PHYSICS

RESONANCE ENGLISH

PART TEST 6

Exercise

1. A digital signal-

A. Is less reliable than analog signal

B. is more reliable than analog signal

C. is equaly reliable as the analog signal

D. none of the above

Answer: B

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2. In amplitude modulation

A. only the amplitude is changed but frequency remains same

B. both the amplitude and frequency change equally

C. both the amplitudes and frequency change unequallity

D. none of these

Answer: A

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3. The number of α and β^- particles emitted during the radioactive decay chain starting from $^{226}_{88}$Ra and ending at $^{206}_{82}$Pb is

A. $3\alpha \& 6\beta^-$

B. $4\alpha \& 5\beta^-$

C. $5\alpha \& 4\beta^-$

D. $6\alpha \& 6\beta^-$

Answer: C

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4. For a transistor $\alpha = 0.9$ the value of β is-

A. 0.9

B. 90

C. 9

D. 90/11

Answer: C

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5. In a semiconductor,

A. At $0^{\circ} k$, Si is a super conductor

B. In P-type semiconductor the acceptor level lies near the conduction band

C. Each donor atom contributes one hole

D. P-N junction diode is electricity neutral

Answer: D

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6. The binding energies of the nuclei of $._{2}^{4}He$, $._{3}^{7}Li$, $._{6}^{12}C$ and $._{7}^{14}N$ are 28, 52, 90, 98 MeV respectively. Which of these is most stable.

A. $._{2}^{4}He$

B. $._{3}^{7}Li$

C. $._{6}^{12}C$

D. $._{7}^{14}N$

Answer: C

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7. If we assume that perptraing power of any radiation/particle is inversely proportional to its de-Broglie wavelength of the particle then:

A. a proton and an α-particle after getting accelerated through same potential difference will have equal penetrating power

B. penetrating power of α-particle will be greater than that of proton which have

been accelerated by same potential difference

C. proton's penetrating power will be less than penetrating power of an electron which has been accelerated by the same potential difference

D. penetrating powers can not be compared as all these are particle having no wavelength or wave nature.

Answer: B

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8. A heavy nucleus having mass number 200 gets disintegrated into smaller fragments of mass number 80 and 120 . If binding energy per nucleon for parent atom is 6.5 eV and for daughter nuclei are 7 eV and 8 eV respectively and the energy released in the decay is given by $\mathrm{X} \times 10^5 eV$, then X will be

A. 200 MeV

B. $-220MeV$

C. 220 MeV

D. 180 MeV

Answer: C

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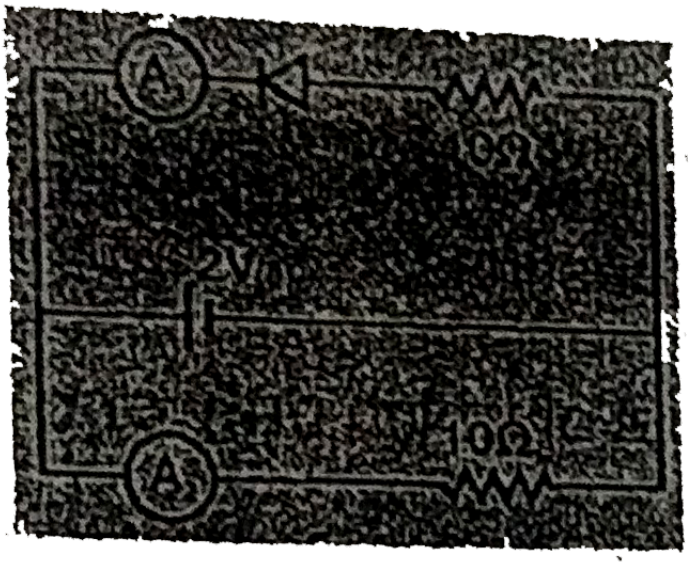
9. In the following circuit readings in ammeters A_1 and A_2 will be -



A. 0.2 A, zero

B. zero,0.2A

C. 0.2A,0.2A

D. 0.2A,0.4A

Answer: B

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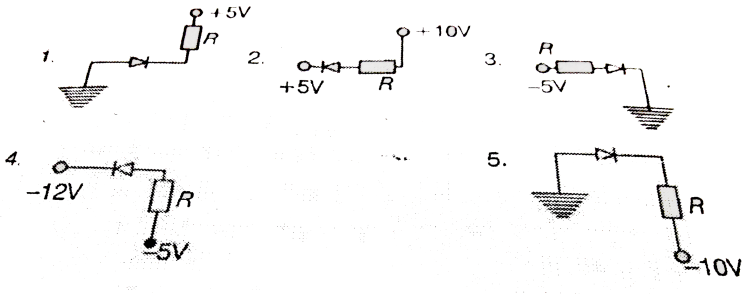
10. In the given figure, which of the diodes are forward biased?



