Proctored Mock CAT- 7 2014

Section I: QA & DI

1. N, a natural number less than 30, has an odd number of factors. The number of consecutive zeroes at the end of N! cannot be more than

(a) 6 (b) 5 (c) 4 (d) 3

1. a As we know that only those numbers have odd number of factors that are squares of natural numbers, the value of N has to the square of a natural number. In order to maximize the number of zeroes at the end of the factorial of a number, the number should contain the maximum possible power of 5. The number that satisfies the aforementioned conditions is 25.
Hence, the required number = Number of zeroes at the end of 25! = 6.

2. In 2013, the price of commodities A and B witnessed an increase of 24% and 18% respectively, over the previous year. If the prices of the two commodities were the same in 2013, what was the ratio of the price of B to that of A in 2012?

(a) 62 : 59 (b) 59 : 62 (c) 41 : 38 (d) 38 : 41

2. a Let the prices of A and B in 2012 be Rs. a and Rs. b respectively.
According to the question,
a × (1+ 0.24) = b × (1 + 0.18)
⇒ a : b = 62 : 59.

3. Find the value of the following expression:

$$\log_{0.1}\left[\frac{1}{2}\right]+\log_{0.1}\left[\frac{2}{3}\right]+\log_{0.1}\left[\frac{3}{4}\right]+....+\log_{0.1}\left[\frac{9}{10}\right].$$

(a) $\log_{0.1}\left[\frac{8}{9}\right]$ (b) 0 **(c) 1** (d) –1

3. c $\log_{(0.1)}\left[\frac{1}{2}\right]+\log_{(0.1)}\left[\frac{2}{3}\right]+\log_{(0.1)}\left[\frac{3}{4}\right]+...+\log_{(0.1)}\left[\frac{9}{10}\right]=\log_{(0.1)}\left[\frac{1}{2}\right]\times\left[\frac{2}{3}\right]\times\left[\frac{3}{4}\right]\times...\times\left[\frac{9}{10}\right]=\log_{(0.1)}\left[\frac{1}{10}\right]=1$

4. The minimum value of the expression $[x]^2-\frac{2}{3}[x]+\frac{7}{9}$, where [x] represents the greatest integer less than or equal to x, is

(a) $\frac{7}{9}$ (b) $\frac{2}{3}$ (c) $\frac{1}{3}$ (d) 0

4. a As [x] can take only integer values, the numerical value of [x] will always be greater than or equal to that of $\frac{2}{3}[x]$. Now, from the expression, it can be observed that it will have the minimum value at x = 0.
Hence, the required value = $\frac{7}{9}$.

5. If P1 is a point on $x^2 + y^2 + 11 = 4(2x + y)$ and P2 is a point on $x^2 + y^2 + 164 = 4(7x + y)$, the distance (in units) between P1 and P2 cannot be more than

(a) 14 (b) 10 **(c) 19** (d) 1

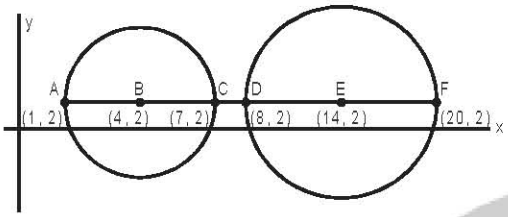
5. c The given equations can be rewritten as:

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

$(x - 14)^2 + (y - 2)^2 = 6^2$ ... (ii)

From the above equations, it can be noted that the given equations represent circles.

The following graph shows the positions of the two circles.



From the graph, it can be noted that the maximum distance between any two points on the circle, with one point on each, cannot be more than AF i.e. 19 units.

6. If $b = a^{\frac{3}{2}}, d = c^{\frac{4}{5}}$ and $d - b = 8$, where a, b, c and d are natural numbers, then what is the value of $(c - a)$?

(a) 28 (b) 32 (c) 24 (d) –12

6. a $b = a^{\frac{3}{2}}, d = c^{\frac{4}{5}}$

$\Rightarrow b^2 = a^3$ and $d^5 = c^4$ ...(i)

Also, $d - b = 8$ ...(ii)

From (i) and (ii), we get a = 4, b = 8, c = 32 and d = 16.

Hence, $c - a = 32 - 4 = 28$.

7. If $f(x) = (\sec x + \operatorname{cosec} x)(\tan x - \cot x)$, where $\frac{\pi}{4} < x < \frac{\pi}{2}$, then the range of f(x) is

(a) $[0, \infty)$ (b) $(0, \infty]$ (c) $[-\infty, 0]$ **(d)** $(0, \infty)$

7. d Let F1 = sec x + cosec x and F2 = tan x – cot x.

It can be observed that both the functions F1 and F2 are increasing functions in the given interval.

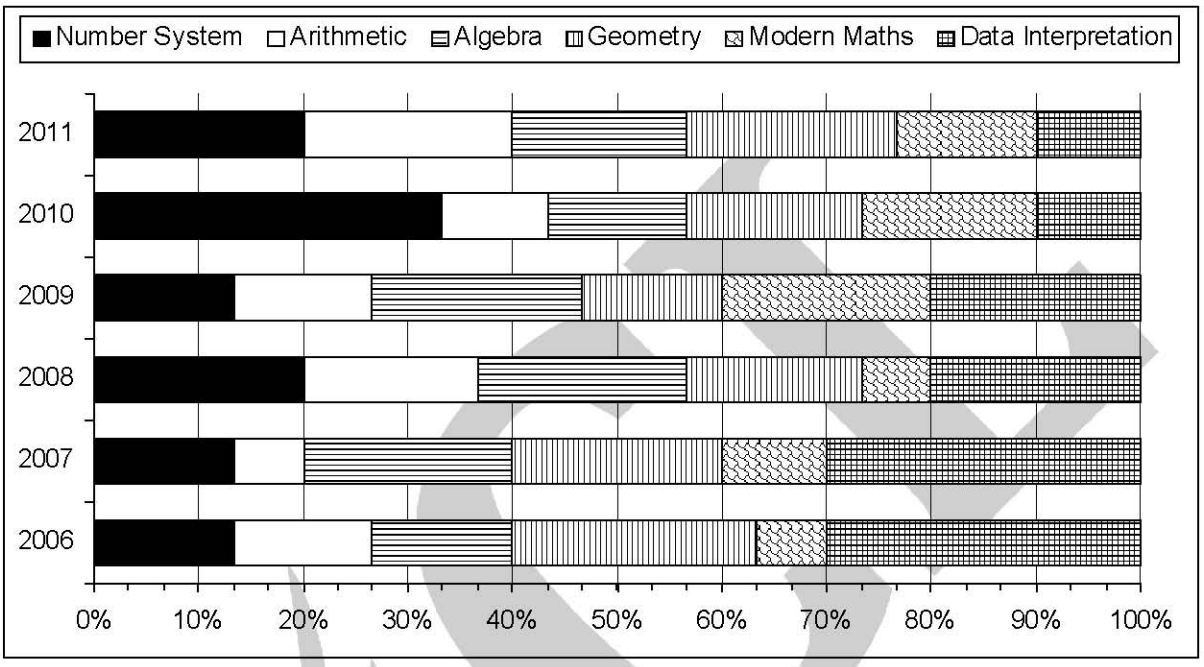
The value of F1 at $x = \frac{\pi}{4}$ is $2\sqrt{2}$ and at $x = \frac{\pi}{2}$ is ∞. The value of F2 at $x = \frac{\pi}{4}$ is 0 and at $x = \frac{\pi}{2}$ is ∞.

Therefore, the value of f(x) i.e. F1 × F2 at $x = \frac{\pi}{4}$ will be 0 and at $x = \frac{\pi}{2}$ will be ∞.

Hence, the range of f(x) in the given range of x is (0, ∞).

Directions for questions 8 to 10: Answer the questions on the basis of the information given below.

The stack chart given below shows the distribution of questions in an Aptitude examination named XPLT, consisting of only math problems, across six different areas during the period 2006-2011. It is also known that the exam was conducted only once a year, during the given period.



8. If in all the six years, during the given period, the number of questions asked in the exam were multiples of 15, in which of the following years could the number of questions asked in the exam be an odd multiple of 15?

I. 2008
II. 2009
III. 2011

(a) Only I **(b) Only II** (c) Both I and II (d) Both II and III

8. b The table below shows the fractions equivalent to the given percentage points in the stock chart.

	2008	2009	2011
Number System	20.00% = $\frac{3}{15}$	13.33% = $\frac{2}{15}$	20.00% = $\frac{3}{15}$
Arithmetic	16.67% = $\frac{2.5}{15}$	13.33% = $\frac{2}{15}$	20.00% = $\frac{3}{15}$
Algebra	20.00% = $\frac{3}{15}$	20.00% = $\frac{3}{15}$	16.67% = $\frac{2.5}{15}$
Geometry	16.67% = $\frac{2.5}{15}$	13.33% = $\frac{2}{15}$	20.00% = $\frac{3}{15}$
Modern Maths	6.67% = $\frac{1}{15}$	20.00% = $\frac{3}{15}$	13.33% = $\frac{2}{15}$
Data Interpretation	20.00% = $\frac{3}{15}$	20.00% = $\frac{3}{15}$	10.00% = $\frac{1.5}{15}$

From the above table, it can be clearly seen that the number of questions asked from Arithmetic and Geometry in 2008 must not have been integers if the total number of questions had been an odd multiple of 15. The same can be seen for Algebra and Data Interpretation in 2011. Hence, only in 2009 the total number of questions can be an odd multiple of 15.

