

(1) One mark

(A) Resistors is connecting in parallel

(B) the e.m.f = 15 V

(2) One mark

(A) Choice (a) 2 Volt

(B) Choice (d) 40 A/s

(3) One mark

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(A) The wavelength at maximum intensity is inversely proportional with temperature in kelvin of the black body.

(B) tomography (tumer detection) and embryology

(4) One mark

$$\Delta E = (E_3 - E_1) \times 1.6 \times 10^{-19} = 1.9344 \times 10^{-18} \text{ J} \quad (\frac{1}{2} \text{ mark})$$

$$\lambda = \frac{hc}{\Delta E} = \frac{6.625 \times 10^{-34} \times 3 \times 10^8}{1.9344 \times 10^{-18}} = 1.0274 \times 10^{-7} \text{ m} \quad (\frac{1}{2} \text{ mark})$$

**(5) One mark**

Point of comparison	He	Ne
Source of excitation to high energy levels	High Dc potential difference ( ½ mark)	Collisions with excited Helium atoms (inelastic collision) ( ½ mark)

**(6) One mark**

It is a flow of current due to electric field is set up, directed from the positive Ions, to the negative ions. This electric field causes a drift current flow in a direction opposite the diffusion current.

**(7) Two marks**

If the currents in the same directions, force of attraction **(one mark)**

If the currents in opposite direction, force of repulsion

**(one mark)**

**(8) Two marks**

$$(e.m.f_2) = - M \frac{\Delta I_1}{\Delta t}$$

**(one mark)**

$$emf_2 = - 0.2 \times \frac{3-5}{0.01}$$

**(½ mark)**

$$emf_2 = 40 \text{ V}$$

**(½ mark)**

**(9) Two marks**

The capacitor is charged and potential difference between the two plates of capacitor becomes equal to the potential of Battery and current = 0

(10) One mark

(A) Choice (b) 12 V

(B) Choice (c)

Reading of voltmeter decrease and ammeter increase.

(11) One mark

$$R_s = \frac{I_g R_g}{I - I_g}$$

(½ mark)

$$R_s = \frac{0.1 \times I_g}{9 I_g} = 0.01 \Omega$$

(½ mark)

(12) One mark

(A) Step-up voltage become step, down current decrease power lost.

(B) To avoid self-Induction.

(13) One mark

The reading of Ammeter increases, then retains back.

**(14) One mark**

- (A) Because the low potential different not able to make the electrons collides with the electron of target atom to produce line spectrum.
- (B) Because the electron of transmit from higher level to the ground state (n=1) with high energy difference.

**(15) One mark**

Choice (C)

C	B	A
0	0	1

**(16) Two marks**

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$$B = \frac{\mu I}{2 \pi d}$$

**(17) Two marks**

Produce two forces equals in magnetude and opposite in direction, thus will produce magnetic torque makes the coil rotates.

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النموذج (ب)

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(18) Two marks

Page

$$Z = \frac{V}{I} = \frac{10}{0.8} = 12.5 \Omega$$

(½ mark)

$$Z = \sqrt{R_2 + X_L^2}$$

(½ mark)

$$(12.5)^2 = 100 + X_L^2 = 56.25$$

(½ mark)

$$X_L = 7.5 \Omega$$

(½ mark)

Or any Other solution gives the result of  $X_L = 7.5 \Omega$

**(19) One mark**

(A) The emitted electrons from the hot filament gained energy and becomes faster. (Gained kinetic energy)

(B) Choice (d) emission continuous spectrum

**(20) One mark**

(A)

Point of comparison	Step – up transform	Step – down transformer
Electric current intensity in the secondary coil with the respect to primary coil	$I_{sec}$ less than $I_{primary}$ ( $\frac{1}{2}$ mark)	$I_{sec}$ greater than $I_{primary}$ ( $\frac{1}{2}$ mark) <b>Page 79</b>

(B)

Point of comparison	Phenomenon of self- induction	Phenomena of mutual induction
Physical concept <b>Page 89</b>	Electromagnetic effect which generate in the coil itself when the current is changed in it. ( $\frac{1}{2}$ mark)	Electromagnetic effect between two coils one of them carries current is changed with time induced e.m.f is generated in other coil ( $\frac{1}{2}$ mark)

(21) One mark

(A) Choice (b) Equal one

(B) To compensate the effect of changing of temperature of the surrounding to avoid zero scale error.

(22) One mark

Choice (d) (Inversely with mass  $m$  and velocity  $v$ )

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(23) One mark

Choice (C) (Emitted by a constant phase difference)

Page 160

(24) One mark

Choice (b) (3 volts)

(25) Two marks

Hot wire ammeter	Ohmmeter	Point of comparison
Because heat energy generated is directly proportional with $I^2$	Because electric current Intensity is inversely proportional with the total resistance (measured resistance and device resistance)	Reason of not equal division scale
one mark - Page 101	one mark - Page 52	



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النموذج (ب)

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(26) Two marks

$$\beta_e = \frac{\infty_e}{1 - \infty_e}$$

(½ mark)

$$50 = \frac{\infty_e}{1 - \infty_e} \quad \therefore \infty_e = 0.98$$

(½ mark)

$$\beta_e = \frac{I_C}{I_B}$$

(½ mark)

$$50 = \frac{I_C}{5 \times 10^{-5}} \quad \therefore I_C = 0.0025 \text{ A} = 2.5 \times 10^{-3} \text{ A}$$

(½ mark)

(27) Two marks

The value of D.C which generate same amount of heat energy when passing through same resistance during same time.