A. 1, 2, 3

B. 2, 4, 5

C. 1, 3, 4

D. $2, 3, 4$

Answer: B

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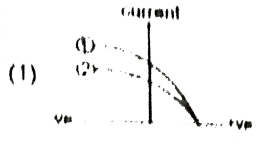
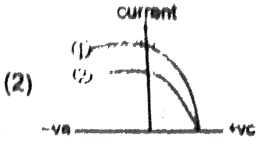
11. The graph between photo electric current and cathode potential when the anode is kept at zero potential, for light of two different intensities out of the same frequency looks like the one:

A.



B.



C.

D.

Answer: A

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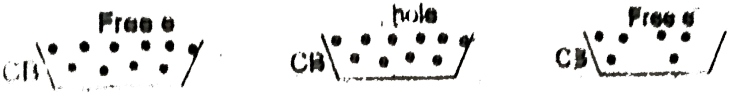
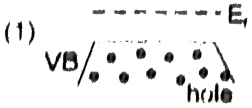
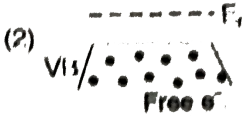
12. For a pure semiconductor energy band shown at 0K choose correct option:



A. 

B. 

C. 

D.

Answer: D

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13. Photo electric effect can be explained only by assuming that light

A. is a form of transverse waves

B..is a form of longitudnal waves

C..can be polarised

D. consists of quanta

A. a.is a form of transverse waves

B. b.is a form of longitudnal waves

C. c.can be polarised

D. d.consists of quanta

Answer: D

14. Light of two different frequencies whose photons have energies 1 eV and 2.5 eV respectively illuminate a metallic surface whose work function is 0.5 eV successively. The

ratio of maximum speed of emitted elections will be

A. $1:4$

B. $1:2$

C. $1:1$

D. $1:5$

Answer: A

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15. In an interference pattern the $(n+4)^{th}$ blue bright fringe and n^{th} red bright fringe are formed at the same spot. If red and blue light have the wavelength of 7800Å and 5200Å then value of n should be-

A. 2

B. 4

C. 6

D. 8

Answer: D

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16. A particle of mass m is projected form ground with velocity u making angle θ with the vertical. The de Broglie wavelength of the particle at the highest point is

A. ∞

B. $\frac{h}{mu\sin\theta}$

C. $\frac{h}{mu\cos\theta}$

D. $\frac{h}{mu}$

Answer: B

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17. When a metallic surface is illuminated with monochromatic light of wavelength λ, the stopping potential is $5V_0$. When the same surface is iluminated with light of wavelength 3λ, the stopping potential is V_0. The work function of the metallic surface is

A. $\frac{hc}{6\lambda}$

B. $\frac{hc}{5\lambda}$

C. $\frac{hc}{4\lambda}$

D. $\frac{2hc}{4\lambda}$

Answer: A

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18. Light of wavelength 400 nm is incident continuously on a caesium ball (work function 1.9 eV). The maximum potential to which the ball will be charged is

A. 3.1V

B. 1.2V

C. zero

D. Infinte

Answer: B

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19. The Rutherford α-particle experiment shown that most of the α-particles pass through almost unscattered while some are

scattered through large angles. What infromation does it given about the structure of the atom ?

A. a.Atoms is hollow

B. b.The whole mass of the atom is concetration in a small centre called nucleus

C. c.Nucleus is positively charged

D. d.All the above

Answer: D

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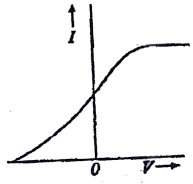
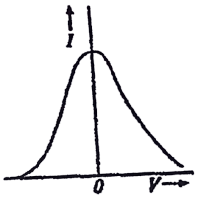
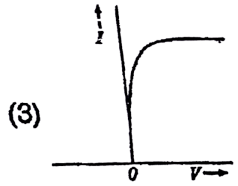
20. Which one of the following graphs in figure shows the variation of photoelectric current (I) with voltage (V) between the electrodes in a photoelectric cell?

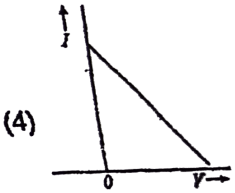
A. (1)



B. (2)



C. 

D. 

