# Analysis of the psychometric properties of business studies achievement test for senior secondary schools in Nigeria 

*Chidiebere Christopher Ufondu ${ }^{1}$, Mohammed Adamu Auta ${ }^{1}$ and Chibuzor Christy Ifi ${ }^{1}$<br>${ }^{1}$ Nnamdi Azikiwe University, Nigeria<br>*Corresponding author: cc.ufondu@unizik.edu.ng

To cite this article (APA): Ufondu, C. C., Auta, M. A., \& Ifi, C. C. (2023). Analysis of the psychometric properties of business studies achievement test for senior secondary schools in Nigeria. Journal of Research, Policy \& Practice of Teachers and Teacher Education, 13(2), 98-110. https://doi.org/10.37134/jrpptte.vol13.2.7.2023

To link to this article: https://doi.org/10.37134/jrpptte.vol13.2.7.2023
Received: 15 November 2022; Accepted: 04 October 2023; Published: 18 October 2023


#### Abstract

The study analyzed the psychometric properties of business studies achievement test for senior secondary schools in Nigeria. One research question guided the study. The study adopted an instrumentation design. The area of the study was Anambra State. The population of the study consists of all 23,077 students and 586 business studies teachers in two hundred and sixty-one senior secondary schools in Anambra State. Taro Yamane formula was used to determine the sample size of the study, which is 630 made up of 393 students in SS1 and 238 business studies teachers in Anambra State. A multi-stage sampling procedure involving two stages was adopted for this study. Proportionate stratified and purposive sampling techniques were employed at the first and second stages respectively. Items were subjected to item analysis to determine the difficulty and discriminatory indices. The study revealed that 125 items were found to be appropriate for inclusion in the business studies achievement test, these test's items met the criteria for item difficulty index and item discrimination. Based on the findings of the study it was recommended that teachers of business studies like commerce, accounting, and office practice among others should employ the created business studies Achievement Test. The BSAT items should be used as a model when creating other accomplishment exams for senior secondary schools in business studies.


Keywords: Achievement test, business studies, difficulty index, discriminatory index

## Introduction

Business studies are the main driver of economic and technological development, either by enhancing human potential, strengthening the workforce's defense against modernization, industrialization, and environmental development, or promoting individual liberty and populist empowerment. Business studies aim to instill or provide the training necessary to help learners or students become productive in their fields of study, which will either result in self-employment or self-reliance or help them land a job in the private or public sector (Duktur \& Barko, 2013). Business Studies in senior secondary school teach students to be independent and to comprehend the global economy and financial system (Duktur \& Barko, 2013; Ebimuna, 2021; Emeasoba \& Victor-Igwe, 2016). At the senior secondary level, business studies are divided into five units that cover commerce, accounting, office practice, store management, and insurance (Federal Republic of Nigeria, 2013).

The performance of students in public exams including business-related subjects has not been promising over time. The government, schools, parents, and the general public have all expressed worry about this. Studies have shown that the reasons for the poor performance may include, among other things, the poor state of education in the nation, low-quality teaching staff, the nature of the subjects, inadequate preparation of students for examinations, education budgets leading to shortages of facilities and equipment needed for effective teaching and learning as well as unstandardized test for accessing students' achievements (Moyinoluwa, 2015).

Any educational endeavor must have standards by which success or achievement is judged. The standards and uniformity of the criteria must also be met. In Nigerian education, it is encouraged that tools used to measure accomplishments be designed so that the measurement process encounters the fewest possible errors. If instruments used to measure achievement are to fulfill the goal for which they were designed, they must have the necessary psychometric qualities (appropriate item difficulty, discrimination, and distracter indices) (Obilor \& Obubere, 2020).

According to de Souz et al. (2017) psychometrics is a branch of research that focuses on the theory and methods of psychological measurement, including the assessment of knowledge, skills, talents, attitudes, personality traits, and educational outcomes. Its main focus is on the development and evaluation of measurement tools like tests, questionnaires, and personality assessments. Building instruments and techniques for assessment and developing and improving theoretical approaches to measurement are the two main tasks that psychometrics addresses.

There is a need to apply some essential psychometric practices like item analysis which include determining item difficulty, discriminatory and distracter index which is meant to enhance the quality of assessment (Fahmi Ishaq El-Uri \& Naser Malas, 2013; Odukoya et al. 2018). Item difficulty index indicates the degree of difficulty of the test item to the cognitive ability of the test taker is calculated by finding the proportion of the testees that got the item correctly (Boopathiraj \& Chellamani, 2013; Opara \& Magnus-Arewa, 2017). The item discrimination index (d) is the difference between the proportion of students who passed an item in the upper group and the proportion of students who passed it in the lower group (Jayanthi, 2014; Shafizan Sabri, 2013).

The curriculum in the educational system requires that various assessments be conducted during the learning process to direct successful teaching, measure student mastery, and guide effective learning. The typical weekly, end-of-term, and/or end-of-session tests are among them. Sadly, the majority of teachers lack the knowledge necessary to provide accurate and valid tests. The researcher and other researchers have noted that teacher-made assessments lack basic psychometric features, making them less suitable for student assessment (Owoyele, 2017; Obilor \& Obubere, 2020; Shella Monica, 2021)

The most frequently used instruments for student promotion into new classrooms as well as assessment are locally developed teacher-made examinations. It has been discovered that the majority of tests created by teachers are haphazardly constructed or are not constructed following test blueprints or tables of specifications. They also lack psychometric properties, appropriate difficulty, discrimination, and the effectiveness of distractions (Ayunda Friatma and Azwir Anhar, 2019; Obilor and Orubere, 2020). According to what has been seen from some of the business studies teachers' test items, this claim is largely accurate. The test questions are not evenly distributed across the topics, and some of them seem to be repeated. Additionally, some of the exam papers are handwritten, and some of the questions don't accurately reflect the subject matter. This study aimed to create the necessary test items to check this anomaly by analyzing the psychometric properties of business studies achievement tests for senior secondary schools in Nigeria.

## Research Question

The following research question guided the study.

1. What are the Difficulty and Discrimination Indices of business studies achievement test for senior secondary schools in Anambra State?

