

1- (one mark)

choice (b) B

(B) choice (c) 8V

2- (one mark)

$$\frac{I}{\frac{1}{3}I} = \frac{6000+R}{R}$$

(½ Mark)

$$R = 3000 \Omega$$

(½ Mark)

3 - (one mark)

(A) choice (d) 4

(B)

1- Decrease magnetic flux density.

2- decrease the speed of wire cutting the fixed.

3- decrease length of wire.

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4- (one mark)

To keep the magnetic torque constant at maximum value.

5- (one mark)

(A) By replacing the materinal of target by another ein has large atomic number.

(B)

$$\lambda = \frac{hc}{\Delta E} \quad (\frac{1}{2} \text{ Mark})$$

$$\lambda = \frac{6.625 \times 10^{-34} \times 3 \times 10^8}{4.968 \times 10^{-19}} \quad (\frac{1}{2} \text{ Mark})$$

$$\lambda = 4 \times 10^{-7} \text{ m}$$

6- (one mark)

$$\begin{matrix} 1 & 1 & 0 & 0 & 0 \\ 2^4 & 2^3 & 2^2 & 2^1 & 2^0 \end{matrix} \quad (\frac{1}{2} \text{ Mark})$$

$$24 = 16 + 8 + 0 + 0 + 0$$

الرقم العشري = 24

7- (Two Marks)

- 1- Decrease resistance of Ammeter.
- 2- Most of current pass through shunt.
- 3- Increase range of measure.

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(Only two functions are needed)

8- (Two marks)

Choice (d)

Electric \longrightarrow magnetic \longrightarrow Thermal

9- (Two marks)

$$V_{\max} = \frac{V_{\text{eff}}}{0.707} = 28.2885\text{v}$$

(½ Mark)

$$X_L = 2 \pi FL = 87.92 \quad \Omega$$

(½ Mark)

$$Z = \sqrt{R^2 + (X_L - X_C)^2} = 9.936 \Omega$$

(½ Mark)

$$I_{\max} = \frac{V_{\max}}{Z} = 2.847 \text{ A}$$

(½ Mark)

10- (one mark)

a) pure semiconductor by doping trivalent atoms is added and that is increase the concentration of + positive Hols. **(Page 184)**

(b) Transistor P - N - P **(Page 191)**

11- (one mark)

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a. To increase the probability of stimulated of emission and Magnify stimulated photons.

b. when the photons in the resonance cavity moving fourth and back passing through another excited atoms to generate stimulated emission.

12- (one mark)

(a) choice (a) 0.8 A

(b) current is 3 A and its direction in Yout of the point (node)

13- (one mark)

Choice (B) decrease.

14- (one mark)

Choice (b) less than one

15- (one mark)

Choice (d) 2

16- (Two marks)

$$I_1 + I_2 - I_3 = 0$$

(½ Mark)

$$0 + 4I_2 + 6I_3 = 9$$

(½ Mark)

