



**DESIGN TECHNOLOGY
STANDARD LEVEL
PAPER 1**

Tuesday 13 November 2001 (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 of the following models could be most quickly modified?
 - A. An orthographic drawing
 - B. A symbolic model
 - C. A physical scale model
 - D. A computer model

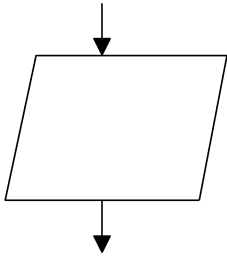
2. Which technique is most useful to enable a manufacturer to plan for the production of a particular product?
 - A. 2 D sketch
 - B. 3 D sketch
 - C. Symbolic model
 - D. Orthographic projection

3. Which of the following is likely to be used in the early (conceptual) stages of the design process?
 - A. Freehand drawing
 - B. Mock up
 - C. Orthographic drawing
 - D. Processing block diagram

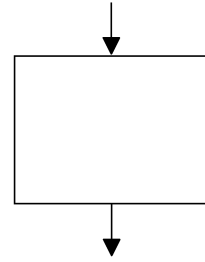
4. The IB simple design loop effectively demonstrates
 - A. that planning takes place throughout the design process.
 - B. that there is considerable communication between the different elements in the design loop.
 - C. the list of activities that make up the design process.
 - D. that evaluation takes place throughout the design process.

5. Which of the following flow chart symbols represents a decision?

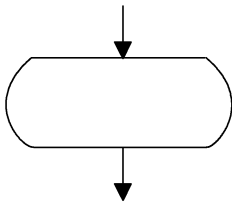
A.



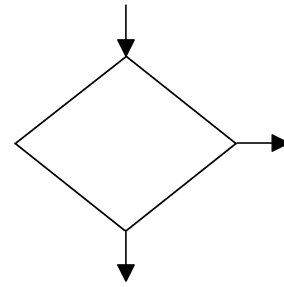
B.



C.



D.



6. Data for which percentile range would normally be applied in the design of the length of a bed?

- A. 5th percentile
- B. 50th percentile
- C. 95th percentile
- D. 99th percentile

7. Which statements are directly relevant to planned obsolescence?

- I. The product is designed to last for a specified time.
- II. The product is made from materials that can be recycled.
- III. Low quality materials are used to manufacture the product.

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

8. Which statement is **not** necessarily true of an appropriate technology?
- A. It is easily maintainable
 - B. It uses energy efficiently
 - C. It uses the latest technology
 - D. It is understandable to the people who use it
9. Recycling always
- I. minimises the depletion of natural resources.
 - II. is cost-effective.
 - III. reduces the amount of solid waste for disposal by landfill or incineration.
- A. I and II
 - B. I and III
 - C. II and III
 - D. I, II and III
10. Which design constraint is most critical in relation to the use of an aircraft?
- A. Safety legislation
 - B. Client preferences
 - C. Conservation of natural resources
 - D. Manufacturing considerations

11. Which of the following materials combine low density, high electrical resistivity and very high resistance to deterioration in damp environments?
- A. Ceramics
 - B. Plastics
 - C. Timbers
 - D. Metals
12. Which statement is true of plastics and makes them more likely to be used for spectacle lenses than glass?
- A. Plastics are harder than glass
 - B. Plastics have a higher tensile strength than glass
 - C. Plastics are more dense than glass
 - D. Plastics are tougher than glass
13. Which of the following materials is **not** shaped by extrusion?
- A. Timber
 - B. Metal
 - C. Plastic
 - D. Food
14. In which units is tensile strength expressed?
- A. kg m^{-3}
 - B. J m^{-2}
 - C. Pa
 - D. $\text{W m}^{-1} \text{K}^{-1}$

15. Which of the following statements defines joining?
- A. Blending into one, usually by the addition of heat
 - B. Forming a fabric by the interlacing of threads
 - C. Using a needle to carry a strand of material in and out of fabric
 - D. Putting together two or more components or materials
16. The protein content of meat is an example of which of the following properties?
- A. Aesthetic properties
 - B. Nutritional properties
 - C. Mechanical properties
 - D. Physical properties
17. Bending a metal tube to form a frame for a chair is an example of which of the following?
- A. Plastic deformation
 - B. Extrusion
 - C. Sintering
 - D. Casting
18. Which of the following mechanical properties are important considerations where abrasion and cutting takes place?
- I. Tensile strength
 - II. Toughness
 - III. Stiffness
- A. I and II
 - B. I and III
 - C. II and III
 - D. I, II and III

19. Which material group may be subdivided with reference to magnetic properties?

- A. Metals
- B. Plastics
- C. Textile fibres
- D. Timber

20. Which statement best describes hardness?

- A. To resist deflection or bending
- B. To resist the propagation of cracks
- C. To resist penetration or scratching
- D. To withstand pulling forces

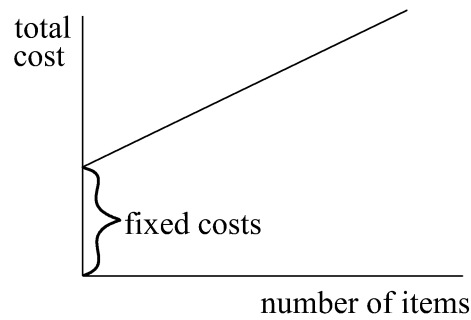
21. Which of the following is **not** a feature of automation?

