

Design technology
Standard level
Paper 1

Thursday 14 May 2015 (afternoon)

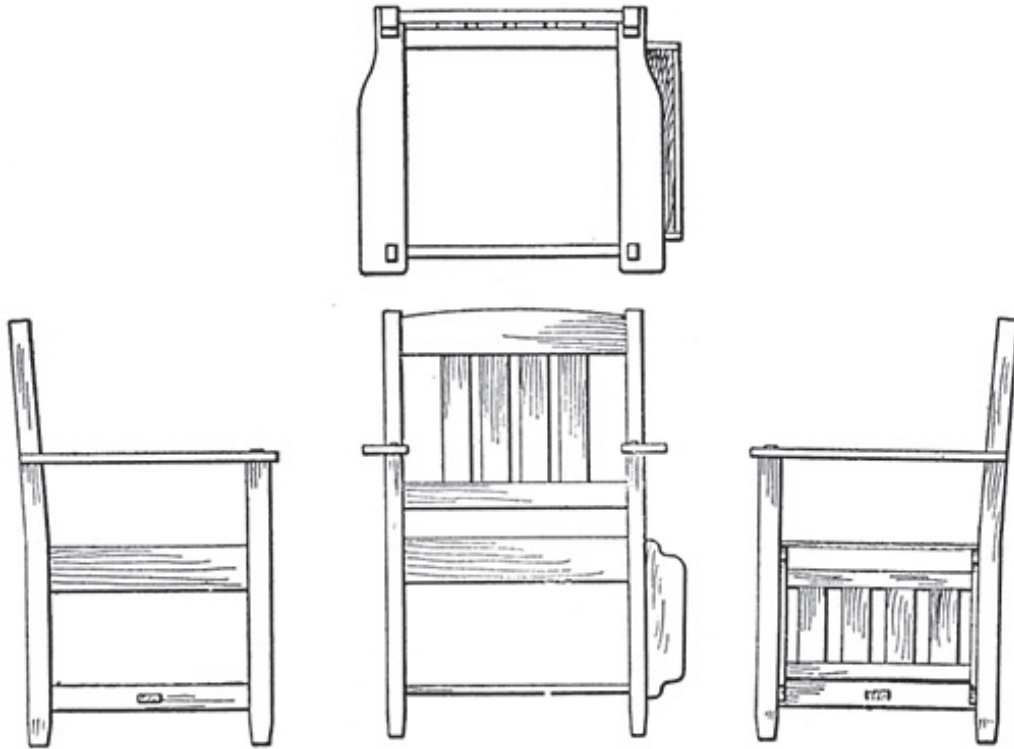
45 minutes

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.
- The maximum mark for this examination paper is **[30 marks]**.

1. **Figure 1** shows a drawing of an armchair.

Figure 1: Drawing of an armchair



[Source: http://etc.usf.edu/clipart/52100/52103/52103_chair_o-p.htm.
Courtesy of the Florida Center for Instructional Technology (FCIT) at USF.]

What type of drawing is shown in **Figure 1**?

- A. Orthographic drawing
 - B. Exploded isometric drawing
 - C. Isometric drawing
 - D. Perspective drawing
2. Which consideration would be part of the criteria rather than part of the constraints in the brief for the design of a flat-pack, self-assembly desk?
- A. Value for money
 - B. Ease of assembly
 - C. Compliance with safety standards
 - D. Transportability

3. What describes the way a designer explores ideas through thought and action in the design cycle?
- A. Linear
 - B. Cyclical
 - C. Sequential
 - D. Iterative
4. What is an ideas-generating technique used to “analyse the important features of a product to identify design opportunities”?
- A. Brainstorming
 - B. Constructive discontent
 - C. Attribute listing
 - D. Morphological synthesis
5. Which model would be **most** appropriate for communicating the design concept for a new shopping centre so that a local authority planning department can collect feedback from local residents?
- A. Scale model
 - B. Surface model
 - C. Wire-frame model
 - D. Mathematical model
6. Which of the following products is in the early stage of its product life cycle?
- A. 4G mobile phone
 - B. CD player
 - C. DVD player
 - D. Video recorder

7. What is defined as a design that “contains those implicit features of a product that are recognised as essential by a majority of manufacturers and purchasers”?
- A. Radical design
 - B. Dominant design
 - C. Product family
 - D. Incremental design
8. Adoption of which strategies would make disassembly of a product more economically viable at the end of its product life?
- I. Minimizing the number of components
 - II. Designing parts for ease of fabrication
 - III. Using standard components and sub-assemblies
- A. I and II
 - B. I and III
 - C. II and III
 - D. I, II and III
9. What is the major obstacle to the recycling of the packaging from products, such as soft drink bottles made of polyethylene terephthalate (PET)?
- A. Collection
 - B. Energy
 - C. Processing
 - D. Redistribution
10. At which stage of the product life cycle does a designer have the most influence?
- A. Pre-production
 - B. Production
 - C. Distribution
 - D. Use