## Method

The study adopted an instrumentation design. The area of the study was Anambra State. The population of the study consist of all the 23,077 students and 586 business studies teachers in two hundred and sixty-one senior secondary schools in Anambra State. Taro Yamane formula will be used to determine the sample size of the study, which is 630 made up of 393 students in SS1 and 238 business studies teachers in Anambra State which were selected using a purposive sampling technique. The following steps were used in analyzing the psychometric properties of business studies achievement test which comprises of isolation of instructional content from the curriculum, development of table of specifications, generation of items corresponding with instructional objectives, initial validation of the drafted test items, item review of the test items, final validation of the instrument for item generation, administering the business studies placement test to students to determine difficulty, discriminatory distracter index, In answering the first research question, on determining items suitable for inclusion in the business studies placement test. Difficulty and discriminatory indices were determined. For the difficulty index of the developed business studies achievement test, the acceptable difficulty indices will range from 0.30 to 0.70 , for the discriminatory index of the business studies placement test, the acceptable discriminatory indices during item analysis will range from 0.30 to 1.00 .

## Results

Difficulty and Discrimination Indices of business studies achievement test for senior secondary schools in Anambra State.

Table 1
Summary Result of Difficulty and Discrimination Indices of the Test Try-out

| Item | Key <br> (K) | No of correct responses among Higher achievers (H) $\mathrm{N}=103$ | No of correct responses among Lower achievers (L) $\mathrm{N}=103$ | Difficulty index | Discrimination index | Decision |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Q1 | C | 88 | 37 | 0.61 | 0.50 | Retained |
| Q2 | C | 82 | 51 | 0.65 | 0.30 | Retained |
| Q3 | C | 85 | 43 | 0.62 | 0.41 | Retained |
| Q4 | C | 72 | 51 | 0.60 | 0.20 | Discarded |
| Q5 | C | 97 | 42 | 0.67 | 0.53 | Retained |
| Q6 | A | 85 | 49 | 0.65 | 0.35 | Retained |
| Q7 | B | 81 | 30 | 0.54 | 0.50 | Retained |
| Q8 | C | 97 | 21 | 0.57 | 0.74 | Retained |
| Q9 | D | 24 | 36 | 0.29 | -0.12 | Discarded |
| Q10 | B | 85 | 41 | 0.61 | 0.43 | Retained |
| Q11 | C | 87 | 53 | 0.68 | 0.33 | Retained |
| Q12 | B | 90 | 39 | 0.63 | 0.50 | Retained |
| Q13 | B | 96 | 29 | 0.61 | 0.65 | Retained |
| Q14 | A | 63 | 53 | 0.56 | 0.10 | Discarded |
| Q15 | B | 89 | 49 | 0.67 | 0.39 | Retained |
| Q16 | B | 98 | 41 | 0.67 | 0.55 | Retained |
| Q17 | A | 102 | 18 | 0.58 | 0.82 | Retained |
| Q18 | C | 73 | 38 | 0.54 | 0.34 | Retained |
| Q19 | B | 97 | 37 | 0.65 | 0.58 | Retained |
| Q20 | A | 85 | 38 | 0.60 | 0.46 | Retained |
| Q21 | D | 94 | 28 | 0.59 | 0.64 | Retained |
| Q22 | C | 77 | 42 | 0.58 | 0.34 | Retained |
| Q23 | A | 76 | 47 | 0.60 | 0.28 | Retained |
| Q24 | D | 88 | 29 | 0.57 | 0.57 | Retained |
| Q25 | C | 88 | 36 | 0.60 | 0.50 | Retained |
| Q26 | B | 84 | 47 | 0.64 | 0.36 | Retained |
| Q27 | C | 85 | 55 | 0.68 | 0.29 | Discarded |
| Q28 | A | 90 | 49 | 0.67 | 0.40 | Retained |
| Q29 | C | 82 | 39 | 0.59 | 0.42 | Retained |
| Q30 | C | 82 | 44 | 0.61 | 0.37 | Retained |
| Q31 | D | 79 | 41 | 0.58 | 0.37 | Retained |
| Q32 | B | 79 | 38 | 0.57 | 0.40 | Retained |
| Q33 | A | 80 | 42 | 0.59 | 0.37 | Retained |
| Q34 | A | 83 | 31 | 0.55 | 0.50 | Retained |
| Q35 | D | 80 | 39 | 0.58 | 0.40 | Retained |
| Q36 | A | 83 | 34 | 0.57 | 0.48 | Retained |
| Q37 | B | 77 | 30 | 0.52 | 0.46 | Retained |
| Q38 | B | 80 | 44 | 0.60 | 0.35 | Retained |
| Q39 | B | 75 | 50 | 0.61 | 0.31 | Retained |
| Q40 | A | 79 | 39 | 0.57 | 0.39 | Retained |
| Q41 | D | 74 | 48 | 0.59 | 0.30 | Retained |
| Q42 | A | 83 | 37 | 0.58 | 0.45 | Retained |
| Q43 | A | 79 | 39 | 0.57 | 0.39 | Retained |
| Q44 | C | 82 | 33 | 0.56 | 0.48 | Retained |
| Q45 | C | 78 | 38 | 0.56 | 0.39 | Retained |
| Q46 | C | 82 | 31 | 0.55 | 0.50 | Retained |
| Q47 | D | 78 | 37 | 0.56 | 0.40 | Retained |
| Q48 | B | 84 | 29 | 0.55 | 0.53 | Retained |
| Q49 | B | 61 | 39 | 0.49 | 0.31 | Retained |
| Q50 | C | 86 | 30 | 0.56 | 0.54 | Retained |
| Q51 | D. | 79 | 40 | 0.58 | 0.38 | Retained |
| Q52 | A | 25 | 31 | 0.27 | -0.06 | Discarded |
| Q53 | A | 81 | 37 | 0.57 | 0.43 | Retained |


