GLOBAL TALENT SEARCH EXAMINATION

MATHEMATICS

Class : X

Max Marks : 80

Time : 9:00 to 10:30 a.m.

Instructions to Candidates :

01. This question paper has 40 objective questions. In addition to this question paper, you are also given an answer-sheet.

02. Read the instructions carefully for each section before attempting it.

03. For each correct answer **2 marks** will be awarded and there is no negative marking.

04. On the answer-sheet, fill up all the entries carefully in the space provided, **ONLY IN BLOCK CAPITAL LETTERS**.

05. Incomplete / incorrect / carelessly filled information may disqualify your candidature.

06. On the answer-sheet, use **PENCIL / BLUE or BLACK BALL PEN.**

07. No extra sheet will be provided for rough-work. Use the space available in the paper for your rough- work.

08. Use of calculator is not permitted.

09. No student is permitted to leave the examination hall before time is complete.

10. Use of unfair means shall invite cancellation of the test.

Roll No.

Centre No.

Male / Female _____

Name of the candidate : (In English only, as you would like it to be printed on the certificate).

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Signature of the invigilator

Signature of the candidate

AMITY INSTITUTE FOR COMPETITIVE EXAMINATIONS

Each question has four alternatives marked (A), (B), (C) and (D), but only one of these alternatives is the correct answer.

1. Which one of the figures shown against (A), (B), (C) and (D) will complete the figure given below ?

(A)   (B)

(C)   (D)
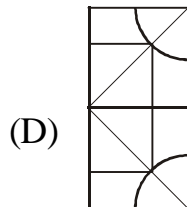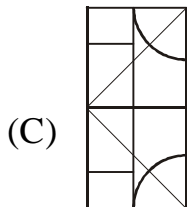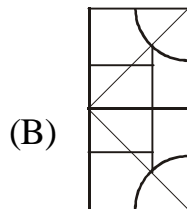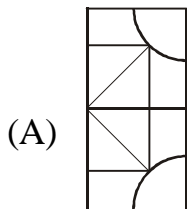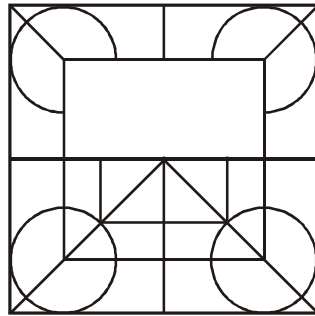
2. Our father is three times as old as my younger brother and I am older than my brother by one third of his age. Four years ago, I was as old as my brother today. Present age of my father is

(A) 48 years   (B) 45 years

(C) 42 years   (D) 36 years

3. 8 men and 5 women can finish a job in 3 days. Whereas 4 men and 4 women can finish the same job in 5 days. The ratio of their labour charges should be
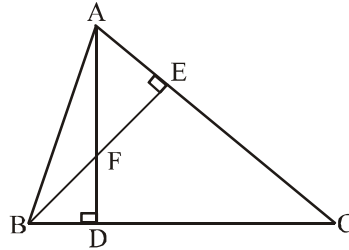
(A) 5 : 4   (B) 6 : 5

(C) 4 : 3   (D) 9 : 5

4. In $\triangle ABC$, altitudes AD and BE intersect each other at point F. Which of the following two sets of triangles are not similar ?

(A) $\triangle ACD$ and $\triangle BCE$

(B) $\triangle BDF$ and $\triangle FEA$

(C) $\triangle AEB$ and $\triangle ADB$

(D) $\triangle BDF$ and $\triangle ADC$

In the following questions, alphabets of the terms follow certain pattern. Try to understand the pattern of the alphabets and find the term out of the four alternatives given below the term, such that the alphabets of this term also follow the same pattern.

