XLRI – Test

Answers and Explanations

1	d	**31**	c	**61**	c	**91**	b	**121**	d	**151**	c	**181**	a
2	d	**32**	b	**62**	c	**92**	c	**122**	c	**152**	b	**182**	a
3	c	**33**	c	**63**	b	**93**	a	**123**	d	**153**	b	**183**	c
4	c	**34**	a	**64**	c	**94**	c	**124**	a	**154**	d	**184**	b
5	c	**35**	d	**65**	a	**95**	d	**125**	a	**155**	a	**185**	d
6	a	**36**	d	**66**	c	**96**	d	**126**	c	**156**	d	**186**	d
7	b	**37**	a	**67**	d	**97**	b	**127**	c	**157**	c	**187**	d
8	d	**38**	c	**68**	c	**98**	c	**128**	c	**158**	a	**188**	b
9	c	**39**	a	**69**	d	**99**	c	**129**	b	**159**	c	**189**	b
10	b	**40**	c	**70**	c	**100**	b	**130**	d	**160**	b	**190**	a
11	d	**41**	c	**71**	b	**101**	b	**131**	c	**161**	a	**191**	a
12	c	**42**	c	**72**	d	**102**	d	**132**	b	**162**	d	**192**	b
13	a	**43**	b	**73**	d	**103**	a	**133**	a	**163**	b	**193**	c
14	a	**44**	c	**74**	b	**104**	a	**134**	b	**164**	d	**194**	b
15	c	**45**	a	**75**	d	**105**	c	**135**	d	**165**	d	**195**	b
16	b	**46**	a	**76**	b	**106**	c	**136**	a	**166**	a	**196**	c
17	d	**47**	d	**77**	d	**107**	a	**137**	c	**167**	b	**197**	c
18	b	**48**	b	**78**	a	**108**	a	**138**	c	**168**	b	**198**	c
19	a	**49**	c	**79**	c	**109**	a	**139**	a	**169**	b	**199**	c
~~**20**~~	~~d~~	~~**50**~~	~~b~~	~~**80**~~	~~b~~	~~**110**~~	~~a~~	~~**140**~~	~~a~~	~~**170**~~	~~b~~	~~**200**~~	~~a~~
21	a	**51**	d	**81**	c	**111**	b	**141**	a	**171**	b		
22	a	**52**	c	**82**	d	**112**	c	**142**	a	**172**	c		
23	b	**53**	c	**83**	b	**113**	b	**143**	a	**173**	b		
24	c	**54**	c	**84**	a	**114**	d	**144**	b	**174**	a		
25	d	**55**	a	**85**	b	**115**	c	**145**	c	**175**	a		
26	a	**56**	a	**86**	b	**116**	a	**146**	c	**176**	b		
27	d	**57**	c	**87**	d	**117**	b	**147**	b	**177**	b		
28	c	**58**	d	**88**	b	**118**	a	**148**	d	**178**	c		
29	a	**59**	c	**89**	b	**119**	b	**149**	b	**179**	b		
30	b	**60**	b	**90**	c	**120**	d	**150**	b	**180**	b		

1. d (b) fits in A, (c) fits in D and (d) fits in A, B and C.

2. d (a) fits in D, (b) fits in B, (c) fits in A, (d) fits in B, C and D.

3. c (a) fits in D, (b) fits in A, (c) fits in B and C.

4. c (b) fits in C, (c) in A and B and (d) in D.

5. c (a) fits in A, (b) fits in B and C, (c) fits in A and D.

6. a The most precious jewel a king had was put on his crown. Similarly the most precious or valuable possession a person has is his education. Thus the correct option is crowning.

7. b The correct answer here is 'bedrock' as it means basic principles.

8. d The correct option is 'innate' as it means existing in a person from birth.

9. c The appropriate option here is imbibe as it means 'to take in or assimilate'.

10. b 'Fraught' here means 'filled with'.

11. d The most appropriate option here is 'alignment'.