| Q54 | C | 82 | 34 | 0.56 | 0.47 | Retained |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Q55 | D | 85 | 33 | 0.57 | 0.50 | Retained |
| Q56 | B | 85 | 23 | 0.52 | 0.60 | Retained |
| Q57 | A | 85 | 35 | 0.58 | 0.49 | Retained |
| Q58 | A | 88 | 24 | 0.54 | 0.62 | Retained |
| Q59 | D | 91 | 33 | 0.60 | 0.56 | Retained |
| Q60 | C | 91 | 23 | 0.55 | 0.66 | Retained |
| Q61 | A | 92 | 32 | 0.60 | 0.58 | Retained |
| Q62 | B | 92 | 28 | 0.58 | 0.62 | Retained |
| Q63 | D | 89 | 33 | 0.59 | 0.54 | Retained |
| Q64 | A | 87 | 28 | 0.56 | 0.57 | Retained |
| Q65 | C | 89 | 33 | 0.59 | 0.54 | Retained |
| Q66 | B | 86 | 28 | 0.55 | 0.56 | Retained |
| Q67 | A | 83 | 34 | 0.57 | 0.48 | Retained |
| Q68 | D | 86 | 31 | 0.57 | 0.53 | Retained |
| Q69 | B | 84 | 35 | 0.58 | 0.48 | Retained |
| Q70 | D | 82 | 33 | 0.56 | 0.48 | Retained |
| Q71 | B | 82 | 38 | 0.58 | 0.43 | Retained |
| Q72 | B | 78 | 35 | 0.55 | 0.42 | Retained |
| Q73 | B | 78 | 38 | 0.56 | 0.39 | Retained |
| Q74 | D | 97 | 28 | 0.61 | 0.67 | Retained |
| Q75 | B | 91 | 40 | 0.64 | 0.50 | Retained |
| Q76 | B | 99 | 24 | 0.60 | 0.73 | Retained |
| Q77 | A | 102 | 38 | 0.68 | 0.62 | Retained |
| Q78 | B | 103 | 39 | 0.69 | 0.62 | Retained |
| Q79 | D | 15 | 42 | 0.28 | -0.26 | Discarded |
| Q80 | A | 90 | 33 | 0.60 | 0.55 | Retained |
| Q81 | A | 101 | 34 | 0.66 | 0.65 | Retained |
| Q82 | A | 102 | 32 | 0.65 | 0.68 | Retained |
| Q83 | A | 81 | 38 | 0.58 | 0.42 | Retained |
| Q84 | A | 102 | 32 | 0.65 | 0.68 | Retained |
| Q85 | D | 66 | 41 | 0.52 | 0.24 | Retained |
| Q86 | C. | 103 | 36 | 0.67 | 0.65 | Retained |
| Q87 | A | 101 | 47 | 0.72 | 0.52 | Retained |
| Q88 | A | 25 | 37 | 0.30 | -0.12 | Discarded |
| Q89 | A | 102 | 47 | 0.72 | 0.53 | Retained |
| Q90 | C | 6 | 35 | 0.20 | -0.28 | Discarded |
| Q91 | A | 103 | 48 | 0.73 | 0.53 | Retained |
| Q92 | A | 99 | 38 | 0.67 | 0.59 | Retained |
| Q93 | A | 66 | 45 | 0.54 | 0.20 | Discarded |
| Q94 | A | 102 | 36 | 0.67 | 0.64 | Retained |
| Q95 | D | 97 | 40 | 0.67 | 0.55 | Retained |
| Q96 | D | 100 | 26 | 0.61 | 0.72 | Retained |
| Q97 | B | 100 | 41 | 0.68 | 0.57 | Retained |
| Q98 | A | 4 | 35 | 0.19 | -0.30 | Discarded |
| Q99 | A | 100 | 28 | 0.62 | 0.70 | Retained |
| Q100 | C | 99 | 30 | 0.63 | 0.67 | Retained |
| Q101 | A | 46 | 41 | 0.42 | 0.05 | Discarded |
| Q102 | D | 60 | 31 | 0.44 | 0.28 | Discarded |
| Q103 | D | 80 | 37 | 0.57 | 0.42 | Retained |
| Q104 | B | 79 | 34 | 0.55 | 0.44 | Retained |
| Q105 | D | 81 | 34 | 0.56 | 0.46 | Retained |
| Q106 | D | 6 | 25 | 0.15 | -0.18 | Discarded |
| Q107 | D | 83 | 38 | 0.59 | 0.44 | Retained |
| Q108 | A | 74 | 24 | 0.48 | 0.49 | Retained |
| Q109 | A | 88 | 34 | 0.59 | 0.52 | Retained |
| Q110 | A | 89 | 23 | 0.54 | 0.64 | Retained |
| Q111 | B | 91 | 32 | 0.60 | 0.57 | Retained |
| Q112 | B | 91 | 28 | 0.58 | 0.61 | Retained |
| Q113 | B | 86 | 33 | 0.58 | 0.51 | Retained |


