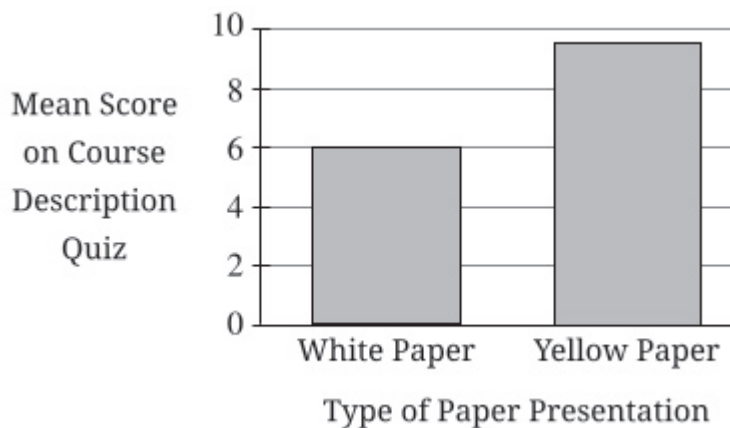2. Professor Gonzalez hypothesizes that students will remember more information from his detailed course description if it is printed on yellow paper than if it is printed on standard white paper. To test this hypothesis, he put the names of all his students into a bowl, then drew out names to assign them to two different groups. He gave one group of the students in his class a course description printed on white paper, and gave the other group of students a course description printed on yellow paper. Students were instructed to thoroughly read the description outside of class in preparation for their next class. In the next class, he gave all students a ten-question quiz asking them about the information found on the course description. Professor Gonzalez then compared the number of correct answers for each group of students. The statistically significant results are depicted in the graph.

Part A
- State the operational definition of the dependent variable.
- Identify the experimental group.
- In addition to the manipulation of an independent variable, identify the procedure Professor Gonzalez used to make this study a true experiment.
- Explain how the data as presented in the graph do or do not support Professor Gonzalez's hypothesis.

Part B

Explain how each of the following might relate to a student's performance on any quiz.
- Context-dependent memory
- Yerkes-Dodson law
- Low level of the Big Five trait of conscientiousness

_____

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.
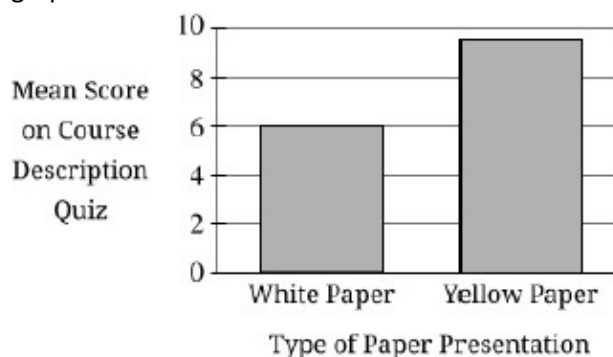
GO ON TO THE NEXT PAGE.

Question 2: Research Design   7 points

Part A Professor Gonzalez hypothesizes that students will remember more information from his detailed course description if it is printed on yellow paper than if it is printed on standard white paper. To test this hypothesis, he put the names of all his students into a bowl, then drew out names to assign them to two different groups. He gave one group of the students in his class a course description printed on white paper and gave the other group of students a course description printed on yellow paper. Students were instructed to thoroughly read the description outside of class in preparation for their next class. In the next class, he gave all students a ten-question quiz asking them about the information found on the course description. Professor Gonzalez then compared the number of correct answers for each group of students. The statistically significant results are depicted in the graph.

Mean Score on Course Description Quiz — Type of Paper Presentation (White Paper, Yellow Paper)

| **State the operational definition of the dependent variable.** | **1 point** |

Response must indicate that the dependent variable is operationally defined as the student's score on the course description quiz.

Acceptable explanations include:

- *The dependent variable is operationally defined as the score on the course description quiz.*
- *The dependent variable is the quiz score/grade on the quiz.*
- *The number of correct answers on the quiz is the dependent variable.*

Unacceptable explanations include:

- *The dependent variable is the type of paper used.*
- *The student's result on the quiz, and that's the dependent variable.*
- *The mean score on the quiz.*

| **Identify the experimental group.** | **1 point** |

Response must indicate that the experimental group is the group with the course description printed on yellow paper.

