

بسمه تعالی

کلید نهایی آزمون‌های پایانی دورهٔ تابستانهٔ بیست و چهارمین المپیاد
زیست‌شناسی ایران -1400



آزمون فیزیولوژی گیاهی

زمان آزمون: 90 دقیقه

Part 1 : (1.5 point)

1 : 6 – 6.7 (0.25 point)

2 : 0.05 – 0.09 cm^2 (0.25 point)

3 : Average Length : 250 - 350 Average Width : 65 - 105

Average Length : 135 - 170 Average Width : 75 - 105 (μm)(1 point)

Part 2 : (18.5 point)

1 : A : 1245 - 1435 B : 115 - 125 C : 125 - 150 D : 230 - 318 (2 point)

2 : t-score : A : 2.43 B : 1.74 C : 3.56 D : 0.76 (6 point)

Significant difference : A ☒ B ☐ C ☒ D ☐ (4 point)

3 : A ☒ B ☒ C ☐ D ☒ (4 point)

4 : $A > B = D > C$ (1 point)

5 : no significant difference (0.75 point) t-score : 1.21 (0.75 point)

Part 3 : (36.5 point)

1 : 1= 0.92-0.94 2= 0.71-0.73 3= 0.48-0.50 4= 0.43-0.45 5= 0.15-0.17
6= 0.83-0.85 7= 0.60 8= 0.55-0.57 9= 0.43-0.45 10= 0.36-0.38
11= 0.15-0.17 12= 0.06-0.08 (6 point)

2 : A : Caffeine B : Theophylline C : Theobromine (1 point)

3 : A : 50% ethanol B : ethanol C : 30% ethanol (1 point)

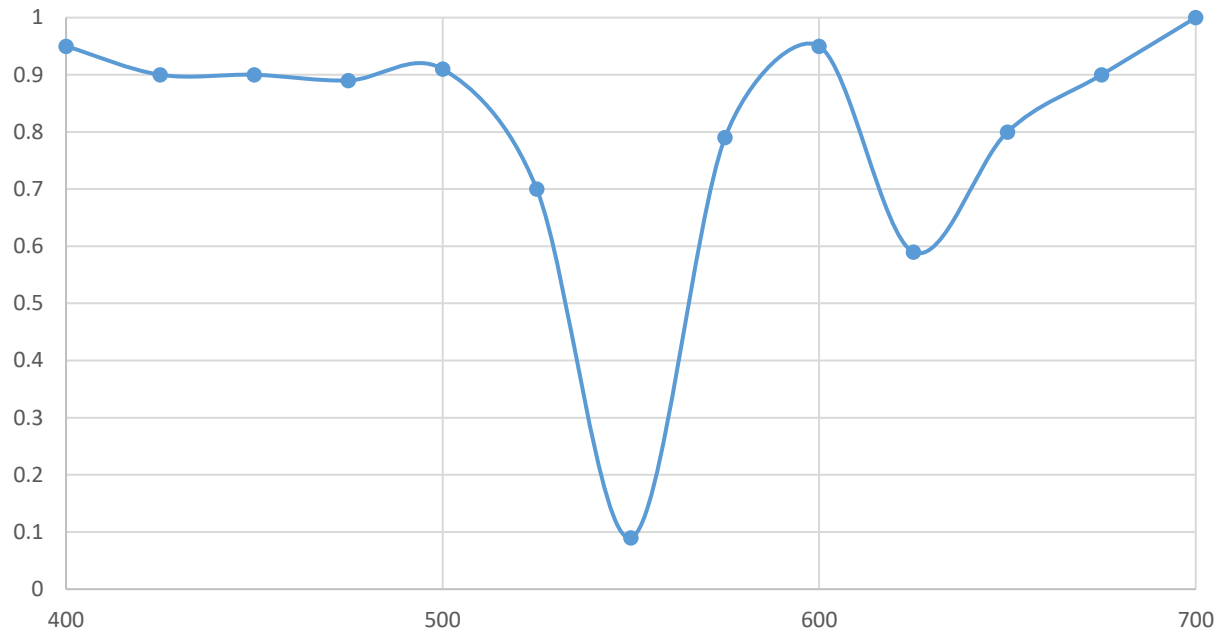
4 :