Answer: A

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21. Two electrons starting from rest are accelerated by equal potential difference

A. they will have different kinetic energy

B. they will have same linear momentum

C. they will same linear momentum de broglie wavelength

D. they may produce x-rays of same minimum wavelength when they strike different targets

Answer: D

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22. Let m_p be the mass of a proton , m_n the mass of a neutron, M_1 the mass of a $._{10}^{20}Ne$ nucleus and M_2 the mass of a $._{20}^{40}Ca$ nucleus . Then

A. $M_2 = 2M_1$

B. $M_2 > 2M_1$

C. $M_2 < M_1$

D. $M_1 < 10(m_n + m_p)$

Answer: D

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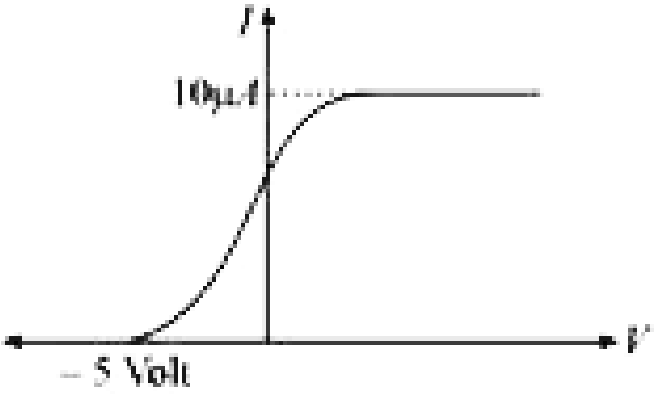
23. In the photoelectric experiment, if we use a monochromatic light, the I – V curve is as shown. If work function of the metal is 2 eV, estimate the power of light used. (Assume efficiency of photo emission $= 10^{-3}$ i.e. number of photoelectrons emitted are 10^{-3} times of number of photons incident on

metal).



A. 2W

B. 5W

C. 7W

D. 10 W

Answer: C

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24. In a photoelectric effect experiment, stopping potential changes by 30Volt if we change frequency of the radiation. The magntude of change in the frequency is $\left(h = 6 \times 10^{-34} Js\right)$

A. $4 \times 10^{-15} s^{-1}$

B. $8 \times 10^{15} s^{-1}$

C. $10^{10} s^{-1}$

D. $18 \times 10^{15} s^{-1}$

Answer: B

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25. The photon radiated from hydrogen corresponding to 2^{nd} line of Lyman series is absorbed by a hydrogen like atom 'X' in 2^{nd} excited state. As a result the hydrogen like atom 'X' makes a transition to n^{th} orbit. Then,

A. $X = He^{+}, n = 4$

B. $X = Li^{++}, n = 6$

C. $X = He^{+}, n = 6$

D. $X = Li^{++}, n = 9$

Answer: D

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26. An electron of mass m when accelerated through a potential difference V, has de Broglie wavelength λ. The de Broglie wavelength associated with a proton of mass

M accelerated through the same potential difference, will be

A. $\lambda\sqrt{\frac{M}{m}}$

B. $\lambda\sqrt{\frac{m}{M}}$

C. $\lambda\left(\frac{M}{m}\right)$

D. $\lambda\left(\frac{m}{M}\right)$

Answer: B

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27. A photon of energy 12.09 eV is absorbed by an electron in ground state of a hydrogen atoms. What will be the energy level of electron ? The energy of electron in the ground state of hydrogen atom is -13.6 eV

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28. What percentage increase in wavelength leads to 75% loss of photon energy in a photon-electron collision?

A. a.200

B. b.100

C. c.67

D. d.300

Answer: D

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29. Statement 1: Though light of a single frequency (monochromatic light) is incident on a metal, the kinetic energies of emitted

photoelectrons are not equal. Statement 2: The energy of electrons just after they absorb photons incident on metal surface may be lost in collision with other atoms in the metal before the electron is ejected out of the metal.

A. Statement-1 is true, Statement-2: is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is true, Statement-2: is true, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is true but statement-2 is false

D. Statement-1 is false, Statement-2 is true

Answer: A

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30. Staements I: ${}_{z}X^{A}$ undergoes 2α-decays, 2β-decays (negative β) and 2γ-decays. As a result, the daughter product is ${}_{z}{}_{-2}X^{A-8}$.

Staements II: In α-decay, the mass number

decreases by 4 unit and atomic number decreases by 2 unit. In β-decay (negative β), the mass number remains unchanged and atomic number increases by 1 unit. In γ-decay, mass number and atomic number remain unchanged.

A. Statement-1 is true, Statement-2: is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is true, Statement-2: is true, Statement-2 is NOT a correct explanation

for Statement-1.

C. Statement-1 is true but statement-2 is false

D. Statement-1 is false, Statement-2 is true

Answer: A

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