Practical Maths for Electrical Installation Students & Apprentices

Full 10 Unit Assessment Pack - Questions Only

Student copy. This document contains assessment questions only. Answers are held in the separate lecturer answer document.

Assessment structure: 10 unit assessments plus one final mixed assessment.

Unit 1: Basic Operations

Instructions: Answer all questions. Show working where appropriate. Calculators may be used where permitted by your centre.

Q	Question	My Answer	Possible Marks	Actual Marks
1	Calculate the total connected load: 120 W + 250 W + 330 W.		1	
2	A circuit has three loads: 450 W, 800 W and 1,250 W. Calculate the total load.		1	
3	A 100 m drum of cable is cut into 4 equal lengths. How long is each length?		1	
4	Calculate: (15 + 5) x 3.		1	
5	Calculate: 96 divided by 8.		1	
6	An electrician uses 18 m of cable on one job and 27 m on another. How much cable is used in total?		1	
7	A circuit draws 10 A at 230 V. Calculate power using P = V x I.		2	
8	Five identical luminaires each use 36 W. Calculate the total wattage.		1	
9	A pack contains 200 clips. If 46 are used, how many remain?		1	
10	A job takes 7.5 hours on Monday and 6.25 hours on Tuesday. Calculate the total time worked.		1	
			Total Marks	

Working:

Unit 2: Fractions

Instructions: Answer all questions. Show working where appropriate. Calculators may be used where permitted by your centre.

Q	Question	My Answer	Possible Marks	Actual Marks
1	Calculate: 1/2 + 1/4.		1	
2	Calculate: 3/4 - 1/8.		1	
3	Simplify 6/8.		1	
4	A cable tray is 12 m long. 1/3 of it has been installed. How many metres have been installed?		2	
5	A job requires 3/4 of a 20 m length of conduit. How many metres are required?		2	
6	Convert 1/2 to a decimal.		1	
7	Calculate: 2/3 x 9.		1	
8	A learner completes 5/8 of a worksheet. What fraction is left?		1	
9	Calculate: 1/2 + 1/3.		2	
10	A cable run is split into 1/4, 1/4 and 1/2 sections. What fraction of the run is this altogether?		1	
			Total	

Working:

Unit 3: Decimals

Instructions: Answer all questions. Show working where appropriate. Calculators may be used where permitted by your centre. Enter your answer in the table below.

Q	Question	My Answer	Possible Marks	Actual Marks
1	Calculate: 0.75 + 0.25.		1	
2	Calculate: 5.6 - 2.35.		1	
3	Calculate: 2.5 x 4.		1	
4	Calculate: 6.6 divided by 2.		1	
5	Round 4.567 to 2 decimal places.		1	
6	A cable length is 12.75 m and another is 8.5 m. Calculate the total length.		1	
7	A voltage reading is 229.6 V. Round this to the nearest whole volt.		1	
8	Convert 0.5 to a fraction in its simplest form.		1	
9	A job takes 3.25 hours. Another task takes 1.75 hours. What is the combined time?		1	
10	A box contains 2.4 kg of fixings. If 0.65 kg is used, how much remains?		1	
			Total	

Working:

Unit 4: Percentages

Instructions: Answer all questions. Show working where appropriate. Calculators may be used where permitted by your centre.

Q	Question	My Answer	Possible Marks	Actual Marks
1	Calculate 25% of 80.		1	
2	Calculate 10% of 200 W.		1	
3	Increase 100 by 15%.		1	
4	Decrease 50 by 20%.		1	
5	A lighting circuit load is 500 W. If 10% is added as allowance, what is the new load?		2	
6	A tool costs GBP 120. It is reduced by 25%. What is the sale price?		2	
7	A learner scores 18 out of 20. What percentage is this?		2	
8	A load increases from 80 W to 100 W. What is the percentage increase?		2	
9	Find 5% of 300.		1	
10	A circuit has 90% efficiency from an input of 600 W. What is the useful output?		2	
			Total	

Working:

Unit 5: Ratios

Instructions: Answer all questions. Show working where appropriate. Calculators may be used where permitted by your centre.

Q	Question	My Answer	Possible Marks	Actual Marks
1	Simplify the ratio 10:20.		1	
2	Simplify the ratio 8:12.		1	
3	Divide 30 in the ratio 1:2.		2	
4	Divide 40 in the ratio 3:1.		2	
5	A job uses 2 parts trunking to 3 parts conduit. If there are 50 parts in total, how many are trunking?		2	
6	Split GBP 60 in the ratio 2:1.		2	
7	A cable run is shared in the ratio 4:1. If the total is 100 m, find both lengths.		2	
8	Write 15:5 in its simplest form.		1	
9	A drawing scale is 1:50. What real length is represented by 2 m on the drawing?		2	
10	Divide 20 in the ratio 1:3.		2	
			Total	

Working:

Unit 6: Powers and Indices

Instructions: Answer all questions. Show working where appropriate. Calculators may be used where permitted by your centre.

Q	Question	My Answer	Possible Marks	Actual Marks
1	Calculate 2^3.		1	
2	Calculate 5^2.		1	
3	Calculate 10^3.		1	
4	Calculate 4^2.		1	
5	Calculate 2^4.		1	
6	Calculate I^2 when I = 6 A.		1	
7	Use P = I^2R to calculate P when I = 4 A and R = 5 ohms.		2	
8	Calculate 3^3.		1	
9	Calculate the square root of 81.		1	
10	Use P = I^2R to calculate R when P = 200 W and I = 10 A.		2	

Working:

Unit 7: SI Units

Instructions: Answer all questions. Show working where appropriate. Calculators may be used where permitted by your centre.

