

**DESIGN TECHNOLOGY
STANDARD LEVEL
PAPER 1**

Monday 18 November 2002 (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. Which part of the Design Cycle Model (DCM) involves mainly divergent thinking?
 - A. Testing and evaluating
 - B. Developing a chosen idea
 - C. Generating ideas
 - D. Researching and specifying requirements

2. What is the main purpose of drawings in the design process?
 - A. To communicate ideas
 - B. To evaluate products
 - C. To test ideas
 - D. To model solutions

3. What is described as a sequence of instructions to describe a set of actions?
 - A. Algorithm
 - B. Flow chart
 - C. Iconic model
 - D. Processing Block Diagram

4. In which design contexts would computer modelling be of benefit?
 - I. Fast food product
 - II. Office layout
 - III. Child's toy
 - A. I and II only
 - B. II and III only
 - C. I and III only
 - D. I, II and III

5. What is described as the pattern of production and profitability of a product?
- A. Design cycle
 - B. Design responsibility
 - C. Product cycle
 - D. Manufacturing
6. Which design factor is most likely to be affected by changes in legislation?
- A. Ergonomic
 - B. Safety
 - C. Comfort
 - D. Aesthetics
7. What is described as a conscious act to ensure a continuing market and allow new technologies to be incorporated?
- A. Design responsibility
 - B. Planned obsolescence
 - C. Resolving design conflicts
 - D. Legislation
8. What does a designer often have to do when considering the needs of users, clients, manufacturers and the impacts of the design on the environment?
- A. Accept hedonistic data
 - B. Use ergonomic data
 - C. Accept design responsibility
 - D. Resolve conflicts

9. Which percentile range of children would be used to determine the maximum height of the top shelf in a school library?
- A. 5th
 - B. 5th – 95th
 - C. 50th
 - D. 95th – 100th
10. Which of these materials are most difficult to recycle?
- A. Paper products
 - B. Timber
 - C. Thermoplastics
 - D. Ceramics
11. In which design context is electrical resistivity an important consideration?
- A. Hair dryer body
 - B. Garden seat
 - C. Car steering wheel
 - D. Pair of scissors
12. For which material does the manufacturer have the most control over physical properties?
- A. Timber
 - B. Ceramic
 - C. Composite
 - D. Natural textile fibres

13. Which property of a material is described by the unit Ωm ?
- A. Density
 - B. Hardness
 - C. Thermal conductivity
 - D. Electrical resistivity
14. Which materials have low density, low thermal conductivity, high toughness and medium resistance to deterioration in damp environments?
- A. Plastics
 - B. Timber
 - C. Metals
 - D. Ceramics
15. What options should a designer consider if materials do not exist which satisfy the design specification?
- I. Change the design
 - II. Use a combination of materials
 - III. Create a new material
- A. I and II only
 - B. II and III only
 - C. I and III only
 - D. I, II and III
16. Which materials can be subdivided by reference to their magnetic properties?
- A. Ceramics
 - B. Plastics
 - C. Metals
 - D. Timber

17. Which material is **not** shaped by casting?
- A. Metals
 - B. Ceramics
 - C. Food
 - D. Textile fibres
18. Which property is **not** a hedonic property?
- A. Nutrient content
 - B. Texture
 - C. Smell
 - D. Taste
19. Which manufacturing technique is used to sharpen the edges of scissors?
- A. Cutting
 - B. Abrading
 - C. Sintering
 - D. Fusing
20. The permanent mounting of components on an electronic circuit board is an example of which manufacturing technique?
- A. Fusing
 - B. Machining
 - C. Sintering
 - D. Moulding