| Q114 | B | 85 | 28 | 0.55 | 0.55 | Retained |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Q115 | D | 89 | 33 | 0.59 | 0.54 | Retained |
| Q116 | D | 86 | 28 | 0.55 | 0.56 | Retained |
| Q117 | A. | 83 | 34 | 0.57 | 0.48 | Retained |
| Q118 | B | 84 | 31 | 0.56 | 0.51 | Retained |
| Q119 | C. | 73 | 35 | 0.52 | 0.37 | Retained |
| Q120 | B. | 82 | 34 | 0.56 | 0.47 | Retained |
| Q121 | D | 81 | 38 | 0.58 | 0.42 | Retained |
| Q122 | C | 78 | 35 | 0.55 | 0.42 | Retained |
| Q123 | A | 77 | 38 | 0.56 | 0.38 | Retained |
| Q124 | D | 85 | 28 | 0.55 | 0.55 | Retained |
| Q125 | D | 99 | 40 | 0.67 | 0.57 | Retained |
| Q126 | D | 99 | 24 | 0.60 | 0.73 | Retained |
| Q127 | B | 102 | 38 | 0.68 | 0.62 | Retained |
| Q128 | A | 103 | 39 | 0.69 | 0.62 | Retained |
| Q129 | B | 14 | 43 | 0.28 | -0.28 | Discarded |
| Q130 | A | 88 | 33 | 0.59 | 0.53 | Retained |
| Q131 | C | 99 | 34 | 0.65 | 0.63 | Retained |
| Q132 | D | 79 | 32 | 0.54 | 0.46 | Retained |
| Q133 | . C | 98 | 38 | 0.66 | 0.58 | Retained |
| Q134 | C | 100 | 32 | 0.64 | 0.66 | Retained |
| Q135 | D | 100 | 41 | 0.68 | 0.57 | Retained |
| Q136 | D | 103 | 36 | 0.67 | 0.65 | Retained |
| Q137 | C | 101 | 37 | 0.67 | 0.62 | Retained |
| Q138 | D | 10 | 40 | 0.24 | -0.29 | Discarded |
| Q139 | D | 102 | 47 | 0.72 | 0.53 | Retained |
| Q140 | D | 19 | 31 | 0.24 | -0.12 | Discarded |
| Q141 | C | 92 | 48 | 0.68 | 0.43 | Retained |
| Q142 | B | 98 | 38 | 0.66 | 0.58 | Retained |
| Q143 | C | 95 | 46 | 0.68 | 0.48 | Retained |
| Q144 | D | 99 | 39 | 0.67 | 0.58 | Retained |
| Q145 | D | 96 | 41 | 0.67 | 0.53 | Retained |
| Q146 | B | 98 | 27 | 0.61 | 0.69 | Retained |
| Q147 | A | 100 | 35 | 0.66 | 0.63 | Retained |
| Q148 | A | 20 | 35 | 0.27 | -0.15 | Discarded |
| Q149 | D | 100 | 29 | 0.63 | 0.69 | Retained |
| Q150 | D | 99 | 29 | 0.62 | 0.68 | Retained |
| Q151 | B | 19 | 35 | 0.26 | -0.16 | Discarded |
| Q152 | B | 100 | 29 | 0.63 | 0.69 | Retained |
| Q153 | C | 99 | 31 | 0.63 | 0.66 | Retained |

Table 3 shows the difficulty and discrimination indices for each item, based on the criteria adopted in this study, 135 items were retained while item numbers $4,9,14,27,52,79,88,91,94.98,102,103,106,129$, $138,140,148,151$ were discarded.

## Findings and discussion

Findings on items suitable for inclusion in the business studies placement test for senior secondary schools in Anambra State revealed that the difficulty index of business studies placement test ranged from 0.20 to 0.54 , All the items possess a positive difficulty index except ten items which had to do with the functions of a retailer, the historical development of accounting, outgoing mail, the principle of indemnity among others which had indices below 0.30. This is in agreement with the findings of Jayanthni (2014) on the development and validation of achievement test in mathematics. The study aimed at developing and validating an achievement test in mathematics for high school students of standard 10 in Chennai district in India. The answer sheets were evaluated and marks were prepared to perform item analysis though the result shows the value of the difficulty index lies between 0.20 and 0.78 . Also, Opara and Magnus (2017) researched the development and validation of mathematics test for primary six pupils which showed the value of difficult indices of MAT items ranged from 0.27 to 0.68. Eleje, Esomonu, Agu, Okoye, Obasi, and Onah (2016) researched on development and validation of a test on Diagnostic Economics Test for senior secondary schools. The study had difficulty indices range from 0.24 to 0.79 . For the discriminatory index, the study revealed that the discriminatory index of business studies
placement test ranged from -0.06 to 0.96 , all items were appropriate except eighteen items which focused on functions of commerce, unfavorable balance of trade, cooperative society, debitors control accounts, incoming and outgoing correspondence, transport document among others which had indices below 0.30 . This is in agreement with Opara and Magnus-Arewa (2017) that researched on development and validation of mathematics achievement tests for primary school pupils. The study shows the value of the discriminatory index lies between 0.27 and 0.68. Muhammad Aamir Hashmi et al. (2012) researched the development and validation of an aptitude test for secondary school mathematics students in Pakistan. The study shows the value of the discriminatory index lies between 0.13 and 0.83 .

## Conclusion

The results of the study show that a sizable number of the multiple-choice Business studies Achievement test items meet some of the psychometric requirements of a standardized test, leading the authors to conclude that the test's items also meet the criteria for item difficulty index and item discrimination. After considering the delicate nature of test items and their emphasized significance, teachers must have a thorough understanding of test psychometrics to create effective test items, especially for a novel examinable subject like commerce, accounting, store management, office practice, and insurance among others.

## Recommendations

Based on the findings of the study, the following recommendations were made:

1. Teachers of business studies like commerce, accounting, and office practice among others should employ the created business studies Achievement Test.
2. The BSAT items should be used as a model when creating other accomplishment exams for senior secondary schools in business studies (and other topics).
3. Teachers should regularly attend sensitization workshops, seminars, and conferences to become familiar with the methods required to create reliable assessment tools.
4. Educational inspectors should step up their tasks by conducting routine, deliberate, and unbiased inspections.
5. Teachers, researchers, and relevant agencies should always carry out item analysis to determine the difficulty, and discriminatory indices of each of the items, especially when carrying out achievement tests. This is recommended because items that are too difficult or too easy are not effective for measuring learning, items of average difficulty are more appropriate.

