M10/4/DESTE/SPM/ENG/TZ0/XX+

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DESIGN TECHNOLOGY
STANDARD LEVEL
PAPER 1

Wednesday 12 May 2010 (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. A solution to a problem in one design context that is used to provide a solution to a problem in another design context is an example of

A. adaptation.

B. constructive discontent.

C. brainstorming.

D. attribute listing.

2. A design specification for a product identifies

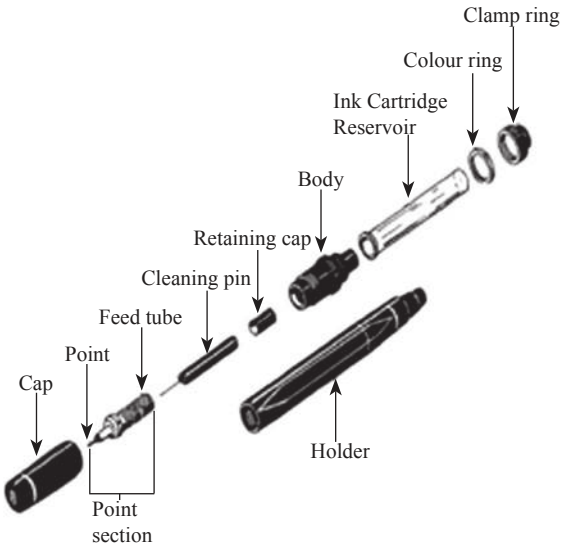
A. performance characteristics.

B. major constraints.

C. target market.

D. criteria for a design proposal.

3. What type of drawing is shown below?



[Source: http://www.tpub.com/content/draftsman/14276/img/14276_175_1.jpg]

A. Perspective

B. Exploded isometric

C. Orthographic

D. Isometric

4. Mathematical modelling is used with

A. CAD/CAM.

B. flowcharts.

C. algorithms.

D. orthographic drawings.

5. The design cycle represents divergent and convergent thinking because

A. it is an iterative process.

B. it is a linear process.

C. divergent thinking is at the start of the cycle.

D. convergent thinking is at the end of the cycle.

6. What is **not** influenced by data from the life cycle analysis of washing machines?

A. Water usage

B. Energy consumption

C. Pollution

D. Planned obsolescence

7. Printer cartridges are designed to fit specific models of printer. Which strategy would optimize the use of existing manufacturing capability?

A. Designing the cartridge so it can be refilled

B. Using standard cartridges for all printers

C. Designing the cartridge so it is easier to use

D. Reducing the amount of packaging

8. Which design objective will increase in importance for a car designer as a result of take-back legislation?

A. Design for materials

B. Design for manufacture

C. Design for process

D. Design for disassembly

9. What contributes to hardwood being considered less renewable than softwood?

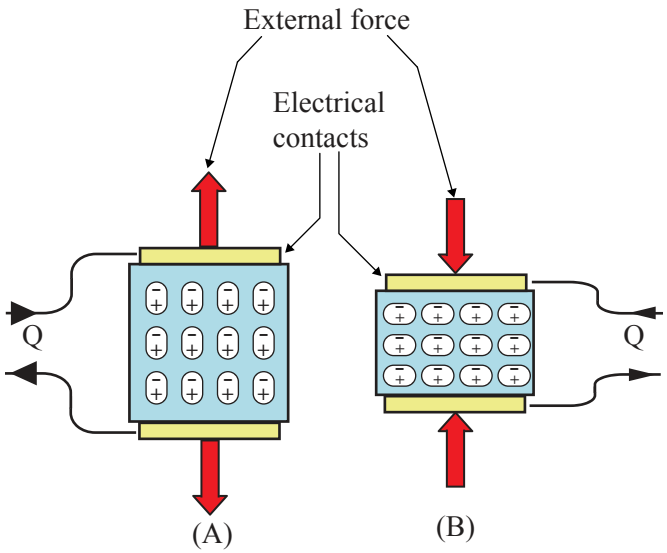
A. Time to reach maturity

B. Soil erosion

C. Greenhouse effect

D. Extinction of species

10. Which term describes the blue material in the diagram below which if stretched or compressed it gives off an electric charge?



[Source: http://archives.sensorsmag.com/articles/0203/33/main.shtml]

