



88086201



**DESIGN TECHNOLOGY
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PAPER 1**

Tuesday 11 November 2008 (afternoon)

1 hour

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 the starting point for the design of a new product?
 - A. The specification
 - B. Research
 - C. The brief
 - D. Generating ideas

2. What describes the impact of small changes to products that prove significant over time?
 - A. Convergent thinking
 - B. Radical design
 - C. Constructive discontent
 - D. Incremental design

3. When is convergent thinking used in the simple design cycle?
 - I. Generating ideas
 - II. Analyzing
 - III. Evaluating
 - A. I only
 - B. II only
 - C. I and II only
 - D. I and III only

4. Why are orthographic drawings used in the design process?
- A. To show the inside of a design
 - B. To represent reality
 - C. To communicate details and dimensions of a design to a manufacturer
 - D. To show a design in three dimensions
5. What is the application of scientific information concerning the relationship of human beings to the design of objects, systems and the environment?
- A. Ergonomics
 - B. Anthropometrics
 - C. Ergonome
 - D. Percentile range
6. What prevents the manufacturers of fashion clothing making clothes for very small and very large sizes?
- A. The complexity of the product
 - B. The limitations of the machinery
 - C. The size of the market
 - D. The cost of the materials

7. How does ICT aid in a literature search?
- I. Easier access to information
 - II. Instant response to any e-mails
 - III. Reduced need for travel
 - IV. Access to reliable information
- A. I and II only
- B. I and III only
- C. II and III only
- D. II and IV only
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8. Synthetics are a sub-group of which material group?
- A. Composites
 - B. Textiles
 - C. Food
 - D. Plastics

9. Which properties are important in the selection of a material for injection moulding?

- I. Melting point
 - II. Thermal expansion
 - III. Density
- A. I and II
 - B. II and III
 - C. I and III
 - D. I, II and III

10. Which material group is characterized by very low thermal conductivity?

- A. Ceramics
- B. Textiles
- C. Timber
- D. Food

11. What is a joining process?

- A. Weaving
- B. Cutting
- C. Machining
- D. Stitching

12. In which part of an injection moulding machine does rapid cooling take place?

- A. Ram
- B. Mould
- C. Screw
- D. Ejector

13. What is true of lamination?



[Source: www.somersetarchitect.co.uk]

- A. Complex shapes can be produced.
- B. Any adhesive can be used.
- C. It is easily automated.
- D. A mould is not often required.

14. What characterizes the late stage of the product life cycle?
- A. A product is introduced to market.
 - B. A new market sector is captured.
 - C. A decline in demand and sales.
 - D. A product gains acceptance and sells well.
15. The production of a mould for an injection-moulding machine is an example of
- A. one-off production.
 - B. mass production.
 - C. volume production.
 - D. batch production.
16. Automated Guided Vehicles (AGVs) are coordinated with other aspects of the manufacturing system to ensure
- A. the automation of the process.
 - B. the cost of manufacturing is reduced.
 - C. efficiency in moving components within the factory.
 - D. that the product is of a high quality.
17. Green design is the term used to describe
- A. consideration of the impact a product has on the environment.
 - B. a product made from recycled materials.
 - C. a product which may be used again and again.
 - D. the use of biodegradable materials.

18. What are people who actively demonstrate against developments they consider to be environmentally damaging called?
- A. Ecowarriors
 - B. Ecofans
 - C. Ecochampions
 - D. Ecophobes
19. The collection and distribution of reading glasses in a developed country and their distribution to a developing country is an example of
- A. reuse.
 - B. repair.
 - C. recycle.
 - D. refurbish.
20. What are formal stages within a life cycle analysis?
- I. Pre-production
 - II. Manufacturing
 - III. Utilization
 - IV. Evaluation
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. III and IV only

21. What characterizes coniferous trees?
- A. Leaf fall in winter
 - B. Grow in tropical climates
 - C. Produce softwood timber
 - D. Produce hardwood timber
22. Which manufactured board is produced by lamination?
- A. Particle board
 - B. Softwood
 - C. Plywood
 - D. Chipboard
23. Which statements are true of laminated glass?
- I. It is made by heating glass to its melting point.
 - II. It shatters into tiny fragments when broken.
 - III. It has a thin layer of plastic between the surfaces.
 - IV. It can be made bullet proof.
- A. I and II only
 - B. I and III only
 - C. II and IV only
 - D. III and IV only

24. How does wrought iron differ from pig iron?

	Iron content	Carbon content
A.	Increased	Increased
B.	Decreased	Increased
C.	Decreased	Decreased
D.	Increased	Decreased