## References

Ayunda Friatma, \& Azwir Anhar. (2019). Analysis of validity, reliability, discrimination, difficulty and distraction effectiveness in learning assessment. Journal of Physics: Conference Series, 1387, Article 012063. https://doi.org/kwkn

Boopathiraj, C., \& Chellamani, K. (2013). Analysis of test items on difficulty level and discrimination index in the test for research in education. International Journal of Science and Interdisciplinary Research, 2, 189-193.
de Souza, A. C., Alexandre, N. M. C., \& de Brito Guirardello, E. (2017). Psychometric properties in instruments evaluation of reliability and validity. Epidemiologia e Serviços de Sáude, 26(3), 110. https://doi.org/gf66kv

Duktur, L. S., \& Barko, L. (2013). Teachers' beliefs in the teaching and examination of business studies in Plateau state secondary schools. Nigerian Journal of Business Education, 1(2), 324-332. https://rb.gy/ib2o2
Ebimuna, M. (2021). School plant maintenance and students academic performance in public secondary schools in Bayelsa state. British Journal of Education, Learning and Development Psychology, 4(1), 5975. https://www.doi.org/10.52589/BJELDP-CBOZ7YPY

Eleje, L. I., Esomonu N. P. M., Agu, N. N., Okoye, R. O., Obasi, E., \& Onah, F. E. (2016). Development and validation of diagnostic economics test for secondary schools. World Journal of Education, 6(3), 90112. https://doi.org/kwkm

Emeasoba, N. C., \& Victor-Igwe, J. N. (2016). Business studies teachers' perception of effective strategies for teaching business studies in promoting national sustainable development. Journal of Emerging Trends in Educational Research and Policy Studies, 7(3), 217-225. https://rb.gy/o0dnt
Fahmi Ishaq El-Uri, \& Naser Malas. (2013). Analysis of use of a single best answer format in an undergraduate medical examination. Qatar Medical Journal, 2013(1), 3-6. https://doi.org/gh4px6
Federal Republic of Nigeria. (2013). National policy on education [Policy]. NERDC. https://bit.ly/3LIuF2E
Jayanthi, J. (2014). Development and validation of an achievement test in mathematics. International Journal of Mathematics and Statistics Invention, 2(4), 40-46. https://rb.gy/101ev
Moyinoluwa, T. D. (2015). Analysing the psychometric properties of mathematics in public examinations in Nigeria. Research on Humanities and Social Sciences, 5(7), 24-30. https://bit.ly/3ZAcDW1
Muhammad Aamir Hashmi, Ashi Zeeshan, Muhammad Saleem, \& Rafaqat Ali Akbar. (2012). Development and validation of an aptitude test for secondary school mathematics students. Bulletin of Education and Research, 34(1), 65-76.
Obilor, E. I., \& Obubere, M. (2020). Development and validation of social studies cognitive achievement test for junior secondary schools in rivers state. International Academic Journal of Educational Research, 5(3), 1-20.
Odukoya, J. A., Adekeye, O., Igbinoba, A. O., \& Afolabi, A. (2018). Item analysis of university-wide multiple choice objective examinations: The experience of a Nigerian private university. Qual Quant, 52, 983997. https://doi.org/kr2r

Opara, I. M., \& Magnus-Arewa, E. A. (2017). Development and validation of mathematics achievement test for primary school pupils. British Journal of Education, 5(7), 47-57. https://bit.ly/48E0svA
Owoyele, J. W. (2017, December). Psychometric properties of teacher-made tests: An assessment of primary school teachers' attitude and competencies [Conference session]. Conference: 7th Global Knowledge Exchange Network, University of Jimma, Ethiopia.
Shafizan Sabri. (2013). Item analysis of student comprehensive test for research in teaching beginner string ensemble using model based teaching among music students in public universities. International Journal of Education and Research, 1(12), 1-14. https://www.ijern.com/December-2013.php
Shella Monica. (2021). The challenges in constructing and administering an objective test for beginners' students during the COVID-19 pandemic. Advances in Social Science, Education and Humanities Research, 532, 441-446. https://doi.org/hr83