9. If the ratio of the number of questions asked in the exam in 2006, 2007 and 2008 was 2 : 3 : 4 and the total number of questions asked in 2006, 2007 and 2008 put together was the same as the total number of questions asked in 2009 and 2010 put together, then the number of questions asked in 2009 from Arithmetic could not be less than

(a) 2 **(b) 4** (c) 6 (d) 5

9. b Let the number of questions asked in 2006, 2007 and 2008 be 2x, 3x and 4x respectively.
In 2006, by looking at the fractions equivalent to the given percentage points, it can be concluded that the number of questions asked in this year must have been a multiple of 30. Therefore, the minimum number of questions that could have been asked in 2006 was 30.
The minimum value of total number of questions asked in 2009 and 2010 put together
= The minimum value of total number of questions asked in 2006, 2007 and 2008 put together
= 2x + 3x + 4x = 9x = 270
It can also be noted that the number of questions asked in 2010 had to be a multiple of 30.
∴ The minimum number of questions asked in 2009 = 30
Hence, the minimum number of questions asked from Arithmetic in 2009 = 4.

10. If the number of questions asked from Modern Maths in 2006, the total number of questions asked from Modern Maths in 2006 and 2007 put together and the total number of questions asked from Modern Maths in 2006, 2007 and 2008 put together were prime numbers, then find the total number of questions asked from Algebra in 2006 and 2007 put together? (Assume in all the six years, during the given period, the number of questions asked in the exam was the same)

(a) 15 (b) 20 **(c) 10** (d) Cannot be determined

10. c Let the number of questions asked in each year be x.

Then the number of questions asked from Modern Math in 2006 (say A) = 6.67% of x = $\frac{x}{15}$

The number of questions asked from Modern Math in 2006 and 2007 put together (say B) = 16.67% of x = $\frac{x}{6}$

The number of questions asked from Modern Math in 2006, 2007 and 2008 put together (Say C)

= 23.33% of x = $\left(\frac{7}{30}\right)x$

∴ A : B : C = $\frac{1}{15} : \frac{1}{6} : \frac{7}{30}$ = 2 : 5 : 7

A, B and C were prime numbers.
∴ A = 2, B = 5 and C = 7
∴ x = 15 × A = 15 × 2 = 30
Hence, the number of questions asked from Algebra in 2006 and 2007 put together
= (13.33 + 20)% of 30 = 33.33% of 30 = 10.

11. If $x^2 - y^2 = 27434$, where x and y are natural numbers, the number of values that the ordered pair (x, y) can have is

(a) 0 (b) 6 (c) 4 (d) 2

11. a $x^2 - y^2 = 27434$
$\Rightarrow (x + y)(x - y) = 2 \times 11 \times 29 \times 43$ ...(i)
It can be observed that for x and y to be natural numbers, the values of both (x – y) and (x + y) have to either odd or even simultaneously. From (i), it can be seen that the aforementioned condition is not possible. Hence, the number of values that ordered pair (x, y) can have is 0.

12. Find the value of the following expression:

$$\frac{\sqrt{3}}{\sqrt{3}+3}+\frac{\sqrt{5}}{\sqrt{15}+5}+\frac{\sqrt{7}}{\sqrt{35}+7}+\ldots+\frac{\sqrt{25}}{\sqrt{575}+25}.$$

(a) 24 (b) 25 (c) 12 **(d) 2**

12. d $\frac{\sqrt{3}}{\sqrt{3}+3}+\frac{\sqrt{5}}{\sqrt{15}+5}+\frac{\sqrt{7}}{\sqrt{35}+7}+\ldots+\frac{\sqrt{25}}{\sqrt{575}+25}$

$$=\frac{\sqrt{3}}{\sqrt{3}(\sqrt{3}+1)}+\frac{\sqrt{5}}{\sqrt{5}(\sqrt{3}+\sqrt{5})}+\ldots+\frac{\sqrt{25}}{\sqrt{25}(\sqrt{23}+\sqrt{25})}$$

$$=\frac{\sqrt{3}-1}{3-1}+\frac{\sqrt{5}-\sqrt{3}}{5-3}+\ldots+\frac{\sqrt{25}-\sqrt{23}}{25-23}$$

$$=\frac{\sqrt{25}-1}{2}=\frac{5-1}{2}=2.$$

13. If $\frac{5^{x^2}\times 5^{xy}}{5^{-y^2}}=625$ and $\frac{3^{x^3}}{3^{y^3}}=81$, find the value of (y– x).

(a) 1 (b) 0 (c) –2 **(d) –1**

13. d $\frac{5^{x^2}\times 5^{xy}}{5-y^2}=625 \Rightarrow 5^{x^2+xy+y^2}=5^4$

$\Rightarrow x^2 + xy + y^2 = 4$ ...(i)

$\frac{3^{x^3}}{3^{y^3}}=81 \Rightarrow 3^{x^3-y^3}=3^4$

$\Rightarrow (x - y)(x^2 + xy + y^2) = 4$ ... (ii)

From (i) and (ii), we get

$y - x = -1$.

14. Two persons – Raju and Kaju – started from A and B for B and A respectively. After reaching their respective destinations, they turned back towards their starting points and concluded their journeys after reaching their starting points. When they met for the 1st time, they were 150 m away from A; when they met for the 2nd time, travelling towards each other, they were 100 m away from B. What is the distance between A and B?

(a) 350 m (b) 250 m (c) 500 m (d) 300 m

14. a Distance travelled by A before the first meeting = 150 m

Let the distance travelled by B before the first meeting be x m.

Distance travelled by A before second and after first meeting = (x + 100) m

Distance travelled by B before second and after first meeting = 150 × 2 + x – 100 = (200 + x) m

Ratio of the speeds of A and B = Ratio of the distance travelled by A and B

$$\Rightarrow \frac{150}{x}=\frac{x+100}{x+200}$$

$\Rightarrow x = 200$ m

Hence, the distance between A and B = 150 + 200 = 350 m.

15. If S = {1, 2, 3, 4,…, 24}, in how many subsets of S, with three elements each, the sum of all the elements is a multiple of 4?

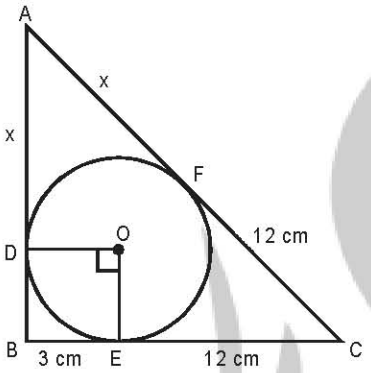
(a) 506 (b) 290 (c) 326 (d) 416

15. a Every element of S is of the form either 4k, 4k – 1, 4k – 2 or 4k – 3, where k is a natural number.
The possible triples of the forms of the numbers the sum of which results in a multiple of 4 are (4k, 4k, 4k), (4k, 4k – 1, 4k – 3), (4k, 4k – 2, 4k – 2), (4k – 2, 4k – 1, 4k – 1), (4k – 3, 4k – 3, 4k – 2).
Number of elements each of the form 4k, 4k – 1, 4k – 2 and 4k – 3 in the set = 6
Hence, the required number of subsets = ${}^6C_3 + ({}^6C_1 \times {}^6C_1 \times {}^6C_1) + ({}^6C_2 \times {}^6C_1) + ({}^6C_2 \times {}^6C_1) + ({}^6C_2 \times {}^6C_1) = 506$

16. In triangle ABC, A and B are 3 cm and 12 cm, not necessarily in the same order, away from the point of contact of AB and the incircle of the triangle. If the radius of the incircle is 3 cm, what is the measure of the longest side of the triangle?

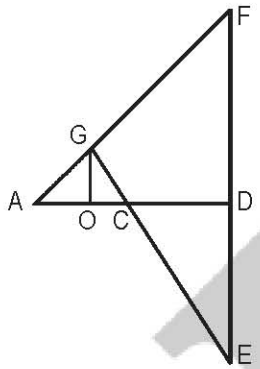
(a) 15 cm (b) 13 cm **(c) 17 cm** (d) 12 cm

16. c In the figure given below, BE = 3 cm and CE = 12cm.



It can be observed that in ABC, BE = OE and OD and OE are perpendicular to each other. Therefore, triangle ABC is a right angled triangle.
As tangents from an external point are of equal lengths, BE = BD = 3 cm, CE = CF = 12 cm.
Let AD = AF = x.
In right ΔABC,
$AB^2 + BC^2 = AC^2 \Rightarrow (3 + x)^2 + 15^2 = (12 + x)^2 \Rightarrow x = 5$ cm
Hence, the length of the largest side of the triangle = AC = 12 + 5 = 17 cm.

17. In the figure given below, D is the midpoint of EF, AD is perpendicular to EF and OG is perpendicular to AD. Which of the following is definitely true?



(a) $\frac{1}{OC} = \frac{1}{OA} + \frac{1}{OD}$ (b) $\frac{2}{OC} = \frac{1}{OA} + \frac{1}{OD}$ (c) $OC = \frac{OA + OD}{2}$ **(d)** $\mathbf{\frac{2}{OD} = \frac{1}{OC} - \frac{1}{OA}}$

17. d It can be observed that ΔAOG is similar to ΔADF, and ΔOCG is similar to ΔDCE.

