IB DIPLOMA PROGRAMME
PROGRAMME DU DIPLÔME DU BI
PROGRAMA DEL DIPLOMA DEL BI

N04/4/DESTE/HPM/ENG/TZ0/XX
88046201

DESIGN TECHNOLOGY
HIGHER LEVEL
PAPER 1

Wednesday 17 November 2004 (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. The design brief can be described as

I. A short statement giving the general outline of the problem to be solved

II. The formal starting point for the design of a product

III. The design solution

A. I and II

B. II and III

C. I and III

D. I, II and III

2. Designers would use a full-size clay model of a car for

A. generating ideas.

B. product testing.

C. brainstorming.

D. market research.

3. An algorithm is

A. a pictorial representation of a sequence of events.

B. a physical model.

C. a sequence of instructions to describe a set of actions.

D. an algebraic equation.

4. Which drawing technique shows **most** evidence of convergent thinking?

A. Perspective

B. Orthographic

C. Isometric

D. 3-D sketch

5. Designers would use ergonomes with

A. orthographic drawings of the same scale.

B. isometric drawings of the same scale.

C. prototypes.

D. physical models of the same scale.

6. Although it impacts on other groups, cost effectiveness is defined from the perspective of

A. retailers.

B. consumers.

C. designers.

D. manufacturers.

7. Fashion influences product design in relation to

A. function.

B. style.

C. size.

D. manufacturing.

8. The material used to manufacture steel suspension cables for a bridge should have high

A. hardness.

B. tensile strength.

C. stiffness.

D. toughness.

9. Which material group has medium density, low tensile strength and very high stiffness?

A. Ceramics

B. Plastics

C. Food

D. Timber

10. Which property combines with toughness to make a material suitable for extrusion?

A. Ductility

B. Tensile strength

C. Thermal expansivity

D. Thermal conductivity

11. Wasting processes include the techniques of

A. bending, moulding and casting.

B. machining and abrading.

C. fabricating and welding.

D. adhesion and fastening.

12. Which technique fuses solid particles with heat and pressure without completely liquefying them?

A. Injection moulding

B. Casting

C. Sintering

D. Lamination

13. The factor that determines how fixed costs are reflected in the final cost of a product is the

A. design brief.

B. breakeven point.

C. raw material costs.

D. distribution costs.

14. In the product cycle the designer is responsible for

A. the whole cycle.

B. the design process.

C. formulating the design brief and specification.

D. generating initial ideas.

15. A CNC system is used for

A. manufacturing.

B. designing.

C. storing.

D. testing.

16. Which strategies relate to packaging design?

I. Recycle

II. Reuse

III. Repair

A. I and III

B. I and II

C. II and III

D. I, II and III

17. Which combination of consumer pressure and legislation provides the impetus for green design?

	Consumer Pressure	**Legislation**
A	✓	✓
B	X	✓
C	✓	X
D	X	X

18. What does the analogy “cradle to grave” describe?

A. Clean technology

B. Green design

C. Product life cycle

D. Planned obsolescence

19. Financial benefits from the proactive adoption of an environmental policy by a manufacturer are **least** likely to be achieved through

A. avoidance of fines.

B. reduced energy utilization.

C. use of recycled materials.

D. more efficient use of raw materials.

20. Labelling plastic products with the plastic type promotes green design via

A. legislation.

B. consumer pressure.

C. advertising.

D. market research.

21. If unseasoned timber is used in furniture manufacture it warps and cracks as it is

A. sawn.

B. finished.

C. attacked by fungi.

D. dried out.

22. Cotton is grown in

A. Spain.

B. Egypt.

C. Italy.

D. Canada.

23. Scrap glass is added to new raw materials in order to

A. increase glass production.

B. increase hardness.

C. reduce the energy used in production.

D. improve appearance.

24. What is a by-product of iron production?

A. CaO

B. Fe_2O_3

C. C

D. $CaSiO_3$

25. Why must mild steel be treated or finished for use in car bodies?

A. To increase its rigidity

B. To increase its tensile strength

C. To prevent its corrosion

D. To reduce its cost

26. Which combination of cholesterol and salt characterize mycoprotein?

	Cholesterol	**Salt**
A.	High	High
B.	High	Low
C.	Low	High
D.	Low	Low

27. A positive ion results from

A. decomposing a substance into simpler substances.

B. two atoms bonding together.

C. electron loss from an atom or molecule.

D. electron gain by an atom or molecule.

28. Metals are good conductors because

A. outer electrons are shared between the nuclei of atoms.

B. outer electrons are “free” and can flow through the crystal.

C. the opposing charges of the ions hold the crystal together.

D. ions can be separated in water.

29. What material has very high electrical resistance, very low thermal conductivity, high hardness and low toughness?

A. Plastic

B. Textile fibre

C. Timber

D. Ceramic

30. Which property of a metal does alloying reduce?

A. Malleability

B. Hardness

C. Tensile strength

D. Toughness

31. The handle of a thermoplastic carrier bag stretches because the molecules slide over each other due to the weakening of

A. metallic bonds.

B. ionic bonds.

C. primary bonds.

D. secondary bonds.

32. Which of the following is **not** a composite material?

A. A high temperature superconductor

B. Reinforced concrete

C. Mild steel

D. Glass reinforced plastic

33. Which value relates the ratio of change in dimension to original length?

A. Stress

B. Strain

C. Young's modulus

D. Equilibrium

34. Yield stress is

A. the stiffness of the material.

B. the stress at which a material will break.

C. the stress at which plastic deformation begins.

D. force per unit area.

35. Appropriate technology is particularly beneficial to

A. governments.

B. multinational companies.

C. consumers.

D. local communities.

36. Which statement is true?

A. Non-renewable resources take more than one human lifetime to replenish

B. Renewable resources take more than one human lifetime to replenish

C. Reserves are greater than resources

D. Resources are exploited, reserves are undeveloped

37. The major barrier to recycling is

A. consumer resistance.

B. increased public subsidies.

C. legislation.

D. increased packaging.

38. Increased use of solar power requires

A. consumer pressure.

B. global warming.

C. technological development.

D. legislation.

39. Who are the major beneficiaries of sustainable development?

A. Future generations

B. Governments

C. Multinational companies

D. Individual consumers

40. Planned obsolescence can contribute to sustainable development if materials are

A. easily cleaned.

B. readily available.

C. man-made.

D. easily recycled.