## Appendix 1

## Business Studies Placement Test (BSPT)

## BUSINESS STUDIES PLACEMENT TEST FOR SENIOR SECONDARY SCHOOLS

Name of the Student
Gender
School
Class

## Instruction: Attempt all questions

Time: 1hr:30 minutes

1. Which of the following are the components of commerce:
(I) trading and advertising
(ii) warehousing and transportation
(iii) packaging and branding
(iv) insurance and banking
(a) I and II
(b) I and III (c) I, II and IV
(d) II, III and IV
2. The central focus of commerce is $\qquad$ (a) distribution (b) buying and selling (c) exchange (d) trade
3. The sustainable growth of commerce is largely due to (a) marketing (b) advertising (c) exchange (d) branding 4. One of the most important factors that determines the choice of occupation is.
(a) skill (b) training (c) interest (d) education
4. Which of the following sets is entirely made up of middlemen? (a) Manufacturers, consumers, and retailers (b) Wholesalers, retailers, and agents (c) Retailers, manufacturers and wholesalers (d) Wholesalers, agents, and consumers
5. The role of a wholesaler in the channel of distribution is to.
(a) produce goods in large quantities and sell in small quantities (b) buy goods directly from the manufacturers
(c) buy goods in large quantities and sell in small quantities (d) sell goods directly to the consumers
6. The production process that combines two or more raw materials into one end product is (a) conditioning (b) blending (c) merging (d) synthesis
7. Reward for land is.................... (a) capital (b) revenue(c) rent (d) interest
8. A country that offers tourism can be said to be involved in (a) visible exports (b) invisible exports (c) tangible imports (d) intangible imports
9. The term PLC implies that the shares are (a) made public on the stock exchange (b) made public in a commercial bank (c) privately on the stock exchange (d) available to the public at the company
10. The document that explains the types of shares available for sale to the public is (a) an invoice (b) an open indent (c) a prospectus (d) a closed indent
11. The difference between a private and public limited liability company is that the former (a) is unable to offer shares to the public (b) is unable to declare and pay a dividend (c) has a higher number of shareholders (d) pays higher salaries to its manager
12. Goods discharged from ships on which import duties have not been paid are kept in the (a) ordinary warehouse (b) public warehouse (c) private warehouse (d) bonded warehouse
13. The major types of warehouse are (a) manufacturer, bonded, departmental and private (b) bonded, public, cold room and private(c) wholesaler, manufacturer, public and bonded (d) manufacturer, bonded, public, and departmental
14. Which of the following cooperatives societies offers direct and indirect credit facilities?
(a) cooperative and thrift society (b) retail cooperative society (c) consumer cooperative society
(d) wholesalers cooperative society
15. A major advantage of a cooperative society is that it (a) gives members the opportunity to make profits (b) draws members closer to government (c) promotes awareness among members (d) encourages thrift among members
16. The traditional way of paying cooperative dividend is to distribute profit in proportion to members'(a) subscriptions (b) total savings (c) volume of purchases (d) total savings
17. Freight note is a document (a) used by a government to transport goods from one country to another (b) issued by a shipping company giving details of charges (c) used for payment of imported goods (d) given by an importer to pay for goods at a future period
18. If an importer wants a freehand to obtain goods from any manufacturer, he needs to provide (a) a consular invoice (b) a closed indent (c) an open indent (d) a freight note
19. The document that indicates obligation that is transferable by delivery and endorsement is a (a) bill of lading
(b) bill of exchange (c) documentary evidence (d) negotiable instrument
20. The exchange of gifts of goods and services of a specified value is called (a) balanced reciprocity (b) exchange
(c) barter (d) generalized reciprocity
21. Chambers of commerce is not restricted to a particular industry while trade association consists of $\qquad$
(a) highly regulated government agencies (b) members engaged in same trade (c) made up of members that are registered (d) made of firms in the banking industry
22. The major functions of a trade association is that it $\qquad$ . (a) liaises with foreign trade association (b) helps to promote foreign trade (c) facilitates members access to credit facilities (d) helps to promote research on behalf of members
23. The main objective of trade association is to (a) protect its members against litigation (b) boost the trade of its members (c) secure credit for its members (d) protect its members against victimization
24. The concept that refers to the sale, transfer or exchange of goods and services is (a) industry (b) trade (c) tariff (d) marketing
25. In international trade, exchanging goods for other goods and services purchased instead of paying in foreign currency is known as (a) countertrade (b) balance of trade (c) balance of payments (d) terms of trade.
26. Foreign trade also involves (a) providing services for other countries (b) specialization and the exchange of goods in a country (c) buying and selling within a country (d) the exchange of goods and services between firms 28. A limitation to international trade is (a) trade imbalance between countries (b) availability of local market (c) quantity of labour (d) cost of finance
27. The overriding advantage of home trade over foreign trade is (a) accessibility of seller to buyer (b) absence of many documents (c) ease in language of transaction (d) ease in form of payment
28. The two main forms of communication are (a) oral and written (b) verbal and non-verbal (c) e-mail and fax
(d) traditional and modern media
29. The major aim of establishing a public corporation is to (a) establish monopoly (b) provide essential services (c) provide employment opportunities (d) encourage specialization
30. The federal government made efforts at rendering public enterprises more efficient and profit -oriented thorough the process of (a) privatization (b) commercialization (c) indigenization (d) nationalization
31. Public enterprises are owned by: (a) government (b) joint stock company (c) private entrepreneur's (d) multinational corporations
32. Which of the following is not a form of organization of public sector enterprises? (a) departmental undertaking (b) government company (c) statutory corporation (d) sole proprietorship
33. A corporation established under a special law of parliament is (a) public enterprise. (b) departmental undertaking. (c) government company (d) joint sector.
34. Money is generally acceptable for transactions due to (a) the legal backing (b) the rule of law (c) its acceptability in the global market (d) the central bank governors' signature
35. Which is of the following is a quality of money? (a) availability (b) indivisibility (c) general acceptability (d) convertibility
36. A form of money with face value which is greater than value of the metal content is.
(a) legal tender (b) bank notes (c) token money (d) commodity money
37. Which is the following is not an advantage of partnership? (a) Diversified managerial talents (b) Greater financial resources (c) Freedom to terminate business (d) Account is not more public
38. Which is the following is not contained in a deed of partnership? (a) Names and addresses of partners (b) Ratio for sharing profits and losses (c) Investment of each partner (d) Rate of taxation
39. Partnership are most suitable where (a) the partners are family friends (b) professional are involved (c) members can easily raise enough capital
40. The maximum number of persons who are legally allowed to operate in a partnership is (a) 2 (b) 20 (c) there is no legal limit (d) 100
41. Which of the following is not an advantage of warehousing (a) matching supply with demand better (b) increase lead times through product travelling longer distances to consumers (c) consolidate product in distribution center (d) provide value added processing through delayed different distribution
42. Goods discharged from ships on which import duties have not been paid are kept in the (a) ordinary warehouse
(b) public warehouse (c) private warehouse (d) bonded warehouse
43. An effective accounting system should provide information (a) for customer feedback and requirement (b) on new products and method (c) for promoters, directors, labor unions and distributors (d) on internal and external reporting for managers and third party.
44. The rule of accounting equation requires that account payable should be placed under (a) liabilities (b) equities (c) assets (d) capital
45. The accounting equation can be expressed as (a) $\mathrm{N} 1000+\mathrm{N} 500+\mathrm{N} 1500=\mathrm{N} 3000$ (b) $\mathrm{N} 1000-\mathrm{N} 500+\mathrm{N} 1500$ $=\mathrm{N} 2000$ (c) $\mathrm{N} 1000+\mathrm{N} 500=\mathrm{N} 1500$ (d) $\mathrm{N} 1500+\mathrm{N} 500=\mathrm{N} 2000$
46. To which class of account would you post each of the following amounts receipt from sale of goods (a) capital (b) income (c ) asset (d) Expense
47. To which class of account would you post each of the following amounts (ii) Receipt of capital from the owner of the business (a) Capital (b) Income (c) Asset (d) Expense

Use the information below to answer July 1- started business with N10, 000 July 31- paid Agrotech N6000 owing them
50. The double entry for July 31 would be (a) debit Agrotech and credit cash (b) debit equipment and credit Agrotech (c) credit capital and debit cash (d) credit cash and debit purchases
51. The concept which states that revenue should be recognized at the point when the sale is deemed to have been made is (a) matching (b) consistency (c) going concern (d) realization
52. The basis upon which assets of an organization is valued is the $\qquad$ concept (a) historical (b) business entity (c) periodicity (d) materiality
53. Which of the following accounting conventions suggests that accountants should use a method of valuation that understates rather than overstates results? (a) conservatism (b) historical (c) monetary (d) cost
54. Stationery which will be used over a long period of time is usually recorded as an expense instead of an assest. This concept is called (a) entity (b) realization (c) accrual (d) materiality
55. Assigning revenues to the accounting period in which goods are sold or services rendered and expenses incurred is known as (a) matching concepts (b) consistency convention (c) adjusting for revenue (d) passing of