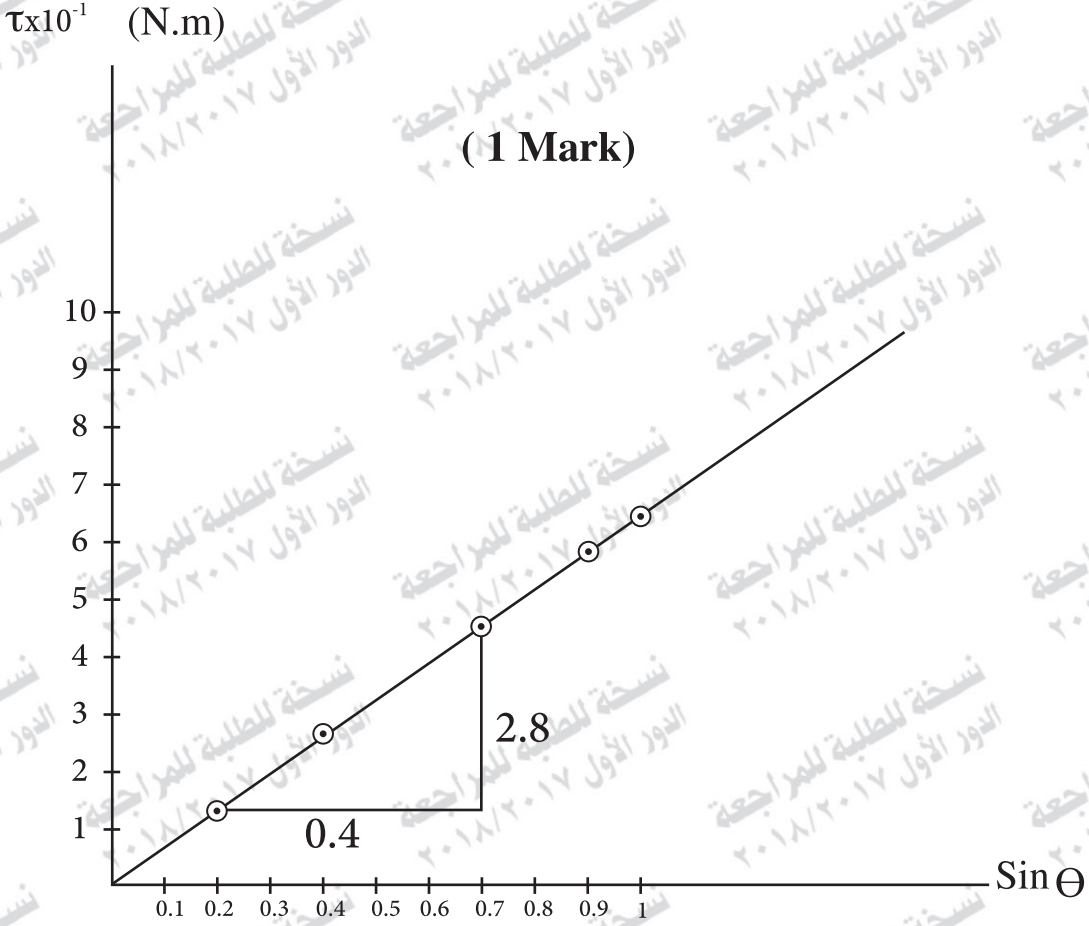
$$2I_1 + 0 + 6I_3 = 12$$

(½ Mark)

$$I_3 = 1.5A$$

(½ Mark)

17- (Two marks)



$$\text{Slope} = \frac{\Delta I}{\Delta \sin \theta} = \frac{2.8 \times 10^{-1}}{0.4}$$

$$\text{Slope} = 0.7$$

(½ Mark)

$$N = \frac{\text{Slope}}{B_2 A} = \frac{0.7}{0.4 \times 3 \times 12.15 \times 10^{-3}}$$

$$N = 48 \text{ Turns.}$$

(½ Mark)

18- (Two Marks)

Modification of A . C Dynamo.

undirection curent dynamo	nearly D.c Dynamo
Replace Two rings by cummutator	Commutator and multi coils normally with small engles.



19- (one mark)

$$R_s = \frac{I_g R_g}{I - I_g} = \frac{0.1 \times 45 \times I}{0.9 I} = 5 \Omega$$

20- (one mark)

a)

Point of comparison	P- type	N - type
valency of impurities	Tri - valent (½ Mark)	penta - valent (½ Mark)

b) Figure (2)

(½ Mark)

Forward bias

(½ Mark)

21- (one mark)

Point of Comparison	Spontaneous emission	stimulated emission
Intensity remains constant a long far distance	Not constant Intensity	Constant Intensity

22- (one mark)

$$2 \pi r = n \lambda$$

23- (one mark)

The equivalent of inductance and Resistance.

24- (one mark)

Point B its a neutral point.

25- (Two marks)

A) when resistor (s) is increased the current decreased and value of (Ir) decreased so V_1 increase and V_2 decreased.

B) choice (d) $\frac{3}{1}$.