A. Magneto-rheostatic

B. Electro-rheostatic

C. Piezoelectric

D. Shape memory alloy

11. Which characteristic is more important for a Pyrex oven dish than for a glass fruit bowl?

A. Thermal expansivity

B. Colour

C. Transparency

D. Unreactivity

12. Which material is the **most** likely to be abraded (worn away) to enhance its aesthetic characteristics?

A. Food

B. Plastic

C. Timber

D. Ceramics

13. How is the structure of metals best described?

A. Fibres

B. Crystalline

C. Chains

D. An amorphous mass

14. Which material group can be divided into “natural” and “composite”?

A. Metal

B. Ceramic

C. Timber

D. Plastic

15. What is a property of urea-formaldehyde?

A. Low stiffness

B. High brittleness

C. Low hardness

D. High toughness

16. Why is timber a popular choice of material for roof structures?

A. Availability

B. Appearance

C. Low cost

D. Resistance to moisture

17. What enabled mechanization to be introduced during the Industrial Revolution?

A. Increasing labour costs

B. Assembly lines

C. Steam power

D. Cheap electricity

18. What is true of both just-in-time (JIT) and just-in-case (JIC) manufacturing?

A. They are examples of mechanization

B. They are volume production systems

C. They require no manual labour

D. They manufacture products to order

19. What is the **most** effective way of attaching leather soles to shoes?

A. Fusing

B. Stitching

C. Glueing

D. Using fasteners

20. Why has craft production increased in popularity in developed countries?

A. Technology push

B. New skills

C. Novel materials

D. Market pull

21. Achieving international consensus for reducing pollution is difficult due to

A. an increase in clean technology.

B. changing pollution targets each year.

C. increase in the control of technology.

D. not all countries agree to the targets.

22. What needs to be considered when designing the controls of a car?

I. Psychological factors

II. Physiological factors

III. Anthropometric factors

A. I only

B. II only

C. III only

D. I, II and III

23. Which data are influenced by individual's perceptions?

I. Anthropometric

II. Psychological

III. Physiological

A. I, II and III

B. I and II

C. I and III

D. II and III

24. What technique would a designer most likely use to evaluate a new colour scheme in a house?

A. User trial

B. User research

C. Performance test

D. Field trial

25. Which strategy is **most** likely to generate quantitative data?

A. User trial

B. User research

C. Performance test

D. Expert appraisal

26. What would enable a manufacturer to confidently provide a guarantee on a product?

A. Value for money

B. Cost-effectiveness

C. Quality assurance

D. Consumer pressure

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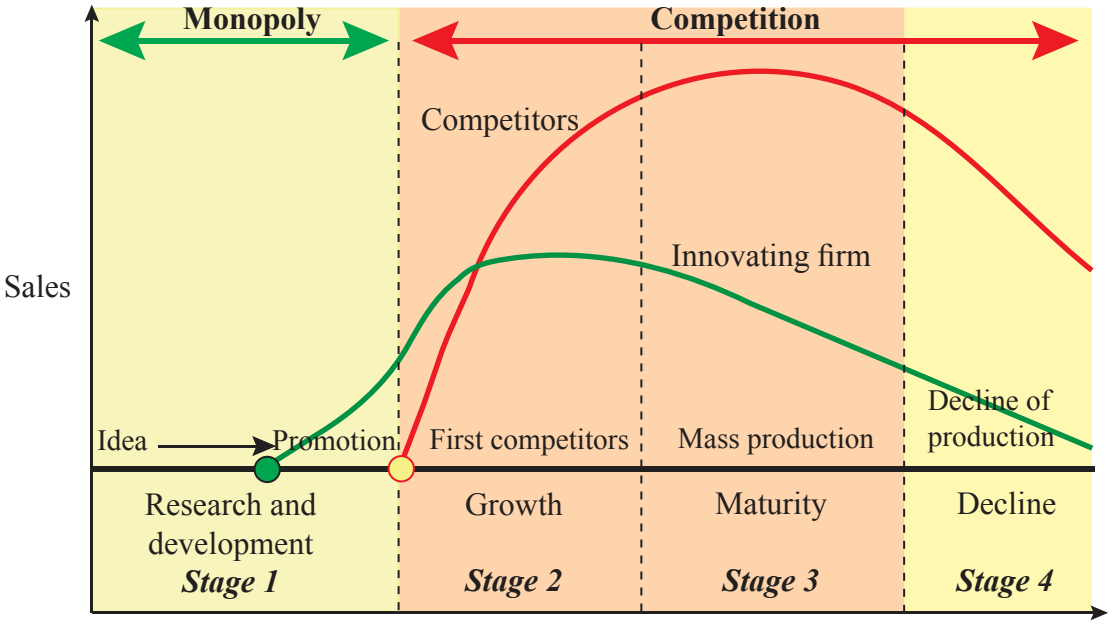
Questions 27–30 relate to the following case study. Please read the case study carefully and answer the questions.

CASE STUDY

The diagram shows the typical stages in a product cycle. It compares an innovating firm (green line), which initially develops and sells the product, with its competitors (red line).



[Source: http://www.people.hofstra.edu/geotrans/eng/ch5en/conc5en/productlifecycle.html. Reprinted with permission]

27. What is true for the innovating firm in Stage 1 of the product cycle?

A. High market awareness and low volume of sales

B. High volume of sales and low market awareness

C. Low research costs and high competition

D. No competition and high research costs

28. Why do the competitors' sales continue to increase after the innovating firm's sales start to decline?

A. The innovating firm's product was robust

B. Competitors have effective imitative strategies

C. Competition increases

D. Product cost increases

29. In Stage 3 the innovating firm creates a range of different products for existing customers. This is an example of

A. market penetration.

B. market development.

C. product development.

D. diversification.

30. At which stage would application of life cycle analysis be most appropriate for a new product?

A. Stage 1

B. Stage 2

C. Stage 3

D. Stage 4