## entries

56. Micheal is a retailer. He recorded sales representing $95 \%$ cash and $5 \%$ credit. He took the total cash sales of N19000 from the business tray and banked it, the credit sales for the period would be (a) N5000 (b) N1900 (c) N1000 (d) N950
57. The transaction in number 66 would be recorded in the cash book as debit (a) cash and credit bank (b) bank and credit bank (c) cash and credit cash (d) bank and credit bank
Use the information below to answer question 58 and 59

|  | N |
| :--- | :--- |
| Sales | 232,000 |
| Opening stock | 28,000 |
| Purchases | 128,000 |
| Carriage inwards | 4000 |
| Carriage outwards | 6000 |
| Closing stock | 10,000 |
| Discount received | 18,000 |
| Expenses | 20,000 |

58. Calculate the gross profit (a) N100, 000 (b) $\mathrm{N} 86,000$ (c) $\mathrm{N} 76,000$ (d) N82, 000
59. Calculate the expenses debited to the profit and loss account (a) $\mathrm{N} 17,000$ (b) $\mathrm{N} 23,000$ (c) $\mathrm{N} 30,000$ (d) N 26, 000
60. Jude mistakenly entered N 7, 000 as credit sales in Abba's account instead of Baba account. This is (a) an error of principles (b) an error of commission (c) a compensating error (d) an error of omission
61. The major focus of the trading account is to show (a) net profit (b) gross margin (c) total purchases (d) total sales
62. Provision for discount allowed can be recorded as a debit to (a) the profit and loss account and a credit to provision for discount allowed (b) provision for discount allowed and a credit to the profit and loss account (c) discount allowed and a credit to the profit and loss account (d) expenses and a credit to customers account
63. An amount or percentage deducted from the normal selling price of something is
(a) profit
(b) discount (c) depreciation (d) accounting

Use the information below to answer questions below 64 and 65
A machine bought for N35, 000 was estimated to have a life span of 5 years with a scrap value of N9000
64. If the scrap value is presently N15, 000 what will be the yearly depreciation using the straight line method (a) N 4000 (b) N 7,000(c) N 11, 000 (d) N 24, 000
Use the information below to answer questions below
Sundry debtor N 20, 000
Provision for bad debt N 500
Provision for bad debt at $4 \%$ of sundry debtors
65. Determine the provision for bad debts to profit and loss account (a) N 500 (b) N 820 (c) N 1300 (d) N 300
66. Calculate the provision to be taken to the balance sheet (a) N 780 (b) N 800 (c) N 1200 (d) N 200
67. The depreciation on motor vehicle that is being used for manufacturing and administration is charged to the (a) debit side of manufacturing and profit and loss account (b) debit side of profit and loss only (c) credit side of profit and loss account only (d) debit side of manufacturing and balance sheet
68. The process of reconciling cheque between banks is termed cheque (a) truncation (b) clearing (c) holding (d) confirmation
69. An item credited in the bank statement but yet to be recorded in the firms' cashbook is (a) bank loan (b) contract payment (c) standing order (d) direct deposit
70. In a bank reconciliation statement, interest charged for overdrawn balances should be added to the (a) balance as per bank statement (b) bank balance as per adjusted cash book (c) aggregate balance as per cash book (d) bank balance as per cash book
71. Given that the balance as per cash book after adjustment was N6315, unpresented cheques N1000 and the bank statement balance N3240. What was the balance of the uncredited cheques (a) N4075 (b) N4240 (c) N3315 (d) N3075
72. A debtors' control account includes which of the following? (a) Accounts payable (b) Total of the sales journal
(c) Detailed entry for each debtor (d) General ledger entries
73. Where are the details behind the control account values captured? (a) On the general ledger (b) In a subsidiary ledger (c) In a spreadsheet (d) They are not required; simply add totals to the control account
74. The control account is also known as

