**Structure of the exam paper:**

* The paper is 2 hours duration
* The exam is 50% of total marks
* There are three sections in the exam:
* **Section A:** Core technical principles (20 marks) - consists of multiple choice and short answer questions examining the core technical principles
* **Section B:** Specialist technical principles (30 marks) - consists of longer response questions that assess the specialist technical principles.
* **Section C:** Designing and making principles (50 marks) - consists of questions that assess the designing and making principles.

Top Tips

1. Start your revision early. There is no substitute for starting early with revision.
2. Organise your study time. You will almost certainly find some subjects easier than others.
3. Look after yourself during study and exam time. You will be able to work better if you eat a healthy.
4. Vary your revision techniques. They say that variety is the spice of life.

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| Revision list Section A (the page numbers are for the blue book) : Core technical principles  |
| New and emerging technologies  | * Industry – Design/organisation of the workplace ie. automation and the use of robotics. **Pages 2 & 3**
* Enterprise – Crowdfunding, co-operatives, virtual marketing and fair trade. **Pages 10 & 11**
* Sustainability – Finite resource, non-finite resource, ecological + social footprint of materials, Disposal of waste. **Pages 6 to 9, 35, 102 & 103**
* People - Technology push and market pull, Culture (fashion), Society and Environment issues with new technologies, designing for disabled/elderly/different religious groups. **Pages 6 to 11, 2 & 3**, 96 & 97
* Production techniques and systems – CAD/CAM, FMS, CNC, JIT, lean manufacturing. **Pages 4 & 5, 8, 3**
* Critical evaluation of emerging technologies – planned obsolescence, design for maintenance, ethics, environment and end of life disposal. **Pages 6 to 8**
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| Energy generation and storage  | * Fossil fuels – Coal, natural gas and oil – how is power generated and arguments for and against. **Page 12**
* Nuclear power – how is power generated and arguments for and against. **Page 12**
* Renewable energy – wind, solar, tidal, water (hydroelectricity), wave and biomass – how does it work and arguments for and against. **Pages 12 & 13**
* Energy storage systems – kinetic pump storage systems, mechanical energy storage, electrical energy storage. **Page 13**
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| Developments in new materials  | * Modern materials – Graphene, metal foam, titanium, coated metals, LCD, nanomaterials, Teflon, Corn starch polymers. **Page 32**
* Smart materials – Thermo-chromic pigments, Shape memory alloys, photochromic pigments. **Page33**
* Composites – Concrete, GRP, CRP. **Page 33**
* Technical textiles – conductive fabrics, fire-resistant fabrics, Kevlar, gore-tex, microfibers. **Page 33**
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| Systems approach to designing  | * Systems approach – Input, process, output. **Pages 24 to 27**
* Input devices – LDR, thermistor, switches and pressure sensors. **Page 25**
* Processes – microcontrollers. **Pages 26 & 27**
* Outputs - Lamps and LEDs, buzzers and speakers. **Page 27**
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| Mechanical devices  | * Types of movement – linear, reciprocating, rotary, oscillating. **Page 28**
* Changing magnitude and direction – levers, linkages, rotary systems, pulleys and gears. **Pages 28 to 31**
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| Materials and their working properties  | * Paper and boards – properties and uses. Paper – Bleed proof, cartridge paper, grid, layout paper and tracing paper. Boards – corrugated card, duplex board, foil-lined board, foam core board, inkjet card, solid white board. **Page 16**
* Natural and manufactured timbers – Properties and uses. **Page 17** - Hardwoods – Ash, beech, mahogany, oak, balsa - Softwoods – Larch, Pine, Spruce - Manufactured boards – MDF, plywood, chipboard. **Pages 23, 44**
* Metals and alloys – Properties and uses. **Page 18** - Ferrous metals – Cast iron, Low carbon steel, high carbon steel - Non-ferrous metals – Aluminium, copper, zinc, tin - Alloys – Brass, stainless steel, high speed steel
* Polymers – Properties and uses. **Page 19** - Thermoforming polymers – Acrylic, HIPS, HDPE,PP, PVC, PET - Thermosetting polymers – epoxy resin, MF, PF, polyester resin, UF - Polymer additives
* Textiles. **Pages 20 to 23** - Natural fibres – cotton , wool silk - Synthetic fibres – Polyester, polymide (nylon), Elastane - Blended and mixed fibres - Woven fabrics - Non woven fabrics – bonded, felted - Knitted textiles – Weft knit fabrics, warp knit fabrics
* Material properties. **Pages 14 & 15** - Physical properties – Fusibility, electrical conductivity, thermal conductivity, resistance to moisture, absorbency - Mechanical properties – Strength, hardness, density, toughness, malleability, ductility, elasticity
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