26- (Two Marks)

1- $\omega = \frac{V}{r}$ (½ Mark)

$= \frac{10 \pi}{0.1} = 100 \pi \text{ Rad/s}$ (½ Mark)

2- $f = \frac{\omega}{2 \pi} = \frac{100 \pi}{2 \pi} = 50 \text{ Hz}$ (one Mark)

(يحصل الطالب على درجة واحدة بتعويضه بناتج الجزئية 1)

27- (Two Marks)

$F = \frac{2P_w}{C} = \frac{2 \times 2.5}{3 \times 10^8}$ (one Mark)

$F = 1.67 \times 10^{-8} \text{ N}$ (one Mark)

28- (one mark)

a. (a) Algebraic sum Of the electro motives forces in any closed loop is equivalent to the algebraic sum of potential difference within that loop.

(Page 21)

b. (b) the current intensity in a conductor is directly proportional to potential difference across its termmales at constant temperature.

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29- (one mark)

(a)

Without iron core	With iron core
Self - induction less	Self inductive More

(b) Choice (a)

Induced Forward current

30- (one mark)

1. (a) Emission of electrons from a surface of metal under the effect of light.

(b) choice (c) λ_1, λ_4

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31- (one mark)

Choice (d) No change

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32- (one mark)

Choice (B) collisions with Neon atoms not excited.

33- (one mark)

Convert information from electric signals to code based on binary system

(0,1)

(Page 194)

34- (Two marks)

Choice (a) π up

35- (Two marks)

(Page 83)

1- use metal wires with low electric resistance.

(one mark)

2- the core is made of thin insulated sheets.

(one mark)

36- (Two marks)

$$\tan\theta = \frac{X_L - X_c}{R}$$

(one mark)

$$\tan\theta = \frac{80 - 60}{20} = 1$$

$$\theta = 45^\circ$$

(one mark)

37- (one mark)

(a) Surface potential barrier.

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(b) Electron microscope.

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38- (one mark)

(a) choice (B) 0.8 H

(b) To decrease electric energy consumed as Thermal energy due to eddy current.

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39- (one mark)

(a) choice (C) 1

(b) Because inductive reactance is directly Proportional with frequency when the Frequency is increased inductive reactance is increased also and Prevent current to flow.

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40- (one mark)

The wavelength at maximum intensity is decrease by increasing temperature.

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41- (one mark)

Due to near equality of the values of the same metastable excited energy levels in these two elements.

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42- (one mark)

choice (B) 11V

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43- (Two marks)

$$|\vec{m}_d| = IAN$$

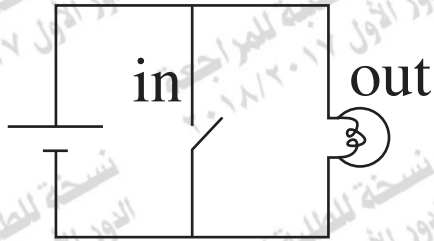
(one mark)

$$|\vec{m}_d| = 3 \times 0.012 \times 50 = 1.8 \text{ A.m}^2$$

(one mark)

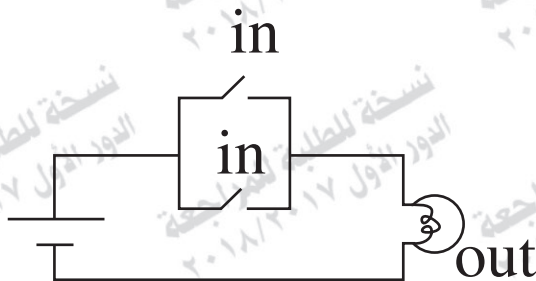
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44- (Two marks)



(Not) gate

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(OR) gate

(Page 196)

45- (Two marks)

Point of compositions	Right - hand rule	Fleming L .H . R
Uses	Detect The direction of Field along the axis of Coli or directions of magnetic dipole	Detect direction of magnitic Force on a wire carries electric current in magnetic Field.

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