



LEVEL 3 COMPOSITE TECHNICIAN

(Standard Number: ST0094/1.1)

AM3: SAMPLE MULTIPLE-CHOICE TEST PAPER

Name	
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INSTRUCTIONS

- Please ensure you have written your full name in the box above.
- This is a closed book test.
- Write your answers in this test paper.
- Answer all questions.
- You do not lose marks for incorrect answers.
- Leave time at the end to check your answers.
- You are not allowed to take this test paper out of the test room.

INFORMATION

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 40.

Materials permitted: Black Pen

Examination Time: 60 minutes

**There is ONE correct answer to each question.
Choose the correct letter A, B, C or D and circle it on this test paper.**

1. Which of the following sectors is NOT typically a large user of composites? (1 mark)
- (A) Aerospace
 - (B) Agriculture**
 - (C) Automotive
 - (D) Energy
2. Which of these statements is NOT a key message in the Work at Height Regulations (2005)? (1 mark)
- (A) Ensure equipment is suitable, stable and strong enough for the job, maintained and checked regularly
 - (B) Consider emergency evacuation and rescue procedures
 - (C) Ensure equipment is suitable, stable and strong enough for the job, maintained and checked regularly
 - (D) Maintain two feet and one hand on a stepladder at all times**
3. Which of the following is covered by the Environmental Protection Act (1990)? (1 mark)
- (A) Air pollution**
 - (B) Flammable substances
 - (C) Computer monitors
 - (D) Reporting of injuries
4. Which of the following is not a composite material? (1 mark)
- (A) A metallised polymer film for a crisp packet
 - (B) Concrete reinforced with steel rope
 - (C) An aluminium honeycomb**
 - (D) Carbon fibre fabric embedded in polymer resin matrix

5. Why might a composite be used to replace a traditional material? (1 mark)
- (A) **They are light weight**
 - (B) They are more expensive
 - (C) They are more difficult to manufacture
 - (D) They cannot be easily recycled
6. Which of the following is NOT a definition of a thermoplastic? (1 mark)
- (A) A material comprised of strongly bonded long chain molecules held together by weaker intermolecular forces
 - (B) **A material held together by metallic bonds that is a good conductor of electricity**
 - (C) An ionically bonded material with a low melting point and excellent stiffness
 - (D) A material containing a three-dimensional network of strong covalent bonds
7. What is the primary function of the reinforcement in a composite material? (1 mark)
- (A) To increase the overall weight of the material
 - (B) **To improve the mechanical properties of the material**
 - (C) To improve the recyclability of the material
 - (D) To provide reinforcement and increase strength
8. What is the primary function of the matrix material in a fibre reinforced composite? (1 mark)
- (A) **To bind and protect the reinforcement material**
 - (B) To increase the electrical conductivity of the material
 - (C) To improve the recyclability of the material
 - (D) To increase the overall weight of the material

9. Which of the following describes a 2-2 twill weave? (1 mark)
- (A) Each warp thread passes over two weft threads and then under one weft threads
 - (B) Each warp thread passes over one weft threads and then under one weft threads
 - (C) Each warp thread passes over two weft threads and then under two weft threads**
 - (D) Each warp thread passes over two weft threads and then under three weft threads
10. Which of the following is NOT a common type of release agent? (1 mark)
- (A) Silicone-based release agents
 - (B) Glue-based release agent**
 - (C) Wax-based release agents
 - (D) Water-based release agents
11. Which of these statements is true: (1 mark)
- A: Vacuum bags help remove air and excess resin from the laminate
B: Vacuum bags provide uniform pressure across the composite part
C: Vacuum bags help improve fibre-to-resin ration in composites
- (A) A is true
 - (B) A and C are true
 - (C) B & C are true
 - (D) All of the statements are true**
12. In the open moulding process, what is typically used to prevent the resin from sticking to the mould surface? (1 mark)
- (A) Vacuum bagging
 - (B) Gel coat
 - (C) Release agent or wax**
 - (D) Breather fabric

13. Which of the following statements is true about automated fibre lay-up? (1 mark)
- (A) It allows for manual adjustment of the fibre orientation during production
 - (B) It is primarily used for creating complex shapes with low fibre-to-resin ratios
 - (C) It requires extensive manual labour for each part produced
 - (D) It is suitable for producing large quantities of parts with high repeatability**
14. Which of the following defines Glass Transition Temperature (T_g)? (1 mark)
- (A) The temperature at which a polymer changes from liquid to solid or vice versa
 - (B) The temperature at which a polymer changes from a glassy to rubbery state**
 - (C) The temperature at which the molecules in a polymer lock together to create a network of strong bonds
 - (D) The temperature at which a material crystallises
15. Why is process control important in manufacturing? (1 mark)
- (A) To increase the number of operators needed**
 - (B) To maintain a consistent and desired output by managing variables
 - (C) To minimise the use of technology in production
 - (D) To create a complex, multi-stage process
16. What is the primary purpose of conducting an audit of a composites manufacturing process? (1 mark)
- (A) To reduce the number of workers needed for a process
 - (B) To identify areas for improvement and ensure compliance**
 - (C) To create new process documentation
 - (D) To delay the implementation of improvements