Q	Question	My Answer	Possible Marks	Actual Marks
1	Convert 1 kW to W.		1	
2	Convert 2.5 kW to W.		1	
3	Convert 5000 mA to A.		1	
4	Convert 0.75 kV to V.		1	
5	Convert 2500 mm to m.		1	
6	Convert 2000 W to kW.		1	
7	Convert 0.5 kg to g.		1	
8	Convert 3 MW to W.		1	
9	A current is 0.8 A. Convert this to mA.		1	
10	A cable length is 0.012 km. Convert this to metres.		1	
			Total	

Working:

Unit 8: Algebra

Instructions: Answer all questions. Show working where appropriate. Calculators may be used where permitted by your centre.

Q	Question	My Answer	Possible Marks	Actual Marks
1	Solve: x + 5 = 10.		1	
2	Solve: 2x = 14.		1	
3	Solve: x - 3 = 7.		1	
4	Solve: x/2 = 6.		1	
5	Solve: 2x + 4 = 10.		2	
6	If V = 230 and I = 5, calculate P from P = V x I.		2	
7	If P = 1,000 and V = 250, calculate I from I = P/V.		2	
8	Solve: 4x = 36.		1	
9	Solve: x + 8 = 20.		1	
10	A job cost is given by C = 35h + 50. Calculate C when h = 4.		2	
			Total	

Working:

Unit 9: Transposition of Formulae

Instructions: Answer all questions. Show working where appropriate. Calculators may be used where permitted by your centre.

Q	Question	My Answer	Possible Marks	Actual Marks
1	Rearrange V = IR to make I the subject.		1	
2	Rearrange V = IR to make R the subject.		1	
3	Rearrange P = VI to make I the subject.		1	
4	Rearrange P = VI to make V the subject.		1	
5	Rearrange P = I^2R to make R the subject.		2	
6	Rearrange d = vt to make t the subject.		1	
7	Rearrange Q = It to make I the subject.		1	
8	Rearrange A = l x w to make w the subject.		1	
9	Rearrange y = mx + c to make x the subject.		2	
10	Rearrange P = I^2R to make I the subject.		2	
			Total	

Working:

Unit 10: Trigonometry and Pythagoras

Instructions: Answer all questions. Show working where appropriate. Calculators may be used where permitted by your centre.

Q	Question	My Answer	Possible Marks	Actual Marks
1	Use Pythagoras to find the hypotenuse when the shorter sides are 3 m and 4 m.		2	
2	Use Pythagoras to find the hypotenuse when the shorter sides are 6 m and 8 m.		2	
3	Use Pythagoras to find the missing side when the hypotenuse is 13 m and one side is 5 m.		2	
4	Find sin 30 deg.		1	
5	Find cos 60 deg.		1	
6	Find tan 45 deg.		1	
7	A ladder is 5 m long and reaches 4 m up a wall. Find the angle to the ground, to the nearest degree.		2	
8	A cable tray rises 2 m over a horizontal distance of 5 m. Find the angle of rise to the nearest degree.		2	
9	Use tan 45 deg to find the height when the horizontal distance is 5 m.		2	
10	A diagonal cable route has horizontal and vertical distances of 9 m and 12 m. Find the diagonal length.		2	

Working:

Final Mixed Assessment - All Units

Instructions: Answer all questions. Show working where appropriate. Calculators may be used where permitted by your centre.

Q	Question	My Answer	Possible Marks	Actual Marks
1	Calculate the total load: 600 W + 750 W + 1,150 W.		1	
2	A 90 m cable is split equally into 3 runs. How long is each run?		1	
3	Calculate: (18 + 12) x 4.		1	
4	Calculate: 1/2 + 1/4.		1	
5	A 24 m conduit length is cut to use 3/4 of it. How many metres are used?		2	
6	Calculate: 0.75 + 1.25.		1	
7	Round 12.678 to 2 decimal places.		1	
8	Calculate 20% of 150.		1	
9	Increase 230 by 10%.		1	
10	A learner scores 21 out of 25. What percentage is this?		2	
11	Simplify 12:18.		1	
12	Divide 60 in the ratio 2:3.		2	
13	Calculate 3^3.		1	
14	Use P = I^2R to find P when I = 5 A and R = 4 ohms.		2	
15	Convert 1.5 kW to W.		1	
16	Convert 2500 mA to A.		1	
17	Solve: 3x = 21.		1	
18	Solve: 2x + 6 = 18.		2	
19	Calculate power when V = 230 V and I = 8 A.		2	

Q	Question	My Answer	Possible Marks	Actual Marks
20	Rearrange V = IR to make I the subject.		1	
21	Rearrange P = VI to make V the subject.		1	
22	Rearrange P = I^2R to make R the subject.		2	
23	Find the hypotenuse when the shorter sides are 9 m and 12 m.		2	
24	Find tan 45 deg.		1	
25	A ladder is 10 m long and reaches 8 m up a wall. Find the angle to the ground to the nearest degree.		2	

Working: