UNIVERSITY OF GHANA

FACULTY OF ENGINEERING SCIENCES
SECOND SEMESTER EXAMINATIONS: 2013/2014
LEVEL 200: BACHELOR OF SCIENCE IN ENGINEERING
FAEN 206: Technical Report Writing (3 Credits)

Total Marks: 100 Time allocation: 3 Hours

ANSWER ALL QUESTIONS IN SECTION A AND SECTION B

SECTION A (70 MARKS): EACH QUESTION CARRIES ONE MARK.

1. A project is considered SIGNIFICANT if the researcher supports his claim with all of the following except
   (a) Critical analysis of the literature
   (b) Advancement of scientific knowledge
   (c) Supports previous claims
   (d) How concepts will drive the field
2. A project is considered INNOVATIVE if the researcher supports his claim with all of the following except
   (a) The research shifts current research to new levels
   (b) The concepts are well established
   (c) State why your approach is different
   (d) Exert greater impact in the field
3. A research strategy has the following in that order
   (a) Approach, timeline and future directions
   (b) Specific aims, approach and timeline
   (c) Timeline, future directions and approach
   (d) Future directions, timeline, approach
4. What is an abstract?
   (a) Conclusion of the report contents
   (b) Comments on the report content
   (c) Summaries of the content of a report
   (d) Introduction of the content of a report
5. If you want to write a technical report on how breast cancer is treated, you will probably include:
   (a) What causes breast cancer
   (b) The effect of the disease on future generations
   (c) How the disease is treated

(d) The kind of technologies available to treat the disease

6. A grant proposal will have to score in the following ranges to stand the chance of getting funded from an Agency:
   (a) 1-2
   (b) 3-5
   (c) 6-7
   (d) 8-9
7. A grant proposal which does go beyond the first stage of the review process is
   (a) Archive for future consideration
   (b) Send back to the PI
   (c) Considered for funding
   (d) Triage
8. A jargon is:
   (a) Specialised language and is always inappropriate.
   (b) Technical language used within a field and therefore has a place in research reports.
   (c) Specialised language and may be appropriate when used between peers but not with people outside the field.
   (d) Specialised language and is never appropriate in reports.

10. In the methods section of the report, the researcher needs to:
    (a) Discuss the results of the research
    (b) Discuss the theoretical background for the research
    (c) Recount in detail the daily research activities conducted during the research process
    (d) Set out in detail how data was gathered and analysed
12. Which report section is intended to describe the purpose with a full statement of the research question?
    (a) Appendices
    (b) Approaches
    (c) Results
    (d) Objectives
13. In a qualitative report presented in the results it is likely that you will always use ..... to describe your findings.
    (a) Words
    (b) Graphs
    (c) Tables
    (d) Pie charts

14. Before you find a research topic in your field the first thing you will do is to
    (a) Talk to your colleagues
    (b) Listen to the news
    (c) Read relevant textbooks
    (d) Review the literature
15. The more citations in a manuscript will mean the work is innovative (True/False)
16. The more citations in a manuscript will mean the work is significant (True/False)

17. Recommendation for further work on published work should be based on:
    (a) Findings
    (b) Assumptions
    (c) Speculations
    (d) Introduction
18. One of the biggest challenges in the "big data" research is
    (a) Writing the algorithm
    (b) Gathering the data
    (c) Pattern recognition
    (d) Working across disciplines
19. Why is the "big data" research gaining such prominence in recent times?
    (a) Cheaper to do
    (b) No real data
    (c) One man research
    (d) Solving real problems
20. The specific aims of a grant proposal are a miniature of the entire grant proposal (True/False).
21. When you are writing a manuscript, the abstract is written first (True/False).
22. A technical abstract is different from a nontechnical abstract in terms of
    (a) Content
    (b) Word count
    (c) Language
    (d) Title
23. A project narrative is meant to
    (a) Serve as abstract
    (b) Describe the project
    (c) Represent the research strategy
    (d) Connect the different segments of the project
24. All of these issues are concerns for "big data" research except
    (a) People are not willing to collaborate
    (b) Pattern recognition
    (c) Cannot publish the results
    (d) All of the above
25. A communication is different from a regular paper because
    (a) A communication has no graph
    (b) A communication is providing useful methodologies for other researchers to use
    (c) A communication is reviewing the literature and summarizing the results of other researchers
    (d) A communication is the same as a regular paper except the number of pages are smaller
26. The three broad categories of research ideas are:
    (a) experience, deduction, and theory.
    (b) theory, models, and application.
    (c) experience, theory, and application.
    (d) experience, theory, and models.

27. A valuable source of systematic observation is:
    (a) informal observations of family members.
    (b) your personal experiences.
    (c) published research reports.
    (d) the anecdotes of a friend.

28. If you designed an experiment to investigate the factors that cause patients to stick to diet and exercise programs, your research is primarily driven by a focus on:
    A) testing the validity of a model.
    B) application.
    C) theory.
    D) Both a and b
    E) None of the above

29. Which of the following questions could (at least in theory) be answered using the scientific method?
    A) How many angels can stand on the head of a pin?
    B) Is abortion moral or immoral?
    C) What conditions contribute to terrorism?
    D) Should prayer be encouraged in public schools?

30. An empirical question is one:
    A) that can be answered by objective observation.
    B) whose answer proves the validity of a theory.
    C) whose answer solves a practical problem.
    D) whose answer separates a good theory from a bad theory.

31. Conducting a literature review before you design a research study can:
    A) help you avoid reinventing the wheel.
    B) identify measures and apparatus you might want to use for your study.
    C) show whether your original question has already been answered.
    D) All of the above

32. A(n) _____ contains full research reports, including all information needed to replicate a study.
    A) primary source
    B) secondary source
    C) anthology
    D) textbook

33. Which of the sources listed would provide the most recent information on a research topic?
    A) textbooks
    B) scholarly journals

C) papers delivered at professional meetings
D) reviews

34. Where would you obtain the most detailed description of the method and results of a research project?
A) In a research report in the Journal of Experimental Psychology.
B) In a paper delivered at the annual meeting of the Midwestern Psychological Association.
C) In a review article in the Psychological Bulletin.
D) In a meta-analysis.

35. An advantage of attending a paper session at a convention rather than reading about the research in a journal is that:
A) you get a more detailed description of the method.
B) you can meet the researchers.
C) the research has been reviewed by experts and approved.
D) All of the above

36. According to your text, a disadvantage of using a general Internet search engine is that:
A) you will probably not find much on your topic.
B) you cannot be sure of the quality of the materials you find.
C) because materials posted on the Internet are so rigorously screened, you may find that there is a limited amount of material available.
D) None of the above

37. When you critically evaluate the method section of a research report, the litmus test of that section is:
A) whether you could replicate the study from the description given.
B) whether the method described is a standard one.
C) the test given to the participants to determine whether they should be included in the study.
D) any test that is administered as a part of the procedure.

38. To be accepted for publication, a research paper today usually must contain:
A) no more than a single experiment involving a treatment and a control condition.
B) a series of experiments or at least a parametric study involving several levels of two or more variables.
C) citations by the editor and reviewers praising the research conducted.
D) a significant new theoretical formulation.

39. To ensure that reviewers of research papers can make their judgments without fear of reprisal, reviews are often:
A) biased in favor of the author of the paper.
B) conducted by a computer.
C) conducted anonymously.
D) kept under lock and key.

40. A _____ links variables and specifies expected relationships among them.
    A) hypothesis
    B) model
    C) theory
    D) research question

41. The final step in the research process is to:
    A) conduct a statistical analysis of the data.
    B) report the research results.
    C) dismantle the apparatus.
    D) clean the laboratory.

42. Learning how to write a research report is valuable:
    A) only if you are going to become a scientist.
    B) only if you are going to become an experimental psychologist.
    C) only if you are planning to become a writer.
    D) for any occupation in which you will have to organize facts, draw logical conclusions, and present those facts and conclusions to others.

43. When you write a research report for submission to an APA journal, the report must conform to:
    A) APA writing style.
    B) the style of the American Physical Society.
    C) the factual and ethical standards of the National Enquirer.
    D) All of the above

44. Manuscripts that follow APA style must be:
    A) single spaced.
    B) double spaced.
    C) triple spaced.
    D) trimmed in gold leaf.

45. The _____ is the first two or three words of your title and appears along with the page number in an APA-style manuscript.
    A) manuscript page header
    B) running head
    C) short title
    D) manuscript page runner

46. To be effective, the title of your article should be:
    A) long so that all important details of the study can be indicated.
    B) short and cute.

C) concise yet informative.
D) peppered with long words.

47. A shortened title that will appear at the top of each page in the published article is the:
A) article title.
B) running head.
C) byline.
D) abstract.

48. An abstract for a research report should not exceed:
A) 50 words.
B) 120 words.
C) 150 words.
D) 25 lines.

49. The primary function of the introduction is to:
A) provide an exhaustive review of the literature on the topic covered by the research.
B) entertain the reader.
C) justify the study described in the report.
D) describe the conclusions drawn from the results of the research.

50. The structure of the introduction proceeds:
A) from the general to the specific.
B) from the specific to the general.
C) from the general to the specific and back to the general again.
D) from the general question to the results of the research.