12. c The correct option is 'perseverance' as it means 'persistence'.

13. a Exhibit is the correct option as it means to display.

14. a The most appropriate option here is 'restrict' as it here means to limit.

15. c 'Hallmark' means a mark or sign of excellence.

16. b Blacksmith uses the hammer as his main tool just as a pilot uses a joystick to steer an aircraft.

17. d Singular and plural relationship.

18. b A group of stars is a cluster just as a group of trees is a clump.

19. a A duplicate is an exact copy of the original or genuine but not the original. In the same manner a reflection is the exact copy of the object but it's not real.

20. d Herpetology is the study of reptiles just a dermatology is the study of skin.

21. a A Snare is a trap to catch birds just as a seine is a net to catch fishes.

22. a A microscope is used to view small objects just as a telescope is used to view distant objects.

23. b When a tide goes back or recedes it is known as ebb. Similarly when a storm settles it is known as subside.

24. c Elegant is the adjective used to describe a horse. Similarly mischievous is the adjective used to describe a monkey.

25. d The compartment for luggage in a car is known as boot just as in a ship it is known as hold.

26. a Watershed means a big change.

27. d Reform here means to change or amend for the better.

28. c The most appropriate option here is (c), meaning something is happening for the first time.

29. a Regimen means a systematic course.

30. b Offender here refers to the wrong-doer or the accused.

31.c Valiant means brave.

32. b Vulgar mean cheap and boorish.

33. c Endorse means to approve while refute means to disprove.

34. a Adore mean to like someone while detest is to loathe or hate.

35. d The most appropriate option is (d), as subtle means to be diplomatic.

36. b To 'irritate' is to annoy while charm is to impress.

37. a Perennial means everlasting while temporal means not forever or temporary.

38. c Lavish means extravagant while miserly is just the opposite.

39. a Hostile means unfriendly.

40. c To betray is to break trust while loyalty is to keep faith always.

41. c Defame is to be famous for the wrong reasons.

42. c Mercantile means commercial.

43. b Unearth is to find out hidden things or information.

44. c Clearly evidence means proof.

45. a Frozen here means stalled.

46. a Remit means to send.

47. d Whopping means uncommonly large.

48. b It means movement of finances from one place to another.

49. c It means to give the money back; refund.

50. b Given in the passage paragraph 5, line 2.

51. d Refer to the first two lines of the passage.

52. c Refer to line 3 of the passage.

53. c Refer to line 4 and 5 of the passage.

54. c Refer to line 5 of the passage.

55. a The language of the passage suggests that the article has been taken from a newspaper.

56. a Refer line 1, paragraph 1.

57. c Refer paragraph 1, first 3 lines.

58. d Refer paragraph 1, 4-5 line.

59. c Refer paragraph 1, line 5.

60. b Refer paragraph 1, line 9.

61. c The most appropriate and grammatically correct option is (c).

62. c *has enthralled* is the most appropriate option as it means to hold spellbound, enchant. Use the Present Perfect Tense for *be*.

63. b *from the ... to the* has the right parallel construction.

64. c Conjure means to evolve images in the mind.

65. a You wait - *to walk,* promenade means a public walk.

66. c The most appropriate option here is 'has seen' since the rest of the sentence is in present tense.

67. d 'delight' is the best option that fits in the sentence.

68. c 'destination' is the most appropriate option.

69. d War machines are meant to harm and destroy so the correct option is 'harm'.

70. c *gives* is the right verbal tense form to go with *is soluble*.

71. b *gape* means to stare *open-mouthed*. The other words mean *gap*.

72. d *finite* means limited. The other words mean *unending*.

73. d *tirade* means an angry outburst. The other words may be used to describe a talkative person in a negative sense.

74. b *maroon* means to be isolated in an island. The other words are uncomplimentary.

75. d *ingenious* means *clever*. The other words mean *cliche-ridden*.

76. b *defer* means to put something on hold. a, c and d have almost the same meaning.

