

Llyfr Atebion Arholiadau

12 Tudalen

Cyfarwyddiadau i Ymgeiswyr

1. Rhewch yr holl wybodaeth y gofynnir amdani yn y blychau isod.
2. Rhewch eich enw yn y lle a ddarparwyd ar y dde, plygwch ef a'i selio i lawr (gan ddefnyddio'r label a ddarparwyd) i guddio'ch enw.
3. Rhaid i'r atebion fod mewn llawysgrifen ddarllenadwy. Gall yr Arholwyr naill ai anwybyddu sgrïpt annarllenadwy, neu drefnu iddi gael ei theipio a chael yr ymgeisydd i dalu.
4. Ysgrifennwch eich atebion mewn inc.
5. Dechreuwch bob ateb ar dudalen newydd. Gwnewch unrhyw fras nodiadau yn y llyfr atebion a thynnu llinell drwyddynt.
6. Ni ddylid rhwygo unrhyw ran o'r llyfr hwn; rhaid ei gyflwyno yn gyfan.
7. Os defnyddir mwy nag un llyfr, rhwymwch hwy gyda'i gilydd gan ddefnyddio'r tagiau sydd ar gael oddi wrth y gwylwr/gwylwyr.
8. Rhaid dychwelyd pob llyfr. Ni chaniateir mynd â llyfrau atebion, wedi eu defnyddio neu heb eu defnyddio, allan o'r lleoliad arholi o dan unrhyw amgylchiadau.

1	Rhif Myfyriwr	
2	Teitl y Papur Arholiad	
3	Cod y Modwl	
4	Dyddiad ac Amser yr Arholiad	
5	Lleoliad yr Arholiad	
6	Rhif Sedd	
7	Nifer y Llyfrau Atebion a gyflwynwyd	

(See the other side for English version)

[illegible]

Llenwch, plygwch a seliwch

CYFENW: _____

ENW(AU) CYNTAF: _____

(Gweler yr ochr arall am y fersiwn Cymraeg)

1	Student Number	121326
2	Title of Examination Paper	Electronic Technology
3	Module Code	~~P05E~~ PSDE 4021
4	Date and Time of Examination	16.00 16/5/2018
5	Examination Venue	Penns College
6	Seat Number	8
7	Number of Answer Books handed in	

[illegible]

Complete, fold
(see note 2 below)

Complete, fold and seal

SURNAME: Potter

FORENAME(S):

~~David~~

Examination Answer Books

12 Pages

Instructions to Candidates

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right, fold over and seal down (using the label provided) to hide your name.
3. The answers must be legibly written. The Examiners can either ignore illegible script or have it typed and the expense of typing charged to the candidate.
4. Write your answers in ink.
5. Begin each answer on a fresh page. Do all rough work in the answer book and cross it through.
6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
8. Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.

2nd May 2005

4

5

6

7

8

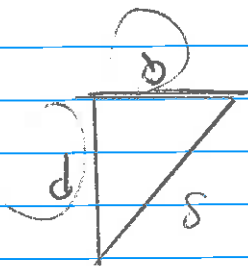
9

Q1

a)

~~S~~
~~P~~
~~Q~~

$S = \text{Apparent Power}$
 $P = \text{Real Power}$
 $Q = \text{Reactive Power}$



$S = IV (VA)$
 $P = IV \cos \phi (W)$
 $Q = IV \sin \phi (VAR)$

b) 5A 50 Hz 240V 0.7 (lagging)

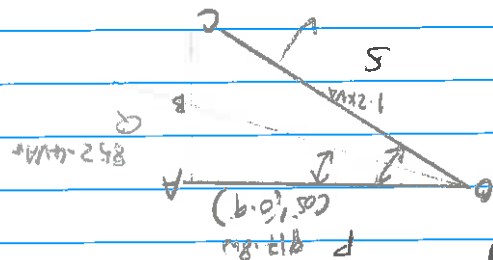
i) Apparent Power = IV
 $= 5 \times 240 = 1.2 \text{ kVA}$

ii) Real Power = $IV \cos \phi$
 $= 5 \times 240 \times \cos(0.7) = 917.8 \text{ W}$

iii) Reactive Power = $IV \sin \phi$
 $= 5 \times 240 \times \sin(0.79) = 852.4 \text{ VAR}$

AS $\sin$ not given $\rightarrow \cos^{-1}(0.7) = 0.76$
 $\sin(0.76) = 0.69$
 $\cos^{-1}(0.7) = 0.76$

~~BC = AC - AB~~



2

6

500

3

[illegible]

3)

a)

Kirchoff's Current Law explains how the current throughout the circuit must always return to the power source. e.g. If 5 Amps is going through R_1 and 2 Amps going through R_2 . Then the 6 Amps (in total) must be coming and going from the battery. Kirchoff's Voltage Law states that the voltage in a closed loop circuit must be zero.

$$b) R_3 // R_4 = \frac{3k \times 6k}{3k + 6k} = 2k$$

$$R_2 + R_3 = 1k + 2k = 3k$$

$$R_1 // R_{234} = \frac{2k \times 3k}{2k + 3k} = 1.5k = R_T$$

$$IV) \frac{15}{1.5k} = 10mA = I_T \left(\frac{V}{R_T} \right)$$

$$I) I_1 = \frac{10mA}{2} = 5mA$$

$$II) I_2 = I_T - I_1 = 10mA - 5mA = 5mA$$

$$III) I_3 = \frac{I_2 \times R_4}{R_3 + R_4} = \frac{5mA \times 6k}{3k + 6k} = 3.34mA$$

$$V) Power = I_3 \times V = (0.00334A \times 15V) = 0.15W$$

*)

III)

II)

I)

IV)

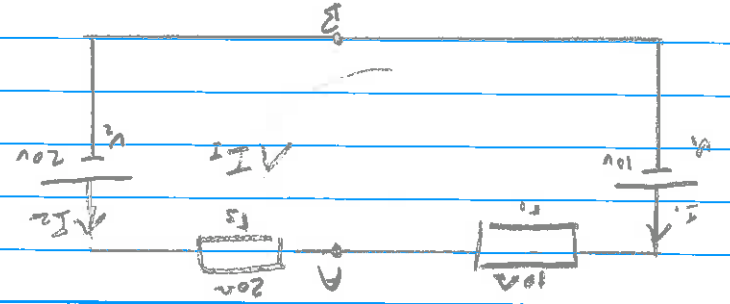
VI)

b)

a)

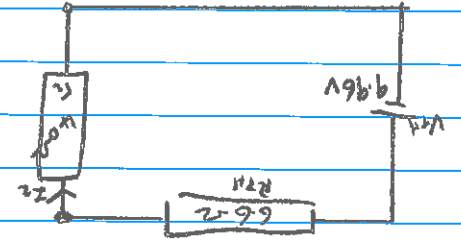
3)

d)



~~$$I_1 = \frac{10V}{10\Omega + 20\Omega} = 0.333A$$~~
~~$$I_2 = \frac{10V}{10\Omega + 20\Omega} = 0.333A$$~~
~~$$I_3 = \frac{10V}{10\Omega + 20\Omega} = 0.333A$$~~

~~$$R_{TH} = r_1 // r_2 = \frac{10 \times 20}{10 + 20} = 6.6\Omega$$~~
~~$$I_{TH} = \frac{V_2 - V_1}{R_{TH}} = \frac{20 - 10}{6.6} = 1.51A$$~~
~~$$V_H = R_{TH} \times I_{TH} = 6.6 \times 1.51 = 9.966V$$~~



$$I_2 = \frac{9.96}{6.6 + 40} = 0.2137mA$$

15
/ 50P

2

1

~~Find the average power
over one cycle of a periodic waveform
over many cycles or over a long time
period the average power is~~

~~$P_{avg} = 50 \sin(3142t) \text{ V}$~~

~~$P_{avg} = 50 \sin(3142t) \text{ V}$~~

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~~$P_{avg} = 50 \sin(3142t) \text{ V}$~~

4)

i) Electromotive force is the potential energy
to push a current. In electrical terms, this is
usually Voltage (V) pushes in current (amps)

ii)

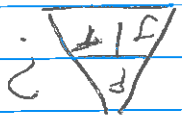
20 V 4C

$$20V \times 4C = 80J$$



iii)

$$80J \times 10s = 800J$$



2

1