11. Which term describes consumers who enthusiastically seek out environmentally-friendly products?
- A. Eco-warriors
 - B. Eco-champions
 - C. Eco-fans
 - D. Eco-phobes
12. What is described as “the smallest part of a chemical element that can exist”?
- A. Atom
 - B. Molecule
 - C. Alloy
 - D. Composite
13. What is the basis of the IB categorization of materials?
- A. Relative impact on the environment
 - B. Availability of resources
 - C. Material properties
 - D. Traditional and modern materials

14. **Figure 2** shows an oven door manufactured from glass and metal.

Figure 2: An oven door made from glass and metal



[Source: www.rentongglass.com]

Which property would be a major consideration in the selection of materials for the production of the oven door shown in **Figure 2**?

- A. Ductility
 - B. Thermal expansion
 - C. Hardness
 - D. Density
15. Which mechanical property is particularly important in selecting a material for extrusion?
- A. Toughness
 - B. Stiffness
 - C. Tensile strength
 - D. Ductility

16. In which regions do deciduous trees grow?

	Temperate regions	Tropical regions
A.	No	No
B.	No	Yes
C.	Yes	No
D.	Yes	Yes

17. Which type(s) of glass is/are used to minimize the risk of personal injury if shattered?

	Laminated glass	Toughened glass
A.	No	No
B.	No	Yes
C.	Yes	No
D.	Yes	Yes

18. Which bonds in a thermoplastic are affected by elastic deformation?

	Primary bonds	Secondary bonds
A.	No	No
B.	No	Yes
C.	Yes	No
D.	Yes	Yes

19. What term describes a fluid in which the viscosity can be changed by applying an electrical field?

- A. Piezoelectric
- B. Magneto-rheostatic
- C. Electro-rheostatic
- D. Shape memory alloys

20. Which materials cannot be shaped by casting?
- I. Timber
 - II. Food
 - III. Textiles
- A. I and II
 - B. I and III
 - C. II and III
 - D. I, II and III
21. What would be a disadvantage of craft production in automobile manufacturing?
- A. It uses hand tools
 - B. It is an expensive process
 - C. Replacement parts would have to be handcrafted
 - D. The car could be easily customized
22. How is batch production best defined?
- A. A continuous flow of products
 - B. A small number of products
 - C. A set number of products
 - D. A large number of products
23. On which of the following characteristics of a workplace does automation have the **least** effect?
- A. Employment
 - B. Working conditions
 - C. Training
 - D. The working day

- 24.** What is **not** a major consideration for the designer of the interior of a car in relation to the location of the hazard-warning-light control button?
- A. Anthropometric data
 - B. Psychological data
 - C. Physiological data
 - D. Appropriate percentile values
- 25.** Which evaluation strategy would be used at the early stage of the development of an energy-rich snack food?
- A. Taste testing
 - B. Physical modelling
 - C. Market testing
 - D. Experimenting
- 26.** When is product performance most important to consumers?
- I. Before purchase
 - II. Purchase
 - III. Initial use
- A. I and II
 - B. I and III
 - C. II and III
 - D. I, II and III

Questions 27–30 relate to the following case study. Please read the case study carefully and answer the questions.

Figure 3 shows a flat sheet of metal which can be folded into a lamp for use in mobile operating theatres as well as the assembled lamp.

This lamp is used in developing countries. Bulb holders clip onto the folded shape and act as fasteners to hold it in shape during use.

Figure 3: An operating theatre lamp

Removed for copyright reasons
Please go to: <http://www.fastcodesign.com/1668939/a-surgical-light-for-the-developing-world>.

27. At which stage of the life cycle is the flat-pack nature of its design most useful?
- A. Production
 - B. Distribution
 - C. Utilization
 - D. Disposal
28. Which type of drawing of the lamp would be most useful to a person assembling the lamp?
- A. Exploded isometric
 - B. Freehand
 - C. Isometric
 - D. Perspective

29. What is **not** achieved by the bulb holders acting as fasteners?
- A. Design for assembly
 - B. Design for disassembly
 - C. Design for maintenance
 - D. Design for materials
30. Which technique is **not** used in the manufacture of the operating theatre lamp?
- A. Abrading
 - B. Use of fasteners
 - C. Moulding
 - D. Machining
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