5. M O R V

(A) P R T W

(B) K M Q T

(C) Y A D G

(D) H J M Q

6. F H D B

(A) P R N L

(B) A C Z X

(C) Y W U S

(D) N P L K

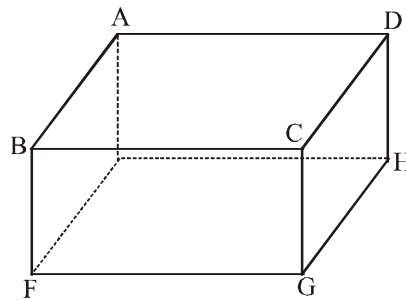**7.** Considering x and y to be positive, find their values if

$$\frac{5}{\sqrt{x}} - \frac{4}{\sqrt{y}} = \frac{1}{2} \text{ and } \frac{6}{\sqrt{y}} - \frac{4}{\sqrt{x}} = \frac{13}{20}$$

(A) $\dfrac{25}{4}, \dfrac{64}{9}$

(B) $\dfrac{16}{9}, \dfrac{64}{9}$

(C) $\dfrac{25}{4}, \dfrac{49}{9}$

(D) $\dfrac{9}{4}, \dfrac{64}{9}$

8. In the rectangular solid block, as shown, the diagonal of the facing side is $4\sqrt{5}$ cm, the diagonal of the upper surface is 10 cm and the diagonal of the side surface is $2\sqrt{13}$ cm. The surface area of this block is

(A) 208 cm^2

(B) 212 cm^2

(C) 228 cm^2

(D) 256 cm^2

9. Points A (1, – 4), B (9, – 2), C (11, 6) and D (3, 4) are the vertices of a quadrilateral. This quadrilateral should be

(A) a rectangle   (B) a parallelogram

(C) a square   (D) a rhombus

10. In the above question, if diagonals intersect at point O, then area of the triangle BCO

(A) 12 sq. units   (B) 15 sq. units

(C) 16 sq. units   (D) 18 sq. units

11. In the circle with O as centre, the sides of the triangle ABC are 17 cm, 8 cm and 15 cm, as shown. The sum of the areas of the two shaded secants is nearly (Take π = 3.12)

(A) 43.5 cm^2

(B) 45.5 cm^2

(C) 52.7 cm^2

(D) 57.2 cm
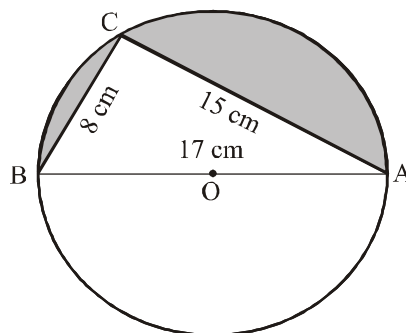
12. A circle is enclosed by four tangents from points *A*, *B*, *C* and *D*, touching it at points *P*, *Q*, *R* and *S*, as shown. If *AP* = *a*, *BQ* = *b*, *CR* = *c* and *DS* = *d* such that

$$a + b = 7 \text{ units}, \ b + c = 9 \text{ units}$$

$$d - c = 4 \text{ units}, \ d + a = 12 \text{ units}$$

then, *AP* (*a*) is equal to

(A) 2 units

(B) 3 units

(C) 4 units

(D) 5 units
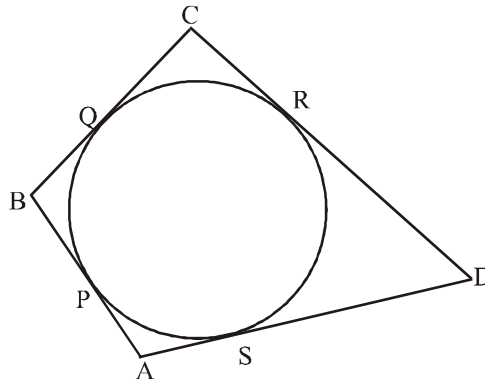
13. A furniture dealer earns Rs. 190 if he sells a table at a profit of 12% and a chair at a loss of 10%. But if he sells the table at a profit of 8% and the chair at a profit of 12% his earning increases to Rs. 332. The cost price of the chair would be