## I. Total account

II. Adjustment account
III. Suspense account
IV. Self-balancing ledger
(a) I and II (b) I and III (c) II and III (d) I and IV
75. Which of the following is in a creditors control accounts? (a) Cash purchases (b) Credit sales (c) Credit purchase (d) Cash Sales
76. $\qquad$ is general ledger accounts containing summary of all debtors and creditors' balances (a) Convention Books (b) Journal Accounts (c) Control Accounts (d) Subsidiary Accounts
77. Outgoing mail should be (a) recorded in the register (b) recorded in the dispatch book (c) left unread (d) all of the above
78. The information sent out from one organization is called (a) outward mails (b) outgoing mails (c) internal mails (d) return outwards
79. The mail sent from one department to another within the some organization is called (a) incoming mail (b) outgoing mail (c) internal mail (d) none of the above
80. The document showing the data of all the staff in an organization is called (a) nominal roll (b) pay roll (c) catalogue (d) voucher
81. The document that shows records of discussion or events and proceedings that took place in particular meeting is called (a) minutes (b) motion (c) bye-laws (d) report
82 A receipt is a legal evidence of (a) payment (b) supply (c) profit recorded (d) loss recorded
83. $\qquad$ is used to communicate with individuals outside of the office. (a) Business Letter (b) Memo (c) Business Report (d) Invoice
84. To present a professional image of the company a receptionist should: (a) Have pointless and casual conversations about the weather with all visitors (b) Point out to visitors any shortcomings in their dress style (c) Leave confidential paperwork lying on the reception desk where everyone can see it (d) Be calm and polite at all times, and deal with all of their enquiries in a professional and courteous manner
85. The receptionist handles the following documents except (a) diary (b) vouchers (c) visitors book (d) visitors slip
86. A receptionist should have a good memory for names and faces, so they can: (a) Remember regular visitors and thereby offer them a quicker and more personal service (b) Use computer equipment more effectively (c) Write letters more professionally (d) Learn to use new office equipment
87. A visitor wants to park their car in the company car park, what is appropriate thing to be done by the security man? (a) Make some polite conversation about their car (b) Point blank refuse, and tell them to park elsewhere (c) If there is a space, issue them a car park pass (d) Tell them there are no spaces available, even when there are 88. A dictating machine is normally used to $\qquad$ message (a) record (b) delete (c) type (d) decode
89. John wants to destroy a document that he wants no one to see, which office machine would he use? (a) dictating machine (b) computer (c) type writer (d) shredding machine
90. Which equipment is used to store files safely? (a) Computer (b) file equipment (c) photocopier (d) file cabinet 91. Three departments in office organization includes $\qquad$ , __ \& $\qquad$ (a) control of stock, purchase department, staff training department (b) trade, cooperative, revenue department (c) control of stock, personnel department, account department (d) account department, purchase department and personnel department
92. The sales department (a) markets the products of the department (b) takes the stock of the company (d) plans and executes all production works (d) lays down company plan of business
93. The department that controls and directs the affairs of an organization is $\qquad$ department (a) account (b) administrative (c) sales (c) planning
94. The department in an organization that performs the function of preparing of vouchers and payment of salaries and wages of staff is. $\qquad$ . department (a) account (b) personnel (c) marketing (d) administrative 95. Office layout is concerned with (a) open office (b) efficient utilization of available space in the office (c) essential furniture in the office (d) closed office
96. All offices perform a variety of (a) communications (b) functions (c) fractions (d) dictions
97. Another name for private office is (a) office layout (b) close office (c) office sub-division (d) open office
98. In organizing a store, the storekeeper must consider (a) cost paid for goods (b) the nature of goods (c) value of goods (d) obsoleteness of goods.
99. Which of the following documents will be needed when goods are received in the store? (a). debit note. (b) Credit note (c) consignment note (d) delivery note
100. Which of the following is not important in store layout arrangement? (a) proper layout (b) proper lighting (c) adequate security (d) adequate staffing
101. A warehouse owned and controlled by an independent business firm is called (a) bonded warehouse (b) private warehouse (c) public warehouse(d) company warehouse
102. In receiving goods, the warehouse must (a) Inspect goods if required (b) Check for damage (c) Check the goods against on order and the bill of lading (d) All of above
103. A document which authorizes the issue of materials for use is (a) record requisition (b) materials requisition (c) bill requisition (d) maintenance
104. The purpose of taking inventory is to (a) ensure the store is not empty (b). keep the storekeeper busy (c) ensure regular flow of production activities (d) facilitate efficient use of funds
105 Which of the following is not an inventory? (a) machines (b) raw material (c)finished products (d) consumable

## tools

106. Which of the following is true for Inventory control? (a) Economic order quantity has minimum total cost per order (b) Inventory carrying costs increases with the quantity per order (c) ordering cost decreases with low size (d) All of the above
107. $\qquad$ includes all the activities involved in selling products or services directly to final consumers for their personal, nonbusiness use. (a) Brokering (b) Franchising (c) Wholesaling (d) Retailing
108. The means that helps people to travel from one place to another are called mode of .
(a) protocol
(b) organization (c) management (d) transport
109. Which of the following has a major influence on pricing decisions? (a) Customer demand (b) Actions of competitors (c) Costs (d) Political, legal and image-related issues
110. A legal maximum price at which a good can be sold is a price (a) floor (b) stabilization (c) support (d) ceiling 111. The market price of a share of common stock is determined by. $\qquad$ .: (a) The board of directors of the firm (b) The stock exchange in which the stocked is listed (c) The president of the company (d) Individual buying and selling the stock
111. In marketing terms, $\qquad$ refers to what we get for what we pay: (a) revenue (b) cost (c) value (d) product
112. An organization general expression of its overall purpose is known as its (a) Objective (b) Vision (c) Goal (d) Mission
113. Organization is a process of.
(a) identifying and grouping of work to be performed (b) defining and delegating the responsibility and authority (c) both ' $A$ ' and ' $B$ ' (d) none of the above
114. The person who undertakes life assurance is said to be (a) assurer (b) insurer (c) insured (d) assured
115. The difference between indemnity insurance and non-indemnity insurance is that the latter provides.
(a) cover for exporters against risks (b) cover for importers against risks (c) full payment to the insured (d) consolation payment to the insured
116. Insurance companies operate on the principle of indemnity. This means that an insured person or firm collects (a) double the value of loss suffered (b) only half of loss suffered (c) the total sum of the premiums paid prior to the loss

Use the table below to answer question 118 and 119.

| Name | Insured Amount (N) | Actual Value (N) | Actual loss (N) |
| :--- | :--- | :--- | :--- |
| Amobi | 25,000 | 100,000 | 30,000 |
| Ray | 30,000 | 120,000 | 40,000 |
| Micheal | 40,000 | 150,000 | 50,000 |

118. If Mr Amobi takes a fire insurance policy with average clause, his compensation will be (a) $\mathrm{N} 70,000$ (b) N75, 000 (c) N5, 000 (d) N 7, 000
119. What insurance principle has Mr Micheal violated if he decides to overstate the actual value of his property (a) uberrimae fidei (b) subrogation (c) indemnity (d) insurable interest
120. The right of an insurance company to stand in place of an insured against a third party, who is liable for the occurrence of a loss, is the principle of (a) proximate cause (b) insurable interest (c) insurance priority (d) subrogation
121. The temporary insurance certificate issued to the insured before drawing up a policy is a (a) testimonial (b) cover note (c) time policy (d) proposal form
122. Which of the following are essential features of a valid simple contract? (a) Offer and acceptance only (b) Offer, acceptance and duress (c) Offer, acceptance, privity, certainty and duress only (d) Offer, acceptance, consideration, intention to create legal relations and certainty of terms
123. The two main categories under which marine loss falls into are (a) total loss and partial loss (b) voyage policy loss and time policy loss (c) particular loss and average loss (d) actual loss and general loss
124. Endowment policy in insurance business is an aspect of (a) accident insurance policy (b) fidelity guarantee insurance policy (c) motor vehicle insurance policy (d) life assurance policy
125. The compensation that insured gets depends heavily on the (a) economic situation (b) premium paid (c) risk suffered (d) insurers buoyancy