$\therefore \frac{OA}{AD} = \frac{AG}{AF} = \frac{OG}{DF}$ and $\frac{OG}{DE} = \frac{OC}{CD} = \frac{GC}{CE}$

$\Rightarrow \frac{OG}{DF} = \frac{OC}{CD} = \frac{OA}{AD}$ (As DE = DF)

$\Rightarrow \frac{OC}{OD - OC} = \frac{OA}{OA + OD} \Rightarrow \frac{OD - OC}{OC} = \frac{OA + OD}{OA}$

$\Rightarrow \frac{OD}{OC} - 1 = 1 + \frac{OD}{OA} \Rightarrow 2 = \frac{OD}{OC} - \frac{OD}{OA}$

$\Rightarrow \frac{2}{OD} = \frac{1}{OC} - \frac{1}{OA}$.

18. If a metallic solid sphere of radius r units is melted and recast into smaller spheres, with diameter $\frac{r}{2}$ units each, then the total surface area of all the smaller spheres put together is what percent more than the surface area of the original sphere?

(a) 200 (b) 400 **(c) 300** (d) 800

18. c Let the number of spheres of diameter $\frac{r}{2}$ formed be n.

$\therefore \frac{4}{3}\pi r^3 = n \times \frac{4}{3}\pi\left(\frac{r}{4}\right)^3 \Rightarrow n = 64$

Total surface area of the smaller spheres = $64 \times 4 \times \pi\left(\frac{r}{4}\right)^2 = 16\pi r^2$

Surface area of original sphere = $4\pi r^2$

Hence, the required percentage change = $\frac{16\pi r^2 - 4\pi r^2}{4\pi r^2} = 300$.

Directions for questions 19 to 21: Answer the questions on the basis of the information given below.

There are three advertisements, namely A, B and C, in the market for promoting a product named 'P'. The following table gives the data related to the percentage of viewers who purchased the product after watching the aforementioned advertisements in July 2014. It is also known that only those viewers who had watched the advertisements in the given month were considered while collecting the data.

Advertisement	Percentage of viewers who purchased the product after watching the mentioned advertisements
Exactly one of A,B or C	35%
At least two out of A,B and C	20%
At least one of A,B and C	25%

19. In July 2014, if the total number of viewers who watched at least one of the three advertisements was 45000, how many viewers watched exactly one advertisement?
(a) 15000 (b) 20000 (c) 30000 (d) 10000

20. In July 2014, which of the following cannot be a value of the ratio of the number of viewers who watched exactly one advertisement, exactly two advertisements and exactly three advertisements?
(a) 4 : 7 : 1 **(b) 3 : 5 : 2** (c) 2 : 1 : 3 (d) 1 : 1 : 1

21. In July 2014, what percentage of the total buyers (who bought the product after watching at least one of the three advertisements) purchased the product after watching exactly one advertisement?
(a) 50 (b) 42.85 (c) 43.33 **(d) 46.66**

For questions 19 to 21: Let the number of viewers who watched exactly one advertisement be x and that of those who watched more than one advertisement be y.

$\therefore$ The number of viewers who watched at least one of A, B and C = x + y
According to the information given in the table,
$\therefore$ 25% of (x + y) = 35% of x + 20% of y $\Rightarrow$ y = 2x

19. a According to the question,
$x + y = 45000 \Rightarrow x + 2x = 45000 \Rightarrow x = 15000.$

20. b If the ratio talked in the question is of the form a : b : c, then x : y = a : b + c.
Among the given options, the ratio given in option (b) does not satisfy the aforementioned condition.

21. d The required percentage = $\frac{35\% \text{ of } x}{35\% \text{ of } x + 20\% \text{ of } y} \times 100 = \frac{35\% \text{ of } x}{35\% \text{ of } x + 20\% \text{ of } (2x)} \times 100 = 46.67.$

22. Two urns – A and B – contain 100 red balls and 100 blue balls respectively. Seven balls are drawn at random from A and put into B, and then 7 Balls are drawn at random from B and put into A. If the probability of a ball drawn from A being red is P1 and the probability of a ball drawn from B being red is P2, what is the sum of P1 and P2?

(a) 1 (b) $\frac{93}{100}$ (c) $\frac{7}{100}$ (d) Cannot be determined

22. a When 7 balls (red) are drawn from A and put into B, the number of balls in:
A = 93 (All red)
B = 107 (100 blue balls and 7 red balls)
Let the number of red balls out of seven balls drawn from B be 'x'.
The number of blue balls drawn from B = 7 – x
When 7 balls balls are drawn from B and put into A, the number of balls in:
A = 100 {(93 + x) red balls and (7 – x) blue balls}
B = 100 {(93 + x) blue balls and (7 – x) red balls}

Probability of a ball draw from A being red = $\frac{93+x}{100}$

Probability of a ball draw from B being red = $\frac{7-x}{100}$

Hence, the sum = $\frac{93+x}{100}+\frac{7-x}{100}$ = 1.

23. A cuboid of dimensions 56 cm × 42 cm × 98 cm is divided into 'H' smaller and identical cubes. Find the minimum possible value of 'H'.
(a) 84 (b) 81 (c) 70 (d) 160

23. a In order to minimize the number of cubes, the side of the smaller cubes has to the maximum possible. Since the smaller cubes are identical, the side of the smaller cube has to be a factor of all the three dimensions of the cuboid i.e. HCF of 56, 42 and 98 or 14.

Hence, the number of cubes = $\frac{56}{14}\times\frac{42}{14}\times\frac{98}{14}$ = 4 × 3 × 7 = 84.

24. How many new regular polygons, each with distinct area, can be constructed by joining three or more vertices of a regular polygon having 1960 sides?
(a) 24 (b) 23 (c) 22 **(d) 21**

24. d With the help of polygons with lesser number of sides, it can be observed that only those newly constructed polygon, by joining three or vertices of the existing polygon, whose number of sides is a factor of the number of sides of the existing polygon, except 1, 2 and the number itself, will be regular 1960 = $2^3 \times 5 \times 7^2$
Number of factors of 1960 = (3 + 1)(1 + 1)(2 + 1) = 24
Hence, the required number of regular polygons = 24 – 3 = 21.

25. The largest amount that cannot be paid by using notes of the denominations Rs 7 and Rs 6 is
(a) Rs 29 (b) Rs 23 (c) Rs 42 (d) Rs 41

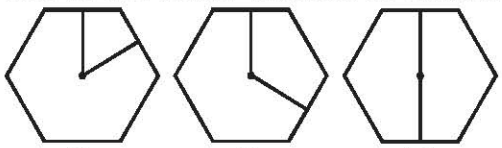
25. a Every possible amount can be expressed in the forms of 6k, 6k + 1, 6k + 2, 6k + 3, 6k + 4 and 6k + 5, where k is a whole number.
It can be noted that all the amounts of the form 6k + 1, where for k > 1, can be paid with the help of notes of the given denominations. Now, let P (= $6n_1 + 7n_2$, where n_1 and n_2 are natural numbers) be an amount of the form 6k + 1, where k is a natural number.
Now, it can be observed that:
$P + 1 = 6k + 2 = 6(n_1 - 1) + 7(n_2 + 1)$
$P + 2 = 6k + 3 = 6(n_1 - 2) + 7(n_2 + 2)$
$P + 3 = 6k + 4 = 6(n_1 - 3) + 7(n_2 + 3)$
$P + 4 = 6k + 5 = 6(n_1 - 4) + 7(n_2 + 4)$
From the above equations, it can be observed that any amount can be paid with the help of notes of the given denominations if n_1 is greater than or equal to 5.
Therefore, any amount worth Rs. 30 or more can be paid with the help of notes of the given denominations.
Hence, the maximum amount that cannot be paid is Rs. 29 as there is no combination of notes of the given denomination that can result in Rs. 29.

Alternative Method
If 'a' and 'b' are the given denominations, then the required amount i.e. the maximum amount that cannot be paid using notes of the given denomination is [(a × b) – (a + b)].
The required amount in the given case = 6 × 7 – (6 + 7) = 29.

26. In a regular hexagon of side 'a' units, two perpendiculars are drawn from its center to any two of its sides. If a convex polygon is constructed by taking the two perpendiculars and some of the sides of the hexagon as its sides, what cannot be a value of the area of the constructed polygon?

(a) $\frac{\sqrt{3}}{2}a^2$ sq. units **(b) $\sqrt{3}a^2$ sq. units** (c) $\frac{\sqrt{3}}{4}a^2$ sq. units (d) $\frac{3\sqrt{3}}{4}a^2$ sq. units

26. b There are three possible shapes that the constructed polygon can assume.