- A. Use of machines
- B. Computer control
- C. Continuous flow
- D. A set number of items to be produced

22. Which of the following would be produced by one-off production?

- A. Computer chair
- B. Ceremonial chair
- C. Stadium seating
- D. Flat pack self assembly chair

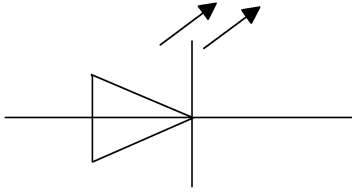
23. The total cost of producing x items can be represented by a graph of total cost against the number of items produced, as shown. An increase in which of the following will increase the gradient of the graph?



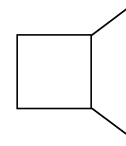
- A. Design costs
 - B. Machinery costs
 - C. Raw material costs
 - D. Market research costs
24. Which of the following would encourage mechanised rather than craft production?
- I. Increased labour costs
 - II. Product demand exceeds supply
 - III. Introduction of new materials, *e.g.* plastics
- A. I and II
 - B. I and III
 - C. II and III
 - D. I, II and III

25. Which of the following is **not** an output transducer?

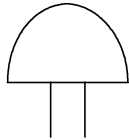
A.



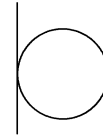
B.



C.



D.

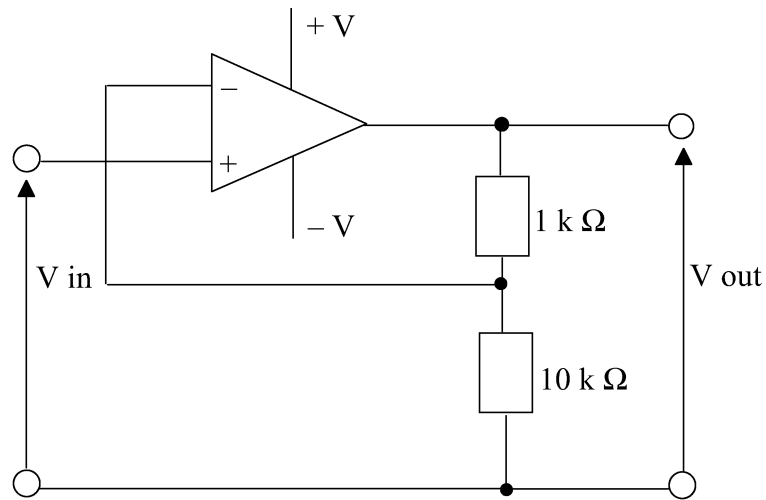


26. Which digital logic gate would give the output Z from the inputs X and Y?

X	Y	Z
0	0	1
0	1	1
1	0	1
1	1	0

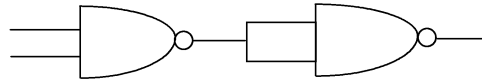
- A. NAND
- B. NOR
- C. AND
- D. EX-OR

27. What is the gain of the following circuit?

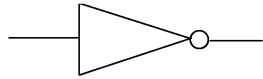


- A. -0.1
 - B. -10
 - C. 1.1
 - D. 11
28. The term used for comparing the output of a closed loop system with the input and performing a particular control action is
- A. cybernetics.
 - B. feedback.
 - C. algorithm.
 - D. transducer.

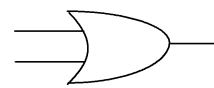
29. Which single digital logic gate is equivalent to the following combination of digital logic gates?



A.



B.



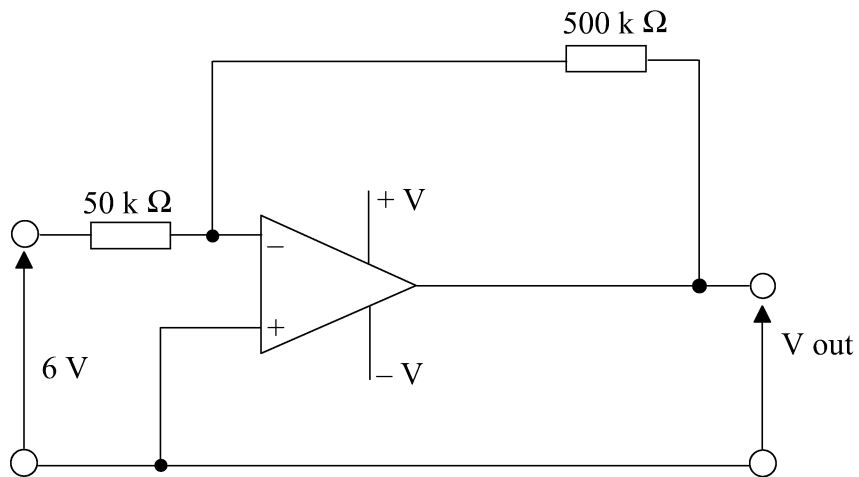
C.



D.



30. What will be the output voltage of the following circuit?



A. 60 volts

B. - 60 volts

C. 0.6 volts

D. - 0.6 volts