(A) Rs. 1300   (B) Rs. 1250

(C) Rs. 1100   (D) Rs. 1000

14. In the equation $6\dfrac{B}{13} \times A\dfrac{5}{9} = 38\dfrac{6}{13}$, the values of A and B are, respectively
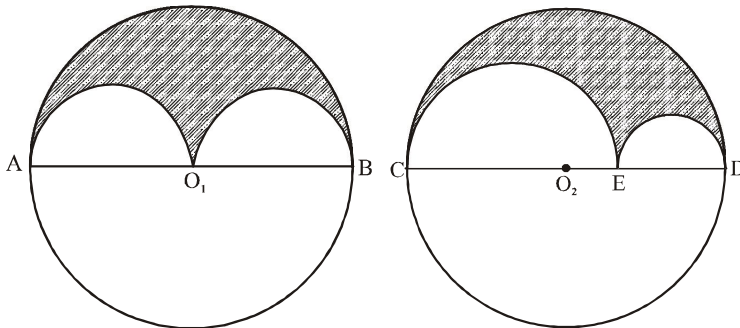
(A) 5, 2   (B) 5, 12

(C) 6, 12   (D) 6, 11

15. $\dfrac{\tan\theta}{\sec\theta - 1} + \dfrac{\tan\theta}{\sec\theta + 1}$, on simplification, gives

(A) sec θ   (B) cosec θ

(C) 2 sec θ   (D) 2 cosec θ

16. Both the circles with centres O_1 and O_2 have equal radii. If $AO_1 = O_1B$ and $CE = 2\ ED$, then the ratio of the shaded areas is

(A) 4 : 3

(B) 2 : 3

(C) 9 : 8

(D) 8 : 7

17. The difference between 21st and 25th terms of an arithmetic progression is 60. The ratio of 10th term and 7th term of this series is 5 : 4. The third term of this series is
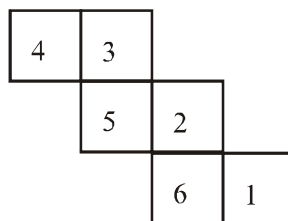
(A) 125

(B) 120

(C) 96

(D) 80

18. When $2^{2^{2^2}}$ is divided by $\left(2^2\right)^4$, the result is

(A) 2^8

(B) 2^4

(C) 2^2

(D) 1

19. When folded along the lines, the following spread will form a hollow cube. Face marked 1 of the hollow cube will be opposite to which of the following faces ?

(A) Marked 5

(B) Marked 4

(C) Marked 3

(D) Marked 2

20. *C* is the centre of a line segment *AB*. With *AC*, *CB* and *AB* as diameters, three semicircles are drawn on the same side of the segment *AB* as shown. A circle with centre *O* is so drawn that it touches all the three semicircles, at points *P*, *Q* and *S*. If *R* is the radius of each of the smaller semicircles and *r* is the radius of the circle with *O* as centre, then *R* : *r* is same

(A) 2 : 1

(B) 3 : 2

(C) 4 : 3

(D) 5 : 3
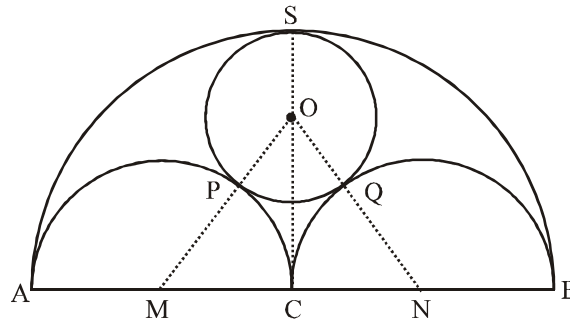
21. Sonia has five bangles *A*, *B*, *C*, *D* and *E* of 22 carrot gold, each having different weight, as given under :

(i)   bangle *A* weighs twice as much as bangle *B*

(ii) bangle *B* weighs four-and-a-half times as much as bangle *C*

(iii) bangle *C* weighs half as much as bangle *D*

(iv) bangle *D* weighs half as much as bangle *E*

Which of the two bangles are heavier than bangle *E* ?

