या विद्या या विमुक्तये	**A. G. High School and G. & D. Parikh Higher Secondary School** Navrangpura, Ahmedabad - 380 009. S.A. : 1 Examination : 2014 Date : 22-09-2014 Std. : 10 (English Medium) Marks : 100 Day : Monday Subject : Maths Time : 3:00 Hrs.

PART : A **Marks: 50**

Section - A

Choose the correct alternative and fill the OMR sheet.

1. $\sqrt{12}$ and ______ are line surds.
   (A) $\sqrt{36}$ (B) $\sqrt{48}$
   (C) $\sqrt{60}$ (D) $\sqrt{72}$

2. $\sqrt{3}$ is irrational number. To obtian rational number from it which of the following operation.
   (A) by adding $\sqrt{3}$ (B) by adding $\frac{1}{\sqrt{3}}$
   (C) by multiplying $\sqrt{3}$ (D) by multiplying $\sqrt{a}$

3. $12+12\times 12+12 =$ ______
   (A) 576 (B) 192
   (C) 168 (D) 300

4. Which of the following is minimum integer such that divided by it is integers from 2 to 10.
   (A) 6000 (B) 2520 (C) 720 (D) 540

5. $\frac{1}{3+\sqrt{8}} =$ ______
   (A) $3-\sqrt{8}$ (B) $\sqrt{3}-8$ (C) $\sqrt{6}-4$ (D) $3+2\sqrt{2}$

6. If $x^{31}-1$ is divided by $x+1$ then the remainder is ______
   (A) 0 (B) 2
   (C) -2 (D) None of these

7. If α and β are zeros of $p(x)=x^2-3x+2$ then $\frac{1}{\alpha}+\frac{1}{\beta}=$ ______.
   (A) $\frac{2}{3}$ (B) $\frac{3}{2}$
   (C) -3 (D) 2

8. If α, β and γ an the zeros of a cubic polynomial $p(x)=ax^3+bx^2+cx+d; a\pm 0,$ $a, b, c, d \in R$ then $\alpha+\beta+\gamma =$ ______
   (A) $\frac{The\ co-efficient\ of\ x^2}{The\ co-efficient\ of\ x^3}$ (B) $-\frac{The\ co-efficient\ of\ x^2}{The\ co-efficient\ of\ x^3}$
   (C) $\frac{The\ co-efficient\ of\ x}{The\ co-efficient\ of\ x^3}$ (D) $\frac{The\ co-efficient\ of\ x^3}{The\ co-efficient\ of\ x}$

9. The sum of zeros of polynomial $p(x) = 6x^2 - 11x + 5$ is ______

(A) $\frac{-5}{6}$ (B) $\frac{-11}{6}$

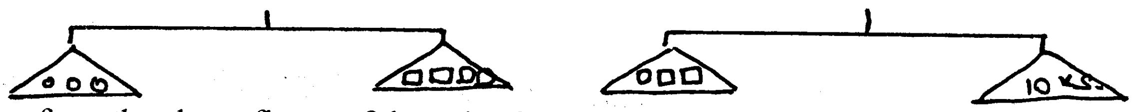
(C) $\frac{5}{6}$ (D) $\frac{11}{6}$

10. If $p(x) = x^3 + 2x^2 + 2x + 5$ the $p(-2) =$ ______

(A) -1 (B) 3

(C) 2 (D) 1

11.



from the above figure of the pair of scales; the pair of linear equation is ______.

(A) $3x=4y,\ x+2y=10$ (B) $x=y,\ 2x+y=10$

(C) $2x=y,\ 2x+2y=0$ (D) $x=2y,\ x+2y=10$

12. To eliminate x, from $3x+y=7$ and $-x+2y=2$ second equation is multiplied by ______.

(A) 1 (B) 2

(C) 3 (D) 0

13. In a two digit number, the digit at unit place is $(x-1)$ and the digit at ten's place is $(x+1)$ then the interchanged number is ______.

