, then the value of r is

- (A) 3 (B) 9
(C) 4 (D) 2.

Ans. : _____

5. The standard deviation and coefficient of variation of the scores of a player are 1.5 and 15 respectively. Then the mean score of the player is

- (A) 1.5 (B) 10
(C) 15 (D) 1000.

Ans. : _____

6. The L.C.M. of $2ab$ and $6ac^2$ is $6abc^2$. Then their HCF is

- (A) $2a$ (B) $6ab$
(C) $6a$ (D) $2ab$.

Ans. : _____

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81-E

4

7. The HCF of $(p - q)$ and $(\sqrt{p} - \sqrt{q})$ is

(A) $(\sqrt{p^3} - \sqrt{q^3})$

(B) $(\sqrt{p} - \sqrt{q})$

(C) $(\sqrt{p} + \sqrt{q})$

(D) $(p - q)$.

Ans. : _____

8. The simplified form of $\sum_{pqr} (p + q - r) + \sum_{pqr} (p - q - r)$ is

(A) $2p + 2q + 2r$

(B) $-p - q - r$

(C) 0

(D) $-2p - 2q - 2r$.

Ans. : _____

9. If $ab + bc + ca = 1$ then $(a + b)(c + a) =$

(A) ac

(B) $1 + bc$

(C) bc

(D) $1 + a^2$.

Ans. : _____

10. If $\sum_{abc} a^3 - 3abc = 0$ then the value of $\sum_{abc} a^2 =$

(A) $\sum_{abc} a$

(B) $2 \sum_{abc} ab$

(C) $\sum_{abc} a^2 - a$

(D) $\sum_{abc} ab$.

Ans. : _____

(SPACE FOR ROUGH WORK)

11. The sum of $4\sqrt{2}$, $\sqrt{2}$ and $-\sqrt{32}$ is

- (A) $-\sqrt{2}$ (B) $9\sqrt{2}$
 (C) $4\sqrt{2}$ (D) $\sqrt{2}$.

Ans. : _____

12. If $F = \frac{mV^2}{r}$ then $V =$

- (A) $\pm \sqrt{\frac{F}{m \cdot r}}$ (B) $\pm \sqrt{\frac{m}{F \cdot r}}$
 (C) $\pm \sqrt{\frac{F \cdot m}{r}}$ (D) $\pm \sqrt{\frac{F \cdot r}{m}}$.

Ans. : _____

13. The roots of the quadratic equation $x^2 - 5x - 6 = 0$ are

- (A) -3 and -2 (B) 3 and 2
 (C) 6 and -1 (D) -6 and 1 .

Ans. : _____

14. The value of p for the equation $x^2 - px + 9 = 0$ to have equal roots is

- (A) $+6$ (B) ± 6
 (C) -6 (D) ± 13 .

Ans. : _____

15. The sum of the roots of the quadratic equation $ax^2 + bx + c = 0$ is

- (A) $\frac{c}{a}$ (B) $\frac{b}{a}$
 (C) $-\frac{b}{a}$ (D) $\frac{a}{c}$.

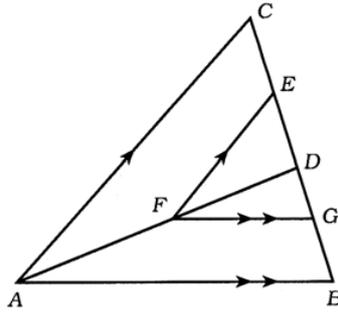
Ans. : _____

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6

16. In the given figure, $EF \parallel CA$ and $FG \parallel AB$ then $\frac{DE}{EC} =$



(A) $\frac{DG}{GB}$

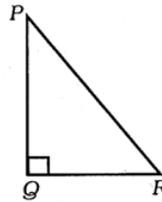
(B) $\frac{GB}{DG}$

(C) $\frac{AF}{DF}$

(D) $\frac{AB}{AD}$

Ans. : _____

17. In ΔPQR , $\angle PQR = 90^\circ$. The correct relation with respect to ΔPQR is



(A) $PR^2 = PQ^2 - QR^2$

(B) $PQ^2 = QR^2 - PR^2$

(C) $PR^2 = PQ^2 + QR^2$

(D) $QR^2 = PQ^2 - PR^2$

Ans. : _____

18. The distance between the centres of two circles of radii 3.4 cm and 1.8 cm is 3.7 cm. Then the circles are

(A) externally touching circles

(B) internally touching circles

(C) intersecting circles

(D) concentric circles.

