



# Engineering Systems

Student: \_\_\_\_\_

Target Grade:

Predicted Grade:

R113 Mock - November (2018) grade:

R114 – coursework score /60:

## Key Dates

Exam Date: 10<sup>th</sup> Jan PM

R113 – 25%

Results for R113 & R114 7<sup>th</sup> March 2019

summer / retake 24<sup>th</sup> May 2019

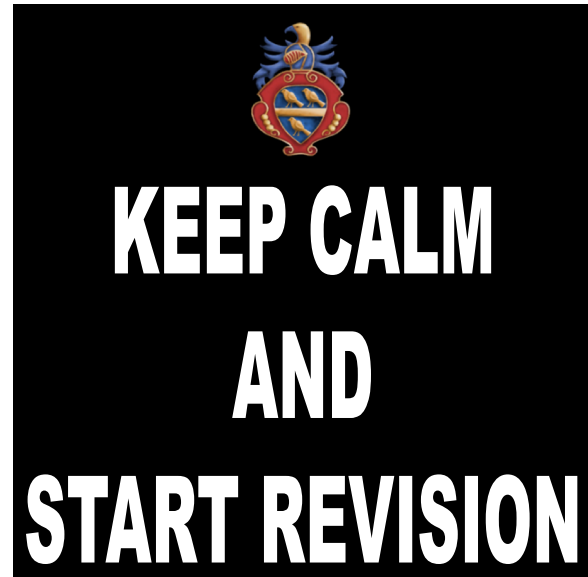
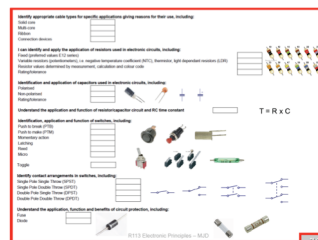
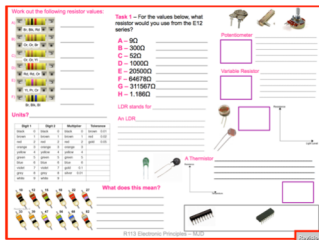
### Extra support available

Additional support is available on request Monday Evenings from 3:30 – 5pm with Mr. Doherty (D7)

Private comments sent on Google Classroom will be answered at our earliest convenience to help support students NEA assessment away from school. Students can also access their NEA (coursework) at home via 'classroom' and they have access to the revision booklet (theory, past papers etc.)

All students have been removed from timetable periods 1-3 on Thursday 10<sup>th</sup> January 2019 for a revision session.

Revision guide / resources / clips – This has been sent via google classroom to support your studies



## Engineering Systems - Revision Programme 2018

Week start	Topic	Revision tasks	Revision Guide Pages
5.11.18	Identification, application and function of switches	<b>Be able to recognise and give uses for:</b> push to break (PTB), push to make (PTM), momentary action, latching, Single Pole Single Throw (SPST), Single Pole Double Throw (SPDT), Double Pole Single Throw (DPST), Double Pole Double Throw (DPDT), reed, micro, toggle	7
12.11.18	Identification, function and application of input devices	<b>Be able to recognise and give uses for:</b> photodiode, phototransistor, LDR, NTC thermistor, switch, moisture sensor, microphone, pressure switch, 'touch screen'	9
19.11.18	Identification, function and application of process devices	<b>Be able to recognise and give uses for:</b> semi-conductors - diodes, NPN transistors, single transistor as amplifier or switch, Darlington Pair, transistor arrays, integrated circuits, operational amplifiers, monostable, astable, bistable circuit Logic gates – AND, OR, NAND, NOR, NOT, XOR - application of logic gates / truth tables single digit counter	8,11,15,23,12,13
26.11.18	Identification, function and application of output devices	<b>Be able to recognise and give uses for:</b> Piezo-electric buzzers/sounders, Lamps, Light Emitting Diode (LED), LED 7 segment display, Liquid Crystal Display (LCD display module), Solenoid, Relays Application and function of DC electric motor control - forward and reverse motor	14, 15
26.11.18	Circuit components, symbols and diagrams	Interpretation of simple circuit schematic diagrams	1,3,5
3.12.18	Types of power sources available	Battery, solar, mains & combined	8
	Reasons for selection of suitable power sources	Portable – battery, Sustainable – solar, Continuous - mains Function and application of voltage regulators in power supply circuits	
3.12.18	Application, function of circuit protection	Fuse & diode	8
3.12.18	Identification and application of resistors used in electronic circuits	Fixed (preferred values E12 series), variable resistors - potentiometers , thermistor, LDR Resistor values determined by measurement, calculation and colour code Rating/tolerance	4,9
3.12.18	Identification and application of capacitors	Types of capacitor – polarised, non-polarised, rating/tolerance	5
10.12.18	Principles, units and measurement	Current (amps), Electro Motive Force (EMF), Induction/back EMF (henry), Potential difference (volts), Resistance (ohms), Capacitance (farads), Power and energy (watts), Frequency (hertz)	1,22
10.12.18	Values for voltage, current, resistance and power	Ohm's Law ( $V=IR$ ) and Power law ( $P=IV$ , $P=I^2R$ ) - calculations	3
10.12.18	Series and parallel circuits	Uses of series and parallel circuits - calculation of resistance within series and parallel circuits	3,5
10.12.18	The operation of a potential divider	Calculation of component values for potential divider circuits & calculation of output voltage from a potential divider circuit	10
17.12.18	Cable types & applications	Solid core, Multi-core, Ribbon, Connection devices	20
17.12.18	Systems approach	Open and closed loop, Input, process, output, feedback, System block diagrams	21
17.12.18	Identification of smart and modern materials	Quantum tunneling composite (QTC) & Shape memory alloys (SMA)	21
24.12.18	Techniques to identify potential electrical hazards	Visual inspection of equipment, Portable appliance testing (PAT compliance ), Use of residual current device (RCD)	16,17
24.12.18	Fault- finding procedures	Visual inspection, The half split method of fault location, Testing, - truth tables & expected values	17,18
24.12.18	Appropriate test equipment	Power supply unit, Multimeter for voltage, current, resistance and continuity, Logic probe for logic levels, Signal generator and oscilloscope (i.e. virtual and physical)	17,18
31.12.18	Commercial circuit construction methods	Discrete, through hole and surface mount components - Benefits and drawbacks to the manufacturer of using surface mount components and using alternatives	18
31.12.18	The manufacturing processes used within commercial circuit construction	Flow solder process (wave soldering), Pick and place robot, Manual component placement	19
31.12.18	Quality assurance methods used during commercial printed circuit board	Automatic test, Visual inspection	19