(i) (ii) (iii)

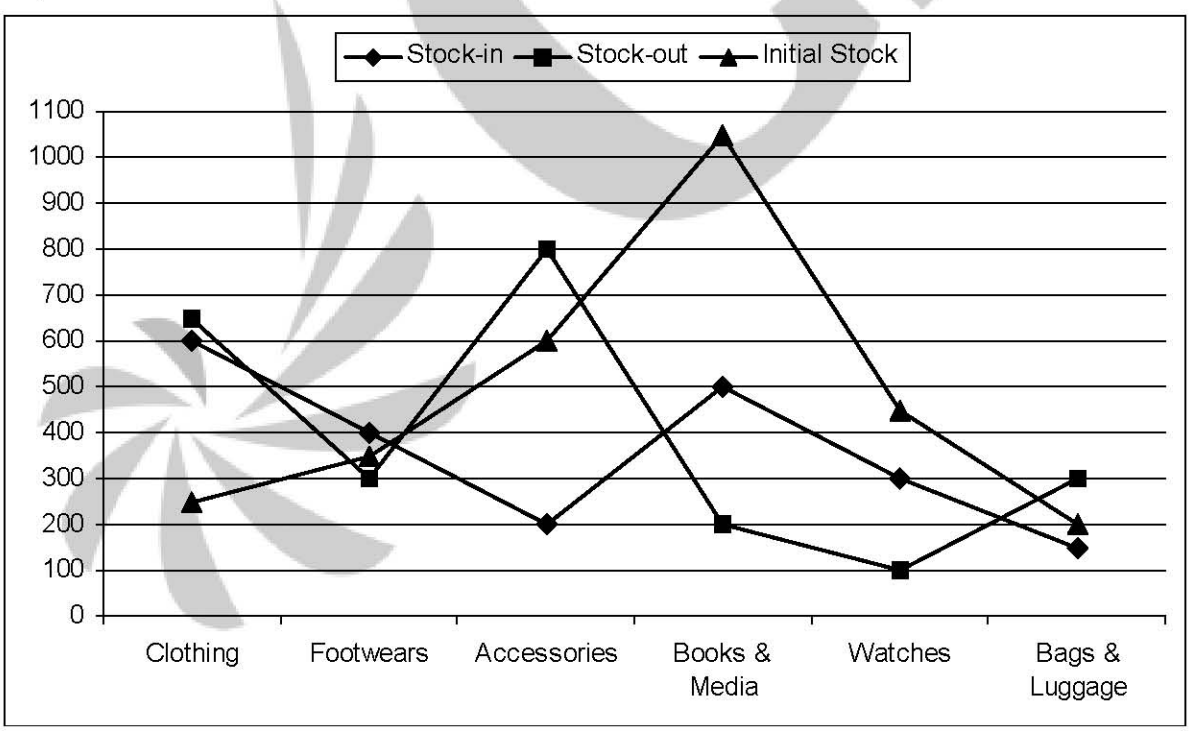
It can be observed that the area of the constructed polygon in case (i) is one-sixth, in case (ii) one-third and in case (iii) half of the regular polygon.

Area of the polygon = $6 \times \frac{\sqrt{3}}{4} \times a^2$

Hence, the values that the area (in sq. cm.) of the constructed polygon can assume are $\frac{\sqrt{3}}{4}a^2, \frac{\sqrt{3}}{2}a^2$ and $\frac{3\sqrt{3}}{4}a^2$.

Directions for questions 27 to 29: Answer the questions on the basis of the information given below.

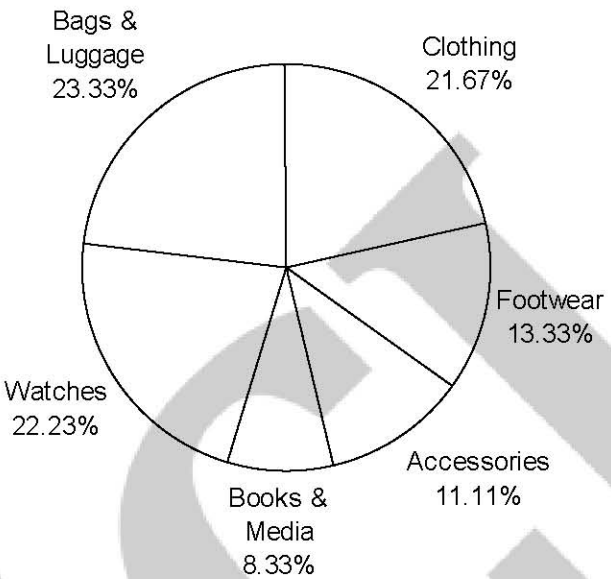
The line graph below shows the stock details of six products with a super market store named Shagun in the year 2013.



Stock-in = Number of units added during the given year
Stock-out = Number of units sold during the given year
Initial stock = Number of units available at the beginning of the given year

The pie-chart given below shows the distribution of sales revenue of the six products in the given year. In the each given product category, assume all units to be identical.

Sales revenue



27. If the revenue through the sales of Books & Media category in the year 2013 was Rs 150,000, what was the revenue per unit from Footwear category?
(a) Rs 1000 (b) Rs 750 (c) Rs 900 **(d) Rs 800**

27. d Let the total revenue generated through the sales of the six products put together be Rs. 'x'.
According to the question,

$$x \times \frac{8.33}{100} = 150000 \Rightarrow x = 1800000$$

Hence, the required per unit price = $\frac{1}{300}\left(\frac{13.33}{100} \times 1800000\right) = \text{Rs. } 800.$

28. If Surya bought a Watch, 2 units of Footwear, 4 Books and 3 units of Accessories from the super market, how much did he pay for his shopping? (Assume the data given in Q. 27 to be true.)
(a) Rs 10000 **(b) Rs 9350** (c) Rs 9000 (d) Rs 8000

28. b Revenue generated through the sale of Watches = 22.22% of 1800000 = $\frac{2}{9}$ of $1800000 = 400000$.

Per unit selling price of Watches = $\frac{400000}{100} = \text{Rs. } 4000$

Similarly, per unit selling price of:
Books = Rs. 750
Accessories = Rs. 250
Hence, the required amount = 4000 + (2 × 800) + (4 × 750) + (3 × 250) = Rs. 9350.

29. What was the total number of unsold units of all the products put together at the end of the given year?

(a) 2700 (b) 2150 (c) 2900 (d) 2250

29. a The total number of units of all the six products put together left at the end of the year 2013
= Initial stock + Stock-in – Stock-out
= (250 + 350 + 600 + 1050 + 450 + 200) + (600 + 400 + 200 + 500 + 300 + 150) – (650 + 300 + 800 + 200 + 100 + 300)
= 2700 units.

30. If 'F' is one of the factors of $40^{240} + 32^{240} - 3^{240} - 5^{240}$, which of the following can be a possible value of 'F'?

(a) 1515 (b) 897 (c) 1155 **(d) 1295**

30. d We have,
$40^{240} + 32^{240} - 3^{240} - 5^{240} = (40^{240} - 3^{240}) + (32^{240} - 5^{240})$
We know that $(a^n - b^n)$ is divisible by both (a – b) and (a + b) when n is an even natural number.
Therefore, $(40^{240} - 3^{240})$ is divisible by both (40 + 3) and (40 – 3), and $(32^{240} - 5^{240})$ is divisible by both (32 + 5) and (32 – 5).
$\therefore (40^{240} - 3^{240}) + (32^{240} - 5^{240})$
$= 43 \times 37 \times A + 37 \times 27 \times B = 37 \times K_1$ ...(i)
Where A, B and K_1 are natural numbers.
Similarly,
$(40^{240} - 5^{240}) + (32^{240} - 3^{240})$
$= 45 \times 35 \times P + 35 \times 29 \times Q = 35 \times K_2$ ...(ii)
Where P, Q and K_2 are natural numbers.
From (i) and (ii), it can be concluded that the given number is divisible by 35 as well as 37. Therefore, the given number has to be divisible by 35 × 37 i.e.1295. Hence, 1295 can be a possible value of F.

Section II: VA & LR

31. A paragraph is given below from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

If Barthes was the ideological framework, David Foster Wallace was the model. 'Everything from Infinite Jest to A Supposedly Fun Thing I'll Never Do Again' rests atop a foundation of personal experience, critical theory, philosophy and spectacular literary pyrotechnics[1] used to stunning effect. And in this case, what was most important to me was the fact that David Foster Wallace didn't confine himself to genre or style. He was just a writer. Book reviews, essays, dictionary entries, anthology introductions, epitomes[2], post-modern short stories, jokes, speeches, screenplays (as embedded into a footnote in Infinite Jest); Wallace was what I want to be.

(a) 'Everything from Infinite Jest to A Supposedly Fun Thing I'll Never Do Again' is a book that stops at nothing to execute 'shock and awe' tactics and, hence, appears very artificial.
(b) If I ever become him, my work, like Wallace's, will conform to the precise genres that reflect my forte in totality.
(c) And what was most fascinating to me is that he found meaning, beauty, truth and sincerity in topics that would, to the average person, appear mundane.
(d) Articles, debates, novellas, magazine articles, his legacy goes on and on.

31. c Option (c) continues to dwell on the praise showered by the author on Wallace and fits well after the penultimate sentence of the paragraph. Option (b) cannot be the answer since it goes against the information in the passage. The passage talks of Wallace's work being non-conforming and eclectic. Option (a) criticizes the book whereas the given paragraph praises the book. Hence, option (a) cannot follow the passage. Option (d) is incorrect as it repeats what has already been stated in the last sentence of the paragraph.

32. A paragraph is given below from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

I am very interested in the issue of extinction. The devastation that followed Katrina revealed a lot of the secrets of this area. It made people elsewhere look at the situation where they lived. It wasn't like they could say, "It's way over there, it doesn't matter," because it filtered into so much of the rest of the country. It was total devastation here—80% of the city was under water. It seems like it has to be that kind of drama, where our lives, livelihoods, and evidences of our own existence are affected, before we realize the kind of impact we are having. Katrina was in 2005—then in 2010 we had the BP oil spill and another example of huge landscape devastation. We're still fighting to receive compensation for BP and we see now how deeply the legislature is involved with BP. What more does it take for us to put our money and policies into clean water, clean air, clean soil and build up our wetlands[3] and stop the coastal erosion?

(a) I will continue to deal with these issues, but it doesn't look very good.
(b) Water, air, soil and food chain quality have all deteriorated so quickly.
(c) I have been here for more than half of my life and I don't really feel comfortable anywhere else. And I'm not leaving.
(d) It might be similar to what war is like – once there's devastation, you don't know your future.

