

SECTION A: ANSWER KEY

Q. No.	a	b	c	d	Q. No.	a	b	c	d
1.			✓		15.				✓
2.		✓			16.		✓		
3.		✓			17.				✓
4.		✓			18.				✓
5.				✓	19.		✓		
6.		✓			20.		✓		
7.		✓			21.			✓	
8.	✓				22.	✓			
9.		✓			23.	✓			
10.			✓		24.				✓
11.			✓		25.				✓
12.				✓	26.	✓			
13.		✓			27.			✓	
14.			✓		28.			✓	

	X	Y	Not attempted	
SECTION A				3X - Y =

SECTION B: ANSWER KEY**CELL BIOLOGY (17 points)**

29. (2 points)

Graph	Correct	Incorrect
A.	✓	
B.		✓
C.	✓	
D.		✓

30. (2 points)

Answer: ___125___

31. (3 points)

(A) Answer: ___37___ kg

(B) Answer: ___740___ times per day

32. (2 points)

a.	b.	c.	d.
			✓

33. (2 points)

No.	Explanation	True	False
1	In the plasmid from blue colony, the insert was in frame and hence did not disrupt the coding of alpha fragment of beta-galactosidase.	✓	
2	The plasmid from white colony had a very large insert (more than 50 kbp).		✓
3	In the plasmid-containing blue colony, the insert was cloned at site other than Multiple Cloning Site.		✓
4	The multiple cloning site in the plasmid from white colony was degraded by exonuclease contamination.	✓	

34. (6 points)

(A)

a.	b.	c.	d.
		✓	

(B)

Step	Protein mg	Activity U	Specific activity U/mg	% Yield of activity	Purification factor
0	1200	800	0.67	-	-
1	600	600	1	75	1.49 or 1.5
2	200	180	0.9	30	0.9
3	30	150	5	83 or 83.3	5.5 - 5.6
4	20	148	7.4	98.6 - 98.7	1.48

(Only a completely correct row is given marks.)

(C)

a.	b.	c.	d.
	✓		

(D)

a.	b.	c.	d.
		✓	

(E)

a.	b.	c.	d.
	✓		

PLANT SCIENCES (9.5 points)

35. (2.5 points)

Characteristic	Sun leaves	Relationship	Shade leaves
Leaf surface area (cm ²)	Su	<	Sh
Thickness of leaf (µm)	Su	>	Sh
Chlorophyll (a+b) concentration [Chl/leaf (w/w)]	Su	<	Sh
Net Photosynthesis (mg CO ₂ .dm ⁻² .h ⁻¹)	Su	>	Sh
Light compensation point (W.m ⁻²)	Su	>	Sh
Dark respiration (mg.dm ⁻² .h ⁻¹)	Su	>	Sh
Light saturation of net photosynthesis (µmol.m ⁻² .s ⁻¹)	Su	<	Sh

36. (2 points)

a.	b.	c.	d.	e.
		✓		

37. (2 points)

a.	b.	c.	d.
			✓

38. (3 points)

(A)

- I. Plant X is a _____ day plant with critical day period _____ hr or less.
- II. Plant X is a _____ day plant with critical day period _____ hr or more.
- III. Plant X is a ___long___ day plant with critical night period ___12___ hr or less.
- IV. Plant X is a _____ day plant with critical night period _____ hr or more.

(B)

a.	b.	c.	d.
✓			

ANIMAL SCIENCES (7 points)

39. (2 points)

Graph P: _____D_____

Graph Q: _____A_____

Graph R: _____B_____

Graph S: _____C_____

40. (3 points)

Interpretation	Correct	Incorrect
I.		✓
II.		✓
III.	✓	
IV.		✓
V.	✓	
VI.	✓	

41. (2 points)

- a. As the body size increases, the respiration frequency increases. _____F
- b. Lung ventilation rate is inversely proportional to the body size. _____F
- c. In mammals, blood volume usually tends to be ten times more than the heart weight.
_____T
- d. As the animal size increases, the relative increase in blood volume is greater than the relative increase in heart weight. _____F

GENETICS & EVOLUTION (17 points)

42. (2 points)

Statements	True	False
a.	✓	
b.	✓	
c.		✓
d.		✓

43. (2 points)

- a. _____iv_____
- b. _____iii_____

c. ____ii____

d. ____i____

44. (3 points)

(A)

a.	b.	c.	d.
		✓	

(B)

Answer: _____ 25% or $\frac{1}{4}$ or 0.25 _____

(C)

Answer: _____ I1, II2, II3, II5, III2, IVP and IVQ _____

45. (2 points)

a.	b.	c.	d.
		✓	

46. (2 points)

(A)

a.	b.	c.	d.
	✓		

(B) Answer: _____ 0.2

47. (3 points)

(A) Answer:

Graph 1: _____ c

Graph 2: _____a

(B)

Answer: _The progeny should be in the ratio of 1(homozygous dominant): 2(heterozygous): 1(homozygous recessive) For example: 100: 200: 100 or 50:100:50, etc with total not exceeding 400 ____

48. (3 points)