77.d *flippant* means to be casual. a, b and c mean almost the opposite.

78. a *podium* is not derived from *ped*, unlike b, c and d.

79. c a, b and d measure speed, revolutions per minute and miles driven respectively. Centipede is just a wormlike creature.

80. b *inactivity* is not necessarily detrimental, unlike a, c and d.

For questions 81 to 90:

$\Delta^2 f(x) = \Delta f(x+1) - 2\,\Delta f(x) = f(x+2) - 2f(x+1) - 2\,f(x+1) + 4f(x)$

$= f(x + 2) - 4f(x + 1) + 4f(x)$

$= \{2(x + 2) - 1\} - 4\,[2(x + 1) - 1] + 4[2x - 1]$

= 2x + 3 – 8x – 4 + 8x – 4 = 2x – 5

Similarly, $\Delta^3 f(x) = -2x + 7$

and $\nabla^2 f(x) = \nabla f(x) - 2\nabla f(x-1)$

$= f(x) - 2f(x-1) - 2f(x-1) + 4f(x-2)$
$= (2x - 1) - 4(2(x-1) - 1) + 4(2(x-2) - 1)$
$= 2x - 1 - 8x + 12 + 8x - 20 = 2x - 9$

$\nabla^3 f(x) = -2x + 13$

81. c $\Delta^2 f(17) - \nabla^2 f(13) = (2 \times 17 - 5) - (2 \times 13 - 9) = 29 - 17 = 12$

82. d $\Delta^3 f(23) = -2 \times 23 + 7 = -46 + 7 = -39$

83. b $\nabla^3 f(51) = -2 \times 51 + 13 = -89$

84. a $\Delta^3 f(x^2) = -2x^2 + 7$

85. b $\nabla^3 f(2x) = -4x + 13$

86. b By the options,
(a) $2x - 1 \neq 2x - 3$; (b) $2x + 1 = 2x + 1$ and (c) $2x + 3 \neq 2x + 5$

87. d $\Delta^2(x) = 125 \Rightarrow 2x - 5 = 125$

$\Rightarrow 2x = 130 \Rightarrow x = 65$

88. b $\nabla^2 f(x) < 0 \Rightarrow 2x - 9 < 0 \Rightarrow 2x < 9$. So x = 4

89. b $\Delta^2 f(x) < 0 \Rightarrow 2x - 5 < 0 \Rightarrow 2x < 5$. So x = 2

90. c $\Delta^2 f(x) > 0 \Rightarrow 2x - 5 > 0 \Rightarrow 2x > 5$ …(i)

and $\nabla^2 f(x) < 0 \Rightarrow 2x - 9 < 0 \Rightarrow 2x < 9$ …(ii)

From (i) and (ii), we get $5 < 2x < 9$
So x = 3 and 4.

For questions 91 to 100: If $x_0 > y_0$, then $f(x_n, y_n) = x_0 + (n-1)y_0$ and if $x_0 < y_0$, then $f(x_n, y_n) = y_0 + (n-1)x_0$

91. b $x_0 > y_0$, then $f(x_3, y_3) = x_0 + 2y_0 = 5$

92. c $x_0 < y_0$, then $f(x_4, y_4) = y_0 + 3x_0 = -4$

93. a $x_0 < y_0$, then $f(x_5, y_5) = y_0 + 4x_0 = 53$

94. c $x_0 > y_0$, then $f(x_4, y_4) = x_0 + 3y_0 = 4$ and $f(x_3, y_3) = x_0 + 2y_0 = 5$
So $f(x_4, y_4) - f(x_3, y_3) = 4 - 5 = -1$

95. d $x_0 > y_0$, then $f(x_5, y_5) = x_0 + 4y_0 = -7$, $f(x_3, y_3) = x_0 + 2y_0 = -1$
and $f(x_1, y_1) = x_0 = 5$
So $f(x_5, y_5) - 4f(x_3, y_3) + 5\ f(x_1, y_1) = -7 + 4 + 25 = 22$

96. d If $x_0 > y_0$, then $f(x_7, y_7) = x_0 + 6y_0$ and if $x_0 < y_0$, then $f(x_7, y_7) = y_0 + 6x_0$. So either (a) or (b) is the answer.