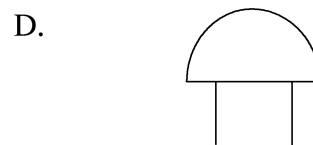
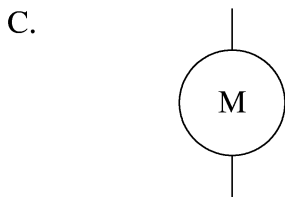
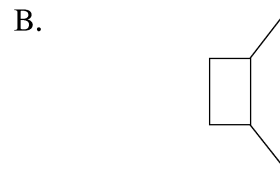
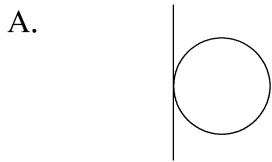
21. Which factors determine the final cost of a product?
- I. Scale of production
 - II. Final use of the product
 - III. Overheads, distribution and sales
- A. I and II only
 - B. II and III only
 - C. I and III only
 - D. I, II and III
22. Which statement defines mechanisation?
- A. The processing of information in controlling the behaviour of a manufactured system
 - B. A volume production process involving machines controlled by humans
 - C. A volume production process involving machines controlled by computers
 - D. A programmed system that contains the collective knowledge of experts
23. Which production process is described as continuous flow, large scale production?
- A. Batch production
 - B. One off production
 - C. Volume production
 - D. Craft production

24. Which statements describe the influence energy considerations have on the design of a product?

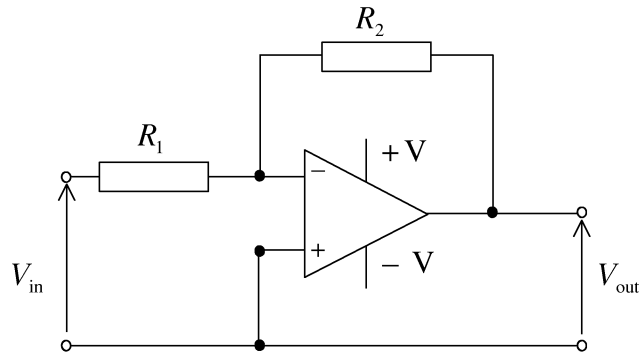
- I. Energy use in the manufacture of the product
- II. The energy efficiency of the product in use
- III. The recycling of the product at the end of its useful life

- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III

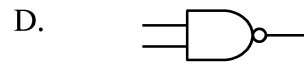
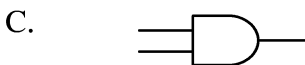
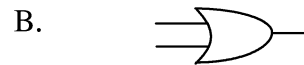
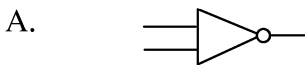
25. Which symbol represents a microphone?



26. What is the function of the op-amp circuit shown below?



- A. Non-inverting op-amp
 - B. Inverting op-amp
 - C. Analogue-digital converter
 - D. Digital-analogue converter
27. Which transducer converts changes in temperature to changes in voltage?
- A. Thermocouple
 - B. Photovoltaic cell
 - C. Thermistor
 - D. Potentiometer
28. Which symbol represents an AND gate?

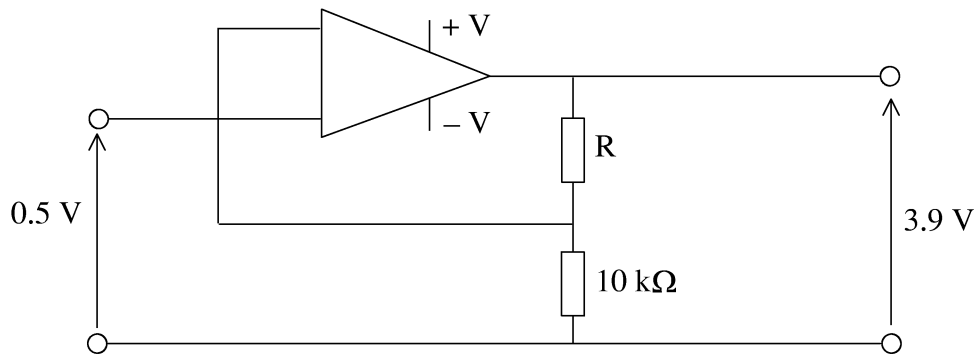


29. Which logic gate has the truth table shown below?

A	B	Out
0	0	0
0	1	1
1	0	1
1	1	0

- A. AND
- B. NOR
- C. EX-OR
- D. NAND

30. What is the required value of the resistor labelled R in the following circuit to get an output voltage of 3.9 volts?



- A. 78 kΩ
- B. 7.8 kΩ
- C. 6.8 kΩ
- D. 68 kΩ