IB DIPLOMA PROGRAMME
PROGRAMME DU DIPLÔME DU BI
PROGRAMA DEL DIPLOMA DEL BI

DESIGN TECHNOLOGY
STANDARD LEVEL
PAPER 1

Wednesday 14 May 2003 (afternoon)

45 minutes

INSTRUCTIONS TO CANDIDATES

- Do not open this examination paper until instructed to do so.
- Answer all the questions.
- For each question, choose the answer you consider to be the best and indicate your choice on the answer sheet provided.

1. What is defined as “a set of precise limits for the complete range of performance requirements for the design of a product”?

A. The brief

B. The specification

C. Radical design

D. The research

2. At which stage of the IB simple design loop does convergent thinking predominate?

A. Identifying the problem and the brief

B. Developing the chosen solution

C. Generating ideas

D. Researching and specifications

3. What defines “incremental design”?

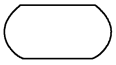
A. A sequence of instructions to describe a set of actions.

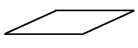
B. A completely new product is devised by going to the root of the problem.

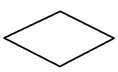
C. Small changes to the design which appear trivial but the cumulative effect is very significant.

D. Designing in stages from problem to completion.

4. Which symbol represents a start or stop action in a flow chart?

A. 

B. 

C. 

D. 

5. What happens during the "planning and realizing the chosen solution" stage of the IB simple design cycle?

A. A final concept is developed to meet the specification.

B. Detail drawings, material lists and costings are determined.

C. The outcome is tested and evaluated against the specification.

D. Divergent thinking is used to consider ways to solve the problem.

6. From where does the solution to a problem come in the approach to generating ideas termed "adaptation"?

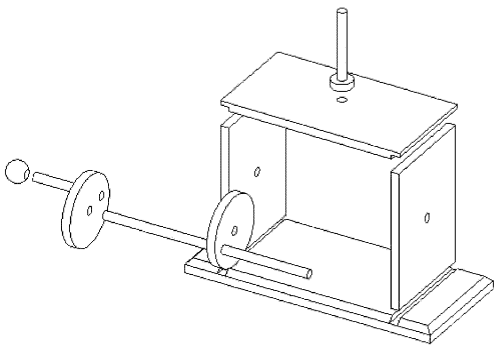
A. Dissatisfaction with an existing solution

B. An existing solution

C. Brainstorming

D. A similar situation

7. What type of drawing is shown below?



A. Freehand drawing

B. Perspective drawing

C. Exploded isometric drawing

D. Orthographic drawing

8. What is described as “body measurements, particularly size, strength and physical capacity”?

A. Anthropometrics

B. Ergonomics

C. Fuzzy logic

D. Control systems

9. Which criteria are used to evaluate products?

I. Performance

II. Ease of use

III. Construction and cost

A. I and II

B. II and III

C. I and III

D. I, II and III

10. What effect does fashion have on the manufacture of products?

A. Shortens product life cycle

B. Leads to less material being used

C. Uses less energy

D. Produces less waste

11. What is the most efficient way of designing and producing a product from a manufacturer’s point of view?

A. Value for money

B. Cost-effectiveness

C. Break-even point

D. Material costs

12. What puts legislative constraint on a designer?

A. Production methods

B. Consumer choice

C. Local and national requirements

D. Material standards

13. In which design context is material density an important consideration?

A. Electrical insulation

B. Wooden toys

C. Winter clothing

D. Food packaging

14. What material has very high electrical resistivity, very low thermal conductivity, very low thermal expansivity and is very hard?

A. Ceramic

B. Plastic

C. Textile

D. Food

15. What mechanical property of a material is its ability to resist the propagation of cracks?

A. Stiffness

B. Toughness

C. Hardness

D. Ductility

16. What manufacturing technique would be most suitable to join two pieces of a waterproof jacket?

A. Fasteners

B. Stitching

C. Adhesives

D. Machining

17. What is “the fusing of solid particles together by heat and pressure without completely liquefying the particles”?

A. Sintering

B. Welding

C. Injection moulding

D. Laminating

18. What technique is used to convert a tree into useful timber?

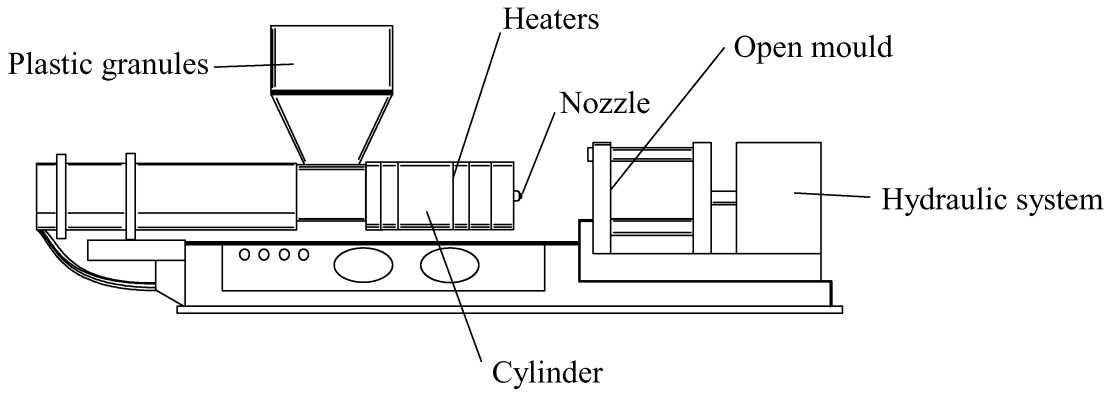
A. Extrusion

B. Cutting and machining

C. Sintering

D. Moulding

19. What manufacturing technique could the machine below be used for?



A. Casting

B. Sintering

C. Laminating

D. Injection moulding

20. Which are “fixed costs”?

A. Distribution costs

B. Energy costs

C. Machinery costs

D. Material costs

21. What type of production needs pre-processed materials and interchangeable parts delivered to a flow line?

A. Craft production

B. Assembly line production

C. Mechanization

D. Automation

22. What distinguishes an automated guided vehicle (AGV) from a domestic robot?

A. Guide wires

B. Human control

C. Position sensors

D. Speed control

23. What is in the late stage of its product life-cycle?

A. Ballpoint pen

B. PC

C. Cassette tape

D. Solar panel

24. Which are characteristics of "clean technology"?

I. Manufacturing using large amounts of energy
II. Low resource exploitation
III. Minimize wastage

A. I and II

B. II and III

C. I and III

D. I, II and III

25. What must a manufacturer do to take a "clean technology" approach?

A. Use CFC propellants in aerosols.

B. Use fossil fuels to create power.

C. Increase use of raw materials.

D. Minimize negative impacts on the environment.

26. Which part of the product life is enhanced if a product is made easily repairable?

A. Production

B. Distribution

C. Utilization

D. Disposal

27. Who actively resist talk of environmental protection?

A. Ecowarriors

B. Ecochampions

C. Ecofans

D. Ecophobes

28. What can be easily recycled?

A. Paper

B. Ceramics

C. Thermosets

D. Composites

29. Which design objective for the green design of a product would not be addressed in a life cycle analysis?

A. More effective use of materials

B. Reduction in damage or pollution

C. Reduction in nuisances, *e.g.* noise

D. Removal of safety hazards

30. Which strategy for optimizing resource utilization uses the least energy?

A. Repair

B. Reuse

C. Recycle

D. Recondition