

First Midterm Exam

Monday, 4/3/1440	PHYS 111	Academic year 1439-40H
10:00 – 11 :30 a.m.	General Physics 2	Second Semester

Student's Name		اسم الطالبة
ID number		الرقم الجامعي
Section No.	1279	رقم الشعبة
Classroom No.		رقم قاعة الاختبار
Teacher's Name	نوف سعد الخضران	اسم أستاذة المقرر
Roll Number		رقم التحضير

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Write your selected answer for each question in CAPITAL LETTERS here:

اكتب الحرف الدال على إجابتك في الجدول التالي:

Q1	Q2	Q3	Q4	Q5
Q6	Q7	Q8	Q9	Q10
Q11	Q12	Q13	Q14	Q15
Q16	Q17	Q18	Q19	Q20

Constants

$$h = 6.63 \times 10^{-34} \text{ J.s,}$$

$$c = 3 \times 10^8 \text{ m.s}^{-1},$$

$$1 \text{ e.V} = 1.6 \times 10^{-19} \text{ J}$$

Q1. The wavelength of light that has a frequency of $4.98 \times 10^{14} \text{ s}^{-1}$ is:

- A) $6 \times 10^{-7} \text{ m}$ B) $14.9 \times 10^{-7} \text{ m}$ C) 0.004 m D) 0.049 m

Q2. The electromagnetic wave that has the highest energy is:

- A) Red B) Radio C) Infrared D) Blue

Q3. What is the refractive index of the glass when the speed of light in a certain glass is $1.91 \times 10^8 \text{ m/s}$.

- A) 0.64 B) 1.57 C) 1.09 D) 4.9

Q4. The image formed by a flat mirror is always:

- A) real and upright B) virtual and upright C) real and inverted D) virtual and inverted

Q5. When light is incident on a rough surface -----reflection takes place.

- A) specular B) irregular C) diffused D) normal

Q6. The focal length of a concave mirror is 15 cm. Its radius of curvature is:

- A) 15 cm B) 30 cm C) 7.5 cm D) 45 cm

Q7. An object is placed 9 cm from a convex lens whose focal length is 8 cm. The image distance is:

- A) 50 cm B) 72 cm C) 9 cm D) 8 cm

Q8. The angle of incidence at a plane mirror is 30° . The angle of reflection is:

- A) 12.5° B) 60° C) 30° D) 15°

Q9. An object located at 4.5 cm in front of a lens forms a virtual image at 2.25 cm in front of the lens. The type of the lens is:

- A) Concave B) Convex C) Converging D) planoconvex

Q10. A 6 cm tall object is placed in front of a convex lens that has a magnification ($M = -2.5$). The image height is:

- A) 15 cm, upright B) 15 cm, inverted C) 3 cm, upright D) 3 cm, inverted

Q11. A spherical mirror has a focal length of +10.00 cm. The image location for an object distance of 10.00 cm is:

- A) 16 cm B) -8 cm C) -10 cm D) ∞

Q12. The work function for zinc is 4.31 eV. The cutoff wavelength for zinc is:

- A) 806 nm B) 666 nm C) 288 nm D) 406 nm

Q13. Light of wavelength 400 nm is incident on a metal surface. As a result an electron is ejected from the metal surface with a maximum kinetic energy of 1.1×10^{-19} J. The work function, in eV, of the metal surface is:

- A) 0.29 B) 1.43 **C) 2.42** D) 4.67

Q14. Wien's displacement law states that as the temperature of the blackbody increases, the peak wavelength of the radiation curve:

- A) increase **B) decrease** C) doubled D) does not change

Q15. -----derived the equation for $I(\lambda, T)$ that is successfully agree with experimental results of blackbody radiation at all wavelengths.

- A) Stefan Boltzmann B) Albert Einstein **C) Max Planck** D) Rayleigh-Jeans

Q16. Four different electric circuits connected differently. These circuits have identical resistors, R and batteries, V. The circuit that draws the largest amount of current is: **C**



Q17. A cylindrical wire has a radius r and length ℓ . If both r and ℓ are tripled, the electric resistance of the wire (R) will become:

- A) 9 R B) 3 R C) R **D) R/3**

Q18. A total charge of 8.0 mC flows through the cross-section of a metallic wire in 4s. The current in the wire in mA is:

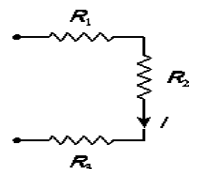
- A) 1 **B) 2** C) 3 D) 1.5

Q19. A good electric conductor has

- A) low resistivity & low conductivity **B) low resistivity & high conductivity** C) high resistivity & low conductivity D) high resistivity & high conductivity

Q20. If $R_1 = 10 \Omega$, $R_2 = 15 \Omega$, $R_3 = 20 \Omega$, and $I = 0.50$ A, the dissipated power in the circuit is:

- A) 29 W B) 16 W **C) 11 W** D) 22 W



Q21. A 1 cm high object is placed 5 cm from a convex mirror whose focal length is 4 cm.

- Sketch the ray diagram.
- Find the location of the image and its size.
- Determine the characteristics of the image.