(A) Bangles *A* and *C*   (B) Bangles *A* and *B*

(C) Bangles *A* and *D*   (D) Bangles *B* and *D*

22. In the above question, which bangle is heavier than only one other bangle ?

(A) *A*   (B) *B*

(C) *D*   (D) *E*

23. A circle is inscribed is an equilateral triangle of side a each. The shaded area has a magnitude of

(A) $\dfrac{3\sqrt{3} - \pi}{72} a^2$

(B) $\dfrac{4\sqrt{3} - \pi}{72} a^2$

(C) $\dfrac{6\sqrt{3} - \pi}{72} a^2$

(D) none of these

In each of the following questions, there are three rows of numbers. In each row, the numbers in the bracket are related with the numbers outside in a particular relation. Find the number from the four alternatives given below each question such that when it replaces the sign ...?..., the same relation is also applicable.

24. 135 (99) 102

309 (42) 295

874 (...?...) 748

(A) 468　　　　　　　(B) 438

(C) 348　　　　　　　(D) 378

25. 279 (25) 346

729 (33) 360

297 (...?...) 432

(A) 23　　　　　　　(B) 27

(C) 33　　　　　　　(D) 37

26. A, B, C, D, E and F are written on faces of a cube. Two views of the cube are given below. Study each view of the cube and give the correct statement :
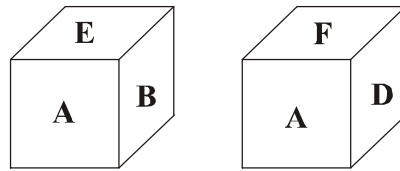
(A) C and F are on the opposite faces of the cube

(B) C and E are on the opposite faces of the cube

(C) B and F are on the opposite faces of the cube

(D) A and C are on the opposite faces of the cube

27. A water tank is fitted with many identical taps for filling water. It has also some identical holes at its base, which are opened to drain out water for cleaning. If 4 taps and 9 holes are opened, it is found that the tank become full in 4 hours. But if 7 taps and 2 holes are opened, then the tank is filled in one and a half hours. In how many hours can a single tap fill the empty water tank when all the holes are closed ?

(A) 10 hours   (B) 12 hours

(C) 15 hours   (D) 16 hours

28. The same digit has to be put in all the three empty boxes of a five-digit number shown below, such that the number becomes divisible by 9 as well as 11.

| 9 | | 6 | | |

Which one of the following digits should be used ?
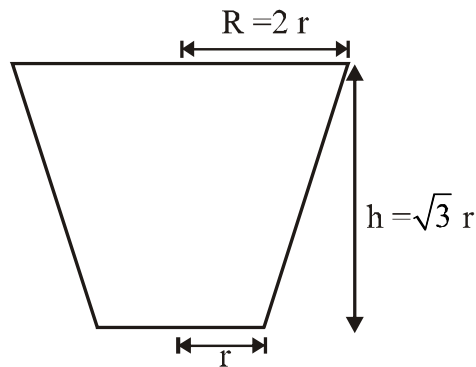
(A) 8   (B) 7
(C) 4   (D) 1

29. The right circular solid frustum has the dimensions as shown. Find the value of *r* such that the volume and the total surface area of the frustum are equal in magnitude.

(A) $\dfrac{9\sqrt{3}}{11}$ units

(B) $\dfrac{11\sqrt{3}}{9}$ units

(C) $\dfrac{7\sqrt{3}}{11}$ units

(D) $\dfrac{11\sqrt{3}}{7}$ units

R = 2 r

h = $\sqrt{3}$ r

r

In the following questions, each series follows its own regular pattern of numbers. Try to understand the pattern of numbers in each series and then find the missing number in each series, which is also given as one of the four alternatives below each series.

30. 4, 5, 9, 18, 34, 59, ...?...

(A) 98   (B) 95

(C) 84   (D) 85

31. 0, 3, 10, 21, 36, 55, ...?..., 105

(A) 88   (B) 80

(C) 78   (D) 76

32. A shopkeeper sells a trouser at a profit of 20%. If the cost price as well as the selling price were Rs. 200 less, then his profit would have been 4% more. The cost price of the trousers is
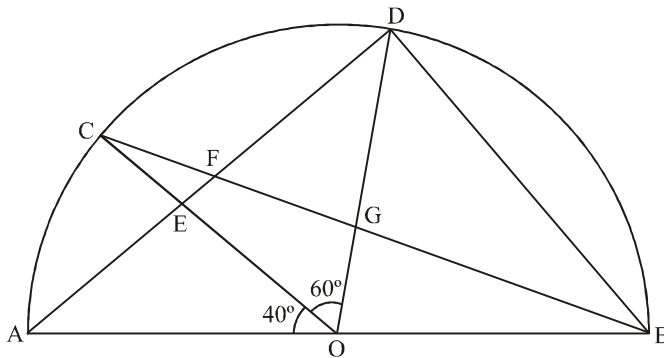
(A) Rs. 1500   (B) Rs. 1350