Ans. : _____

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8

II. Fill in the blanks with suitable answers :

 $10 \times 1 = 10$ 21. If A and B are disjoint sets then $n(A \cap B) = \dots\dots\dots$

Ans. : _____

22. The formula to find the n^{th} term of Harmonic progression is $\dots\dots\dots$

Ans. : _____

23. P is a matrix of order 2×3 . Then the order of the transposed matrix of P is $\dots\dots\dots$

Ans. : _____

24. The HCF of prime expressions is $\dots\dots\dots$

Ans. : _____

25. The Σ notation form of $x^2 + y^2 + z^2$ is $\dots\dots\dots$

Ans. : _____

26. The standard form of an adfected quadratic equation is $\dots\dots\dots$

Ans. : _____

27. The angle between the radius and tangent to a circle at the point of contact is equal to $\dots\dots\dots$

Ans. : _____

28. A straight line drawn parallel to one side of a triangle divides the other two sides $\dots\dots\dots$

Ans. : _____

29. The curved surface area of a cone of radius r and slant height l is $\dots\dots\dots$

Ans. : _____

30. The Euler's formula for polyhedral solid is $\dots\dots\dots$

Ans. : _____

(SPACE FOR ROUGH WORK)

III. 31. If the universal set

$U = \{ 1, 2, 3, 4, 5, 6, 7, 8, 9 \}$, $P = \{ 2, 3, 5, 7 \}$ and $Q = \{ 1, 3, 5, 7, 9 \}$ then prove that $(P \cup Q)' = P' \cap Q'$. 2

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10

32. A florist has certain number of garlands. 110 of them have champak flowers, 50 have jasmine flowers and 30 garlands have both the flowers. Find the total number of garlands with him. 2

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33. In a geometric progression if $S_{\infty} = \frac{2}{3}$ and $a = 1$ then find the geometric progression. 2

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34. In a geometric progression the 3rd term is 8 times the 6th term, and 4th term is 4 times the 6th term. Find the common ratio of the geometric progression. 2

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35. Find the value of x if $12, \frac{1}{x-1}, 20$ are in Harmonic progression.

2

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14

36. If $A = \begin{bmatrix} 3 & 4 \\ 5 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 \\ 7 & 8 \end{bmatrix}$ then find $A + 2B$.

2

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37. If $a + b + c = abc$ then prove that $1 + a^2 = (1 - ab)(1 - ac)$.

2

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

2

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39. Rationalise the denominator and simplify :

2

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

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40. What is a pure quadratic equation ? Give one example.

2

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41. If m and n are the roots of the quadratic equation $x^2 - 3x + 1 = 0$, then find the value of $\frac{m}{n} + \frac{n}{m}$. 2

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20

42. Construct Cayley's table on $A = \{ 2, 4, 6, 8 \}$ under $\oplus \text{ mod } 10$.

2

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43. In a circle of radius 3 cm draw two radii such that the angle between them is 60° .
Construct tangents at the ends of the radii. 2

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22

44. A mansion has 12 cylindrical pillars, each having the circumference 50 cm and height 3.5 m. Find the cost of painting the lateral surface of all pillars at Rs. 150 per sq. m. 2

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45. 21 spheres of equal radii are melted to form a cylinder of radius 14 cm and height 49 cm. Find the radius of sphere. 2

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24

46. Draw the plan of the field for the following data :

2

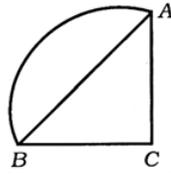
[Scale : 25 m = 1 cm]

	To D (in metres)	
50 to E	100	75 to C
	75	
	50	50 to B
	25	
	From A	

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47. In the given network, write the number of regions and number of arcs. 2



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26

48. Draw the graph for the given matrix :

2

$$\begin{bmatrix} 2 & 1 & 0 \\ 1 & 4 & 1 \\ 0 & 1 & 2 \end{bmatrix}$$

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- IV. 49. A basket contains 3 white and 5 red flowers. 4 flowers are removed from the basket at random.
- a) In how many ways can 4 flowers be removed ?
- b) Out of 4 flowers, how many of them may contain 2 white flowers ? 3

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28

50. Find the standard deviation for the following data :

3

Scores (x)	32	37	42	47	52
Frequency (f)	2	5	6	5	2

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51. Find the L.C.M. of $a^3 - 3a^2 - 10a + 24$ and $a^3 - 2a^2 - 9a + 18$ by division method.

3

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52. The perimeter of a right angled triangle is 30 cm and its hypotenuse is 13 cm.
Find the length of other two sides of the triangle. 3

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32

53. $ABCD$ is a trapezium in which $AB \parallel CD$ and $BC \perp AB$. If $AB = 7.5$ cm, $AD = 13$ cm and $CD = 12.5$ cm, find the length of BC . 3

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54. Prove that the tangents drawn from an external point to a circle are equal. 3

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34

- V. 55. Three numbers are in arithmetic progression and their sum is 18 and the sum of their squares is 140. Find the numbers. 4

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56. Construct two direct common tangents to two circles of radii 4 cm and 2 cm such that the distance between their centres is 10 cm. Measure the length of the tangents and write. 4

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36

57. Prove that the areas of similar triangles are proportional to the squares of their corresponding sides.

4

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38

58. Solve graphically :

$$x^2 - x - 2 = 0.$$

4

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