97. b By the options, (a) $x_0 > y_0$, $f(x_6, y_6) = x_0 + 5y_0 = 6 - 5 = 1 > 0$
(b) $x_0 > y_0$, $f(x_6, y_6) = x_0 + 5y_0 = -1 < 0$
(c) $x_0 < y_0$, $f(x_6, y_6) = y_0 + 5x_0 = 2 > 0$

98. c By the options, (a) $x_0 < y_0$, $f(x_9, y_9) = y_0 + 8x_0 = -1 < 0$
(b) $x_0 > y_0$, $f(x_9, y_9) = x_0 + 8y_0 = -2 < 0$
(c) $x_0 > y_0$, $f(x_9, y_9) = x_0 + 8y_0 = 1 > 0$

99. c $x_0 > y_0$, $f(x_7, y_7) = x_0 + 6y_0$
Here $y_0 = -1, -2, -3$ and x0 = 1, 2, ..., 17.
If $y_0 = -1$, then $x_0 = 1$ to 5, five values.
If $y_0 = -2$, then $x_0 = 1$ to 11, 11 values.
Hence, the number of pairs is 5 + 11 = 16.

100. b $x_0 < y_0$, $f(x_n, y_n) = y_0 + (n - 1)x_0$
Here $x_0 = -2, -1$ and $y_0 = 1$
So $y_0 + (n - 1)x_0 = 1 + (n - 1)(-1)$
$= 2 - n > 0$, if n = 0, 1
or $y_0 + (n - 1)x_0 = 1 + (n - 1)(-2)$
$= 3 - 2n > 0$, if n = 0, 1

For questions 101 to 110: The grid is composed of n coloumns and n rows.

101. b Obviously, the common vertex cannot lie along the outer borders of the grid. Thus, the common vertex will be one of the vertices of the (n – 1) × (n – 1) grid. With any one vertex selected, the two squares can be selected in 2 ways. Thus, total number of ways of selecting $= 2 \times (n - 1)^2$

102. d The common edge again cannot lie along the outer border of the grid. If the edge is vertical, there will be n rows of (n – 1) edges. If the edge is horizontal, there will be (n – 1) rows of n edges. Thus, the common edge can be any one of 2n(n – 1) edges within the grid. With one common edge, there is only one way of selecting the two squares.

103. a In any such grid, the number of squares of particular dimension can be found by using the following observations.

Dimensions	Number of squares of this dimension
$n \times n$	1
$(n-1) \times (n-1)$	2^2
$(n-2) \times (n-2)$	3^2
⋮	⋮
$m \times m$	$(n-m+1)^2$

If m =3, the solution will be $(n-2)^2$.

104. a Each diagonal will have n squares of which 2 squares can be chosen in ${}^nC_2$ ways. Thus, considering both diagonals the numbers of ways two squares selected can lie along either diagonal is $2 \times {}^nC_2 = n \times (n-1)$.

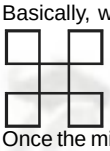
105. c Each diagonal will have n squares. However, when n is odd, one square will be common to both diagonals. Thus, the two squares have to be selected out of (2n – 1) squares, i.e. in ${}^{2n-1}C_2$ ways.

106. c One square can be selected in n^2 ways (i.e. any one out of the n × n squares). After having selected the square, there are only $n^2 - (2n-1)$, i.e. $(n-1)^2$ squares out of which the second square can be selected. Again each pair of selection will be counted twice in the above process.

Thus, the answer is $\frac{n^2 \times (n-1)^2}{2}$.

107. a As explained in solution to question 103, the number of distinct squares of dimensions m × m is $(n-m+1)^2$.

108. a Basically, we have to select a figure like



Once the middle square is selected, there is only one way of selecting the other 4 squares. The middle square cannot lie along the outer

most row or column. Thus, the middle square has to be a square out of the inner $(n-2) \times (n-2)$ grid, i.e. $(n-2)^2$ squares.

109. a The dimensions of the rectangle can be chosen in the following manner:

Width	Length
1	1 to n
2	2 to n
3	3 to n
⋮	⋮
n	n

Thus, the total number of ways are $1 + 2 + 3 + \ldots + n = \frac{n(n+1)}{2}$.

110. a The first square can be chosen in three ways: (1) a corner square, (2) a square on an edge but not in the corner, and (3) a square which is neither in a corner nor on the edge.
For (1), the first square can be chosen in 4 ways. The second square can be chosen in $(n^2 - 4)$ ways.
Total number of ways = $4(n^2 - 4)$
For (2), the first square can be chosen in $4(n - 2)$ ways. The second square can be chosen in $(n^2 - 6)$ ways. Total number of ways = $4(n - 2)(n^2 - 6)$
For (3), the first square can be chosen in $(n - 2)^2$ ways. The second square can be chosen in $(n^2 - 9)$ ways. Total number of ways = $(n - 2)^2 (n^2 - 9)$
Thus, the total number of ways of selecting a pair of non-adjacent squares is $4(n^2 - 4) + 4(n - 2)(n^2 - 6) + (n - 2)^2 (n^2 - 9)$. But here we have counted each valid pair twice. Thus, the correct answer on simplification is $\frac{(n^4 - 9n^2 + 12n - 4)}{2}$.

111. b The polynomial is expressed as (6, –5, 1) and the function can be evaluated as

3	6	–5	1
		$+3\times6$	$+3\times13$
3	6	13	40
		$+3\times6$	$+3\times31$
	6	31	133

Since the 2nd quotient is asked we stop at this level and the 2nd quotient is 6, 31, 133.

112. c For the 3rd quotient we will work on the result of the 2nd quotient (i.e. perform the function once more).

2	1	2	4	8
		+2×1	+2×4	+2×12
	1	4	12	32

113. b

–1	0	0	–1	1
		–1×0	–1×0	–1×–1
–1	0	0	–1	2
		–1×0	–1×0	–1×–1
–1	0	0	–1	3
		–1×0	–1×0	–1×–1
	0	0	–1	4

114. d

4	1	2	0	2	1
		+4×1	+4×24	+4×96	+4×386
	1	6	96	386	1544

115. c

2	12	6	3
		+2×12	+2×30
1	12	30	63
		+1×12	+1×42
1	12	42	105
		+1×12	+1×54
	12	54	159

and also

1	12	6	3
		+1×12	+1×30
1	12	18	21
		+1×12	+1×42
2	12	30	51
		+2×12	+2×54
	12	54	159

116. a Working backwards

–1	a	b	c	d
	3	5	2	7

a = 3
5 = b + (–1) × 3 ⇒ b = 8
2 = c + (–1) × 5 ⇒ c = 7
7 = d + (–1) × 2 ⇒ d = 9

For questions 117 to 120:

A	5	6	10	9
		$+A\times5$	$+A\times B$	$+A\times C$
	5	B	C	93

Working backwards
$A \times C = 93 - 9 = 84$
Also $A \times C = A(10 + A \times B) = A(10 + A \times (6 + 5A)) = A(10 + 6A + 5A^2)$
Substituting the options we see that when
$A = 2$, $A(10 + 6A + 5A^2) = 84$
$\therefore B = 16 = y$
$C = 42 = z$

For questions 121 to 130: The transformation basically divides the sequence into k parts with the first part having the first x_1 elements, the second part having the next x_2 elements and so on. . .