Acceptable explanations include:

- *The experimental group is the people who have the yellow paper.*

Unacceptable explanations include:

Responses that state the yellow paper without indicating the people/group.

- *The experimental group is the yellow paper.*

Responses that state a control group instead of an experimental group.

- *Example: The control group is the group with the yellow paper.*

References to taking the quiz on yellow paper do not score.

| **In addition to the manipulation of an independent variable, identify the procedure Professor Gonzalez used to make this study a true experiment.** | **1 point** |

Response must indicate that the procedure used to make this a true experiment is random assignment.

Acceptable explanations include:

- *Professor Gonzalez randomly assigned the participants to groups.*
- *Professor Gonzalez put people in groups randomly.*
- *Professor Gonzalez puts the names of all students into a bowl and pulls them out of a bowl.*

Unacceptable explanations include:

Responses that refer to random selection/sampling.

- *Professor Gonzalez used random selection to make this a true experiment.*

| **Explain how the data as presented in the graph do or do not support Professor Gonzalez's hypothesis.** | **1 point** |

Response must indicate that data support the hypothesis because the experimental group (i.e., the yellow paper group) scored higher on the test.

Acceptable explanations include:

- *Professor Gonzalez thought that the experimental group would score higher, and they did, so the data support the hypothesis.*
- *The bar for the yellow paper group is higher than the bar for the white paper group, which supports the hypothesis.*
- *The control group/white paper group scored lower than the experimental group/yellow paper group, which is what Professor Gonzalez expected.*

Unacceptable explanations include:

Responses that do not provide an explanation for data supporting the hypothesis.

- *The data do not support the hypothesis.*
- *The data **support the hypothesis** (needs to make clear what the hypothesis was).*

Part B Explain how each of the following might relate to a student's performance on any quiz.

| **Context-dependent memory** | **1 point** |

Response must indicate that the student's memory retrieval is affected if some external element (e.g., room, sensory cues, equipment) that is present when the information was learned/encoded is present/the same or absent/not the same as when they take a quiz.

Acceptable explanations include:

- *If students learn the information in a particular classroom, they should take a quiz in that same classroom so they can use the surroundings to cue them for their memories.*
- *If a student chews gum while studying, they should chew gum while taking a quiz.*
- *If students sit in different seats taking the quiz than when they learned that information, they will do worse on the quiz.*

Unacceptable explanations include:

- *Students must consider context in order to remember things well enough for their quiz.*

Responses that refer only to mood-dependent or state-dependent memory.

- *If a student is happy while learning the information, they will do better if they are happy when they take the quiz.*

Yerkes-Dodson law	**1 point**

Response must indicate that students would perform best under a level of optimal arousal.

OR

Response must indicate that students would perform worse if they were under- or over-aroused.

Synonyms for "under-aroused" can include a reference to the amount (e.g., too little, under, insufficient).

Synonyms for "over-aroused" can include a reference to the amount (e.g., too much, overly, super).

Acceptable explanations include:

- *Students might be too aroused on the quiz, so they don't do well.*
- *Students may be at their optimal arousal, so they end up doing well on the quiz.*
- *Students are extremely disinterested/very bored in the class, so they don't do well on a quiz.*
- *Students who have a high level of arousal perform poorly on the quiz.*

Unacceptable explanations include:

Responses that refer to arousal without quantity (i.e., too much, too little).

- *Students may be relaxed, so they do well on the quiz.*
- *Students who are excited do poorly on the quiz.*

Low level of the Big Five trait of conscientiousness	**1 point**

Response must indicate that a low level of an enduring characteristic of conscientiousness would hinder student performance on the quiz (e.g., not being diligent, being less hardworking, being unorganized, being undisciplined, being irresponsible, being unprepared, etc.).

Acceptable explanations include:

- *Students who aren't hardworking may be hindered from doing well on the quiz.*

Unacceptable explanations include:

- *Students who are diligent do better on the quiz.*
- *Students who did not study hard did poorly on the quiz.*

Total for question 2   7 points