(C) Rs. 1200   (D) Rs. 1100

33. In the given semicircle, *AOB* is the diameter and *O* is the centre of the circle of which this semicircle is a part. ∠*AOC* = 40°, ∠*COD* = 60° and *AD*, *BD* and *CB* are joined.

Find the magnitudes of ∠*AEO*, ∠*OGB* and ∠*ODB*.

	∠*AEO*	∠*OGB*	∠*ODB*
(A)	100°	80°	50°
(B)	100°	80°	40°
(C)	100°	60°	50°
(D)	80°	100°	50°

34. The first term of a series is 5 and each next term increases by 3. If the sum of the last five terms of the series is 370, then the number of terms in the series is

(A) 27   (B) 26

(C) 25   (D) 24

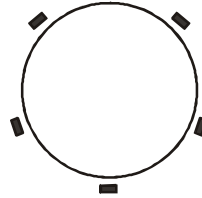**35.** $\dfrac{\operatorname{cosec}}{\sqrt{\operatorname{cosec}^2\theta - 1}} \times \dfrac{1}{\sqrt{1+\tan^2\theta}} - \dfrac{\cot^2\theta}{1+\cot^2\theta}$, on simplification, gives

(A) $\tan^2\theta$ (B) $\cot^2\theta$

(C) $\sin^2\theta$ (D) $\cos^2\theta$

36. Five friends *P*, *Q*, *R*, *S* and *T* are sitting on chairs around a circular table. *P* is sitting on the left of *R* and *S* is sitting between *P* and *Q*. Who is sitting between *S* and *T* ?

(A) R

(B) Q

(C) P

(D) None of these

37. $\dfrac{5}{5-3\frac{1}{3}} \times \dfrac{\frac{5}{2}}{3-\frac{2}{1.5}} - \dfrac{15}{49} \text{ of } \left[\dfrac{1}{1\frac{3}{7}} + \dfrac{6}{5} \text{ of } \dfrac{3\frac{1}{3}-2\frac{1}{2}}{\frac{47}{21}-2} \right]$

On simplification, the result would be

(A) 2   (B) 3

(C) 4   (D) 5

38. When one twelfth of 15% of a number is subtracted from the sum of 25% of the number increased by 5 and 5% of the number increased by 12, then the result is the sum 45% of the number and 4. The number under consideration is

(A) 80   (B) 100

(C) 96   (D) 120

39. A letter-series is repeated and in this group, some letters are missing. The missing letters, in proper order, are given as one of the four alternatives below the question. Try to find out the letter series and give the correct group of missing letters.
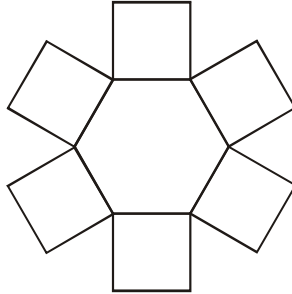
b – a – – a – b – a a b – a

(A) a b b a b a   (B) a b a b a b

(C) a b b a b b   (D) a b a a b b

40. In the following diagram, if the area of whole figure is $54\left[4 + \sqrt{3}\right]$ cm^2, then the side of the hexagon is

(A) 9 cm

(B) 6 cm

(C) 4 cm

(D) 3 cm

ANSWERS CLASS X MATHS

1	D	2	D	3	A	4	C	5	D
6	A	7	A	8	A	9	D	10	B
11	C	12	B	13	C	14	B	15	D
16	C	17	B	18	A	19	A	20	B
21	B	22	C	23	A	24	D	25	B
26	D	27	A	28	C	29	D	30	B
31	C	32	C	33	A	34	B	35	C
36	B	37	B	38	A	39	C	40	B