17. Why might a composite be used to replace a traditional material? (1 mark)
- (A) **Allowed lighter components to be introduced to improve fuel efficiency**
 - (B) Provided a cheap alternative to metal components
 - (C) Allowed components to be recycled more easily
 - (D) Decreased the cost of manufacturing simple components
18. Which of the following is NOT a protected characteristic under the Equality Act (2016)? (1 mark)
- (A) Age
 - (B) Race
 - (C) **Children**
 - (D) Disability
19. Which of the following regulations covers pollution control? (1 mark)
- (A) General Data Protection Act (2016)
 - (B) Working at Height Regulation (2005)
 - (C) Control of Substances Hazardous to Health (2002)
 - (D) **Environmental Protection Act (1990)**
20. Which of the following statements is NOT true: (1 mark)
- A core may be added to a composite component to...*
- (A) to reduce the volume of fibres and resin needed
 - (B) to decrease the overall weight of a component
 - (C) to increase the stiffness of the component
 - (D) **to add to the cost of the component**
21. Which industry extensively uses glass fibre reinforced plastic? (1 mark)
- (A) Aerospace
 - (B) **Marine**
 - (C) Automotive
 - (D) Food processing

22. What is a key characteristic of thermoplastics? (1 mark)
- (A) They cannot be shaped after moulding
 - (B) They undergo irreversible chemical changes when heated
 - (C) They soften when heated and harden when cooled**
 - (D) They decompose when heated
23. Where would you find Kevlar used as a reinforcing material? (1 mark)
- (A) Body armour and bullet proof vests**
 - (B) Bicycle frames
 - (C) Automotive bumpers
 - (D) Electrical wiring insulation
24. What is the key advantage of cyanate ester over an epoxy resin as a matrix material? (1 mark)
- (A) Lower strength and stiffness
 - (B) Higher electrical conductivity
 - (C) Improved thermal stability and lower moisture absorption**
 - (D) Lower chemical resistance
25. What does the term crimp refer to in relation to the fibres used in a composite? (1 mark)
- (A) The smoothness and uniformity of the fibres' surface
 - (B) The chemical treatment applied to fibres to help them adhere to the matrix
 - (C) The ability of a fibre to resist high temperature
 - (D) The degree of twist or bend in the fibre which can affect its alignment and strength**

26. Which weave type provides the best drapability? (1 mark)
- (A) Plain weave
 - (B) Satin weave**
 - (C) Twill weave
 - (D) Basket weave
27. Which material is commonly used to make release films for composites manufacturing? (1 mark)
- (A) Polyethylene (PE)
 - (B) Epoxy resin
 - (C) Glass fibre
 - (D) Polytetrafluoroethane (PTFE)**
28. What is a common characteristic of gel coats? (1 mark)
- (A) They are thick and viscous, providing excellent surface protection**
 - (B) They create a bondable surface after application
 - (C) They cure very quickly at room temperature
 - (D) They can be used as internal reinforcement
29. What is the typical role of the vacuum in the Resin Transfer Moulding process? (1 mark)
- (A) To prevent resin from curing too quickly
 - (B) To help resin flow evenly and fully impregnate the fibres**
 - (C) To cool the resin after injection
 - (D) To compress the mould and create a better surface finish
30. What type of component might be produced using fibre braiding? (1 mark)
- (A) Hoses and pipes**
 - (B) Large flat panels
 - (C) Small intricate parts
 - (D) Thick structural plates

31. What is the sequence of steps in a composite curing cycle? (1 mark)
- (A) Heat, mould, soak
 - (B) Soak, heat, cool
 - (C) Mould, heat, cool
 - (D) Heat, soak, cool**
32. What is feedback control in process control? (1 mark)
- (A) A method where the process is adjusted based on future predictions
 - (B) A method where the process is adjusted based on the difference between the desired and actual outputs**
 - (C) A control system that operates without measurement or adjustment
 - (D) A method used only in automated process
33. Who typically conducts a process audit? (1 mark)
- (A) External auditors with no knowledge of the process
 - (B) Experts from a competitor organisation
 - (C) Managers and employees directly involved in the process**
 - (D) Anyone unrelated to the process
34. Which of the following factors can affect the cure cycle of composite materials? (1 mark)
- (A) The type of resin used
 - (B) The size and shape of the part
 - (C) The atmospheric pressure
 - (D) All of the above**

35. Which of the following is typically used as the reinforcement in the spray lay-up technique? (1 mark)
- (A) Woven fabric sheets
 - (B) Chopped strands of fibres**
 - (C) Prepreg materials
 - (D) Long unidirectional fibres
36. Why must some types of prepreg be stored in the fridge? (1 mark)
- (A) To maintain the temperature for easy handling
 - (B) To reduce the viscosity of the resin
 - (C) To prevent the fibres from becoming damaged
 - (D) To prevent the resin from curing prematurely**
37. Which of the following is NOT a natural material for reinforcing a composite? (1 mark)
- (A) Carbon fibre**
 - (B) Hemp
 - (C) Bamboo
 - (D) Jute
38. Which of the following does NOT relate to thermosetting polymers? (1 mark)
- (A) Thermosetting materials will degrade rather than melt on heating
 - (B) Thermosetting polymers can be heated and reformed an infinite number of times without a loss of properties**
 - (C) On curing, a continuous network of strong chemical bonds is formed between polymer molecules in a thermoset
 - (D) Recycling thermosetting polymers is easy and there is an established infrastructure to do this

39. Which of the following symbols would you find on a substance that is dangerous to the environment? (1 mark)

(A)



(B)



(C)



(D)



40. What is the primary advantage of composite materials in aerospace applications? (1 mark)

(A) Low durability

(B) Low cost

(C) High strength to weight ratio

(D) Excellent electrical conductivity

END OF TEST PAPER

