



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)



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

