

國立臺灣科技大學 109 年度產業碩士專班招生(秋)試題

班 別：3D 列印
科 目：3D 列印英文

(總分為 100 分)

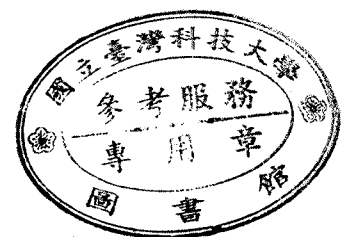
不得使用計算器

1. **Technical Words Translation (20%).** Please translate the following technical words into Chinese. (2% each).

- (1) 3D Printing Technology: _____ ◦
- (2) Rapid Prototyping: _____ ◦
- (3) Direct Manufacturing Technology: _____ ◦
- (4) Stereolithography Technology: _____ ◦
- (5) Fused Deposition Modeling: _____ ◦
- (6) Selective Laser Melting: _____ ◦
- (7) Selective Laser Sintering: _____ ◦
- (8) Supporting Structure: _____ ◦
- (9) Slicing Operation: _____ ◦
- (10) Lattice Design: _____ ◦

2. **Translation (80%).** Please translate the following paragraph into English. (請將以下翻譯成中文)

- (1) 3D printing is also known as desktop fabrication or additive manufacturing, it can form any material that can be obtained as a powder. For creating an object, first you will need a digital 3D-model. You can scan a set of 3D images, or draw it using computer-assisted design or CAD software. You can also download them from internet. The digital 3D-model is usually saved in STL format and then sent to the printer. The printing process then "print" a three-dimensional object layer-by-layer with equipment, which is similar with ink-jet printing process. (20%)
- (2) Generally speaking, printing time for an individual model or an assembly depends on printer's printing speed, part size, layer thickness and build orientation. Regardless of the printing processes, in general, the larger the object's height in the lay-up direction, the longer it takes to print. Therefore, given the print speed and object size, in order to reduce the build time, it is necessary to make the overall built height low. (20%)
- (3) Vat photo polymerization method has attractive attributes of creating objects with a high-quality surface finish, dimensional accuracy, and a variety of material options. The working principle of an VP process is to solidify each layer of photopolymer liquid resin with light energy applied. The parts are produced in line by line or layer by layer fashion. The material distribution is homogeneous in a layer, but changes along the build direction. It is challenging to attain heterogeneous material compositions within intralayer. (20%)



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- (4) Printed objects with built-in support material require post-processing operations that separate them. The methods and ease of removal vary by printing methods and build materials. If the support material is water-soluble, it can be washed away by a lye bath with gentle scrubbing. Non-soluble support materials require breaking and peeling away from the model using pliers or conventional cutting tools. In order to further ensure a smooth surface finish, printed parts often need to be polished using sanding or vapor smoothing. (20%)

