

	Hard Fail	Soft Fail	Fair	Adequate	Good	Very Good	Excellent	Outstanding
<b>Introduction: background, filter types, advantages, and disadvantages.</b>  <b>15%</b>	No attempt, or one with no correct advantages / disadvantages.	Fails to meet the standards described in the next category.	Description of filter advantages/ disadvantages is unclear or difficult to follow, or there are notable points missing, or is just a list of features with minimal discussion. Some examples of real applications presented.	Description of filter advantages/ disadvantages is somewhat unclear or difficult to follow, or there are some key points missing, or is just a list of features with some discussion. Some examples of real applications discussed.	Filter advantages/ disadvantages description is generally complete and can be followed without much difficulty, with a good discussion. Some examples of real applications discussed with references.	Filter advantages/ disadvantages description is largely complete and can be followed without much difficulty, with a good discussion. Good number of examples of real applications presented, discussed, and referenced.	An excellent description of the advantages and disadvantages of the three filter types. Covers all of the key points clearly and well discussed with reference to performance characteristics. Extensive number of examples of real applications presented with justification of benefit of that particular filter, including a range of references.	An outstanding description of the advantages and disadvantages of the three filter types. Covers all the key points in a clear and concise manner. Explains why the performance characteristics are important (i.e. analysis rather than just presenting the features). Extensive number of examples of real applications presented with justification of benefit of that particular filter, with a selection of good reference sources.

<b>Filter circuit design calculations and description.</b>  <b>35%</b>	No attempt or use of incorrect design formulae.	Fails to meet the standards described in the next category.	Calculations are presented without explanation, or without working; or unusual choice of component values. Design largely meets the specification.	Calculations are presented with limited explanation, or incomplete working; or unusual choice of component values with some explanation. Design largely meets the specification.	Calculations and working are largely complete, but some steps are not covered or are not clear. Reasonable component values are used. Design largely meets specification.	Calculations and working are largely complete and clear, but some steps are not covered in necessary detail. Reasonable component values are used. Design largely meets specification.	Calculations and explanations are very detailed, show the equations being used and have full working out. Explanations are clear and demonstrate understanding of the design process in relation to the requirements. Reasonable component values are used and have justification for the choices made. Design meets specification.	Calculations and explanations are very detailed, show the equations being used and have full working out. Explanations are clear and demonstrate understanding of the design process in relation to the requirements and performance. Reasonable component values are used and have justification for the choices made. Design meets specification.
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<b>Results: Simulation results</b>  <b>25%</b>	No attempt or clearly incorrect results.	Fails to meet the standards described in the next category.	Simulation results are present and labelled, but are not discussed, or some simulation results are missing.	Simulation results are present and labelled, but are not discussed in a clear fashion.	Simulation results are largely complete, well labelled, and are discussed, but some minor elements are missing; or has some parts missing. Analysis of low frequency results is inadequate.	Simulation results are largely complete, well labelled with suitable axis range, and are discussed, but discussion or analysis of the results is not clear in places. Analysis of low frequency results is adequate.	Most simulation results clearly highlight the performance of the circuits and are well presented. The output of the simulations are discussed and compared to the expected behaviour.	Most simulation results clearly highlight the performance of the circuits and are well presented. The output of the simulations are discussed and compared, in detail, to the expected behaviour.
<b>Schematic design in LTSpice</b>  <b>5%</b>	No attempt or all are incomplete; or all fail to simulate.	Fails to meet the standards described in the next category.	Schematic layouts are messy and difficult to read; more than one schematic is not present; or more than one schematic does not simulate.	Schematic layouts are messy and difficult to read; or at most one of the schematics is not present; or at most one of the schematics does not simulate.	Schematic layouts are generally clear but could have been presented in a way that is much clearer to the reader.	Schematic layouts are largely clear but may have some elements that are messy, such as upside down voltage sources.	Schematics are tidy and are presented in a format that is familiar to electronic engineers.	Schematics are presented in a professional format for electronic engineers, with key nets labelled.

<b>Discussion:</b> <b>discussion points</b> <b>(high cut-off</b> <b>frequency,</b> <b>amplification,</b> <b>results of</b> <b>changing to E24,</b> <b>tolerance) and</b> <b>your reflection</b>  <b>10%</b>	No attempt; or values not from E24 series; or combination of parts to achieve a value.	Fails to meet the standards described in the next category.	Discussion points are largely missing. Little or no analysis attempted.	Discussion points are largely unclear or unjustified. Some analysis attempted.	Discussion points are largely clear but fail to justify some points. Some analysis of points.	All discussion points covered and are largely clear but have a small point missing. Good analysis of points.	All discussion points covered with most discussion points covered comprehensively in an intelligent manner, with analysis.	All discussion points are covered comprehensively in an intelligent manner, with extensive analysis.
	<b>Hard Fail</b>	<b>Soft Fail</b>	<b>Fair</b>	<b>Adequate</b>	<b>Good</b>	<b>Very Good</b>	<b>Excellent</b>	<b>Outstanding</b>

<p><b>Clarity of language and overall presentation: Logically written text; grammar, spelling, clear communication of ideas; legible and relevant figures, consistent figure numbering and captions; quality of document</b></p> <p><b>10%</b></p>	No attempt or complete lack of structure.	Fails to meet the standards described in the next category.	Ideas difficult to follow with little or no use of illustration. Spelling and grammar contain a large number of mistakes. There is only very limited text.	Ideas difficult to follow. Spelling and grammar contain a large number of mistakes; Figures are of poor quality, with inappropriate scaling, or text that is too small. It may be unclear what message diagrams convey.	Text written in students own words is reasonably clear. Some effort is required to follow ideas. Clear use of diagrams and figures. Largely correct grammar and use of language. Document of around appropriate length. Most diagrams clear. Most diagrams are referenced appropriately.	Text written in students own words is clear. Ideas easy to follow without difficulties. Clear use of diagrams and figures. Largely correct grammar and use of language. Document of around appropriate length. Most diagrams clear. All diagrams are referenced appropriately. Most figures and diagrams are cross-referenced in text.	Complex ideas are logically developed and clearly explained. Document makes good use of space and material is structured well. Well-balanced sections. Excellent use of diagrams. All diagrams are referenced appropriately. All figures and diagrams are cross-referenced in text.	Complex ideas are logically developed and clearly explained. Clear, concise and correct use of language. Document makes good use of space and material is structured well. Well-balanced sections and figures cross-referenced in text. Excellent use of diagrams showing the data in an accessible form for the reader. All diagrams are referenced appropriately.
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