SSL MODEL EXAM

ANSWE KEY-SET-2

EM

Questions from 1 to 4 carries two scores. Answer any three. $3 \times 2 = 6$

1) a) $13, 17$
   b) $4n - 3$

2) a) 90°
   b) Rectangle.

3) a) $\frac{3}{10}$
   b) $\frac{4}{10}$

4) a) $x^2 + x = 2$
   b) $x = 1$

Questions from 5 to 11 carries two scores. Answer any five . $5 \times 3 = 15$

5) a) 10cm
   b) $5\sqrt{3}$cm

6) a) $| 4 - 1 | = 3$
   b) $AC = \sqrt{5^2 - 3^2} = 4$
   $C(1, 5)$
   c) $\frac{1}{2} \times 3 \times 4 = 6$

7) a) $7 + 3 + 7 + 3 = 20$cm
   b) 90°
   c) $180 - 130 = 50^\circ$

8) a) $l = \sqrt{13^2 - 5^2} = 12$cm
   b) $12 + 12 + 10 = 34$cm
   c) $a^2 + 2al = 100 + 260 = 360$ sq.cm

9) a) $\sqrt{2}$
   b) $(1, 0), (0, 1), (-1, 0), (0, -1)$
   c) $x^2 + y^2 = 1$

10) a) $x - 1, x + 1$
   b) Since $x - 1$ is a factor $p(1) = 0$
   $a + b + c + d = 0$

11) a) Let x be the smaller side. $x(2x + 12) = 80$, $2x^2 + 12x = 80$, $x^2 + 6x = 40$
   b) $x^2 + 6x + 3^2 = 40 + 3^2$
   $(x + 3)^2 = 7^2, x + 3 = 7, x = 4$
   Sides are 4 and $2 \times 4 + 12 = 20$

Questions from 12 to 21 carries four scores. Answer any six . $6 \times 4 = 24$

12) a) Since $x_5 - x_1 = 12$ then $x_6 - x_2$ is also 12

b) $x_7 = x_3 + 4d = 10 + 12 = 22$

c) $4d = 12, d = 3$

13) a) 90°

b) $180 - 60 = 120^\circ$

c) Since $AD = CD$ opposite angles of $\triangle ADC$ are 30° each
$\angle BCD = 90 + 30 = 120^\circ$

d) $\angle DAB = 180 - 120 = 60^\circ$

14) a) $\frac{4}{7}$

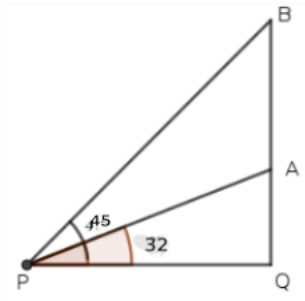
b) $\frac{3}{7}$

c) x black balls should be added.
$\frac{3+x}{7+x} = \frac{5}{7}$
$7 \times (3 + x) = 5 \times (7 + x)$
$21 + 7x = 35 + 5x, 2x = 14, x = 7$
7 black balls should be added.

15) a) Let r be the radius of small circle. Radius of other circle is $2r + 1$
$\pi r^2 + \pi(2r + 1)^2 = 58\pi$, $r^2 + (2r + 1)^2 = 58$
$5r^2 + 4r - 57 = 0$

b) Solving $r = 3$.Radii are 3 and 7.

16) a) Diagram



b) $QB = 100$ meter

c) $\tan 32 = \frac{AQ}{100}$
$AQ = 62$ meter
$AB = 100 - 62 = 38$ meter

17) a) $AB = \mid 7 - (-3) \mid = 10$

b) $\mid 11 - 2 \mid = 9$

c) $\frac{1}{2} \times 10 \times 9 = 45$

18) Steps of construction.

a) Draw the triangle with the given measurement

b) Draw bisectors of two angles.The bisectors intersect at a point Oinside the triangle.

c) Draw perpendicular from O to a side. Draw circle with O as the center and perpendicular distance to the side as the radius.

