Section I
This section contains 25 questions

1. The price of Darjeeling tea (in rupees per kilogram) is $100 + 0.10n$, on the n^{th} day of 2007 (n = 1, 2, ..., 100), and then remains constant. On the other hand, the price of Ooty tea (in rupees per kilogram) is $89 + 0.15n$, on the n^{th} day of 2007 (n = 1, 2, ..., 365). On which date in 2007 will the prices of these two varieties of tea be equal?
(1) May 21
(2) April 11
(3) May 20
(4) April 10
(5) June 30

Solution:
Note that the price of Darjeeling tea remains constant after the 100^{th} day (n = 100).
If the prices of the two varieties of tea become equal before n = 100, then
$100 + 0.1n = 89 + 0.15n$
$\therefore n = 220$, which is not possible. (Since n is assumed to be less than 100)
$\therefore$ The prices of the two varieties will be equal after n = 100,
i.e., when the price of Darjeeling tea = $100 + 0.1 \times 100 = 110$
$\therefore 89 + 0.15n = 110$
$\therefore n = 140$
2007 is not a leap year. Number of days till 30^{th} April = 31 + 28 + 31 + 30 = 120
The prices of the two varieties will be equal on 20^{th} May.
Hence, option 3.

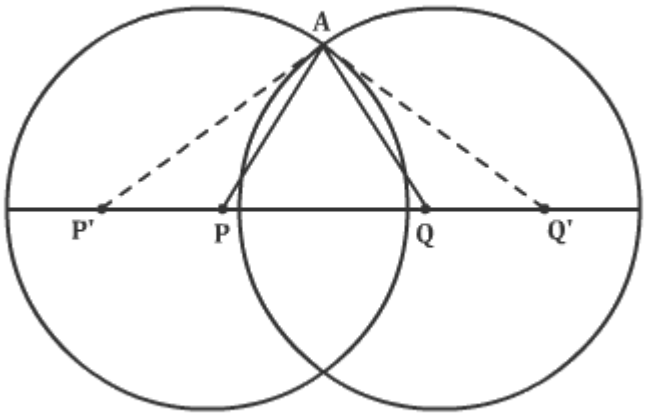
2. A quadratic function $f(x)$ attains a maximum of 3 at x = 1. The value of the function at x = 0 is 1. What is the value of $f(x)$ at x = 10?
(1) –119
(2) –159
(3) –110
(4) –180
(5) –105

Solution:
Let $f(x) = px^2 + qx + k$, where p, q and k are integers
$\therefore f(0) = k = 1$
$\therefore f(x) = px^2 + qx + 1$
$f(x) = px^2 + qx + k$
$f'(x) = 2px + q$

When $f'(x) = 0$, $x = -q/2p$
$f(x)$ attains maximum at $x = 1$
$\therefore q = -2p$
$f(1) = p + q + 1 = 3$
$\therefore 1 - p = 3$
$\therefore p = -2$
$\therefore q = 4$
$\therefore f(x) = -2x^2 + 4x + 1$
$\therefore f(10) = -200 + 40 + 1 = -159$
Hence, option 2.

3. Two circles with centres P and Q cut each other at two distinct points A and B. The circles have the same radii and neither P nor Q falls within the intersection of the circles. What is the smallest range that includes all possible values of the angle AQP in degrees?
(1) Between 0 and 90
(2) Between 0 and 30
(3) Between 0 and 60
(4) Between 0 and 75
(5) Between 0 and 45

Solution:



P and Q do not lie within the intersection of the two circles.

So they lie on the circumferences or outside the circumferences. If they lie on the circumferences, then ΔAPQ forms an equilateral triangle.
So, m ∠AQP = 60^o

From the diagram, if they lie outside the circumferences, m ∠AQ'P' < 60^o

Also, m ∠AQP would be 0^o if A, Q and P were collinear.
But as P and Q cut each other in two distinct points, A, Q and P cannot be collinear.
∴ m ∠AQP > 0^o

∴ m ∠AQP lies between 0^o and 60^o
Hence, option 3.

Directions for Questions 4 and 5:
Let S be the set of all pairs (i, j) where $1 \le i < j \le n$ and $n \ge 4$. Any two distinct members of S are called "friends" if they have one constituent of the pairs in common and "enemies" otherwise. For example, if $n = 4$, then $S = \{(1, 2), (1, 3), (1, 4), (2, 3), (2, 4), (3, 4)\}$. Here, (1, 2) and (1, 3) are friends, (1, 2) and (2, 3) are also friends, but (1, 4) and (2, 3) are enemies.

4. For general n, how many enemies will each member of S have?
(1) $n - 3$
(2) $\frac{1}{2}(n^2 - 3n - 2)$
(3) $2n - 7$
(4) $\frac{1}{2}(n^2 - 5n + 6)$
(5) $\frac{1}{2}(n^2 - 7n + 14)$

Solution:
Enemies of every pair are the pairs formed with all numbers other than the two in the member itself.
∴ If there are n elements then each member has
$${}^{(n-2)}C_2 = \frac{(n-2)(n-3)(n-4)!}{2(n-4)!}$$
$$= \frac{n^2 - 5n + 6}{2} \text{ enemies}$$
Hence, option 4.

5. For general n, consider any two members of S that are friends. How many other members of S will be common friends of both these members?

(1) $\frac{1}{2}(n^2 - 5n + 8)$

(2) $2n - 6$

(3) $\frac{1}{2}n(n - 3)$

(4) $n - 2$

(5) $\frac{1}{2}(n^2 - 7n + 16)$

Solution:

Two members are friends if they have one element in common.

∴ All the members having one constituent as the common element are common friends.

There are $(n - 3)$ such friends.

Also, one pair formed by the uncommon constituents of the two friends is a common friend.

∴ There are $n - 3 + 1 = n - 2$ common friends.

Hence, option 4.

Directions for Questions 6 and 7:

Shabnam is considering three alternatives to invest her surplus cash for a week. She wishes to guarantee maximum returns on her investment. She has three options, each of which can be utilized fully or partially in conjunction with others.

Option A: Invest in a public sector bank. It promises a return of +0.10%

Option B: Invest in mutual funds of ABC Ltd. A rise in the stock market will result in a return of +5%, while a fall will entail a return of –3%

Option C: Invest in mutual funds of CBA Ltd. A rise in the stock market will result in a return of –2.5%, while a fall will entail a return of +2%

6. The maximum guaranteed return to Shabnam is:

(1) 0.25%

(2) 0.10%

(3) 0.20%

(4) 0.15%

(5) 0.30%

Solution:

Let Shabnam have Rs. 100 to invest. Let Rs. x, Rs. y and Rs. z be invested in option A, B and C respectively.

∴ $x + y + z = 100$ ... (I)

If there is a rise in the stock market, returns = $0.001x + 0.05y - 0.025z$

If there is a fall in the stock market, returns = $0.001x - 0.03y + 0.02z$

Now, x, y and z should be such that regardless of whether the market rises or falls, they give the same return, which is the maximum guaranteed return.
$\therefore 0.001x + 0.05y - 0.025z = 0.001x - 0.03y + 0.02z$
$\therefore y/z = 9/16$

Now, consider different possible values of x, y and z. The returns are as follows:

x	y	z	**Returns = $0.001x + 0.05y - 0.025z$**
75	9	16	0.125
50	18	32	0.15
25	27	48	0.175
0	36	64	0.2

We see that as the values of y and z increase, the returns increase.

$\therefore$ The returns are maximum when $x = 0\%$, $y = 36\%$ and $z = 64\%$
(Note that the values of y and x are multiples of 9 and 16.)
The maximum returns are 0.2%.
Hence, option 3.

7. What strategy will maximize the guaranteed return to Shabnam?
(1) 100% in option A
(2) 36% in option B and 64% in option C
(3) 64% in option B and 36% in option C
(4) 1/3 in each of the three options
(5) 30% in option A, 32% in option B and 38% in option C

Solution:
As shown by the table formulated in the first question, maximum returns are guaranteed by investing 36% in option B and 64% in option C.
Hence, option 2.

Directions for Questions 8 and 9:
Cities A and B are in different time zones. A is located 3000 km east of B. The table below describes the schedule of an airline operating non-stop flights between A and B. All the times indicated are local and on the same day.

Departure		Arrival	
City	**Time**	**City**	**Time**
B	8:00 a.m.	A	3:00 p.m.
A	4:00 p.m.	B	8: p.m.

Assume that planes cruise at the same speed in both directions. However, the effective speed is influenced by a steady wind blowing from east to west at 50 km per hour.

8. What is the time difference between A and B?
(1) 1 hour and 30 minutes
(2) 2 hours
(3) 2 hours and 30 minutes
(4) 1 hour
(5) Cannot be determined

Solution:
Let the speed of the plane be x kmph.
Then the speed from B to A is $(x - 50)$ kmph and that from A to B is $(x + 50)$ kmph.
Note that the plane travels from B to A, halts for 1 hour and travels back to B, all in 12 hrs.
$\therefore 3000/(x - 50) + 1 + 3000/(x + 50) = 12$
Now consider options for this question. We can easily see that $x = 550$ satisfies the above expression.
Speed of plane = 550 kmph
Now, the plane takes 3000/500 = 6 hrs to travel from B to A.
It reaches A when the time at B is 8:00 am + 6 hrs = 2:00 p.m.
=> The time difference between A and B is 1 hour.
Hence, option 4.

9. What is the plane's cruising speed in km per hour?
(1) 700
(2) 550
(3) 600

(4) 500
(5) Cannot be determined

Solution:
As calculated in the first question, the cruising speed of the plane is 550 kmph.
Hence, option 2.

10. Consider all four digit numbers for which the first two digits are equal and the last two digits are also equal. How many such numbers are perfect squares?
(1) 3
(2) 2
(3) 4
(4) 0
(5) 1
Solution:
Let $aabb$ ($a \neq 0$, a and b being single digits) be a perfect square.
$aabb = 1100a + 11b = 11(100a + b)$
Also, as $aabb$ is a perfect square, it is a multiple of 121.
$\therefore aabb = 121K$, where K is also perfect square.
For $K = 4$, $aabb$ is a 3 digit number, while for $K > 81$, K is a 5 digit number.
For $81 \geq K \geq 9$,
$121 \times 9 = 1089$
$121 \times 16 = 1936$
$121 \times 25 = 3025$
$121 \times 36 = 4356$
$121 \times 49 = 5929$
$121 \times 64 = 7744$
$121 \times 81 = 9801$
$\therefore$ There is only one number 7744 of the form $aabb$, which is a perfect square.
Hence, option 5.

11. In a tournament, there are n teams T_1 , T_2 ....., T_n with $n > 5$. Each team consists of k players, $k > 3$. The following pairs of teams have one player in common:
T_1 & T_2 , T_2 & T_3 ,....., T_{n-1} & T_n , and T_n & T_1.
No other pair of teams has any player in common. How many players are participating in the tournament, considering all the n teams together?
(1) $n(k - 1)$
(2) $k(n - 1)$
(3) $n(k - 2)$
(4) $k(k - 2)$

(5) $(n-1)(k-1)$

Solution:
Each team has $(k-2)$ players to itself and shares 2 players with other two teams.
n pairs of teams have 1 player in common and there are n teams.
Total number of players = $n(k-2) + n$
$= nk - 2n + n$
$= nk - n$
$= n(k-1)$
Hence, option 1.