Wavelength(nm)	$\epsilon(mM^{-1}cm^{-1})$
400	103.23
425	80.46
450	79.80
475	77.99
500	81.83
525	41.98
550	3.41
575	55.94
600	103.30
625	30.88
650	56.17
675	79.13
700	250.04

(3.25 point)

Wavelength(nm)	T
400	19.51
425	10.13
450	9.94
475	9.44
500	10.54
525	3.35
550	1.10
575	5.00
600	19.56
625	2.43
650	5.04
675	9.75
700	1334.94

(3.25 point)



(1.5 point)

Color : Yellow (1 point)

5 : A : Cryptochrome B : Cryptochrome C : Phototropin D : Phytochrome E : Phytochrome

(2.5 point)

6 :

A	Concentration(μM)
2.491	16.00
3.541	22.74
2.784	17.88
2.439	15.66
2.942	18.90
3.189	20.48
1.974	12.68
2.735	17.57
4.361	28.01
2.736	17.57

(2.5 point)

7 :

$\epsilon(mM^{-1}cm^{-1})$ در محیط بازی
68.65
6.05
8.18
24.73
31.03
24.85
8.88
15.55
1.93

(4.5 point)

Significant difference (0.5 point) t-score : 1.57 (0.5 point)

8 : 1) Chlorophyll b 2) Chlorophyll d 3) Chlorophyll f (1.5 point)

9 : 1) ☒ 2) ☐ 3) ☒ 4) ☐ 5) ☐ (2.5 point)

10 : 1) Anthocyanidin 2) Flavanone 3) Flavanonole 4) Flavanonole 5) Flavone
6) Flavone 7) Flavonole 8) Flavonole 9) Anthocyanidin 10) Flavan-3-ol
(5 point)

Part 4 : (14 point)

1 : i : 1.12 (0.5 point) % : 11.83% (0.5 point)

2 : Right side 0.16 MPa (0.5 point)

3 : 570.42 s (1 point)

4 : (5) (1 point)

5 : "این کمیت دارای واحد نمیباشد ، از جنس عدد است" (0.5 point)

6 : Δx : 7.44 cm (3 point) Osmotic potential : 801.29 Pa (1 point)

7 : $9.11 \times 10^{-4} \frac{m}{s.Pa}$ (1 point)

8 : 0.73 MPa (2 point)

9 : 14.77% (4.5 point)

10 : 0.77 s (0.5 point)

11 : -1.51 MPa (0.5 point)

Part 5 : (29.5 point)

1 : Adequate zone (0.5 point) R : 0.89 (0.5 point)

2 : Elements : Cu (0.75 point)

Ag t-score : 0.55 (0.5 point)

Cu t-score : 1.61 (0.5 point)

Si t-score : 0.34 (0.5 point)

3 : no (0.25 point) X^2 : 2.39 (0.25 point)

4 : Micronutrient (0.25 point) ppm : 270.42 (0.5 point)

5 : "اکسیژن مناسب برای ریشه تامین میشود" (1 point)

6 : B (1 point)

7 : illite > kaolinite (1 point)

8 : Silt + Fine sand (1 point)

9 : Cl^- (1 point)

10 : A : Mn B : P or B C : S or Ca or Mo (3 point)

11 : 8 ATP (2 point)

12 : (Ca , Fe , Cu , S , B) (2 point)

13 : i) T ii) F iii) F iv) F v) T (2 point)

14 : A : B	B : Ca	C : Ca	D : N
E : Zn	F : Mg	G : P	H : N

(8 point)