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1. **pyrotechnics(noun)** : a very impressive show or display that requires great skill. Derived from an impressive show of fireworks.
2. **epitomes(noun)** : a brief summary, as of a book or article; an abstract.
3. **wetlands(noun)** : an area of land (such as a marsh or swamp) that is covered with shallow water.

32. a The author speaks of himself being interested in the issue of extinction in the very first line. Also, the last lines speak of the efforts that have been put in thus far. We can thus guess that he will continue to talk about the efforts being put and the minimal results being achieved. Thus, option (a) fits the context by mentioning these issues and the bleak prospect of results. Option (b) is repetitive; it simply restates points already mentioned in the passage. Option (c) is not related to the paragraph at all; in the given paragraph, the author has never mentioned leaving any place. Option (d) neither answers the question put forward in the last line nor does it continue to ask similar ones.

33. Four sentences are given below, labeled (a), (b), (c) and (d). Of these, three sentences need to be arranged in a logical order to form a coherent paragraph/passage. From the given options, choose the one that does not fit the sequence.

(a) The moment an ancient site is discovered, its physical condition immediately begins to deteriorate.
(b) High-tech copies of ancient archaeological sites are needed to help preserve it.
(c) Every dig removes a layer of the archaeological record that can never be replaced, and once humans are allowed to visit, with their hot breath and sweat and backpacks, walls start crumbling.
(d) The thing to understand about archaeology is that it's a science of destruction.

33. b The logical sequence is (d), (a) and (c). Option (d) introduces us to the concept of archaeology being a destructive science. How this destruction takes place is then further explained in options (a) and (c). Option (b) is the odd one out since it changes the focus from destruction to preservation.

Directions for questions 34 to 37: The passage given below is followed by a set of four questions. Choose the most appropriate answer to each question.

The universe of Dalinian imagery, whether religious, mythological or in the case of 'Dream Caused by the Flight of a Bee', Freudian, is repeated in many of the artist's other illustrations, including those for the Biblia Sacra$_4$ and Divine Comedy$_5$. In 'Provenance is Everything', Bernard Ewell, considered the foremost authority on the art of Salvador Dali, discusses the artist's connection with Freud:

"A well-read student of Sigmund Freud, Salvador Dali – who never used drugs and only drank alcohol (especially champagne) in moderation – turned to a most unusual way to access his subconscious. He knew that the hypnologic$_6$ state between wakefulness and sleep was possibly the most creative for a brain.

Like Freud and his fellow surrealists, he considered dreams and imagination as central rather than marginal to human thought. Dali searched for a way to stay in that creative state as long as possible just as any one of us on a lazy Saturday morning might enjoy staying in bed in a semi-awake state while we use our imagination to its fullest. He devised a most interesting technique.

Sitting in the warm sun after a full lunch and feeling somewhat somnolent$_7$, Dali would place a metal mixing bowl in his lap and hold a large spoon loosely in his hands which he folded over his chest. As he fell asleep and relaxed, the spoon would fall from his grasp into the bowl and wake him up. He would reset the arrangement continuously and thus float along – not quite asleep and not quite awake – while his imagination would churn out the images that we find so fascinating, evocative$_8$, and inexplicable when they appear in his work..."

Dream Caused by the Flight of a Bee' was painted while Dalí and his wife Gala were living in America. Even upon a cursory view, it is clear that Dali has incorporated distinct symbolism – the tigers, pomegranates, an elephant, a rifle – into the work. The ArtDaily had the following interesting analysis of the imagery.

4.	**Biblia Sacra(noun)**	:	Jerome's translation of the Greek and Hebrew Scriptures (parts of the Bible) into the common language, Latin.
5.	**Divine Comedy(noun)**	:	a narrative epic poem written by Dante.
6.	**hypnology(noun)**	:	the science dealing with the phenomena of sleep.
7.	**somnolent(adj.)**	:	drowsy, sleepy.
8.	**evocative(adj.)**	:	bringing thoughts, memories, or feelings into the mind.

The painting depicts a woman (Dalí's wife, Gala) sleeping while sunbathing during a calm day on rocks floating over the sea, possibly at Port Lligat. An elephant with incredibly long, extremely thin legs walks across the sea's horizon while carrying an obelisk[9]. Near the woman float two drops of water and a small pomegranate. From a larger pomegranate comes a fish that spews a tiger from which comes another tiger, while in front of that second tiger a rifle's bayonet nearly touches the woman's right arm.

The bayonet[10], as a symbol of the stinging bee, may thus represent the woman's abrupt awakening from her otherwise peaceful dream. The bee around the smaller pomegranate is repeated symbolically. The two tigers represent the body of the bee (yellow with black stripes) and the bayonet its stinger. The fish may represent the bee's eyes, because of similarity of the fish's scaly skin with the scaly complex eyes of bees.

The elephant is a distorted version of a well-known sculpture by Bernini that is located in Rome. The smaller pomegranate floating between two droplets of water may symbolize Venus, especially because of the heart-shaped shadow it casts. It may also be used as a Christian symbol of fertility and resurrection[11]. This female symbolism may contrast with the phallic[12] symbolism of the threatening creatures.

34. Which of the following is a valid inference on the basis of the passage?
    (a) Salvador Dali derived his ideas about the connection between hypnology and creativity from Sigmund Freud.
    (b) Many surrealists consider dreams and imagination a central part of human thought, not a marginal one.
    (c) Accessing the subconscious mind's workings is a process that usually involves the use of drugs and alcohol to induce a hypnologic state.
    (d) The use of the elephant in 'Dream caused by the flight of a Bee' was a deliberate attempt by Dali to distort Bernini's similar sculpture.

34. b The passage only states that Dali was a student of Freud and that he believed in certain things that Freud too believed in. But there is nothing in the passage to suggest that Freud influenced Dali's theories of hypnology and creativity. Hence, option (a) is incorrect. The third paragraph of the passage clearly mentions that many surrealists consider dreams and imagination to be central to human thought, not marginal. Hence, option (b) is the correct answer. The author mentions that Dali's way of accessing the subconscious was unusual, but he does not say anything about the usual way of accessing the subconscious. Hence, option (c) cannot be inferred. Option (d) is negated since the passage says that the elephant 'is distorted' but does not state that the distortion was deliberate.

35. Which of the following arrangements most resembles Dali's interesting technique of keeping himself in a creative state?
    (a) Dali being roused by his wife early in the morning after having gone to sleep in the wee hours of the night.
    (b) Keeping an alarm clock next to Dali, set to go off the moment his eyelids droop with sleep after he's had a heavy meal.
    (c) Dali's wife alternately slapping him and singing him a lullaby to awaken him and put him to sleep respectively.
    (d) Warm water and cold water being thrown again and again on Dali's face just as he tries to doze off for an afternoon siesta.

9. obelisk(noun)	:	a tall, four-sided stone column that becomes narrower toward the top and that ends in a point.
10. bayonet(noun)	:	a long knife that is attached to the end of a rifle and used as a weapon in battle
11. resurrection(noun)	:	rising again to life from death.
12. phallic(adj.)	:	of, relating to, or resembling a male reproductive organ.

35. b Any method which might match Dali's original approach needs to work on the premise that he 'falls asleep and then is in a few moments awakened.' Option (a) is incorrect since in this case, Dali would have gone to sleep altogether instead of hovering in the desired creative state. Option (d), similarly, would completely wake him up and hence would not allow him to stay in the creative state. Option (c) is also incorrect since this method would require his wife to lull him to sleep while Dali's method did not require anyone lulling him to sleep. Option (b) talks of the alarm clock going off the very minute Dali feels sleepy and his eyes start drooping. This is similar to Dali's own approach. Hence, option (b) is the right answer.

36. Keeping the passage in mind, which of the following questions would you be most likely to ask the author?
(a) Did the absence of drugs and alcohol (to get into a hypnotic state) affect the quality of Dali's work?
(b) What can be an aid in comprehending the heavy symbolism in Dali's paintings?
(c) What can be seen as a striking contrast in 'Dream Caused by Flight of a Bee?'
(d) What inspired Dali to churn out the fascinating, evocative and inexplicable images that he produced?

36. b Options (a), (c) and (d) redundantly repeat the exact points which have already been discussed in the passage. They are unlikely to provide any fresh information. On the other hand, option (b) can lead to information about the correct interpretation of the symbolism in Dali's paintings and, therefore, can provide a better understanding of his paintings.

37. Which of the following best encapsulates the approach used by the author to describe Dali's unusual technique of painting?
(a) He analyses the psychological gears working inside Dali's mind and then breaks down the elements in the painting to exemplify Dali's method.
(b) He connects the individual pieces of the puzzle that Dali's painting is to the hypnologic state that Dali kept his mind in.
(c) He gives a background of Dali's enigmatic mode of working and then brings out the deficiencies in the style by quoting a popular critic.
(d) He suggests that Salvador Dali's surrealist method of depicting the workings of his subconscious mind distorts his paintings.

37. a In the first part of the passage, through Bernard Ewell's discussion, we are introduced to the eccentric way in which Salvador Dali worked and to Freud's influence on him. The next part is a critique by the Art Daily, which gives us insight into the actual meaning of the painting mentioned in the passage. Together, the two parts help us understand the workings of Dali's mind. Hence, option (a) is correct. Option (b) is incorrect because the entire painting is explained as a whole - the individual pieces are not connected to Dali's methods. Option (c) talks about deficiency in Dali's style, which has not been mentioned in the passage. Similarly, the author doesn't mention any distortion in Dali's work. Hence, option (d) is also negated.

Directions for questions 38 to 40: Answer the questions on the basis of the information given below.