Directions for Questions 12 and 13:
Mr. David manufactures and sells a single product at a fixed price in a niche market. The selling price of each unit is Rs. 30. On the other hand, the cost, in rupees, of producing x units is $240 + bx + cx^2$, where b and c are some constants. Mr. David noticed that doubling the daily production from 20 to 40 units increases the daily production cost by 66.66%. However, an increase in daily production from 40 to 60 units results in an increase of only 50% in the daily production cost. Assume that demand is unlimited and that Mr. David can sell as much as he can produce. His objective is to maximize the profit.

12. How many units should Mr. David produce daily?
(1) 130
(2) 100
(3) 70
(4) 150
(5) Cannot be determined

Solution:
The cost function $C(x) = 240 + bx + cx^2$
$C(20) = 240 + 20b + 400c$
$C(40) = 240 + 40b + 1600c$
$C(60) = 240 + 60b + 3600c$

By conditions,
$2/3 \times C(20) = C(40) - C(20)$
$\therefore\ C(40) = 5/3 \times C(20)$
$\therefore 240 + 40b + 1600c = 400 + 100b/3 + 2000c/3$
$\therefore 20b/3 + 2800c/3 = 160$
$\therefore 20b + 2800c = 480$ ... (I)

Also,
$½ \times C(40) = C(60) - C(40)$
$\therefore 3/2 \times C(40) = C(60)$
$\therefore 360 + 60b + 2400c = 240 + 60b + 3600c$
$\therefore c = 1/10$
$\therefore b = 10$ ... (from I)

Profit for x units is $30x - C(x)$
$P(x) = 30x - 240 - 10x - x^2/10 = -240 + 20x - x^2/10$

The derivative of $P(x) = P'(x) = 20 - x/5$
For maximization of profit $P'(x) = 0$ and $P''(x) < 0$
When $P'(x)$ is zero,
$20 - x/5 = 0$
$\therefore x = 100$
$P''(x) = -0.2$
Hence, option 2.

13. What is the maximum daily profit, in rupees, that Mr. David can realize from his business?
(1) 620
(2) 920
(3) 840
(4) 760
(5) Cannot be determined

Solution:
Following from the first question, at $x = 100$ the profit is maximum.
At that level of production
$P(x) = -240 + 20\ (100) - (100)^2/10$
$= -240 + 2000 - 1000$
$= 760$
Hence, option 4.

Directions for Questions 14 and 15:
Let $a_1 = p$ and $b_1 = q$, where p and q are positive quantities.
Define:
$a_n = pb_{n-1}$; $b_n = qb_{n-1}$ (for even $n > 1$)
and $a_n = pa_{n-1}$; $b_n = qa_{n-1}$ (for odd $n > 1$)

14. Which of the following best describes $a_n + b_n$ for even n?

(1) $q(pq)^{\frac{1}{2}n-1}(p+q)^{\frac{1}{2}n}$
(2) $q(pq)^{\frac{1}{2}n-1}(p+q)$
(3) $qp^{\frac{1}{2}n-1}(p+q)$
(4) $q^{\frac{1}{2}n}(p+q)$
(5) $q^{\frac{1}{2}n}(p+q)^{\frac{1}{2}n}$

Solution:
We have the following for different values of n

n	a_n	b_n
1	p	q
2	pq	q^2
3	p^2q	pq^2
4	p^2q^2	pq^3
5	p^3q^2	p^2q^3
6	p^3q^3	p^2q^4
7	p^4q^3	p^3q^4

∴ For even n (say, $n = 4$),
$a_n + b_n = p^2q^2 + pq^3 = pq^2(p+q)$

Now consider the given options, for $n = 4$
(1) gives $pq^2(p+q)^2$
(2) gives $pq^2(p+q)$
(3) gives $pq(p+q)$
(4) gives $q^2(p+q)$
(5) gives $q^2(p+q)^2$

Hence, option 2.

15. If $p = 1/3$ and $q = 2/3$, then what is the smallest odd n such that $a_n + b_n < 0.01$?

(1) 7
(2) 13
(3) 11
(4) 9
(5) 15

Solution:

For odd n, $a_n + b_n = p^{(n+1)/2} q^{(n-1)/2} + q^{(n+1)/2} p^{(n-1)/2}$

$= p^{(n-1)/2} q^{(n-1)/2} (p + q)$

Here, $p = 1/3$, $q = 2/3$

$\therefore\ p + q = 1$

$\therefore\ a_n + b_n = p^{(n-1)/2} q^{(n-1)/2} = (2/9)^{(n-1)/2}$

Now considering options starting from the lowest,

For $n = 7$, $a_n + b_n = 8/729 = 1/91 > 1/100$

For $n = 9$, $a_n + b_n = 16/6561 = 1/410 < 1/100$

Hence, option 4.

Directions for Questions 16 through 19:

Each question is followed by two statements A and B. Answer each question using the following instructions.

Mark (1) if the question can be answered by using statement A alone but not by using statement B alone.

Mark (2) if the question can be answered by using statement B alone but not by using statement A alone.

Mark (3) if the question can be answered by using both the statements together but not by using either of the statements alone.

Mark (4) if the question cannot be answered on the basis of the two statements.

16. The average weight of a class of 100 students is 45 kg. The class consists of two sections, I and II, each with 50 students. The average weight, W_I, of Section I is smaller than the average weight, W_{II}, of Section II. If the heaviest student, say Deepak, of Section II is moved to Section I, and the lightest student, say Poonam, of Section I is moved to Section II, then the average weights of the two sections are switched, i.e., the average weight of Section I becomes W_{II} and that of Section II becomes W_I. What is the weight of Poonam?

A. $W_{II} - W_I = 1.0$
B. Moving Deepak from Section II to I (without any move from I to II) makes the average weights of the two sections equal.

Solution:
Let the weights of Deepak and Poonam be d and p respectively.
$(50W_{II} + 50W_{I})/100 = 45$
$\therefore W_{II} + W_{I} = 90$ _____ (i)

$50W_{I} + d - p = 50W_{II}$
$\therefore 50(W_{II} - W_{I}) = d - p$ _____ (ii)

From Statement A, $W_{II} - W_{I} = 1$ _____ (iii)

From (i), (ii) and (iii),
W_{I} and W_{II} can be found.
Also, $d - p = 50$ _____ (iv)
However this information does not give us the value of p. Statement A is insufficient to answer the question.

From Statement B,
$49(W_{I} + d) = 51(W_{II} - d)$
$\therefore 51W_{II} - 49W_{I} = 100d$ _____ (v)
This alone cannot help us find the value of p. Statement B is insufficient to answer the question.

Considering both statements together, we have values of W_{I} and W_{II}, which can be substituted in (v) to find d, which can be used to find p using (iv).
Hence, option 3.

17. Consider integers x, y and z. What is the minimum possible value of $x^2 + y^2 + z^2$?
A. $x + y + z = 89$
B. Among x, y, z two are equal.

Solution:
Statement A:
$x + y + z = 89$
$x^2 + y^2 + z^2$ will be minimum when $x = y = z = 89/3$
But $89/3$ is a non-integer.
$\therefore$ We consider integer values of x, y, z which are as close as possible to $89/3$.
We get two cases:
1. $x, y, z = 30, 30, 29$
   $x^2 + y^2 + z^2 = 2641$

2. $x, y, z = 31, 29, 29$
   $x^2 + y^2 + z^2 = 2643$

Minimum possible value of $x^2 + y^2 + z^2$ is 2641. Thus statement A is sufficient to get the answer. Though statement B states a fact related to the minimum value, it is not necessary to arrive at the minimum value.
Hence, option 1.

18. Rahim plans to draw a square JKLM with a point O on the side JK but is not successful. Why is Rahim unable to draw the square?
A. The length of OM is twice that of OL.
B. The length of OM is 4 cm.

Solution:
Let p be the side of square JKLM.
From Statement A,
OM = 2 × OL
OM is maximum when it is the diagonal of the square and has length $(\sqrt{2})p$
When OM is maximum, OM = $(\sqrt{2})$OL
∴ OM ≠2 × OL if O lies on JK.
∴ Rahim is unable to draw the square.
Hence, option 1.

19. ABC Corporation is required to maintain at least 400 Kilolitres of water at all times in its factory, in order to meet safety and regulatory requirements. ABC is considering the suitability of a spherical tank with uniform wall thickness for the purpose. The outer diameter of the tank is 10 meters. Is the tank capacity adequate to meet ABC's requirements?
A. The inner diameter of the tank is at least 8 meters.
B. The tank weighs 30,000 kg when empty, and is made of a material with density of 3 gm/cc.

Solution:
Let the inner radius be r meter. Capacity of tank = (1 m^3 = 1 kilolitre)
From statement A, since $r \geq 4$m
∴ Capacity of tank > 256 m^3
Since the capacity needed is more than 256 m^3 statement A is insufficient.
From statement B,

Volume of the material of tank = mass/density = 30000kg/(3 gm/cc) = 10,000,000 cm^3 = 10 m^3
Hence the inner volume of tank = Outer volume – Volume of material of tank
Therefore, we can say that the tank capacity is adequate.
Hence, option 2.

20. Suppose you have a currency, named Miso, in three denominations: 1 Miso, 10 Misos and 50 Misos. In how many ways can you pay a bill of 107 Misos?
(1) 17
(2) 16
(3) 18
(4) 15
(5) 19

Solution:
The bill can be paid in 18 ways as shown in the given table. Hence, option 3.

50 Misos	10 Misos	1 Miso	Total
0	0	107	107
0	1	97	107
0	2	87	107
0	3	77	107
0	4	67	107
0	5	57	107
0	6	47	107
0	7	37	107
0	8	27	107
0	9	17	107
0	10	7	107
1	0	57	107
1	1	47	107
1	2	37	107
1	3	27	107
1	4	17	107
1	5	7	107
2	0	7	107

21. How many pairs of positive integers m, n satisfy $1/m + 4/n = 1/12$ where n is an odd integer less than 60?
(1) 6
(2) 4
(3) 7
(4) 5
(5) 3

Solution:
$1/m + 4/n = 1/12$
$\therefore 1/m = 1/12 - 4/n$
$\therefore m = 12n / (n - 48)$
As, m is a positive integer, n should be greater than 48 and moreover since n is a positive odd integer lesser than 60, n can take values 49, 51, 53, 55, 57 and 59.
If n = 49, 51, 57 then m is a positive integer.
If n = 53, 55, 59 then m is not an integer.
$\therefore$ 3 pairs of values of m and n satisfy the given equation.
Hence, option 5.