121. d The transformation breaks the sequence into three parts, first part of first 2 elements, second part of 3 elements and third part of balance 5 elements.
(1, 2)(3, 4, 5)(6, 7, 8, 9, 10) Thus, $S_2 \equiv 3, 4, 5$

122. c $T(S, 3, 2, 3, 5) \equiv (1, 2)(3, 4, 5)(6, 7, 8, 9, 10)$
$T(S_3, 2, 1, 4) \equiv (6)(7, 8, 9, 10)$
Thus, S_1 of this $\equiv 6$

123. d $T(S, 2, 4, 6) \equiv (1, 2, 3, 4)(5, 6, 7, 8, 9, 10)$
$S_2 \equiv 5, 6, 7, 8, 9, 10$
$F(S_2) \equiv 10, 9, 8, 7, 6, 5$

124. a If $S \equiv a, b, c, d$
S_2 of $T(S, 2, 2, 2) \equiv c, d$
$F(S_2) \equiv d, c \equiv 4, 5$. Thus, $s_4 = d = 4$

125. a $S \equiv S_1 S_2 S_3 \equiv 3, 5, 7, 2, 5, 1, 7, 9$

126. c Since it is broken in three parts, k = 3.

127. c x_3 denotes the number of elements in third part, i.e. 3.

128. c S is a AP with a = 1, d = 2 and $t_n = 99$. Thus, n = 50. This series of S is divided into 25 parts with 2 elements in each. Thus, the 20th part will have the 39th and 40th elements $t_{39} = 1 + 38 \times 2 = 77$
$t_{40} = 79 \quad \therefore F(S_{20}) \equiv 79, 77$

129. b $t_n = 61 = 1 + (n-1)2 \Rightarrow n = 31$. Thus, the 30 elements before 61 will form the first 15 parts and (61, 63) will be the 16th part.

130. d Again S is an AP with a = 1, d = 3 and $t_n = 34$.
$\therefore$ n = 12 . Now the function defines $x_1 + x_2 + x_3 + \cdots + x_k = n = 12$.

131. c $f(x_5, x_4, x_3, x_2, 1) = 1^5 (x-3) + 1^4(x-2) + 1^3(x-1) + 1^2(x) = 4x - 6$

132. b $f(x_6, x_4, x_2, x_1, 2) = 2^6 (x-5) + 2^4(x-4) + 2^2(x-2) + 2^1(x)$
$= 64(x-5) + 16(x-4) + 4(x-2) + 2x$
$= 86x - 392$

133. a $f(x_7, x_5, x_3, x_2, x_1, 2)$
$= 2^7 (x-6) + 2^5(x-5) + 2^3(x-4) + 2^2(x-2) + 2^1(x)$
$= 128(x-6) + 32(x-5) + 8(x-4) + 4(x-2) + 2x = 174x - 968$

134. b Here value of the coefficient is 0. So the expression is 0.

135. d $f(x_6, x_5, x_4, x_{-2}, 2) = 2^6(x-8) + 2^5(x-2) + 2^4(x-1) + 2^{-2}x$
$= 64(x-8) + 32(x-2) + 16(x-1) + 2^{-2}x$
$= 64(-4-8) + 32(-4-2) + 16(-4-1) + 2^{-2}(-4)$ [Put x = – 4]
$= 64(-12) + 32(-6) + 16(-5) + (-1)$
$= -1041$

136. a $f(x_4, x_3, x_2, x_{-1}, 3) = 81(3-5) + 27(3-2) + 9(3-1) + 3^{-1} \times 3$
$= -116$

137. c $f(x_5, x_3, x_2, x_{-1}, 2) = 32(x-6) + 8(x-3) + 4(x-2) + 2^{-1}x$
$= \frac{89x - 448}{2}$

138. c By the options, option (c) is $f(x_3, x_2, x_1, 3) = 27(x-2) + 9(x-1) + 3x$
$= 39x - 63$

139. a By the options, option (a) is $f(x_3, x_{-1}, x_{-2}, 1)$
$= (x-5) + (x-4) + x$
$= 3x - 9 = 6$

140. a Check the option, (a) is the correct choice.