(A) $10x+11$ (B) $11x-9$

(C) $11x+9$ (D) $11x+10$

14. For $\frac{5}{x}+\frac{2}{y}=9$ and $\frac{4}{x}+\frac{7}{y}=9$ then $\frac{1}{x}+\frac{1}{y}=$ ______

(A) 1 (B) 2

(C) 3 (D) None of these

15. 3 years ago, the sum of ages of a father and his son was 40 years. After 2 years, the sum of ages of the father and his son will be ______

(A) 40 (B) 46

(C) 50 (D) 60

16. In ΔABC, A-M-B, A-N-C and $\overline{MN} \parallel \overline{BC}$. If $AM=8$, $MB=16$ and $MN=12$, then $BC =$ ______

(A) 24 (B) 36

(C) 32 (D) 48

17. "Measure what is measurable and make measurable what is so" which mathematician give this statement ?

(A) Rene De Carte (B) Gialileo

(C) Albert Einstein (D) George Polya

18. In ΔABC and ΔPQR $\frac{AB}{PQ} = \frac{AC}{QR}$ and $\angle A \cong \angle Q$. If $m\angle B = 50$, $m\angle Q = 40$, then $m\angle R =$ ______.

(A) 90 (B) 75

(C) 60 (D) 45

19. The bisector of $\angle A$ in ΔABC intersects $\overline{BC}$ in D. If $AB:AC=5:7$ and $BD=5.5$ then $BC=$ ______.
(A) 6.5 (B) 7.7
(C) 13.2 (D) 11

20. $\overline{AD}$ and $\overline{BE}$ an altitudes in ΔABC. If $AC=12$, $AD=15$, $BC=18$, then $BE=$ _____.
(A) 20 (B) 15
(C) 10 (D) 5

21. If measures of three sides of a triangles are ______ then it is not a right triangle.
(A) $20, 21, 29$ (B) $8, 24, 26$
(C) $8, 18, 17$ (D) $9, 40, 41$

22. In ΔABC, $\overline{AB}$ is median, then ______
(A) $AB^2+AC^2=AD^2+2BD^2$ (B) $AB^2+AC^2=AD^2+BD^2$
(C) $AB^2+AC^2=2AD^2+2BD^2$ (D) $AB^2+AC^2=2AD^2+BD^2$

23. A staircase of length 15 meters touches wall at height of 9 meter. The distance of base of the staircase from the wall is _____ meters.
(A) 12 (B) 15
(C) 10 (D) 14

24. In rectangle $\square ABCD$, $AB^2+BC^2+CD^2+AD^2=200$ then length of diaganol is _____.
(A) 9 (B) 10
(C) 13 (D) 14

25. In ΔABC, $m\angle A=90$, $\overline{AD}$ is altitude so $AB^2=$ _____
(A) $BD \bullet BC$ (B) $BD \bullet DC$
(C) $\frac{BD}{DC}$ (D) $BC \bullet DC$

26. If $4\sqrt{1-\sin^2\theta}=9\sqrt{1-\cos^2\theta}$ then $\tan\theta=$ _______.
(A) $\frac{3}{5}$ (B) $\frac{5}{3}$
(C) $\frac{9}{4}$ (D) $\frac{4}{9}$

27. $\sin^2 23+\cos^2 x=1$ find x
(A) 32^o (B) 45^o
(C) 90^o (D) None of these

28. In Δxyz, $m\angle y=90$, then $\sin^2x+\sin^2z=$ ______
(A) 2 (B) 1
(C) 3 (D) 0

29. $\tan^2\theta-\sec^2\theta=$ _____
(A) 1 (B) -1
(C) 2 (D) -2

30. $cos^2 45 - cos^2 30 = x, cos 45 \; sin 45$ then $x =$ ______.