22. A confused bank teller transposed the rupees and paise when he cashed a cheque for Shailaja, giving her rupees instead of paise and paise instead of rupees. After buying a toffee for 50 paise, Shailaja noticed that she was left with exactly three times as much as the amount on the cheque. Which of the following is a valid statement about the cheque amount?
(1) Over Rupees 13 but less than Rupees 14
(2) Over Rupees 7 but less than Rupees 8
(3) Over Rupees 22 but less than Rupees 23
(4) Over Rupees 18 but less than Rupees 19
(5) Over Rupees 4 but less than Rupees 5

Solution:
Let the amount on Shailaja's cheque be Rs. x and paise $y = (100x + y)$ paise (x and y are positive integers)
The teller gives her $(100y + x)$ paise.

Now, $100y + x - 50 = 3(100x + y)$
$\therefore 97y - 299x = 50$
$\therefore y = (50 + 299x)/97$
$= [50 + 8x + 291x]/97$

$= [(50 + 8x)/97] + 3$

Now as y is an integer, $(50 + 8x)$ has to be a multiple of 97 with $x, y \leq 99$
$50 + 8x = 97k$ (k is an integer)
$\therefore x = 12k - 6 + [(k - 2)/8]$
$\therefore k = 2, 10, 18\ldots$
$\therefore x = 18, 115, 212\ldots$
$\therefore x = 18$ is the only possible value.
This implies that $y = 5$
$\therefore$ The amount on Shailaja's cheque is over Rs. 18 but less than Rs. 19.
Hence, option 4.

23. Consider the set $S = \{2, 3, 4, ..., 2n + 1\}$, where n is a positive integer larger than 2007. Define X as the average of the odd integers in S and Y as the average of the even integers in S. What is the value of $X - Y$?
(1) 0
(2) 1
(3) $n/2$
(4) $n + 1/2n$
(5) 2008

Solution:
$Y = (2 + 4 + 6 + 8 + \ldots + 2n)/n$
$X = (3 + 5 + 7 + 9 + \ldots + (2n + 1))/n$
$= ((2 + 1) + (4 + 1) + (6 + 1) + (8 + 1) + \ldots + (2n + 1))/n$
$= (2 + 4 + 6 + 8 + \ldots + 2n)/n + (1 + 1 + 1 + 1 + \ldots n \text{ times})/n$
$= Y + 1$
$\therefore X - Y = 1$
Hence, option 2.
Note: The information that 'n is a positive integer larger than 2007' does not affect the answer in any way.

24. Ten years ago, the ages of the members of a joint family of eight people added up to 231 years. Three years later, one member died at the age of 60 years and a child was born during the same year. After another three years, one more member died, again at 60, and a child was born during the same year. The current average age of this eight member joint family is nearest to:
(1) 23 years
(2) 22 years
(3) 21 years

(4) 25 years
(5) 24 years

Solution:
The sum of the ages of the members of the family ten years ago = 231
∴ The sum of the ages of the members of the family seven years ago = 231 + (3 × 8) – 60 = 195
∴ The sum of the ages of the members of the family four years ago = 195 + (3 × 8) – 60 = 159
∴ The sum of the ages of the members of the family now = 159 + (4 × 8) = 191
∴ Required average = 191/8 = 23.875 ≈ 24
Hence, option 5.

25. A function $f(x)$ satisfies $f(1) = 3600$, and $f(1) + f(2) + \ldots + f(n) = n^2 f(n)$, for all positive integers $n > 1$. What is the value of $f(9)$?
(1) 80
(2) 240
(3) 200
(4) 100
(5) 120

Solution:
$f(1) + f(2) + f(3) + \ldots + f(n-1) + f(n) = n^2 f(n)$ ... (i)
Similarly, $f(1) + f(2) + f(3) + \ldots + f(n-1) = (n-1)^2 f(n-1)$ ... (ii)

Subtracting equation (ii) from (i),
$f(n) = n^2 f(n) - (n-1)^2 f(n-1)$
$\therefore (n^2 - 1) f(n) = (n-1)^2 f(n-1)$
$$\therefore f(n) = \frac{(n-1)^2}{(n^2-1)} f(n-1)$$
$$\therefore f(n) = \frac{(n-1)}{(n+1)} f(n-1)$$
$$\therefore f(n) = \frac{8}{10} \times \frac{7}{9} \times \frac{6}{8} \times \frac{5}{7} \times \frac{4}{6} \times \frac{3}{5} \times \frac{2}{4} \times \frac{1}{3} \times 3600$$
$$\therefore f(n) = \frac{2 \times 3600}{10 \times 9} = 80$$

Hence, option 1.

Section II
This section contains 25 questions

Directions for Questions 26 to 29: Each question is followed by two statements, A and B. Answer each question using the following instructions*:*
Mark (1) if the question can be answered by using the statement A alone but not by using the statement B alone.
Mark (2) if the question can be answered by using the statement B alone but not by using the statement A alone.
Mark (3) if the question can be answered by using either of the statements alone.
Mark (4) if the question can be answered by using both the statements together but not by either of the statements alone.
Mark (5) if the question cannot be answered on the basis of the two statements.

26. In a football match, at half-time, Mahindra and Mahindra Club was trailing by three goals. Did it win the match?
A. In the second half Mahindra and Mahindra Club scored four goals.
B. The opponent scored four goals in the match.

Solution:
From Statement A, the MM club scored 4 goals in the second half. The number of goals scored by the opponent is not known. So the winner cannot be determined. Statement A is insufficient.

From Statement B, the opponent scored 4 goals in the match, but we do not know the number of goals that the MM club scored. Statement B is insufficient.

Considering both the statements we have the following.

First Half		Second Half		Final Score	
MM Club	Opponent	MM Club	Opponent	MM Club	Opponent
0	3	4	1	4	4
1	4	4	0	5	4

Thus, MM club could have won the match or could have tied it. The question cannot be answered.
Hence, option 5.

27. In a particular school, sixty students were athletes. Ten among them were also among the top academic performers. How many top academic performers were in the school?

A. Sixty per cent of the top academic performers were not athletes.

B. All the top academic performers were not necessarily athletes.

Solution:

From Statement A, 40% of the top academic performers were athletes.

$\therefore$ If there are x top academic performers, $10 = 0.4x$

$\therefore x = 25$

Statement A is sufficient.

Statement B does not give any useful information.

Hence, option 1.

28. Five students Atul, Bala, Chetan, Dev and Ernesto were the only ones who participated in a quiz contest. They were ranked based on their scores in the contest. Dev got a higher rank as compared to Ernesto, while Bala got a higher rank as compared to Chetan. Chetan's rank was lower than the median. Who among the five got the highest rank?

A. Atul was the last rank holder.

B. Bala was not among the top two rank holders.

Solution:

Chetan's rank = 4 or 5

Now, Bala < Chetan and Dev < Ernesto.

From Statement A,

	Case 1	**Case 2**	**Case 3**
1	Bala	Dev	Dev
2	Dev	Ernesto	Bala
3	Ernesto	Bala	Ernesto
4	Chetan	Chetan	Chetan
5	Atul	Atul	Atul

The highest rank holder cannot be determined. Statement A is insufficient.

Statement B is also insufficient.

Considering both statements together (refer to the table), Case 2 holds. Dev got the highest rank.

Hence, option 4.

29. Thirty per cent of the employees of a call centre are males. Ten per cent of the female employees have an engineering background. What is the percentage of male employees with engineering background?

A. Twenty five per cent of the employees have engineering background.
B. Number of male employees having an engineering background is 20% more than the number of female employees having an engineering background.

Solution:
Let there be $100x$ employees.
So, $30x$ are male and $70x$ are female.
$\therefore 7x$ female employees have an engineering background.

From statement A, $25x$ employees have an engineering background.
$\therefore 18x$ male employees have an engineering background.
Required percentage = $18x \times 100/ 30x$
Statement A is sufficient.

From Statement B, Number of male employees having an engineering background = $1.2 \times 7x$
Required percentage = $1.2 \times 7x \times 100/30x$
Statement B is also sufficient.

Hence, option 3.

DIRECTIONS for Questions 30 to 33: Answer the following questions based on the information given below:

The proportion of male students and the proportion of vegetarian students in a school are given below. The school has a total of 800 students, 80% of whom are in the Secondary Section and rest equally divided between Class 11 and 12:

	Male (M)	**Vegetarian (V)**
Class 12	0.6	
Class 11	0.55	0.5
Secondary Section		0.55
Total	0.475	0.53

30. What is the percentage of male students in the secondary section?

(1) 40
(2) 45
(3) 50
(4) 55
(5) 60

Solution:

From the table given in the question,
Total students = 800
Students in Secondary
= 0.8 × 800
= 640

Students in Class 11
= (800 – 640)/2
= 80

∴ Students in Class 12 = 80

Males in Class 11
= 0.55 × 80
= 44

Males in Class 12
= 0.6 × 80
= 48

∴ Males in Secondary
= 0.475 × 800 – 44 – 48
= 288

Vegetarians in Class 11
= 0.5 × 80
= 40

Vegetarians in Secondary
= 0.55 × 640
= 352

Vegetarians in Class 12
= 800 × 0.53 – 40 – 352
= 32

Now, the percentage of male students in secondary section
= 288 × 100/640
= 45%
Hence, option 2.

31. In Class 12, twenty five per cent of the vegetarians are male. What is the difference between the number of female vegetarians and male non-vegetarians?
(1) less than 8
(2) 10
(3) 12
(4) 14
(5) 16

Solution:
Vegetarian Males in Class 12
= 0.25 × 48
= 12

∴ Non-vegetarian Males in class 12 = 36
∴ Vegetarian females in class 12
= Vegetarians in class 12 – Male vegetarians in class 12
= 32 – 12 = 20
(We derived the number of vegetarians in the class in the previous question)

∴ Required difference = 36 – 20 = 16
Hence, option 5.

32. What is the percentage of vegetarian students in Class 12?
(1) 40
(2) 45
(3) 50
(4) 55
(5) 60

Solution:
In the first question we derived the number of vegetarians in class 12 as 32 and the total number of students in the class as 80.
∴The percentage of vegetarians in class 12 = 32 × 100/80 = 40%
Hence, option 1.

33. In the Secondary Section, 50% of the students are vegetarian males. Which of the following statements is correct?
(1) Except vegetarian males, all other groups have same number of students.
(2) Except non-vegetarian males, all other groups have same number of students.
(3) Except vegetarian females, all other groups have same number of students.
(4) Except non-vegetarian females, all other groups have same number of students
(5) All of the above groups have the same number of students.

Solution:
(This question was not considered for evaluation as there was an error in the question)
"50% of the students are vegetarian males" contradicts the data given initially.
Interpreting it as "50% of the males are vegetarian", we have the following:
In secondary,
Vegetarian males = 144
Non-vegetarian males = 144
Vegetarian females = 352 –144 = 208
Non-vegetarian females = 352 – 208 = 144
∴ Except vegetarian females, all other groups have same number of students.
Hence, option 3.

Directions for Questions 34 to 37: Answer the following questions based on the information given below.