51. When writing the introduction, you should assume that:
A) the reader knows nothing about the topic.
B) the reader knows everything about the topic.
C) the reader has some knowledge of the basic psychological concepts that underlie your study.
D) the editors of the journal will fill in any missing details for you.

52. The Method section of your research report should:
A) describe everything that you can think of concerning your participants, apparatus, and procedure.
B) provide enough information about your study that the reader could duplicate it in all its essential details.
C) tell what mistakes you made in your pilot study that you eliminated in the actual study.
D) discuss the results of your study.

53. Interpretation of your results belongs in the:
A) introduction.
B) Method section.
C) Results section.
D) Discussion section.

54. The purpose of the discussion section is to:
    A) explain why the results of your study don't really mean anything.
    B) interpret the results and indicate how they fit with previous research and theory.
    C) justify the study.
    D) list all the things that went wrong as you attempted to carry out the study.

55. The Reference section of your research report should contain a listing of all the references that:
    A) were cited in the report.
    B) you read when preparing to write the report.
    C) you believe the readers of your report would find useful.
    D) have anything at all to do with the topic of your report.

56. If you have two articles to list in your reference section by the same author, you then list them:
    A) from the oldest to the newest.
    B) from the newest to the oldest.
    C) alphabetically according to the first word of the journal title.
    D) alphabetically according to the first word in the title of the article or book.

57. On a graph, the levels of the independent variable are usually represented on the:
    A) x-axis.
    B) y-axis.
    C) ordinate.
    D) figure caption.

58. Which of the following sentences is grammatically incorrect?
    A) The independent variable was found to effect the dependent variable.
    B) The data from the experiment is presented in Figure 1.
    C) The affect of the independent variable was minimal.
    D) All of the above

59. After you submit your paper to a journal for review, you may have to wait _____ before you receive your first feedback.
    A) as much as 2 weeks
    B) a month
    C) 2 months or more
    D) several years

60. When giving an oral presentation of your research results, you should:
    A) provide an informal description, organized on the spot.

B) read your paper from typed notes.
C) develop an outline of your talk and stick to it.
D) give all the details of your methodology.

61. For an experimental design that goes beyond two groups and a dependent variable measured on an interval scale, the best statistic is the:
    A) ANOVA.
    B) t test for correlated samples.
    C) Mann–Whitney U test.
    D) chi-square test.

62. According to your text, total variation can be partitioned into:
    A) independent and correlated variation.
    B) type I and type II variation.
    C) between-groups and within-groups variation.
    D) None of the above

63. If you have unequal sample sizes, you would use an unweighted means analysis if:
    A) your experimental procedure caused the unequal sample sizes.
    B) your experimental procedure did not cause the unequal sample sizes.
    C) the size of the sample in one group did not exceed any of the others by more than three participants.
    D) Both a and b

64. Nonparametric tests:
    A) are used only when your data do not meet the assumptions of parametric statistics.
    B) are used if your data do not meet the assumptions of a parametric test, even if your data were scaled on an interval or ratio scale.
    C) are used when your data are scaled on less than an interval scale.
    D) Both a and b only
    E) Both b and c only

65. The power of a statistical test refers to its:
    A) ability to eliminate statistical errors.
    B) ability to analyze data that violate the assumptions of the test.
    C) ability to detect differences between means.
    D) All of the above

66. The power of a statistical test is affected by:
    A) sample size.
    B) the alpha level chosen.
    C) effect size.
    D) all of the above
    E) Both b and c only

67. If one finding is statistically significant at $p < .01$ and a second at $p < .05$, it would be logical to say that:
    A) finding 1 is more significant than finding 2.
    B) finding 2 is more significant than finding 1.
    C) finding 1 and finding 2 are equally significant.
    D) you can have greater confidence in rejecting the null hypothesis for finding 1 than finding 2.

68. A data transformation that changes the value of numbers, but not the scale of measurement are called:
    A) nonlinear transformations.
    B) geometric transformations.
    C) linear transformations.
    D) simple transformations.

69. A legitimate reason for transforming your data is:
    A) to help a nonsignificant finding become significant.
    B) when your data do not meet assumptions of a parametric statistic and no nonparametric alternative is available.
    C) to reduce the effects of extraneous variables.
    D) All of the above

70. If for some reason you cannot use inferential statistics, you may have to:
    A) establish reliability through replication.
    B) redo your experiment so that you can use inferential statistics.
    C) simply "eyeball" your results to determine reliability.
    D) ignore reliability issues and interpret your data anyway.

SECTION B [30 marks]

1. The faculty of Engineering has been tasked by a Funding Organization to identify a specific problem from the following: