SECTION A : 25 QUESTIONS (+4, 0)

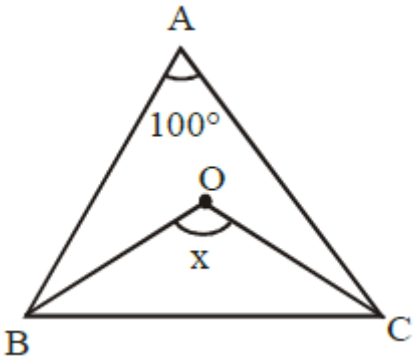
In this section, only one option is correct and correct answer will fetch +4 marks, NO answer or wrong answer will fetch zero marks.

1. Straight line $3x + 4y - 12 = 0$ will pass through the following quadrants
(A) I, II, III (B) IV, I, II (C) II, III, IV (D) I, IV, III

2. The largest number that will divide 398, 436 and 542 leaving remainder 7, 11 and 15 respectively is :
(A) 11 (B) 17 (C) 24 (D) 45

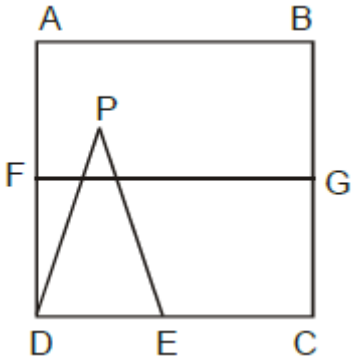
3. Every line segment has one and only one mid-point
(A) True (B) False (C) unpredictable (D) none

4. In the given figure the angle bisector of $\angle B$ and $\angle C$ are BO and CO respectively. What is the value of x?



(A) 120° (B) 130° (C) 140° (D) 150°

5. The area of the square ABCD is 64. Let E, F and G be mid points of DC, AD and BC, respectively. If P is any point inside the rectangle ABGF and if X is the area of the triangle DPE, then which one of the following is necessarily true?



(A) $8 < X < 16$ (B) $8 < X < 32$ (C) $16 < X < 32$ (D) $16 < X < 64$

6. If p and q are the zeroes of the polynomial $x^2 - 12x + 20$. Find the value of $p^3 + q^3$:
(A) 84 (B) 240 (C) 1008 (D) 406

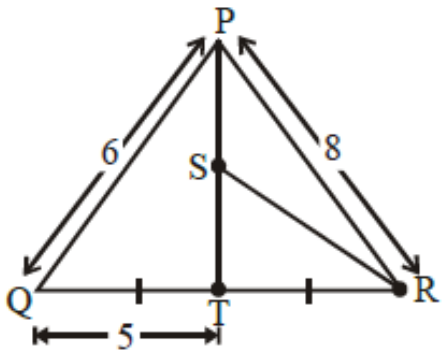
7. $\sin 2A = 2\sin A$ is true when A =?
(A) 0° (B) 30° (C) 45° (D) 60°

8. Two circles of equal radius of $2\sqrt{3}$ intersect each other in such a way that both pass through center of each other. The length of common chord is
(A) 8 (B) 6 (C) 4 (D) 3

9. Which of these numbers cannot be probability of an event?
(A) 1.001 (B) 0 (C) 1 (D) 20%

10. If the sides of triangle are in ratio $\frac{1}{2}:\frac{1}{3}:\frac{1}{4}$, the perimeter is 52cm, then the length of smallest side is
(A) 12cm (B) 11cm (C) 8cm (D) None of these

11. In the given figure, S is the mid-point of median PT of ΔPQR, then area of triangle RST is equal to



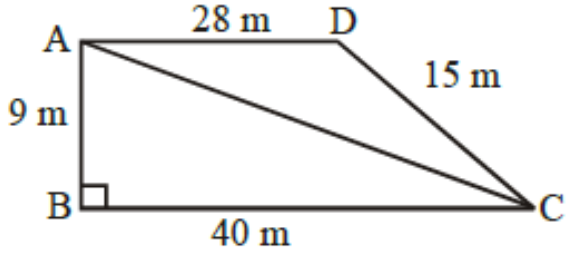
(A) 24 sq. unit (B) 12 sq. unit (C) 6 sq. unit (D) 9 sq. unit

12. O is the centre of a circle of radius 15 cm. M is a point at a distance of 5 cm from O. AMB is any chord of the circle passing through M then the value of AM × MB is
(A) 100 (B) 50 (C) 150 (D) 200

13. The steps from solids to points are
(A) Solids - Surfaces - Lines - Points (B) Solids - Lines - Surfaces - Points
(C) Lines - Points - Surfaces - Points (D) Lines - Surfaces - Points – Solids

14. A box contain number chits from 1 to 50. A person randomly picked 1 chit, find the probability of number should be divisible by 3 but not divisible by 5.
(A) $\frac{13}{50}$ (B) $\frac{23}{50}$ (C) $\frac{10}{50}$ (D) $\frac{1}{5}$

15. In below figure, area of traingle ADC is 'p'. The value of $\sqrt{\frac{p}{140}}$ (in m) is



(A) 0.3 (B) Between 0.4 to 0.8
(C) 0.03 (D) More than 0.9

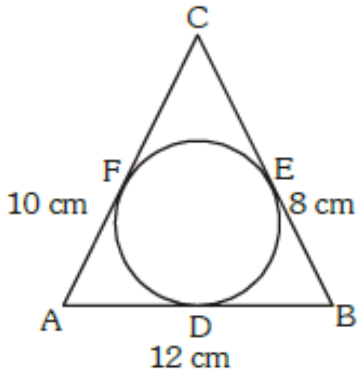
16. A cube whose edge is 10 cm long, has circles on each of its faces painted blue. What is the total area of the unpainted surface of the cube, if the circles are of the largest possible areas ? (Take $\pi = 3.14$)
(A) 129 cm^2 (B) 300 cm^2 (C) 429 cm^2 (D) 450 cm^2

17. Find the remainder, when $x^3 - mx^2 - 3m$ is divided $(x - m)$?
(A) m (B) –m (C) 3 m (D) –3 m

18. If $\cos 9A = \sin A$ and $A < 10°$ then value of $\tan 5A$ is
(A) 0 (B) 1 (C) $\frac{1}{\sqrt{3}}$ (D) $\sqrt{3}$

19. The mean of 20 observations is 12.5. By error, one observation was noted as –15 instead of 15. Then the correct mean is:
(A) 11.75 (B) 11 (C) 14 (D) None of these

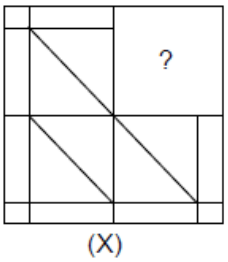
20. A circle is inscribed in a ΔABC having sides 8 cm, 10 cm and 12 cm as shown in figure. Find AD.



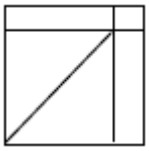
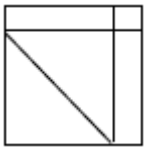
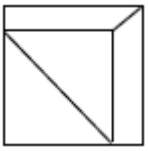
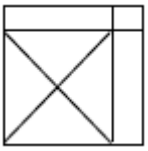
(A) 5 cm (B) 4 cm (C) 6 cm (D) 7 cm

Directions (Q. 21 to 22): In each of the following questions a problem figure is given marked as (X). This is followed by four answer figures. In the problem figure a blank is left which is shown by question mark. Find the figure which completes the pattern by replacing question mark (?).

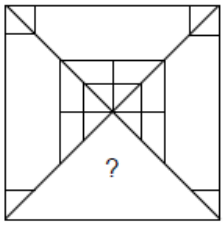
21.



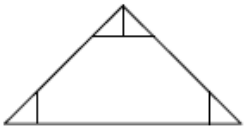
(X)

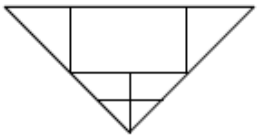
(A)  (B)  (C)  (D) 

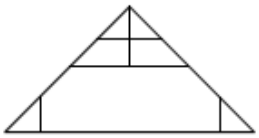
22.

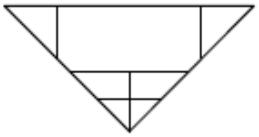


(X)

(A) 

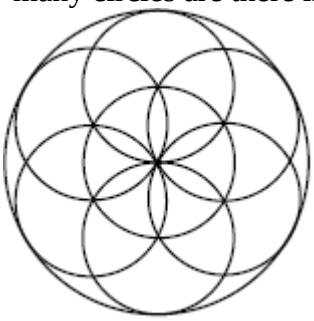
(B) 

(C) 

(D) 

23. In a code language '**RAJIV**' is coded as '**WJKBS**', then how do we code the word '**SINDHU**'?
(A) VIEOJT (B) EVIOTJ (C) WVJKB (D) TOJVEI

24. How many circles are there in the given figure?



(A) 12 (B) 10 (C) 8 (D) 6

25. Ram walks 7 km towards North and turns towards left and covers 3 km. Again he turns towards left and walks 11 km. How far is he from the starting point?
(A) 16 km (B) 21 km (C) 12 km (D) 5 km

ACE OF PACE

ENGINEERING **ANSWERS KEY** **SAMPLE PAPER**

Question No.	Answer
1	B
2	B
3	A
4	C
5	A
6	C
7	A
8	B
9	A
10	A
11	C
12	D
13	A
14	A
15	D
16	A
17	D
18	B
19	C
20	D
21	B
22	C
23	A
24	C
25	D

SOLUTIONS

1. (B)

Points in third quadrant have both x and y coordinate negative.

2. (B)
HCF (391, 425, 527) = 17

3. (A)
Basic fact

4. (C)
$\angle B + \angle C = 80^o = \frac{1}{2}(\angle B + \angle C) = 40^o \Rightarrow \angle BOC = 180^o - 40^o$

5. (A)
DE = 4 & height from P to DE is more than 4 but less than 8.

6. (C)
$p + q = 12,\ pq = 20$
$\Rightarrow p^3 + q^3 = (p+q)^3 - 3pq(p+q)$

7. (A)
Using options A = 0^o clearly satisfies.

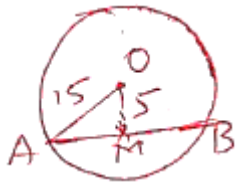
8. (B)
Line joining centre is perpendicular bisector of common chord.

9. (A)
$0 \le \text{Probability} \le 1$

10. (A)
$\frac{1}{2} : \frac{1}{3} : \frac{1}{4} = 6 : 4 : 3$
$\therefore 13x = 52 \Rightarrow x = 4$

11. (C)
Median divides the triangle into two equal areas.

12. (D)



$AM = \sqrt{225-25}$
$= \sqrt{200}$
$= 10\sqrt{2}$

13. (A)
Obvious

14. (A)
Favourable chits numbers are {3, 6, 9, ….., 48} – {15, 30, 45}

15. (D)
$P = \frac{1}{2} \times 28 \times 9 = 126 \Rightarrow \sqrt{\frac{P}{140}} = \sqrt{0.9} > 0.9$

16. (A)
$6 \times 10^2 - 6 \times \pi \times 5^2$

17. (D)
$P(x) = x^3 - mx^2 - 3x \Rightarrow P(m) = m^3 - m^3 - 3m = -3m$

18. (B)
$\cos 81^o = \sin 9^o \Rightarrow A = 9^o \Rightarrow 5A = 45^o$

19. (C)
Change in sum $= 30 \Rightarrow$ change in average = 1.5

20. (D)
$AD = s - a = 15 - 8 = 7$ cm

21. (B)

22. (C)

23. (A)

24. (C)

25. (D)