The following table shows the break-up of actual costs incurred by a company in last five years (year 2002 to year 2006) to produce a particular product.
The production capacity of the company is 2000 units. The selling price for the year 2006 was Rs. 125 per unit. Some costs change almost in direct proportion to the change in volume of production, while others do not follow any obvious pattern of change with respect to the volume of production and hence are considered fixed. Using the information provided for the year 2006 as the basis for projecting the figures for the year 2007, answer the following questions.

	Year 2002	Year 2003	Year 2004	Year 2005	Year 2006
Volume of production	1000	900	1100	1200	1200
Costs (Rs.)					
Material	50,000	45,100	55,200	59,900	60,000
Labour	20,000	18,000	22,100	24,150	24,000
Consumables	2,000	2,200	1,800	1,600	1,400
Rent of building	1,000	1,000	1,100	1,100	1,200
Rates and taxes	400	400	400	400	400
Repair and maintenance expenses	800	820	780	790	800
Operating cost of machines	30,000	27,000	33,500	36,020	36,000
Selling and marketing expenses	5,750	5,800	5,800	5,750	5,800

34. What is the approximate cost per unit in rupees, if the company produces and sells 1400 units in the year 2007?
(1) 104
(2) 107
(3) 110
(4) 115
(5) 116

Solution:
Observing the values through the years, we can say that Material, Labour and Operating costs directly vary with the change in volume of production.
The other costs are almost constant.

If the production is x units, the variable cost for material, labour and operation is $50x$, $20x$ and $30x$ respectively.
$\therefore$ Total variable cost = $100x$

Total fixed cost (using information for 2006)
= 1400 + 1200 + 400 + 800 + 5800
= 9600

∴ Total cost of producing x units = $100x + 9600$
Now, $x = 1400$
Cost per unit = $(1400 \times 100 + 9600)/1400$
= 106.85
Hence, option 2.

35. What is the minimum number of units that the company needs to produce and sell to avoid any loss?
(1) 313
(2) 350
(3) 384
(4) 747
(5) 928

Solution:
From the explanation given in the first question, to avoid any loss, $100x + 9600 \leq 125x$
∴ $x \geq 384$
Hence, option 3.

36. If the company reduces the price by 5%, it can produce and sell as many units as it desires. How many units should the company produce to maximize its profit?
(1) 1400
(2) 1600
(3) 1800
(4) 1900
(5) 2000

Solution:
The new reduced price
= 0.95 × 125
= 118.75

Profit
= 118.75x – 100x – 9600
= 18.75x – 9600

Profit will be maximum when 18.75x is maximum. As the maximum production capacity is 2000 units, profit is maximum when 2000 units are produced.
Hence, option 5.

37. Given that the company cannot sell more than 1700 units, and it will have to reduce the price by Rs. 5 for all units, if it wants to sell more than 1400 units, what is the maximum profit, in rupees, that the company can earn?
(1) 25,400
(2) 24,400
(3) 31,400
(4) 32,900
(5) 32,000

Solution:
Profit for 1400 units
= 1400 × 125 – (1400 × 100 + 9600)
= 25400

Profit for (1400 + m) units
= (1400 + m) × 120 – ((1400 + m) × 100 + 9600)
= 18400 + 20m

Maximum value of m = 300
Maximum profit for 1400 + 300 units = 24400
∴ Maximum profit that the company can earn is 25400.
Hence, option 1.

Directions for Questions 38 to 41: Answer the following questions based on the information given below.
The table below shows the comparative costs, in US Dollars, of major surgeries in USA and a select few Asian countries.

Procedure	Comparative Costs in USA and some Asian Countries (in US Dollars)				
	USA	India	Thailand	Singapore	Malaysia
Heart Bypass	130000	10000	11000	18500	9000
Heart Valve Replacement	160000	9000	10000	12500	9000
Angioplasty	57000	11000	13000	13000	11000
Hip Replacement	43000	9000	12000	12000	10000
Hysterectomy	20000	3000	4500	6000	3000
Knee Replacement	40000	8500	10000	13000	8000
Spinal Fusion	62000	5500	7000	9000	6000

The equivalent of one US Dollar in the local currencies is given below.

	1 US Dollar Equivalent	
India	40.928	Rupees
Malaysia	3.51	Ringits
Thailand	32.89	Bahts
Singapore	1.53	$ Dollars

A consulting firm found that the quality of the health services were not the same in all the countries above. A poor quality of a surgery may have significant repercussions in future, resulting in more cost in correcting mistakes. The cost of poor quality of surgery is given in the table below.

Procedure	Comparative Costs in USA and some Asian Countries (in US Dollars '000)				
	USA	India	Thailand	Singapore	Malaysia
Heart Bypass	0	3	3	2	4
Heart Valve Replacement	0	5	4	5	5
Angioplasty	0	5	5	4	6
Hip Replacement	0	7	5	5	8
Hysterectomy	0	5	6	5	4
Knee Replacement	0	9	6	4	4
Spinal Fusion	0	5	6	5	6

38. A US citizen is hurt in an accident and requires an angioplasty, hip replacement and a knee replacement. Cost of foreign travel and stay is not a consideration since the government will take care of it. Which country will result in the cheapest package, taking cost of poor quality into account?
(1) India
(2) Thailand
(3) Malaysia
(4) Singapore
(5) USA

Solution:
As shown in the table, Malaysia will have the cheapest package.
Hence, option 3.

	India	Thailand	Singapore	Malaysia	USA
Angioplasty	16000	18000	17000	17000	57000
Hip Replacement	16000	17000	17000	18000	43000
Knee Replacement	17500	16000	17000	12000	40000
Total	49500	51000	51000	47000	140000

39. Taking the cost of poor quality into account, which country/countries will be the most expensive for knee replacement?
(1) India
(2) Thailand
(3) Malaysia
(4) Singapore
(5) India and Singapore

Solution:
Referring to the table formulated in the first question, India will be the most expensive for knee replacement.
Hence, option 1.

40. Approximately, what difference in amount in Bahts will it make to a Thai citizen if she were to get a hysterectomy done in India instead of in her native country, taking into account the cost of poor quality? It costs 7500 Bahts for one-way travel between Thailand and India.
(1) 23500

(2) 40500
(3) 57500
(4) 67500
(5) 75000

Solution:
Cost of Hysterectomy in Thailand
= 4500 + 6000
= 10500 USD

Cost of Hysterectomy in India
= 3000 + 5000
= 8000 USD

Travelling cost
= 15000 Bahts
= 15000/32.89 USD
= 456 USD

Required difference
= 10500 – 8456
= 2044 USD
= 2044 × 32.89
= 67227 Bahts
Hence, option 4.

41. The rupee value increases to Rs. 35 for a US Dollar, and all other things, including quality, remain the same. What is the approximate difference in cost, in US Dollars, between Singapore and India for a Spinal Fusion, taking this change into account?
(1) 700
(2) 2500
(3) 4500
(4) 8000
(5) No difference

Solution:
Cost of spinal fusion in India = Rs. 5500 × 40.928
Cost with the increased value of Rupee = 5500 × 40.928/35 = 6431 USD
Cost of Spinal Fusion in Singapore = 9000 USD
Required difference = 9000 – 6431 = 2569 USD
Hence, option 2.

Directions for Questions 42 to 46: Answer the following questions based on the information given below.

A low-cost airline company connects ten Indian cities, A to J. The table below gives the distance between a pair of airports and the corresponding price charged by the company. Travel is permitted only from a departure airport to an arrival airport. The customers do not travel by a route where they have to stop at more than two intermediate airports.

Sector No.	Airport of Departure	Airport of Arrival	Distance between the Airports (km.)	Price (Rs.)
1	A	B	560	670
2	A	C	790	1350
3	A	D	850	1250
4	A	E	1245	1600
5	A	F	1345	1700
6	A	G	1350	2450
7	A	H	1950	1850
8	B	C	1650	2000
9	B	H	1750	1900
10	B	I	2100	2450
11	B	J	2300	2275
12	C	D	460	450
13	C	F	410	430
14	C	G	910	1100
15	D	E	540	590
16	D	F	625	700
17	D	G	640	750
18	D	H	950	1250
19	D	J	1650	2450

20	E	F	1250	1700
21	E	G	970	1150
22	E	H	850	875
23	F	G	900	1050
24	F	I	875	950
25	F	J	970	1150
26	G	I	510	550
27	G	J	830	890
28	H	I	790	970
29	H	J	400	425
30	I	J	460	540

42. What is the lowest price, in rupees, a passenger has to pay for travelling by the shortest route from A to J?

(1) 2275
(2) 2850
(3) 2890
(4) 2930
(5) 3340

Solution:
Possible routes from A to J are as shown in the table below.

Route	Distance	Price
ABJ	2860	2945
ADJ	2500	3700
AFJ	2315	2850
AGJ	2180	3340
AHJ	2350	2275
ABHJ	2710	2995
ABIJ	3120	3660
ACDJ	2900	4250
ACFJ	2170	2930
ACGJ	2530	3340
ADFJ	2445	3100
ADGJ	2320	2890

ADHJ	2200	2925
AEFJ	3465	4450
AEGJ	3045	3640
AEHJ	2495	2900
AFGJ	3075	3640
AFIJ	2680	3190
AGIJ	2320	3540
AHIJ	3200	3360

The shortest distance is by the route A-C-F-J.
The price is 1350 + 430 + 1150 = Rs. 2930
Hence, option 4.

43. The company plans to introduce a direct flight between A and J. The market research results indicate that all its existing passengers travelling between A and J will use this direct flight if it is priced 5% below the minimum price that they pay at present. What should the company charge approximately, in rupees, for this direct flight?
(1) 1991
(2) 2161
(3) 2707
(4) 2745
(5) 2783

Solution:
The current market price paid by the customers is Rs. 2275 (A-H-J).
Therefore, the company should charge (2275 × 0.95) = Rs. 2161.25
Hence, option 2.

44. If the airports C, D and H are closed down owing to security reasons, what would be the minimum price, in rupees, to be paid by a passenger travelling from A to J?
(1) 2275
(2) 2615
(3) 2850
(4) 2945
(5) 3190

Solution:
If C, D and H are closed, the cheapest route will be A-F-J and it will cost Rs. 2850.

Hence, option 3.

45. If the prices include a margin of 10% over the total cost that the company incurs, what is the minimum cost per kilometer that the company incurs in flying from A to J?
(1) 0.77
(2) 0.88
(3) 0.99
(4) 1.06
(5) 1.08

Solution:
The minimum cost per km that the company incurs would correspond to the minimum price per km route.
By observation from the table, minimum price per kilometre is for the route AHJ and is equal to 2275/2350 = 0.97
Minimum cost per kilometre = 0.97/1.1 = 0.88
Hence, option 2.

46. If the prices include a margin of 15% over the total cost that the company incurs, which among the following is the distance to be covered in flying from A to J that minimizes the total cost per kilometer for the company?
(1) 2170
(2) 2180
(3) 2315
(4) 2350
(5) 2390

Solution:
Even if the margin for the prices changes the minimum cost per km would correspond to the same route namely A-H-J.
∴ From the table, the distance for the travel = 2350 km
Hence, option 4.