In an Electronic Voting Machine (EVM), there are ten symbols – House, Farmer, Tiger, Banana, Hat, Balloon, Bull, Rose, Motorcycle and Torch – from left to right – not necessarily in the same order. It is also known that:
(i) The number of symbols between Torch and Banana, neither of which is at an extreme end, is not more than two.
(ii) Out of the two middlemost symbols, one is named after an animal.
(iii) The symbol 6th to the right of Torch is Farmer, and exactly one of the two is at an extreme end.
(iv) There is only one symbol, named Hat, next to the symbol that is named after a flower.

(v) The symbols with the highest occurrence of the same initial are in a reverse alphabetical order, from left to right.

(vi) The symbols with initials 'H' are as far as possible.

38. The number of symbols between Rose and Tiger cannot be more than
(a) 1 (b) 3 **(c) 6** (d) 7

39. Which of the following statements is definitely false?
(a) Tiger is at the 3rd position from the left.
(b) Bull is at the 5th position from the right.
(c) Motorcycle is at the 9th position from the left.
(d) Tiger is at the 6th position from the right.

40. Which of the following could be a correct order of symbols from left to right?
(a) Rose, Hat, Farmer, Torch (b) Farmer, Hat, Banana, Balloon
(c) Torch, Banana, Balloon, Farmer (d) Rose, Bull, Hat, Torch

For questions 38 to 40: From statements (iv), (iii) and (i), in the given order, it can be deduced that Rose and Farmer are at the extreme ends. By using the derived conclusion, preliminary arrangement can be deduced as follows:

Rose, Hat, __, Torch, __, __, __, __, __, Farmer

From statement (vi), it can be concluded that House should be immediate left to Farmer. Now, by using statements (i), (ii) and (v), in the given order, we get the following two arrangements of symbols in the EVM:

Rose, Hat, __ Torch, Bull, Banana, Balloon, __, House, Farmer

or

Rose, Hat, __ ,Torch,__, Bull, Banana, Balloon, House, Farmer

38. c By considering the first arrangement, it can be said that the number of symbols between Rose and Tiger cannot be more than 6.

39. c Statement (c) is definitely false.

40. c Symbols given in option (c) are arranged in EVM from left to right.

41. Four sentences are given below, labeled (a), (b), (c) and (d). Of these, three sentences need to be arranged in a logical order to form a coherent paragraph/passage. From the given options, choose the one that does not fit the sequence.
(a) One cool thing about pi is that it is not a simple ratio of numbers.
(b) That day is 3/14 because the start of the number pi is 3.14.
(c) And you won't believe this, but, in New York City, there really is a Museum of Mathematics, which opened in 2012.
(d) The museum will, as you might imagine, celebrate pi on what's known as Pi Day.

41. a The correct sequence is (c), (d) and (b). There's a clear link between options (d) and (b), which connect Pi day to the significance of the day 3/14. Option (a) fails to fit in with the remaining options since it starts to talk about "one cool thing about pi" which is not the author's focus in any of the other sentences. All the other sentences talk about "the museum" celebrating Pi day and not about the properties of pi in general.

42. Given below are four sentences or parts of sentences that form a paragraph. Identify the sentence(s) or part(s) of sentence(s) that is/are incorrect in terms of grammar and usage. Then, choose the most appropriate option.

A. Hazel had never been thrown a party as a kid
B. but she knew better than letting her girls be bereft of the joy
C. and so, returning home from work, she bought a huge Strawberry cake
D. and served home-made Apple-Ham sandwiches to the children on paper plates.

(a) Only A **(b) Only D** (c) A and B (d) C and D

42. b There's a modifier error in part D. Part D should read as "and served home-made Apple-Ham sandwiches on paper plates to the children." The erroneous structure here makes it seem as if the children were on paper plates. The remaining parts of the sentence are correct. Hence, option (b), only D, is the correct answer.

43. The word given below has been used in the given sentences in four different ways. Choose the option corresponding to the sentence in which the usage of the word is *incorrect or inappropriate*.

Press

(a) The huge slices of pizza were pressed upon Richa and she found it increasingly hard to say no.
(b) The supervisor tried to pacify the union pressing for better pay and work conditions.
(c) Lighting streaked across menacingly as they pressed ahead in the hike despite the deteriorating weather conditions.
(d) When the front line was breached, reserve troops were pressed into service, fortifying the vital frontier.

43. c 'To press something upon someone' means to pressure someone to accept something offered. 'To press for' is to apply pressure to get permission or to obtain something. 'Press into' is to bring or force into use. The correct phrase here is 'press ahead with' and is used to mean continuing with something. Hence, option (c) is the correct answer.

Directions for questions 44 to 46: The passage given below is followed by a set of three questions. Choose the most appropriate answer to each question.

While it was nice to see the first ever RISD grad hosting the Academy Awards, Seth MacFarlane's Oscar hosting turn was not really a triumph for humor. The woman-bashing element, in particular, has come in for endless (and deserved) criticism. As I suggested earlier, of course it was no surprise that the creator of Family Guy would come out with tasteless, demeaning humor – that's his schtick[13]. The show had big ratings, particularly among younger audiences, proving that putting in charge an edgy, under forty host would draw a younger crowd. I can see the Hollywood suits analyzing it with wonder now: "the kids like kids!" Amazing.

And of course, lots of people enjoyed it and laughed along. What does surprise me is many of his defenders claiming that MacFarlane was delivering clever satire. Here's a typical note: "anyone complaining in these comments ever heard of satire? I think MacFarlane's humor is satire and is meant to provoke. Seems pretty effective to me."

Provoking, yes – like a blunt instrument. Satire is meant to take one thing and examine it through a humorous lens, usually in a critical way. MacFarlane's humor often doesn't have that object at all—it's one-dimensional shock humor.

13. schtick(noun) : a usual way of performing, behaving, speaking, etc.

Let's take the most obvious example: "We Saw You." The set up is William Shatner as Captain Kirk sling-shooting back in time to warn MacFarlane not to do the horrible tasteless things he's about to do and thus earn the label of worst Oscar host ever. To show what's about to happen, Shatner cuts to a video of MacFarlane singing a song called "We Saw You" where he names actresses and the films in which they appeared sans shirt.

Now, if the object of the humor was actually MacFarlane and his penchant[14] for ribald[15] attack humor, a simple 15-second cutaway—much like those on Family Guy—would have gotten across the point... and the humor. But no, it goes on for nearly two minutes—the point is to name and shame, and turn actresses into dehumanized objects yet again. I have a dream that someday women will be judged by the content of their character and not the content of their maiden forms, but that day has not come for MacFarlane. In his world, if you're a woman and doggedly track down the worst terrorist the world has ever known, you're not a hero—you're just another woman who's mad at being stood up on a date.

44. The main objective of the passage seems to be
   (a) Lambasting MacFarlane's desensitized behavior towards women as reflected by his jokes while hosting the Oscars.
   (b) Shooting down MacFarlane's show Family Guy as a case of ribald attack humor and showing that he cannot do better.
   (c) Judging MacFarlane on the basis of his hosting the Oscars and proving that his humor was clichéd and tasteless.
   (d) Championing women's rights and shattering the chauvinistic stereotypes encouraged by people like MacFarlane.

44. a Option (b) is too judgemental. The author does not indicate that MacFarlane can't do better. Further, McFarlane's show Family Guy has only been mentioned in passing and is not the core of the passage. Option (d) talks of something very general - 'championing women's rights' - while the passage does not do so. Instead, the passage specifically points out to MacFarlane's poor jokes about women during his hosting the Oscars. Further, the passage does not indicate any 'chauvinistic stereotypes encouraged by people'. Option (c) is too general and fails to take the author's criticism of MacFarlane's chauvinistic jokes into perspective. The author focuses only on this aspect of MacFarlane's hosting of the Oscars. Further, the author has simply presented his opinion throughout the passage – he has not attempted to prove anything. Option (a) captures the essence of the passage and, hence, is the right answer.

45. The author would agree to which of the following conclusions about the satire mentioned in the passage?
   (a) MacFarlane's supporters themselves have no understanding of satire and, hence, erroneously claim that he was delivering clever satire.
   (b) Satire should not be one-dimensional and needs to look at things in a way that incorporates both criticism and humor.
   (c) The satire used by MacFarlane at the Oscars was deliberately meant to be provocative and, hence, was quite effective.
   (d) The use of satire at the Oscars by MacFarlane led to a lot of controversies, for instance, the video, "We Saw You."

14. penchant(noun) : a strong liking for something or a strong tendency to behave in a certain way
15. ribald(adj.) : characterized by or using coarse indecent humor, referring to sex in a rude but amusing way.

45. b Option (a) is not correct since the author does not at all state that MacFarlane's supporters do not have any understanding of satire. Option (c) is the perspective of MacFarlane's defenders. In fact, the author has countered this view in the passage. The passage does not mention any controversies, unlike what has been suggested in option (d). Option (b) is the correct answer and it can be clearly inferred from the line, "MacFarlane's humor often doesn't have that object at all—it's one-dimensional shock humor."

46. The author speaks of Seth MacFarlane in the first paragraph and uses the phrase, "that's his schtick." Which of the following options best explains what the author is trying to convey through the phrase?

(a) MacFarlane intended to demean women at the Oscars in order to provoke the audience and achieve higher ratings for the show, especially by pulling in younger audiences.

(b) Delivering clever satire is Seth's style and his fans felt that he did it with panache; unfortunately, he was largely misunderstood.

(c) MacFarlane using garish humor at the Oscars wasn't a shock – it was only to be expected of someone who created Family Guy.