(A)

a.	b.	c.	d.
	✓		

(B)

a.	b.	c.	d.
		✓	

(C)

a.	b.	c.	d.
			✓

ECOLOGY (7 point)

49. (3 points)

		True	False
1	Introduction of second batch of lions shall prevent the population bottleneck and improve genetic quality but shall also increase territorial conflicts	✓	
2	The final tally of total lions will be 12 with identical sex ratio of male : female at the end of 3 years		✓
3	About 80 herbivores per lion are ideally considered as a healthy prey base in the wilderness. At the end of second stint of translocation of 2 adult males, there be sufficient food available for the existing total population		✓

50. (4 points)

(A)

a.	b.	c.	d.
	✓		

(B)

a.	b.	c.	d.
	✓		✓

ETHOLOGY (7.5 points)

51. (2.5 points)

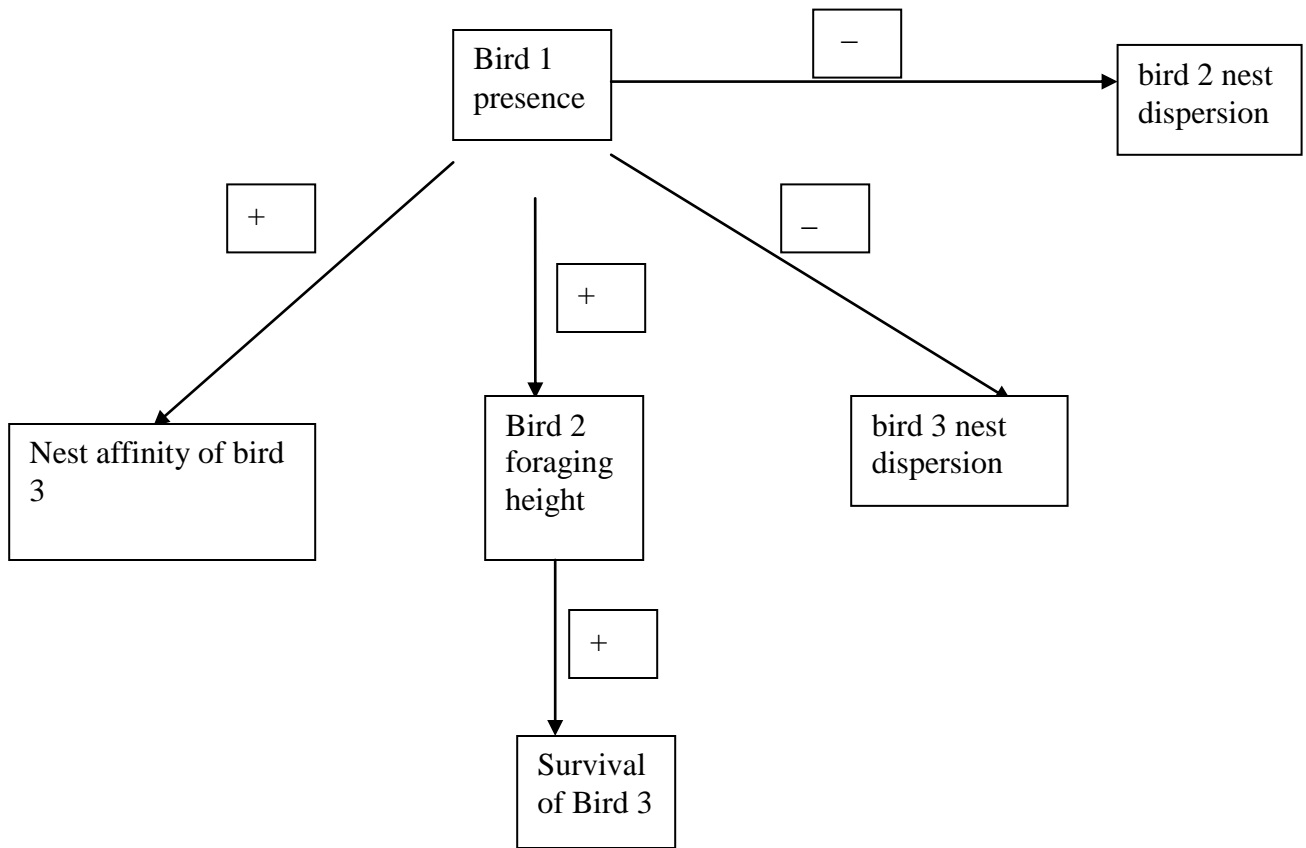
Interpretation	Correct	Incorrect
a.		✓
b.	✓	
c.	✓	
d.		✓
e.		✓

52. (5 points)

(A)

Results/Hypotheses	Consistent	Not consistent
a.	✓	
b.		✓
c.		✓
d.	✓	
e.	✓	

(B)



BIOSYSTEMATICS (7 points)

53. (2 points)

a.	b.	c.	d.
			✓

54. (2 points)

a.	b.	c.	d.
	✓		

55. (3 points)

Answer:

A: _____iv

INBO - 2020

ROLL NO.

--	--	--	--

 -

--	--	--	--

 -

--	--	--	--

B: _____v

C: _____ii

D: _____iii

E: _____vi

F: _____i

***** END OF SECTION B *****