Directions for Questions 47 to 50: Answer the following questions based on the information given below.

A health-drink company's R&D department is trying to make various diet formulations, which can be used for certain specific purposes. It is considering a choice of 5 alternative ingredients (O, P, Q, R, and S), which can be used in different proportions in the

formulations. The table below gives the composition of these ingredients. The cost per unit of each of these ingredients is O: 150, P: 50, Q: 200, R: 500, S: 100.

	Composition			
Ingredient	**Carbohydrate %**	**Protein %**	**Fat %**	**Minerals %**
O	50	30	10	10
P	80	20	0	0
Q	10	30	50	10
R	5	50	40	5
S	45	50	0	5

47. For a recuperating patient, the doctor recommended a diet containing 10% minerals and at least 30% protein. In how many different ways can we prepare this diet by mixing at least two ingredients?
(1) One
(2) Two
(3) Three
(4) Four
(5) None

Solution:
The diet should contain 10% minerals. P contains no minerals.
∴ P cannot be a part of any mixture.

R and S both contain 5% minerals.
∴ Mix of R and S in any proportion cannot give 10% minerals.

Consider O and R in the proportion x:y
∴ $10x + 5y = 10(x + y)$
∴ $5y = 10y$, which is not possible.

Similarly, Q and S, O and S, and Q and R are not possible.
Similarly a mix of three ingredients is not possible.

∴ The only possible mix is that of O and Q in equal proportion.
Hence, option 1.

48. Which among the following is the formulation having the lowest cost per unit for a diet having 10% fat and at least 30% protein? The diet has to be formed by mixing two ingredients.
(1) P and Q
(2) P and S
(3) P and R
(4) Q and S
(5) R and S

Solution:
Consider the options.
Option 1:
P and Q have to be mixed in the proportion 4:1 to achieve 10% fat content. But this does not give 30% protein.
Option 2:
P and S do not contain fat.
Option 3:
P and R should be mixed in the proportion 3:1 to achieve 10% fat content. But 30% protein content is not achieved.
Option 4:
Q and S should be mixed in the proportion 1:4 to achieve 10% fat content and 46% protein content. The cost of this mix per unit would be 6/5.
Option 5:
R and S should be mixed in the proportion 1:3 to achieve 10% fat content and 50% protein content. The cost per unit of this mix would be 2.
Therefore, lowest cost is for Q and S.
Hence, option 4.

49. In what proportion should P, Q and S be mixed to make a diet having at least 60% carbohydrate at the lowest per unit cost?
(1) 2 : 1 : 3
(2) 4 : 1 : 2
(3) 2 : 1 : 4
(4) 3 : 1: 2
(5) 4 : 1 : 1

Solution:
P, Q and S contain 80%, 10% and 45% carbohydrates respectively.
To achieve 60% carbohydrates, proportion of P should be maximum. Hence, options 1 and 3 are eliminated.

Option 2:
Carbohydrate content
= (320 + 10 + 90)/700 = 420/700
= 60%
Cost per unit = (200 + 200 + 200)/700 = 6/7 = 0.857

Option 4:
Carbohydrate content
= (240 + 10 + 90)/600 < 60%

Option 5:
Carbohydrate content
= (320 + 10 + 45)/600
= 62.5%
Cost per unit = (200 + 200 + 100)/600 = 5/6 = 0. 833
P, Q and S in the proportion 4 : 1 : 1 has the lowest cost per unit.
Hence, option 5.

50. The company is planning to launch a balanced diet required for growth needs of adolescent children. This diet must contain at least 30% each of carbohydrate and protein, no more than 25% fat and at least 5% minerals. Which one of the following combinations of equally mixed ingredients is feasible?
(1) O and P
(2) R and S
(3) P and S
(4) Q and R
(5) O and S

Solution:
A mixture of O and S in equal proportion satisfies the given constraints as can be seen from the table.
Hence, option 5.

	Carbohydrate	**Protein**	**Fat**	**Minerals**
O & P	65	25	5	5
R & S	25	50	20	5
P & S	62.5	35	0	2.5
Q & R	7.5	40	45	7.5
O & S	47.5	40	5	7.5

Section III
This section contains 25 questions

Directions for Questions 51 to 53: In each question, there are four sentences. Each sentence has pairs of words/phrases that are italicized and highlighted. From the italicized and highlighted word(s)/phrase(s), select the most appropriate word(s)/phrase(s) to form correct sentences. Then, from the options given, choose the best one.

51. The cricket council that **was[A]/were[B]** elected last March **is[A]/are[B]** at sixes and sevens over new rules.
The critics **censored[A]/censured[B]** the new movie because of its social inaccessibility.
Amit's explanation for missing the meeting was **credulous[A]/credible[B]**.
She coughed **discreetly[A]/discretely[B]** to announce her presence.

1) BBAAA
2) AAABA
3) BBBBA
4) AABBA
5) BBBAA

Solution:
The first sentence is the easiest to decide. Since the 'cricket council' is singular, singular verbs (was and is) are required. Hence the answer choice should begin with A. This eliminates option 1, 3, and 5.
Comparing option 2 and 4, the difference is in the third choice – credulous vs. credible. Credulous means ready to believe easily and credible means: offering reasonable grounds for being believed. Hence Amit's explanation is credible – B. Sequence AAB is option 4.
Other confusable options: censor(v): to examine in order to delete anything that is objectionable. Censure(v): criticize. Discrete: distinct; discreet: modest, unnoticeable.
Hence, the correct answer is option 4.

52. The **further[A]/farther[B**] he pushed himself, the more disillusioned he grew.
For the crowds it was more of a **historical[A]/historic[B]** event; for their leader, it was just another day.
The old man has a healthy **distrust[A]/mistrust[B]** for all new technology.
This film is based on a **real[A]/true [B]** story.

One suspects that the **compliment[A]/complement[B]** was backhanded.

1) BABAB
2) ABBBA
3) BAABA
4) BBAAB
5) ABABA

Solution:

Further is temporal and farther is spatial. The choice of A in the first sentence eliminates option 1, 3 and 5.

Comparing 2 and 5 (ABBBA vs. ABABA), one can see that the third sentence is decisive. Distrust: misgiving, lack or absence of trust. Mistrust: a lack of confidence or uncertainty; to regard as untrustworthy. The tinge of 'suspicion' that colours mistrust eliminates mistrust. Hence distrust is the correct use in the context.

Hence, the correct answer is option 5.

53. **Regrettably[A]/Regretfully[B]** I have to decline your invitation.
I am drawn to the poetic, **sensual[A]/sensuous[B]** quality of her paintings.
He was **besides[A]/beside[B]** himself with rage when I told him what I had done.
After brushing against a **stationary[A]/stationery[B]** truck my car turned turtle.
As the water began to rise **over[A]/above[B]** the danger mark, the signs of an imminent flood were clear.

1) BAABA
2) BBBAB
3) AAABA
4) BBAAB
5) BABAB

Solution:

In this set, the last two sentences are the easiest to decide: stationary truck and to rise above are correct uses. The answer choice has to end with AB. Options 1 and 3 are eliminated.

Beside oneself with rage is the correct idiom. Hence third sentence is B.

Sensuous implies gratification of the senses for the sake of aesthetic pleasure- the sensuous delights of great music. Sensual tends to imply the gratification of the senses or the indulgence of the physical appetites as ends in themselves - a life devoted to sensual pleasures. Poetry is sensuous rather than sensual. Hence the second sentence is B.

When we decline something we do it regretfully, when someone else has declined we find it regrettable. Hence the first sentence is B.
Hence, the correct answer is option 2.

Directions for Questions 54 to 56: The passage given below is followed by a set of three questions. Choose the **most** appropriate answer to each question.

To discover the relation between rules, paradigms, and normal science, consider first how the historian isolates the particular loci of commitment that have been described as accepted rules. Close historical investigation of a given specialty at a given time discloses a set of recurrent and quasi-standard illustrations of various theories in their conceptual, observational, and instrumental applications. These are the community's paradigms, revealed in its textbooks, lectures, and laboratory exercises. By studying them and by practicing with them, the members of the corresponding community learn their trade. The historian, of course, will discover in addition a penumbral area occupied by achievements whose status is still in doubt, but the core of solved problems and techniques will usually be clear. Despite occasional ambiguities, the paradigms of a mature scientific community can be determined with relative ease.

That demands a second step and one of a somewhat different kind. When undertaking it, the historian must compare the community's paradigms with each other and with its current research reports. In doing so, his object is to discover what isolable elements, explicit or implicit, the members of that community may have abstracted from their more global paradigms and deploy it as rules in their research. Anyone who has attempted to describe or analyze the evolution of a particular scientific tradition will necessarily have sought accepted principles and rules of this sort. Almost certainly, he will have met with at least partial success. But, if his experience has been at all like my own, he will have found the search for rules both more difficult and less satisfying than the search for paradigms. Some of the generalizations he employs to describe the community's shared beliefs will present more problems. Others, however, will seem a shade too strong. Phrased in just that way, or in any other way he can imagine, they would almost certainly have been rejected by some members of the group he studies. Nevertheless, if the coherence of the research tradition is to be understood in terms of rules, some specification of common ground in the corresponding area is needed. As a result, the search for a body of rules competent to constitute a given normal research tradition becomes a source of continual and deep frustration.

Recognizing that frustration, however, makes it possible to diagnose its source. Scientists can agree that a Newton, Lavoisier, Maxwell, or Einstein has produced an apparently permanent solution to a group of outstanding problems and still disagree, sometimes

without being aware of it, about the particular abstract characteristics that make those solutions permanent. They can, that is, agree in their identification of a paradigm without agreeing on, or even attempting to produce, a full interpretation or rationalization of it. Lack of a standard interpretation or of an agreed reduction to rules will not prevent a paradigm from guiding research. Normal science can be determined in part by the direct inspection of paradigms, a process that is often aided by but does not depend upon the formulation of rules and assumption. Indeed, the existence of a paradigm need not even imply that any full set of rules exists.

54. What is the author attempting to illustrate through this passage?
(1) Relationships between rules, paradigms, and normal science.
(2) How a historian would isolate a particular 'loci of commitment'.
(3) How a set of shared beliefs evolve in to a paradigm.
(4) Ways of understanding a scientific tradition.
(5) The frustrations of attempting to define a paradigm of a tradition

Solution:
Option 1 is factually correct and answers the question how rather than what.
Options 2, 3 and 5 are partial in answering the question what the author is trying to illustrate.
Option 4 is supported by the following: "To discover the relation between rules, paradigms, and normal science, consider first how the historian isolates the particular loci of commitment that have been described as accepted rules." (at the beginning of the passage) and "Normal science can be determined in part by the direct inspection of paradigms, … formulation of rules and assumption." (Towards the end of the passage). This, then is the purpose of the passage.
Hence, the correct answer is option 4.