(A) 2 (B) $\frac{3}{2}$

(C) $-\frac{1}{2}$ (D) $\frac{3}{4}$

31. $tan^4 \theta + tan^6 \theta =$ ______

(A) 1 (B) 0

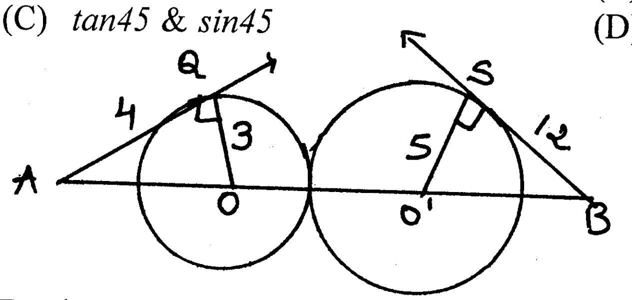
(C) $tan^4 \theta \cdot sec^2 \theta$ (D) $tan^4 \theta + cot^2 \theta$

32. The value of ______ are not equal.

(A) $cos\ 45\ \&\ sin45$ (B) $sin0\ \&\ cos90$

(C) $tan45\ \&\ sin45$ (D) $sin90\ \&\ cos0$

33.



For the above figure $AB =$ ______

(A) 20 (B) 26

(C) 24 (D) 28

34. $\odot (P, 5)$ and $\odot (Q, 4)$ touches each other externally, $PQ =$ ______.

(A) 9 (B) 5

(C) 1 (D) 7

35. In ΔPQR, $p=3$, $q=4$ and r=5 then circumradius of ΔPQR is ______

(A) 2.5 (B) 3.5

(C) 4.5 (D) 1.5

36. $\odot (P, r)$ touches the sides of $\square\ ABCD$. If $AB=7$, $BC=8$, $CD=12$, then $AD=$ ______.

(A) 10 (B) 11

(C) 13 (D) 8

37. The chord of circle $\overline{AB}$ and $\overline{CD}$ intersect point p at exterior of circle. If $AB=5$, $PB=5$, $DP=2$ then $CD =$ ______.

(A) 8 (B) 12

(C) 5 (D) 10

38. If point is in interior part of circle then ______ tangent is obtained from this point of circle.

(A) 0 (B) 1

(C) 2 (D) infinite

39. The probability of a non-loeap year having 53 sunday is ______.

(A) $\frac{1}{7}$ (B) $\frac{3}{7}$

(C) $\frac{2}{7}$ (D) $\frac{4}{7}$

40. In 52 cards, randomly selected cards are black and red than probability of this event is _____

(A) 1 (B) $\frac{1}{2}$

(C) $\frac{1}{4}$ (D) $\frac{3}{4}$

41. If one balanced coin is tossed 4 times, then total number of event is _____.

(A) 4 (B) 8

(C) 16 (D) 32

42. The probability of the event "The sun set in west" is _____.

(A) 0.2 (B) 0.5

(C) 0 (D) 1

43. L.C.M. $(35, 28, 63)$

(A) 1250 (B) 1140

(C) 1260 (D) 1450

44. $0.\overline{05}$ can be written as _____ in $\frac{p}{q}$ form

(A) $\frac{5}{99}$ (B) $\frac{5}{100}$

(C) $\frac{1}{5}$ (D) $\frac{5}{10}$

45. All natural numbers are divided into _______ groups.

(A) 1 (B) 2

(C) 3 (D) 4

46. If 4 is a zero of $p(x) = x^2 - kx + 12$ find another zero ?

(A) 7 (B) -7

(C) 3 (D) -4

47. In ΔPQR, $\frac{m\angle P}{3} = \frac{m\angle Q}{4} = \frac{m\angle R}{2}$, then the measure of smallest angle is _____.

(A) 40 (B) 30

(C) 20 (D) 50

48. The measure of side of one triangle are 3, 4 and 5. The perimeter of other similar triangle is 18, then measure of other triangle are _______.