(d) RISD grads are anyway not expected to bring anything great to humor, as they are tasteless and deserve criticism.

46. c The paragraph states that it came as no surprise to the author that MacFarlane would use demeaning humor while hosting the Oscars, since he's the creator of Family Guy, a show which is reflective of his low taste in humor. Thus, option (c) is the answer. Although the passage does suggest that Seth demeaned women while hosting the Oscars, the passage doesn't say that it was deliberate or that it was done in order to provoke the audience. Hence, option (a) is incorrect. The text also does not suggest that Seth is largely misunderstood, thus negating option (b). Option (d) is also incorrect since the passage does not criticize RISD graduates at all.

47. The word given below has been used in the given sentences in four different ways. Choose the option corresponding to the sentence in which the usage of the word is *incorrect or inappropriate*.

Rat

(a) Envious of the fact that her neighbours were smuggling Vodka from Russia and raking in the moolah[16], she ratted on them to the police.

(b) "You search here in the closet; I'll rat through the attic. Finding that document is a matter of life and death."

(c) "How dare you rat me out to the warden!" bellowed the bully to the boy.

(d) The minute I came in, I smelled the rat. Sure enough, my confectionery shop had been robbed.

47. d The idiomatic expression is 'smell a rat.' The context tries to confuse you with the use of the words 'confectionery shop' but there's no suggestion that there's an actual rat involved. Instead, the sentence implies that the owner came in and 'had a hunch that something was wrong.' To 'rat on someone' means to report them to the authorities or tattle on them - similar in meaning to 'rat someone out.' To 'rat through' means to search frantically for something. Option (d) is the correct answer.

16. raking in the moolah(idiom) : the expression to rake in the moolah means to earn large amounts of money in a short span at a young age.

Directions for questions 48 to 50: Answer the questions on the basis of the information given below.

Six persons – Arjun, Abhishek, Pawan, Rakesh, Fahmeed and Gaurav – were sitting around a circular table, on six equispaced chairs, while playing 'Pass the parcel' game in which a parcel is passed from one person to another, not necessarily in any particular order. Puneet, a friend of Arjun, joined the six persons in the game, after the start. Puneet placed his chair exactly in between two already existing adjacent chairs. After the conclusion of the game, it was noted that each person had got exactly one chance, during the course of the game, to pass on the parcel. It is also known that:

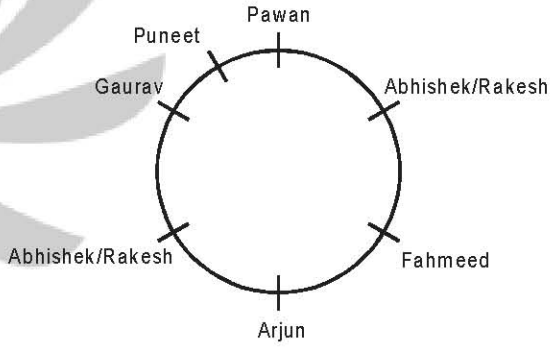
(i) The angular distance between Abhishek and Puneet is half that between Fahmeed and Gaurav.
(ii) Arjun passed on the parcel to neither a person who was one of his neighbors nor the person who was sitting opposite him.
(iii) Puneet was equidistant from Fahmeed and Arjun.
(iv) The neighbors of Gaurav were not equidistant from him.
(v) Fahmeed was sitting to the immediate right of Arjun.
(vi) Pawan was one of the neighbors of Puneet.

48. Who among the following could certainly not be a person to whom Arjun passed on the parcel?
(a) Gaurav (b) Puneet **(c) Pawan** (d) Abhishek

49. If Rakesh passed on the parcel to Pawan, who was sitting next to him, then which of the following statements is definitely true?
(a) Rakesh was sitting two places to the right of Gaurav.
(b) Rakesh was sitting three places to the left of Gaurav.
(c) Pawan was sitting adjacent to Arjun.
(d) None of the above

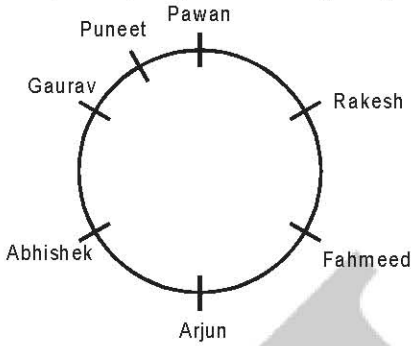
50. If no two persons (from the original six) sitting adjacent to each other had the same initial, the number of persons sitting between Pawan and Rakesh could not be less than
(a) 1 (b) 2 (c) 3 **(d) Cannot be determined**

For questions 48 to 50: From statements (iv) and (vi), it can be asserted that Gaurav and Pawan are the neighbors of Puneet. Now using the statements (iii), (v) and (i), in the given order, we get the following sitting arrangement:



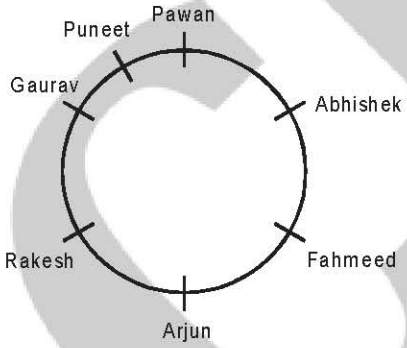
48. c By using statement (ii), we can say that Arjun could certainly not pass on the parcel to Pawan.

49. b By using the information given in the question, we get the following sitting arrangement:



From the above arrangement, it can be seen that statement (b) is definitely true.

50. d By using the information given in the question, we get the following sitting arrangement:



From the above arrangement, it can be seen that the number of persons sitting between Pawan and Rakesh could not be less than 2.

Directions for questions 51 to 53: The passage given below is followed by a set of three questions. Choose the most appropriate answer to each question.

The genome of the tsetse fly—a disease-ridden insect with surprisingly mammalian biology that stalks the people and livestock of sub-Saharan Africa—has been decoded, a team of 146 scientists announced today in 'Science.'

The sequence has revealed chinks in its strange biology that could help alleviate the human suffering and economic losses caused by the trypanosome parasite it transmits.

The tsetse fly has long been an oddball among disease-transmitting insects. The fly carries the parasite for sleeping sickness, which strikes about 20,000 people a year and puts an estimated 70 million people in sub-Saharan Africa at risk. And since the disease also affects livestock, it makes animal husbandry all but impossible in some parts of the region, exacting a severe economic toll.

But these bloodsuckers are also oddly mammalian. Females get pregnant with single young that they nourish with milk inside a womb. The female then gives birth, much like squeezing a slug of toothpaste from a tube, to a single undulating[17] larva nearly her own size. And a female tsetse fly produces only eight to ten offspring her whole life (compared to a female mosquito, which produces teeming hordes of larvae every cycle, up to about a thousand over her life span).

17. undulating(verb) : to cause to move in a smooth wavelike motion.

"If you can eliminate one female, it can have a big effect on the population," said Serap Aksoy, professor of epidemiology at the Yale School of Public Health in New Haven, Connecticut.

The new genome may provide a host of new weapons in the control of sleeping sickness, more properly called trypanosomiasis (after the parasite that causes it), as well as of its livestock counterpart, nagana. For instance, the tsetse genome reveals a single regulatory protein, ladybird latte, which orchestrates milk production in the fly. Targeting that protein with inhibitory chemicals could be a good strategy for population control—less milk, less fertility.

51. Which of the following statements would the author most likely disagree with?
    (a) Genome studies in disease-transmitting insects can prove useful in controlling the spread of the epidemics they cause.
    (b) The nagana parasite causes the counterpart of sleeping sickness in livestock, making animal husbandry nearly impossible in certain regions.
    (c) At least 146 scientists had been involved in decoding the genome of the tsetse fly which may provide a possible weapon against sleeping sickness.
    (d) The genome of the tsetse fly has weaknesses that can be exploited, thus preventing it from breeding and contributing to an increase in the population of these flies.

51. b The author will agree with option (a) since the passage clearly gives an example of how genome studies can help fight disease-carrying insects. Option (b), however, doesn't agree with the passage. The author states that nagana is the livestock counterpart of sleeping sickness, both of which are caused by trypanosome parasite. Nagana, thus, is not the name of the parasite that causes the disease but the proper name of the disease itself. Option (c) can be clearly inferred from the last line of the introductory paragraph. Option (d) can be inferred from the last two paragraphs of the passage.

52. The author refers to the tsetse fly as "an oddball among disease-transmitting insects." The meaning of this phrase is best reflected in which of the following statements?
    (a) Chinks in the tsetse fly's genome have been discovered recently while weaknesses in other disease-bearing insects have long been known to man.
    (b) The tsetse fly causes more human suffering and economic loss than other insects which cause diseases.
    (c) The tsetse fly has mammalian characteristics, particularly the conception and birth of a single young one which is nourished with milk.
    (d) The female tsetse fly produces about a thousand offspring in her whole life, a significant number.

52. c The passage says that the tsetse-fly is an oddball. It then goes on to explain how the tsetse fly has mammalian characteristics, for instance giving birth to a single young one at a time and nourishing it with milk, like mammals do. Thus, option (c) is the right answer. Option (a) goes wrong when it mentions that weaknesses in other disease-transmitting insects have long been discovered. There is no mention of any such idea in the passage. Similarly, option (b) compares the suffering and loss caused by the tsetse fly to that caused by other insects; there's no such comparison in the passage. Option (d) contradicts the information presented in the passage and is, hence, incorrect.