55. The term 'loci of commitment' as used in the passage would most likely correspond with which of the following?
(1) Loyalty between a group of scientists in a research laboratory.
(2) Loyalty between groups of scientists across research laboratories.
(3) Loyalty to a certain paradigm of scientific inquiry.
(4) Loyalty to global patterns of scientific inquiry.
(5) Loyalty to evolving trends of scientific inquiry.

Solution:
The meaning given in option 3 to 'loci of commitment' is explicitly stated in the passage. The passage says: the historian tries to isolate the 'particular loci of commitment' at a given time and then explains what he is trying to find out and

concludes by saying 'these are the community's paradigms'. Thus, loci of commitment are the same as the paradigms.
None of the other options are worth evaluating because they are further in the passage and not related to the question.
Hence, the correct answer is option 3.

56. The author of this passage is likely to agree with which of the following?
(1) Paradigms almost entirely define a scientific tradition.
(2) A group of scientists investigating a phenomenon would benefit by defining a set of rules.
(3) Acceptance by the giants of a tradition is a sine qua non for a paradigm to emerge.
(4) Choice of isolation mechanism determines the types of paradigm that may emerge from a tradition.
(5) Paradigms are a general representation of rules and beliefs of a scientific tradition.

Solution:
Option 5 is a mere definition of the term 'paradigm' as used in the passage.
Paradigm in the context means a set of broad guidelines accepted by a group of researchers. They are not as rigid as rules. They are not very concrete and differ from community to community.
Option 1 is easily eliminated because of "entirely define' which is too drastic.
Option 2 is eliminated because of 'would benefit' – nothing in the passage even implicitly supports this.
Option 3 is contrary to the passage in the part referring to Newton, Lavoisier, Maxwell, and Einstein.
Option 4 – 'the choice of isolation mechanism' is not discussed in the passage, nor is it even indirectly referred to.
Hence, the correct answer is option 5.

Directions for Questions 57 to 59: Each of the following questions has a paragraph from which the last sentence has been deleted. From the given options, choose the sentence that completes the paragraph in the most appropriate way.

57. Characters are also part of deep structure. Characters tie events in a story together and provide a thread of continuity and meaning. Stories can be about individuals, groups, projects or whole organizations, so from an organizational studies perspective, the focal actor(s) determine the level and unit of analysis used in a study. Stories of mergers and acquisitions, for example, are common place. In these

stories whole organizations are personified as actors. But these macro-level stories usually are not told from the perspective of the macro-level participants, because whole organizations cannot narrate their experiences in the first person.

(1) More generally, data concerning the identities and relationships of the characters in the story are required, if one is to understand role structure and social networks in which that process is embedded.
(2) Personification of a whole organization abstracts away from the particular actors and from traditional notions of level of analysis.
(3) The personification of a whole organization is important because stories differ depending on who is enacting various events.
(4) Every story is told from a particular point of view, with a particular narrative voice, which is not regarded as part of the deep structure.
(5) The personification of a whole organization is a textual device we use to make macro-level theories more comprehensible.

Solution:

The paragraph briefly is about why stories are structured around focal characters. And why in stories of organizations, organizations have to be personified and focal characters as organizations cannot narrate their experiences. Option 5 concludes this chain of thoughts by saying that this kind of personification is a textual device resorted to bring coherence.

Option 1 is incorrect as it continues the first part of the paragraph and is unrelated the second part.

Option 2 is incorrect as it talks about abstracting away from the particular whereas the paragraph is talking about particularizing.

Options 3 and 4 talk about different points of view, which is irrelevant to the paragraph.

Hence, the correct answer is option 5.

58. Nevertheless, photographs still retain some of the magical allure that the earliest daguerreotypes inspired. As objects, our photographs have changed; they have become physically flimsier as they have become more technologically sophisticated. Daguerre produced pictures on copper plates; today many of our photographs never become tangible thins, but instead remain filed away on computers and cameras, part of the digital ether that envelops the modern world. At the same time, our patience for the creation of images has also eroded. Children today are used to being tracked from birth by digital cameras and video recorders and they expect to see the results of their poses and performances instantly. The space between life as it is being lived and life as it is being displayed shrinks to a mere second.

(1) Yet, despite these technical developments, photographs still remain powerful because they are reminders of the people and things we care about.
(2) Images, after all, are surrogates carried into battle by a soldier or by a traveller on holiday.
(3) Photographs, be they digital or traditional, exist to remind us of the absent, the beloved, and the dead.
(4) In the new era of the digital image, the images also have a greater potential for fostering falsehood and trickery, perpetuating fictions that seem so real we cannot tell the difference.
(5) Anyway, human nature being what it is, little time has passed after photography's inventions became means of living life through images.

Solution:
'Nevertheless 'at the beginning of the paragraph, and "yet' at the beginning of option 1 make the paragraph logically complete.
Option 1 is the reason why the paragraph is written - to communicate that 'photographs are still powerful'.
The traveler in option 2, the beloved and the dead in option 3, falsehood and trickery in option 4, and the invention and means of living in option 5 do not help conclude the paragraph.
Hence, the correct answer is option 1.

59. Mma Ramotswe had a detective agency in Africa, at the foot of Kgale Hill. These were its assets; a tiny white van, two desks, two chairs, a telephone, and an old typewriter. Then there was a teapot, in which Mma Ramotswe - the only private lady detective in Botswana - brewed red bush tea. And three mugs - one for herself, one for her secretary and one for the client. What else does a detective agency really need? Detective agencies rely on human intuition and intelligence, both of which Mma Ramotswe had in abundance.

(1) But there was also the view, which again would appear on no inventory.
(2) No inventory would ever include those, of course.
(3) She had an intelligent secretary too.
(4) She was a good detective and a good woman.
(5) What she lacked in possessions was more than made up by a natural shrewdness.

Solution:
The paragraph mentions the tangible parts of the inventory that Mma Ramotswe had at the agency, and 'human intuition and intelligence'. Option 2 concludes the paragraph by stating that 'no inventory would ever be able to include those.
Options 3, 4 and 5 are eliminated in comparison to options 1 and 2 which continue the idea of the inventory.
Option 1, though continuing the idea of inventory is far inferior to option 2. The 'those' in option 2 scores over option 1.
Hence, the correct answer is option 2.

Directions for Questions 60 to 62: The passage given below is followed by a set of three questions. Choose the **most appropriate** answer to each question

The difficulties historians face in establishing cause-and-effect relations in the history of human societies are broadly similar to the difficulties facing astronomers, climatologists, ecologists, evolutionary biologists, geologists, and palaeontologists. To varying degrees each of these fields is plagued by the impossibility of performing replicated, controlled experimental interventions, the complexity arising from enormous numbers of variables, the resulting uniqueness of each system, the consequent impossibility of formulating universal laws, and the difficulties of predicting emergent properties and future behaviour. Prediction in history, as in other historical sciences, is most feasible on large spatial scales and over long times, when the unique features of millions of small-scale brief events become averaged out. Just as I could predict the sex ratio of the next 1,000 newborns but not the sexes of my own two children, the historian can recognize factors that made inevitable the broad outcome of the collision between American and Eurasian societies after 13,000 years of separate developments, but not the outcome of the 1960 U.S. presidential election. The details of which candidate said what during a single televised debate in October 1960 could have given the electoral victory to Nixon instead of to Kennedy, but no details of who said what could have blocked the European conquest of Native Americans.

How can students of human history profit from the experience of scientists in other historical sciences? A methodology that has proved useful involves the comparative method and so-called natural experiments. While neither astronomers studying galaxy formation nor human historians can manipulate their systems in controlled laboratory experiments, they both can take advantage of natural experiments, by comparing systems differing in the presence or absence (or in the strong or weak effect) of some putative causative factor. For example, epidemiologists, forbidden to feed large amounts of salt to people experimentally, have still been able to identify effects of high salt intake by comparing groups of humans who already differ greatly in their salt intake; and cultural

anthropologists, unable to provide human groups experimentally with varying resource abundances for many centuries, still study long-term effects of resource abundance on human societies by comparing recent Polynesian populations living on islands differing naturally in resource abundance.

The student of human history can draw on many more natural experiments than just comparisons among the five inhabited continents. Comparisons can also utilize large islands that have developed complex societies in a considerable degree of isolation (such as Japan, Madagascar, Native American Hispaniola, New Guinea, Hawaii, and many others), as well as societies on hundreds of smaller islands and regional societies within each of the continents. Natural experiments in any field, whether in ecology or human history, are inherently open to potential methodological criticisms. Those include confounding effects of natural variation in additional variables besides the one of interest, as well as problems in inferring chains of causation from observed correlations between variables. Such methodological problems have been discussed in great detail for some of the historical sciences. In particular, epidemiology, the science of drawing inferences about human diseases by comparing groups of people (often by retrospective historical studies), has for a long time successfully employed formalized procedures for dealing with problems similar to those facing historians of human societies.

In short, I acknowledge that it is much more difficult to understand human history than to understand problems in fields of science where history is unimportant and where fewer individual variables operate. Nevertheless, successful methodologies for analyzing historical problems have been worked out in several fields. As a result, the histories of dinosaurs, nebulae, and glaciers are generally acknowledged to belong to fields of science rather than to the humanities.

60. Why do islands with considerable degree of isolation provide valuable insights into human history?

(1) Isolated islands may evolve differently and this difference is of interest to us.
(2) Isolated islands increase the number of observations available to historians.
(3) Isolated islands, differing in their endowments and size may evolve differently and this difference can be attributed to their endowments and size.
(4) Isolated islands, differing in their endowments and size, provide a good comparison to large islands such as Eurasia, Africa, Americas and Australia.
(5) Isolated islands, in so far as they are inhabited, arouse curiosity about how human beings evolved there.

Solution:
The answer is supported by the paragraph beginning "The student of human history can draw on many more natural experiments than just comparisons among the five inhabited continents. Comparisons can also utilize large islands that have developed complex societies in a considerable degree of isolation ….. as well as societies on hundreds of smaller islands and regional societies within each of the continents."
Options 1 and 3 say the same thing. Option 1 is eliminated because the 'difference' mentioned in option 1 is explained in 3. Hence option 3 scores over option 1.
Option 4 is eliminated because 'the good comparison to large islands' is inconsequential to the student of history. The student is more interested in knowing how endowments and size affect societies – as a natural experiment.
Option 5 is eliminated because the paragraph says nothing about arousing 'curiosity about how humans evolved' as stated in the option.
Hence, the correct answer is option 3.

61. According to the author, why is prediction difficult in history?
(1) Historical explanations are usually broad so that no prediction is possible.
(2) Historical out comes depend upon a large number of factors and hence prediction is difficult for each case.
(3) Historical sciences, by their very nature, are not interested in a multitude of minor factors, which might be important in a specific historical outcome.
(4) Historians are interested in evolution of human history and hence are only interested in log term predictions.
(5) Historical sciences suffer from the inability to conduct controlled experiments and therefore have explanations based on a few long-term factors.