19) a) 24cm

b) $lx = 360r \to 24 \times 120 = 360 \times r$
$r = \frac{24 \times 120}{360} = 8$cm
For the second cone $r = 16$cm

c) For the first cone, curved surface area $= \pi \times 8 \times 24 = 192\pi$ sq.cm
For the secone cone curved surface area is $2 \times 192\pi = 384\pi$ sq.cm

20) a) $(3, 6), (3, 2)$

b) 2

c) $x = 5$ or $x = 1$

d) $(x - 3)^2 + (y - 4)^2 = 2^2$

Questions from 21 to 29 carries five scores. Answer any seven. $7 \times 5 = 35$

21) Table

Marks	Number of children
Below 10	5
Below 20	16
Below 30	26
Below 40	38
Upto 50	45

a) The number of students $n = 45$.Since its is odd, $\frac{45+1}{2}$ th term comes in the middle.The mark of 23 rd student is median.

b) It is assumed that distribution of marks in the median class are in arithmetic sequence.
$20 - 30$ is the median class.10 marks is divided equally among 10 children. Each one's share is 1.
Score of 17 th term is $20 + \frac{1}{2} = 20.5$

c) 7 th term of the arithmetic sequence having first term $20.$ and common difference 1 is the median. It is the score of 23 rd term.
Median $= f + 6d = 20.5 + 6 \times 1 = 26.5$

22) a) Since $x_5 - x_1 = 16$ then $x_6 - x_2$ is also 16

b) $x_7 - x_3 = 16$
$x_7 = x_3 + 16 = 19 + 16 = 35$

c) $4d = 16, d = 4$

d) $f = x_3 - 2d = 19 - 2 \times 4 = 11$
$x_n = 4n + 7$

23) ⋆ Draw the circle of radius 4cm

⋆ Divide the angle around the center as $2 \times 50 = 10^\circ, 2 \times 70 = 140^\circ$ by drawing radii

⋆ Join the ends of radii. It makes the traingle.

24) a) $AP = 4$cm

b) $QC = x, QB = 4 - x$

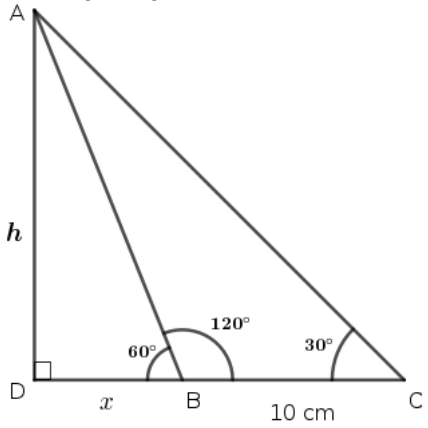
c) $4^2 + (4 - x)^2 = (4 + x)^2$
Solving $x = 1$
$PQ = 4 + 1 = 5$cm

25) a) $PA \times PB = PC^2 = 144$

b) $PA = x + 32$

c) $(x+32)\times x=144$
$x^2+32x+16^2=144+16^2$
$(x+16)^2=20^2$
$x+16=20, x=4$
$PA=36, PB=4$

26) Draw rough diagram.



a) 60°

b) Take $AD=h, BD=x$. Triangle ADC is a $30-60-90$ triangle. Triangle ADB is also a $30-60-90$ triangle
$x+10=h\sqrt{3}$
$h=x\sqrt{3}$
$\therefore x+10=x\sqrt{3}\times\sqrt{3}$
$x+10=3x, 2x=10, x=5$, $h=5\sqrt{3}$

c) Area $=\frac{1}{2}\times 10\times 5\sqrt{3}=25\sqrt{3}$

27) a) $A(0,2), D(4,5)$

b) $\mid 5-2\mid=3$

c) $AB\times BD=4\times 3=12$

28) a) $a+b=4, ab=-21$

b) $(a-b)^2=(a+b)^2-4ab$
$(a-b)^2=4^2-4\times -21=100$
$a-b=10, a+b=4\rightarrow a=7, b=-3$

c) $p(x)=(x+7)(x-3)=0$
$x+7=0, x=-7$
$x-3=0, x=3$

29) a) $10, 26, 42\cdots$

b) $4^2=16$

c) 5

d) $10^2=100$

e) 20

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[1]Prepared by John P A , mathematics teacher . jpavpz@gmail.com