(A) $5, 8, 5$ (B) $4.5, 6, 7.5$

(C) $4, 8, 6$ (D) $6, 6, 6$

49. If zeros of the given polynomial $p(x)$ is opposite, then _______ is true.

(A) $b=0$ (B) $a=c$

(C) $c=0$ (D) $a=0$

50. In ΔABC, $\angle B$ is right angle BE is attitude. If $AE=6$, $BE=3$ then $AC=$ _______.

(A) 7.5 (B) 8.5

(C) 7 (D) 8

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PART - B

Section - A

Solve the following. (2 marks each) **(16)**

1. Express | 0 | 0 | as a product of primes.

OR

Find *l.c.m.* (*105, 95*) using *g.c.d.* (*a, b*) X *l.c.m.* (*a, b*)=*ab*.

2. Simplify $\frac{1}{\sqrt{2}+1}+\frac{1}{\sqrt{2}+\sqrt{2}}+\frac{1}{\sqrt{4}+\sqrt{3}}+.....+\frac{1}{\sqrt{n}+\sqrt{n-1}}$
3. The sum of zeros is 2 and the product of zeros is *-3* then obtain a quadratic polynomial.
4. In ΔXYZ, the bisector of $\angle Y$ intersects $\overline{ZX}$ in *P* if *XY:YZ=4:5* and *XZ=27* find *XP* & *PZ*.
5. $\overline{AD}, \overline{BE}, \overline{CF}$ an the medians of ΔABC. If *BE=12, CF=9* and $AB^2+BC^2+AC^2=600$, *BC=100* find *AC*.
6. $\overline{AD}$ is a median of ΔABC, $AB^2+AC^2=148$ and *AD=7* find *BC*.
7. If $m\angle B=90$, *AB=3, AC=6* in ΔABC then find $m\angle C$, $m\angle A$ and *BC*.

OR

Check : $\cos 90 = 4\cos^3 30 - 3\cos 30$

8. A coin is tossed three times. Find the probability of the following events :
   (i) A : getting at most one head
   (ii) B : getting more heads then tails.

Section - B

Solve the following. (3 marks each) **(12)**

9. $\overline{AB}$ is a chord of $\odot$ (*O, 5*) such that *AB=8*. Tangents at *A* & *B* to the circle intersect in *P*. Find *PA*.
10. If α is acute angle and $3\sin\alpha=2\cos\alpha$ then prove that;

$$\left(\frac{1-\tan^2\alpha}{1+\tan^2\alpha}\right)^2+\left(\frac{2-\tan^2\alpha}{1+\tan^2\alpha}\right)^2=1$$

OR

If $\tan\theta+\sin\theta=a$ and $\tan\theta-\sin\theta=b$ then prove that $a^2-b^2=4\sqrt{ab}$.

11. Solve the pair of linear equation by cross multiplication method.

$$\frac{x}{3}+\frac{y}{5}=1, 7x-15y=21$$

12. A trader bought $2x^2-x+2$ T.V. sets for Rs.$8x^4+7x-6$. Find the price of one T.V. set.

Section - C

Solve the following. (4 marks each) **(12)**

13. State and prove the "Pythagoras theorem."

14. $(2+\sqrt{3})$ and $(2-\sqrt{3})$ are the zeroes of $P(x)=x^4-6x^3-26x^2+138x-35$.
Find the remaining zeroes of $P(x)$.

15. The area of a rectangle gets increased by 30 sq. units, if its length is reduced by 3 units and breadth is increased by 5 units. If we increase the length 5 units and reduce the breath by 3 units then the area of a rectangle reduced by 10 square units. Find the length and breadth of the rectangle.

OR

A fraction becomes $\frac{2}{5}$ when 2 is substracted from the numerator and denominator it becomes $\frac{3}{4}$ when 5 is added to its denominator and numerator, find the fraction.

Section - D

Solve the following. (5 marks each) **(10)**

16. Prove that "Areas of two similar triangles are proportional to squares of corresponding sides.

17. Draw AB such that $AB=10cm$. Draw ⊙ $(A, 3)$ and ⊙ $(B, 4)$. Construct tangents to each circle through the centre of the circle.

OR

Draw ΔPQR with $m\angle P=60$, $m\angle Q=45$ and $PQ=6\ cm$. Then construct ΔPBC whose sides have length $5/3$ times the length of the corresponding sides of ΔPQR.

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