Solution:
This is directly stated in the passage. "Prediction in history, as in other historical sciences, is most feasible on large spatial scale and over long times, when the unique future of millions of small scale brief events become averaged out." The answer option is merely the same thing expressed in different (even easier) words.
Option 1 is eliminated because of "the complexity arising from enormous numbers of variables, the resulting uniqueness of each system, the consequent impossibility of formulating universal laws, and the difficulties of predicting emergent properties and future behaviour" - in other words the explanations are broad because prediction is not possible and not the other way round.
In option 3 'not interested' is first data inadequate (passage does not say not interested) and by implication incorrect, because history is interested "in a multitude of minor factors," – in order that the average may be worked out over long periods of time.

Option 4 is factually correct but does not answer the question – why prediction is difficult.
Option 5 is also factually correct but does not explain why prediction is difficult –it merely explains the constraints that history faces and how then it operates.
Hence, the correct answer is option 2.

62. According to the author, which of the following statements would be true?
(1) Students of history are missing significant opportunities by not conducting any natural experiments.
(2) Complex societies inhabiting large islands provide great opportunities for natural experiments.
(3) Students of history are missing significant opportunities by not studying an adequate variety of natural experiments.
(4) A unique problem faced by historians is their inability to establish cause and effect relationships.
(5) Cultural anthropologists have overcome the problem of confounding variables through natural experiments.

Solution:
The answer is directly supported by "The student of human history can draw on many more natural experiments than …. the five inhabited continents. Comparisons can also utilize large islands ….. as well as societies on hundreds of smaller islands and regional societies within each of the continents". The implication is expressed in option 3.
Option 1 is false in "not conducting…" – this is not true in the context of the passage, nor is the author implying it.
Option 2 is false – the passage nowhere says that large islands provide 'great' opportunities for natural experiments" – they are one of the opportunities among many.
The problem faced by historians is not 'unique' as stated in option 4. The passage explicitly states that it is faced by several other studies mentioned in the first sentence itself.
There is no data in the passage (even by implication) about cultural anthropologists. Hence option 5 too is eliminated.
Hence, the correct answer is option 3.

Directions for Questions 63 to 65: In each question, there are five sentences or parts of sentences that form a paragraph. Identify the sentence(s) or part(s) of sentence(s) that is/are correct in terms of grammar and usage. Then, choose the **most appropriate** option.

63.

A. When I returned to home, I began to read
B. everything I could get my hand on about Israel.
C. That same year Israel's Jewish Agency sent
D. a Shaliach a sort of recruiter to Minneapolis.
E. I became one of his most active devotees.

(1) C & E
(2) C only
(3) E only
(4) B, C & E
(5) C, D & E

Solution:

Statement A is incorrect because of the phrase, 'returned to home'. The correct usage is 'returned home'.
Statement B is incorrect because the idiom is 'get one's hands on' and not 'hand on'.
Statement C is correct.
Statement D is incorrect because there should be a hyphen or a comma after a Shaliach. (a Shaliach – a sort of recruiter to Minneapolis.) "a sort of" though rather informal, is correct usage.
Statement E is correct.
Hence, the correct answer is option 1.

64.

A. So once an economy is actually in recession,
B. The authorities can, in principle, move the economy
C. Out of slump - assuming hypothetically
D. That they know how to - by a temporary stimuli.
E. In the longer term, however, such policies have no affect on the overall behaviour of the economy.

(1) A, B & E
(2) B, C & E
(3) C & D
(4) E only
(5) B only

Solution:

Statement A is incorrect – The use of the word, 'so' is redundant and inappropriate. (So and once, in the context are adverbs – one of them is enough).
Statement B is correct.

Statement C is incorrect because the use of 'assuming hypothetically' makes it redundant. One can either assume or hypothesize, but 'assuming hypothetically' is meaningless.
Statement D is incorrect in the plural use of 'stimuli' instead of 'stimulus' with the article 'a'.
Statement E should have been 'effect' instead of 'affect'.
Hence, the correct answer is option 5.

65.

A. It is sometimes told that democratic
B. government originated in the city-states
C. of ancient Greece. Democratic ideals have been handed to us from that time.
D. In truth, however, this is an unhelpful assertion.
E. The Greeks gave us the word, hence did not provide us with a model.

(1) A, B & D
(2) B, C & D
(3) B & D
(4) B only
(5) D only

Solution:
Statement A is incorrect because the verb 'told' is incorrectly used. The verb 'said' should be used instead.
There is no error in statement B.
Statement C contains the incorrect idiom 'handed to us' instead of 'handed down to us'.
Statement D is correct.
Statement E is incorrect because the word, 'hence' is used as a conjunction, whereas it is an adverb. The use of a proper conjunction (e.g. and / but) will improve the sentence.
Hence the correct answer is option 3.

Directions for Questions 66 to 68: The passage given below is followed by a set of three questions. Choose the **most** appropriate answer to each question.

Human Biology does nothing to structure human society. Age may enfeeble us all, but cultures vary considerably in the prestige and power they accord to the elderly. Giving birth is a necessary condition for being a mother, but it is not sufficient. We expect mothers to behave in maternal ways and to display appropriately maternal sentiments. We prescribe a clutch of norms or rules that govern the role of a mother. That the social role is

independent of the biological base can be demonstrated by going back three sentences. Giving birth is certainly not sufficient to be a mother but, as adoption and fostering show, it is not even necessary!

The fine detail of what is expected of a mother or a father or a dutiful son differs from culture to culture, but everywhere behaviour is coordinated by the reciprocal nature of roles. Husbands and wives, parents and children, employers and employees, waiters and customers, teachers and pupils, warlords and followers; each makes sense only in its relation to the other. The term 'role' is an appropriate one, because the metaphor of an actor in a play neatly expresses the rule-governed nature or scripted nature of much of social life and the sense that society is a joint production. Social life occurs only because people play their parts (and that is as true for war and conflicts as for peace and love) and those parts make sense only in the context of the overall show. The drama metaphor also reminds us of the artistic licence available to the players. We can play a part straight or, as the following from J.P. Sartre conveys, we can ham it up.

Let us consider this waiter in the cafe. His movement is quick and forward, a little too precise, a little too rapid. He comes towards the patrons with a step a little too quick. He bends forward a little too eagerly; his voice, his eyes express an interest a little too solicitous for the order of the customer. Finally there he returns, trying to imitate in his walk the inflexible stiffness of some kind of automaton while carrying his tray with the recklessness of a tightrope-walker....All his behaviour seems to us a game....But what is he playing? We need not watch long before we can explain it: he is playing at being a waiter in a cafe.

The American sociologist Erving Goffman built an influential body of social analysis on elaborations of the metaphor of social life as drama. Perhaps his most telling point was that it is only through acting out a part that we express character. It is not enough to be evil or virtuous; we have to be seen to be evil or virtuous.

There is distinction between the roles we play and some underlying self. Here we might note that some roles are more absorbing than others. We would not be surprised by the waitress who plays the part in such a way as to signal to us that she is much more than her occupation. We would be surprised and offended by the father who played his part 'tongue in cheek'. Some roles are broader and more far-reaching than others. Describing someone as a clergyman or faith healer would say far more about that person than describing someone as a bus driver.

66. What is the thematic highlight of this passage?

(1) In the absence of strong biological linkages, reciprocal roles provide the mechanism for coordinating human behaviour.
(2) In the absence of reciprocal roles, biological linkages provide the mechanism for coordinating human behaviour.
(3) Human behaviour is independent of biological linkages and reciprocal roles.
(4) Human behaviour depends on biological linkages and reciprocal roles.
(5) Reciprocal roles determine normative human behavior in society.

Solution:

The theme of the passage is that biological linkages (for example mother – child; father – child) do not structure human society. We expect a biological mother to display certain characteristics in her 'role' as a mother as an ideal. The passage is then an explanation of how human society is structured on the basis of such definitions of roles considered as ideals. Only option 5 captures this briefly.
Option 1 talks about 'absence of strong biological linkages' which is not dealt with in the passage.
Option 2 is contrary to the theme of the passage.
Option 3 which states "… behavior is independent of … reciprocal roles" is contrary to the passage.
Option 4 may be evaluated as the answer, but passage does not state that human behavior is dependent on biological linkages, and the example of the step mother disproves this option.
Only option 5 captures the theme of the passage.
Hence, the correct answer is option 5.

67. Which of the following would have been true if biological linkages structured human society?

(1) The role of mother would have been defined through her reciprocal relationship with her children.
(2) We would not have been offended by the father playing his role 'tongue in cheek'.
(3) Women would have adopted and fostered children rather than giving birth to them.
(4) Even if warlords were physically weaker than their followers, they would still dominate them.
(5) Waiters would have stronger motivation to serve their customers.

Solution:
"There is distinction between the roles we play and some underlying self. Here we might note that some roles are more absorbing than others. We would not be surprised by the waitress who plays the part in such a way as to signal to us that she is much more than her occupation. We would be surprised and offended by the father who played his part 'tongue in cheek'" (insincerely). The father's self is denied by his identification with his biological relationship. If this does not happen, if a father behaves in a tongue in cheek manner, we are offended. If biological relations structured human society, it is enough to be a biological father to be accepted by society. His behavior (and with it, the reciprocal relationship) then becomes unimportant.
All the other options support the fact that 'reciprocal relationship' structure human society.
Hence, the correct answer is option 2.

68. It has been claimed in the passage that "some roles are more absorbing than others". According to the passage, which of the following seem(s) appropriate reason(s) for such a claim?

A. Some roles carry great expectations from the society preventing manifestation of the true self.
B. Society ascribes so much importance to some roles that the conception of self may get aligned with the roles being performed.
C. Some roles require development of skill and expertise leaving little time for manifestation of self.

(1) A only
(2) B only
(3) C only
(4) A & B
(5) B & C

Solution:
The answer comes from the last paragraph where three examples are given, the father, the waitress, and the priest.
The example of the priest makes statement A correct. (There is so much expectation from the society that the priest's true self is not revealed at all).
The father's example makes statement B correct. (The father's self gets aligned with his biological relationship and the self is denied).
Statement C is incorrect in that the passage does not discuss the development of skill as a reason for the denial of the self.
Hence, the correct answer is option 4.

Directions for Questions 69 to 72: In each question, there are five sentences/paragraphs. The sentence/ paragraph labelled A is in its correct place. The four that follow are labelled B, C, D and E, and need to be arranged in the logical order to form a coherent paragraph/passage. From the given options, choose the **most appropriate** option.

69.

A. In America, highly educated women, who are in stronger position in the labour market than less qualified ones, have higher rates of marriage than other groups.
B. Some work supports the Becker thesis, and some appears to contradict it.
C. And, as with crime, it is equally inconclusive.
D. But regardless of the conclusion of any particular piece of work, it is hard to establish convincing connections between family changes and economic factors using conventional approaches.
E. Indeed, just as with crime, an enormous academic literature exists on the validity of the pure economic approach to the evolution of family structures.

(1) BCDE
(2) DBEC
(3) BDCE
(4) ECBD
(5) EBCD

Solution:

When the four statements are studied well, it is very easy to establish that EC and BD are mandatory pairs.

Only statements E and C contain the idea of 'crime'. Hence one cannot place any other statement along with statement E, but statement C.