25. Which finish would be applied to a mild steel garage door by a homeowner to protect it from the environment?

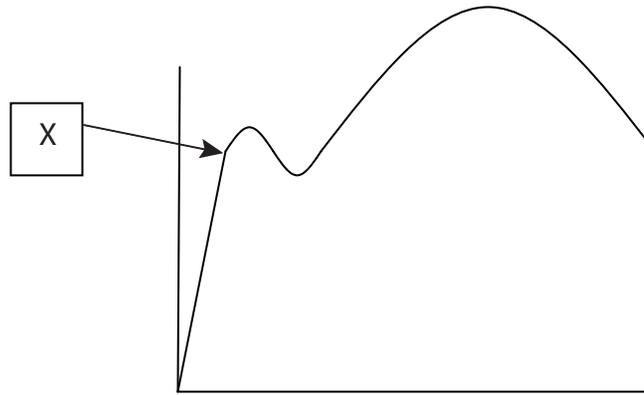


- A. Painting
- B. Enamelling
- C. Plastic coating
- D. Galvanising

26. Which statement is true of cotton?
- A. When exposed to high temperatures it melts.
 - B. It resists creases.
 - C. It is very absorbent of moisture.
 - D. When wet it decreases in strength.
27. Which statements are true of superconductors which can operate at room temperature compared to those which cannot?
- I. Less material is required
 - II. Cables can be far smaller
 - III. Less energy is required
 - IV. They are more expensive to produce
- A. III and IV only
 - B. II and III only
 - C. I and III only
 - D. I and II only
28. Which is true of covalent compounds?
- A. They consist of positively charged nuclei in a sea of electrons.
 - B. The atoms can be separated easily in water.
 - C. The opposing charges of the ions hold the lattice together.
 - D. Electrons are shared between the nuclei.

- 29.** Which heat treatment results in the formation of a material with a large grain structure?
- A. Rapid cooling
 - B. Repetitive re-heating and re-cooling
 - C. Selective cooling
 - D. Slow cooling
- 30.** Which property leads to medical equipment being manufactured from polypropylene?
- A. Electrical conductivity
 - B. Density
 - C. Recyclability
 - D. Melting point
- 31.** Which product is likely to be manufactured using Kevlar?
- A. Sails for yachts
 - B. Solar panels
 - C. Shafts for golf clubs
 - D. Helmets for motorcycle riders

32. In the diagram shown here what is the name given to the part of the stress/strain curve labelled X?



- A. Plastic limit
- B. Elastic limit
- C. Tensile limit
- D. Stress limit

33. What effect do tensile forces have on a structure?

- A. They ensure the structure is in a state of equilibrium.
- B. They extend the structure.
- C. They compress the structure.
- D. They shorten the structure.

34. Which factors determine the deflection of a structure when an external load is applied?

- I. The angle of the load
 - II. The stiffness of the structure
 - III. The size of the structure
 - IV. The size of the load
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. II and IV only

35. Which energy sources are renewable resources?

- I. Coal
 - II. Natural gas
 - III. Biofuels
 - IV. Hydroelectric power
- A. I and III only
 - B. II and III only
 - C. II and IV only
 - D. III and IV only

36. What is **not** a characteristic of an appropriate technology?
- A. It aims to utilise locally available materials.
 - B. It involves the use of complex technologies.
 - C. It is generally low in capital cost.
 - D. It creates employment.
37. Which energy source is the most likely to be used for a domestic home to enhance its sustainability?
- A. Wave
 - B. Solar
 - C. Geothermal
 - D. Biomass
38. Which considerations are appropriate when designing for disassembly?
- I. Avoiding permanent bonding of materials
 - II. Using only recyclable materials
 - III. Adopting clean technologies
 - IV. Ensuring parts can be manually disconnected
- A. I and III only
 - B. I and IV only
 - C. II and III only
 - D. III and IV only

39. Manufacturers could promote long-term sustainability by
- I. developing highly-automated factories.
 - II. utilising appropriate technologies.
 - III. developing smaller factories close to major markets.
- A. I, II and III
 - B. I and II only
 - C. I and III only
 - D. II and III only
40. How can energy utilization be made more consistent with sustainable development?
- I. Minimize CO₂ emissions
 - II. Use renewable sources of energy
 - III. Only use fuels available locally
 - IV. Utilise the existing technologies for energy production
- A. I and II only
 - B. I and IV only
 - C. II and III only
 - D. III and IV only
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