53. Which of the following is most likely to be the source of this passage?
    (a) A science journal focusing on disease-control in Sub-Saharan Africa.
    (b) An amateur science magazine about disease-bearing insects and their habitats.
    (c) A report published about new and exciting genome studies and their implications.
    (d) A magazine called 'Science' which deals with trending articles around the world.

53. a The structure, scope and theme of the passage, all suggest that the passage is part of an article written with the purpose of showing how a new study about tsetse flies can help control a particular disease in Sub-Saharan Africa. Thus, option (a) is the right answer. The passage does not describe the habitat of the tsetse fly at all. Further, a magazine about insects would go into details of the tsetse fly, its structure and anatomy, etc. The given passage does not cover any of these points. Thus, option (b) is not correct. Similarly, the focus of the passage is not the genome study; instead, the passage focuses on how that study may help control a disease. This rules out option (c) as well. Option (d) is also incorrect. The passage mentions that the news about the new genome study was published in 'Science' (probably a magazine called Science). This clearly implies that the given passage was not published in the same magazine.

54. There are two gaps in the sentence/ paragraph given below. From the pairs of words given, choose the one that fills the gaps most appropriately.

Nothing could _____ the audience; all eyes remained fixed on the magician whose pickpocket accomplice continued dipping into pockets and purses, thanks to the _____.

(a) tempt, disillusionment
(b) disenchant, diversion
(c) enthrall, spell
(d) disillusion, extravaganza

54. b A reading of the context provides us the picture that a con is in progress. While the magician keeps the audience distracted, his accomplice picks pockets in the crowd. We know thus that the first blank needs a word that would denote how the crowd's attention was fixed on the magician's tricks. So we can negate options (a) and (c). Option (b) completes the picture well by use of the words 'disenchant' and 'diversion.' Option (d) is ruled out as the word 'disillusion' has a slightly negative connotation to it and is not apt in this context.

55. There are two gaps in the sentence/ paragraph given below. From the pairs of words given, choose the one that fills the gaps most appropriately.

All vestiges of _____ vanished when our sleek, new speed-boat had to be rescued, and we were towed back in an/a _____ fashion to the boat-yard.

(a) vanity, ignominious
(b) pretentiousness, apologetic
(c) glory, ordinate
(d) revelry, felonious

55. a The passage suggests that the speed boat had to be rescued. Options (c) and (d) can be negated since they do not bring out the contrast visible in the given context. Ordinate doesn't fit here at all; it is a mathematical term. There is also nothing to justify the word felonious which means 'related to serious crime.' Option (b) can be eliminated since 'apologetic' means 'offering apologies' which does not fit into the given context. Ignominious, which means 'being in a sorry state,' is correct and clearly conveys how their (the subject in the sentence) pride was punctured.

56. Five sentences are given below, labeled A, B, C, D and E. They need to be arranged in a logical order to form a coherent paragraph/passage. From the given options, choose the most appropriate sequence.

A. Space is breathtaking but hostile; without protection we have no business up there.
B. In the beginning it feels like floating.
C. Then you're hurtling through like a missile but never realize how fast you're going.
D. You gain speed.
E. I was not frightened; I had practised.

(a) BCDEA
(b) ACDBE
(c) EBDCA
(d) BEACD

56. c BDC is the link that leads us to the answer. It makes sense to first talk about how it feels in the beginning and then follow up with what happens when you gain speed. Thus, BDC can be easily identified as a mandatory sequence. Statement E fits in the beginning with the speaker talking about how he was frightened. Statement A comes in the end as a final summation of what it is to be in space. Option (c) has the correct sequence and is, hence, the answer.

57. Five sentences are given below, labeled A, B, C, D and E. They need to be arranged in a logical order to form a coherent paragraph/passage. From the given options, choose the most appropriate sequence.

A. A small group of students had taken to the streets in protest in Tiananmen Square—and their numbers were swelling.
B. David Turnley was in Paris when he got the call.
C. "I think something is happening here," Peter told his brother. "You need to cover this too", Peter urged.
D. David flew out to cover the events as well, and as he walked among the million or more protesters who soon filled Tiananmen Square, "there was a sense of an elevated human spirit," he says. "It was euphoric."
E. His brother Peter was in Beijing to cover the visit of Soviet leader Mikhail Gorbachev to China but was on the line with different, more exciting news.

(a) ABCDE (b) CADBE (c) CBDAE **(d) BEACD**

57. d The correct sequence starts with BEA - B tells us where David was, E tells us where his brother was and that there was 'more exciting news', A follows with revealing details about what was so exciting. C then adds what Peter wanted from his brother and why he had made the call. And then D chronologically concludes with how David responded to his brother's request. The phrases 'cover this too' and 'cover the events as well' make CD the mandatory pair. Another such pair can be seen in A and C where 'numbers were swelling' and 'something is happening' create a link.

Directions for questions 58 to 60: Answer the questions on the basis of the information given below.

A basketball match was played between two teams – Cereal Killers and Big Ballers. Players who represented the two teams with five players each in the match were Jordan, Bryant, James, Johnson, Larry, Chamberlain, Kareem, Russell, O'Neal and Oscar. A player can either score 2 points by throwing the ball into the basket while standing inside the D-area or 3 points by throwing the ball into the basket while standing outside the D-area.

(i) Players with the same initials belonged to the same team.
(ii) Each player had at least one successful throw and there were two players in Cereal Killers and one in Big Ballers who did not throw a 3-pointer.
(iii) The total number of successful throws and the total score of both the teams put together were 22 and 56 respectively.
(iv) Johnson and Bryant both had exactly one successful throw and scored a 2-pointer and a 3-pointer respectively. Both of them were in different teams.
(v) O'Neal and Russell both scored 4 points each and were in the same team.
(vi) Kareem, James and Jordan scored 7, 8 and 9 points respectively.
(vii) No one scored more than Larry, who did not score any 2-pointer while pushing the score of his team to 25 points.

58. Which of the following pair of players did not belong to the same team?
(a) James and Chamberlain (b) Bryant and Larry
(c) Jordan and Larry (d) Kareem and Johnson

59. What was the absolute difference between the total points scored by Cereal Killers through 2-pointers and that by Big Ballers through 3-pointers?
(a) 11 (b) 2 (c) 5 (d) Cannot be determined

60. What was the ratio of the points scored by Oscar, Larry and Chamberlain?
(a) 5 : 9 : 5 (b) 5 : 12 : 5 (c) 1 : 2 : 1 (d) 12 : 2 : 5

For questions 58 to 60: From statements (i), (iv) and (v), we can deduce that Jordan, James and Johnson belonged to the same team, while O'Neal, Oscar, Russell and Bryant belong to another team.
Total points scored by Jordan, James and Johnson put together = 2 + 8 + 9 = 19
Total points scored by O'Neal, Russell and Bryant put together = 4 + 4 + 3 = 11
Larry must have scored 9 or more points and as his team's total score was 25, he must have been a member of the team that comprised O'Neal, Oscar, Russell and Bryant. So Chamberlain and Kareem belonged to the team that comprised Jordan, James and Johnson.
The number of successful throws was 22.
Let the number of 2-pointer and 3-pointer be 'a' and 'b' respectively.
$\therefore$ a + b = 22 and 2a + 3b = 56 $\Rightarrow$ a = 10 and b = 12
Now, by using statements (iv), (v) and (vi), we can arrive at the following table:

Team	Player	Number of 2-pointer	Number of 3-pointer	Total score
	O'Neal	2	0	4
	Oscar			
	Russell	2	0	4
	Bryant	0	1	3
	Larry			
	Jordan	3 or 0	1 or 3	9
	Johnson	1	0	2
	James	4 or 1	0 or 2	8
	Kareem	2	1	7
	Chamberlain			

The total points scored by the two teams put together = 56
Total points scored by Larry, Oscar and Chamberlain put together = 56 – (4 + 4 + 3 + 9 + 2 + 8 + 7) = 56 – 37 = 19
As Larry, whose score was not less than anyone else, scored only 3-pointer, his score must have been either 9, 12 or 15.
Now from statement (ii), only 3 players did not score a 3 pointer and these players must have been O'Neal, Russell and Johnson, from the table above. It implies that Oscar and Chamberlain scored at least one 3-pointer each i.e. at least 6 points. So Larry scoring 15 points was not possible as 19 – 15 = 4 < 6. He could not even score 12 as 19 – 12 = 7, which would have made impossible the earlier derived conclusion i.e. Oscar and Chamberlain scored two 3-pointer between them. Hence, Larry scored 9 points, which he scored only through three 3-pointer.
Points scored by Oscar = 25 – (4 + 4 + 3 + 9) = 5
Similarly, we can calculate the number of points scored by Chamberlain.
According to statement (ii), there were 2 players in Cereal Killers who did not score 3-pointer. Hence, it can be concluded that O'Neal, Oscar, Russell, Larry and Bryant represented Cereal Killers. Also, as the number of 2-pointer in the match was 10 and the number of 3-pointer 12, Jordan must have scored zero 2 pointers and three 3-pointer and James one 2-pointer and two 3-pointer.
The final table is given below:

Player	Number of 2-pointer	Number of 3-pointer	Total score
O'Neal	2	0	4
Oscar	1	1	5
Russell	2	0	4
Bryant	0	1	3
Larry	0	3	9
Jordan	0	3	9
Johnson	1	0	2
James	1	2	8
Kareem	2	1	7
Chamberlain	1	1	5

58. c Jordan and Larry did not belong to the same team.

59. a The difference = (3 + 2 + 1 + 1) × 3 – (2 + 1 + 2) × 2 = 21 – 10 = 11.

60. a The ratio = 5 : 9 : 5.