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(28) One mark

Page

Choice (A) 1.5 T

(29) One mark

Page

(A) Only allow to current flow in the case of forward bias and not allows to current flow in reverse biase.

(B) Because when the temperature is increased, the number of broken bonds increased and number of free electron increased therefore conductivity increased.

(30) One mark

Because the beam of laser propagate as a parallel rays without scattering or deviation.

(31) One mark

Page

$$E_n = \frac{-13.6}{n^2} = eV$$

(32) One mark

AC it is a current continously changing in its magnitude and its direction is revised every half cycle.

**(33) One mark**

Because the perpendicular distance between to equal forces becomes maximum in Parallel position and zero in normal position.

(Or any right answer)

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**(34) Two marks**

(A) Choice (d) Does not change

(B) Choice (a) 120 C

**(35) Two marks**

Choice (d) 0.25

**(36) Two marks**

$$v = \frac{c}{\lambda} = \frac{3 \times 10^8}{3 \times 10^{-7}}$$

(½ mark)

$$v = 7.5 \times 10^{14} \text{ Hz}$$

(½ mark)

$$KE = h\gamma - E_w$$

(½ mark)

$$KE = (6.625 \times 10^{-34} \times 7.5 \times 10^{14}) - 2.3 \times 10^{-19}$$

$$KE = 2.67 \times 10^{-19} \text{ J}$$

(½ mark)

**(37) One mark**

(A) Electronic devices (optoelectronic and control device)

**Page 125**

(B) Analog – Digital converter (A D C)

**Page 194**

**(38) One mark**

(A) Transfer energy to the atoms of active medium and transmit it to the excited state by using optical energy to obtain laser.

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(B) It means that Intensity of laser beam remains constant with distance.

Or

(The laser rays falling is in a unit surface area unspread and they maintain constant Intensity).

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**(39) One mark**

(A) Choice ③  $18 \Omega$

(B) Choice ④  $6 V$

**(40) One mark**

The reading of voltmeter is decreased.

(41) One mark

Choice © - 45°

(42) One mark

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The electrons gained High K.E and its velocity increased thus  $\lambda$  decreased so its resolving power high

(43) Two marks

$$I = I_1 + I_2 + I_R$$

(½ mark)

$$I_R = 0.3A$$

(½ mark)

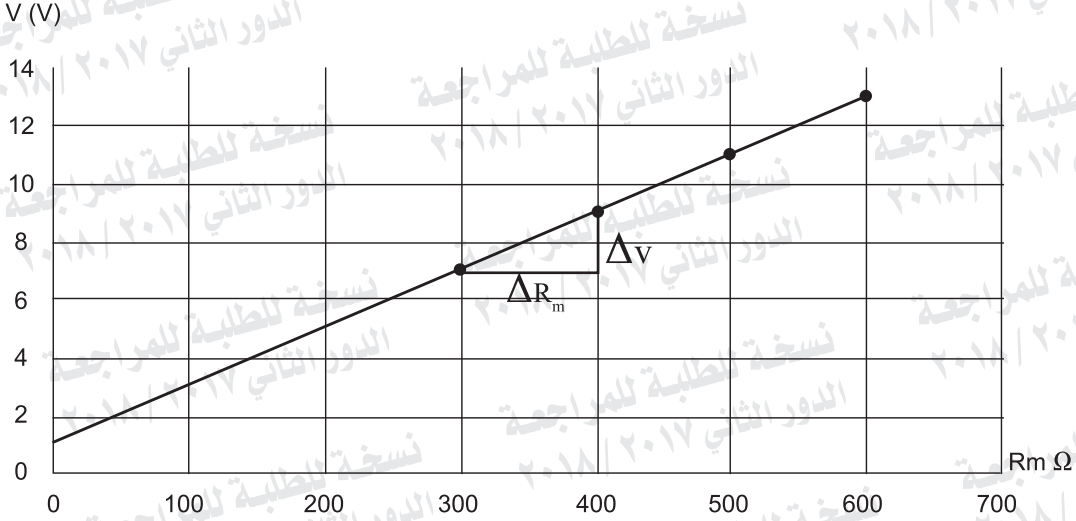
$$V = 0.1 \times 12 = 1.2 V$$

(½ mark)

$$R = \frac{1.2}{0.3} = 4 \Omega$$

(½ mark)

(44) Two marks



$$\text{Slope} = \frac{\Delta V}{\Delta R_m} = 0.02$$

( 1/2 mark)

$$\text{Slope} = I_g = 0.02$$

( 1/2 mark)

(45) Two marks

Choice (d) Zero