In the same way, statements B and D both have reference to written 'piece of work', making BD in that order mandatory. Once this is noticed, placing EC and BD in that order with the help of A (fixed) is easy.

Hence, the correct answer is option 4.

70.

A. Personal experience of mothering and motherhood are largely framed in relation to two discernible or "official" discourses: the "medical discourse and natural childbirth discourse". Both of these tend to focus on the "optimistic stories" of birth and mothering and underpin stereotypes of the "godmother".
B. At the same time, the need for medical expert guidance is also a feature for contemporary reproduction and motherhood. But constructions of good mothering

have not always been so conceived - and in different contexts may exist in parallel to other equally dominant discourses.

C. Similarly, historical work has shown how what are now taken-for-granted aspects of reproduction and mothering practices result from contemporary “pseudoscientific directives” and “managed constructs”. These changes have led to a reframing of modern discourses that pattern pregnancy and motherhood leading to an acceptance of the need for greater expert management.

D. The contrasting, overlapping and ambiguous strands within these frameworks focus to varying degrees on a woman’s biological tie to her child and predisposition to instinctively know and be able to care for her child.

E. In addition, a third, “unofficial popular discourse” comprising “old wives” tales and based on maternal experiences of childbirth has also been noted. These discourses have also been acknowledged in work exploring the experiences of those who apparently do not “conform” to conventional stereotypes of the “good mother”

(1) EDBC
(2) BCED
(3) DBCE
(4) EDCB
(5) BCDE

Solution:

The "two discernible" or "official discourses" makes it compulsory to place statement E after statement A, because statement E talks about "a third unofficial discourse". (In other words if not placed next to statement A, statement E cannot be placed anywhere else). AE is the first mandatory pair.

'These frameworks' in statement D is explained in statement E so that statement D unless placed next to statement E, will not make sense. (In other words ED too is mandatory.) The idea of motherhood from statement D (biological tie) is continued in statement B. Thus the links in EDB are most obvious.

Statements C and B too are clearly linked because statement B ends with reference to 'dominant discourse' and statement C begins with 'historical work' making EDBC most logical sequence.

Hence, the correct answer is option 1.

71.

A. Indonesia has experienced dramatic shifts in its formal governance arrangements since the fall of President Soeharto and the close of his centralized, authoritarian "New Order" regime in 1997.

B. The political system has taken its place in the nearly 10 years since *Reformasi* began. It has featured the active contest for political office among a proliferation of parties

at central, provincial and district levels; direct elections for the presidency (since 2004); and radical changes in centre-local government relations towards administrative, fiscal, and political decentralization.

C. The mass media, once tidily under Soeharto's thumb, has experienced significant liberalization as has the legal basis for non-governmental organizations, including many dedicated to such controversial issues as corruption control and human rights.

D. Such developments are seen optimistically by a number of donors and some external analysts, who interpret them as signs of Indonesia's political normalization.

E. A different group of analysts paint a picture in which the institutional forms have changed, but power relations have not. Vedi Hadiz argues that Indonesia's "democratic transition" has been anything but linear.

(1) BDEC
(2) CBDE
(3) CEBD
(4) DEBC
(5) BCDE

Solution:

As per the options comparing statements B, C and D as the sentences to follow statement A, statement C gets eliminated. Statements B and D are far better sentences to follow statement A than statement C.

The next decisive point is the 'such developments' in statement D. As statements A, B, and C are talking about several developments, statement D is best placed at the end of all, and will mar the structure of the paragraph if placed anywhere in between.

The choice then becomes very clear. Also, the link between statement D and statement E with their "some analysts' (statement D) and 'different analysts" (statement E) is also obvious.

Hence, the correct answer is option 5.

72.

A. I had six thousand acres of land, and had thus got much spare land besides the coffee plantation. Part of the farm was native forest, and about one thousand acres were squatters' land, what [the Kikuyu] called their *shambas.*

B. The squatters' land was more intensely alive than the rest of the farm, and was changing with the seasons the year round. The maize grew up higher than your head as you walked on the narrow hard-trampled footpaths in between the tall green rustling regiments.

C. The squatters are Natives, who with their families hold a few acres on a white man's farm, and in return have to work for him a certain number of days in the year. My squatters, I think, saw the relationship in a different light, for many of them were born on the farm, and their fathers before them, and they very likely regarded me as a sort of superior squatter on their estates.
D. The Kikuyu also grew the sweet potatoes that have a vine like leaf and spread over the ground like a dense entangled mat, and many varieties of big yellow and green speckled pumpkins.
E. The beans ripened in the fields, were gathered and thrashed by the women, and the maize stalk and coffee pods were collected and burned, so that in certain seasons thin blue columns of smoke rose here and there all over the farm.

(1) CBDE
(2) BCDE
(3) CBED
(4) DBCE
(5) EDBC

Solution:
Either by looking at the options or by reading the sentences in the given order, one can easily see that statement A has to be followed either by statement B or by statement C because they talk about the 'squatters' introduced in statement A. (This eliminates options 4 and 5).
A more careful reading of statement B and statement C establishes that since statement C explains the identity of the squatters and statement B talks about their farming, statement B has to follow statement C rather than precede it.
At his stage one has to evaluate/compare only options 1 and 3. Considering statement E and statement D to follow statement B, the link between statement B and statement E because of the "maize" conclusively makes option 3 the answer.
Hence, the correct answer is option 3.

Directions for Questions 73 to 75: The passage given below is followed by a set of three questions. Choose the **most** appropriate answer to each question.

Every civilized society lives and thrives on a silent but profound agreement as to what is to be accepted as the valid mould of experience. Civilization is a complex system of dams, dykes, and canals warding off, directing, and articulating the influx of the surrounding fluid element; a fertile fenland, elaborately drained and protected from the high tides of chaotic, unexercised, and inarticulate experience. In such a culture, stable and sure of itself within the frontiers of 'naturalized' experience, the arts wield their creative power not so much in width as in depth. They do not create new experience, but deepen and purify the old. Their

works do not differ from one another like a new horizon from a new horizon, but like a madonna from a madonna.

The periods of art which are most vigorous in creative passion seem to occur when the established pattern of experience loosens its rigidity without as yet losing its force. Such a period was the Renaissance, and Shakespeare its poetic consummation. Then it was as though the discipline of the old order gave depth to the excitement of the breaking away, the depth of job and tragedy, of incomparable conquests and irredeemable losses. Adventurers of experience set out as though in lifeboats to rescue and bring back to the shore treasures of knowing and feeling which the old order had left floating on the high seas. The works of the early Renaissance and the poetry of Shakespeare vibrate with the compassion for live experience in danger of dying from exposure and neglect. In this compassion was the creative genius of the age. Yet, it was a genius of courage, not of desperate audacity. For, however elusively, it still knew of harbours and anchors, of homes to which to return, and of barns in which to store the harvest. The exploring spirit of art was in the depths of its consciousness still aware of a scheme of things into which to fit its exploits and creations.

But the more this scheme of things loses its stability, the more boundless and uncharted appears the ocean of potential exploration. In the blank confusion of infinite potentialities flotsam of significance gets attached to jetsam of experience; for everything is sea, everything is at sea -
.... The sea is all about us;
The sea is the land's edge also, the granite
Into which it reaches, the beaches where it tosses
Its hints of earlier and other creation ...
- and Rilke tells a story in which, as in T.S. Eliot's poem, it is again the sea and the distance of 'other creation' that becomes the image of the poet's reality. A rowing boat sets out on a difficult passage. The oarsmen labour in exact rhythm. There is no sign yet of the destination. Suddenly a man, seemingly idle, breaks out into song. And if the labour of the oarsmen meaninglessly defeats the real resistance of the real waves, it is the idle single who magically conquers the despair of apparent aimlessness. While the people next to him try to come to grips with the element that is next to them, his voice seems to bind the boat to the farthest distance so that the farthest distance draws it towards itself. 'I don't know why and how,' is Rilke's conclusion, 'but suddenly I understood the situation of the poet, his place and function in this age. It does not matter if one denies him every place - except this one. There one must tolerate him.'

73. In the passage, the expression “like a madonna from a madonna” alludes to
(1) The difference arising as a consequence of artistic license.

(2) The difference between two artistic interpretations.
(3) The difference between 'life' and 'interpretation of life'.
(4) The difference between 'width' and 'depth' of creative power.
(5) The difference between the legendary character and the modern day singer.

Solution:
The lines, "… the art wield their creative power not so much in width as in depth. They do not create new experience, but deepen and purify the old. Their works do not differ from one another like a new horizon from a new horizon…" tell us that the works of art do not differ in their 'width' and 'depth' (as mentioned in option 4) 'life' and its 'interpretation' (as mentioned in option 3), but are merely different interpretations of the 'old' experience as one painting of Madonna (Virgin Mary, the mother of Jesus) differs from another version. This eliminates options 3 and 4.
The consequence of artistic license is not discussed in the passage so this eliminates option 1.
Option 5 is ridiculous because the Madonna here does not refer to the modern day singer.
Hence, the correct answer is option 2.

74. The sea and 'other creation' leads Rilke to
(1) Define the place of the poet in his culture.
(2) Reflect on the role of the oarsman and the singer.
(3) Muse on artistic labour and its aimlessness.
(4) Understand the elements that one has to deal with.
(5) Delve into natural experience and real waves.

Solution:
Rilke's conclusion is repeated almost verbatim in option 1. "I don't know why and how,' is Rilke's conclusion, 'but suddenly I understood the situation of the poet, his place and function in this age." These are the concluding words of Rilke from the passage after the example of the 'sea' and 'the other creation' mentioned in the question.
Option 2 is mundane and quotes the example itself and not its purpose.
Option 3 is abstract, and an 'aimlessness' cannot be attributed either to the oarsmen or the singer.
Option 4 'understanding the elements' is not the purpose of either the oarsmen or the singer.
Option 5 is vague; the passage does not explain either natural experience or real waves.
Hence, the correct answer is option 1.

75. According to the passage, the term "adventurers of experience" refers to

(1) Poets and artists who are driven by courage.
(2) Poets and artists who create their own genre.
(3) Poets and artists of the Renaissance.
(4) Poets and artists who revitalize and enrich the past for us.
(5) Poets and artists who delve in flotsam and jetsam in sea.

Solution:

"Adventurers of experience set out as though in lifeboats to *rescue and bring back to the shore treasures of knowing and feeling which the old order had left floating on the high seas.* The work of the early Renaissance and the poetry of Shakespeare vibrate with the compassion for live experience in danger of dying from exposure and neglect. In this compassion was the creative genius of the age." Renaissance artists are cited as examples of 'adventurers of experience'. These italicized words make option 4 right.

As a result, option 3 is eliminated as being merely an example.

Driven by courage (option1), create their own genre (option 2) are partial and not the intended meaning of the writer. This eliminates options 1 and 2.

Option 5 is also related to the example in a literal way, whereas the writer is being symbolic in calling the artists adventurers. This eliminates option 5.

Hence, the correct answer is option 4.